Leaving the Tier: Asymmetry in Pricing Patterns in Online High Tech Shops

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Abstract

Using simulation and empirical analysis, we examine asymmetry in pricing patterns within high-tech markets, where market leaders lead in both price increases and decreases. We examine 475,866 prices and 51,260 price changes for 810 high-tech products from 26 vendors over 283 days. We show that price premiums exist for the market leaders, but these leaders also engage in aggressive price decreases where market followers are unable or unwilling to competitively respond. Surprisingly, we show that large price premiums and market power can motivate a market leader to abandon high price premiums since capturing the entire market at a lower price can lead to greater profits. This research adds to the discussion of market friction and tiers by demonstrating that, in high-tech industries, drastic price cuts from market leaders that go beyond barriers to entry and loss leading can be profit maximizing.

1. Introduction

Many researchers discuss a price tier where competitors of similar market level compete (e.g., [8] and [1]). However, we have noticed that, on occasion, a market leader (a firm that attracts more consumer interest than its competitors) will leave its tier and price at a very low level. Consider Figure 1, where we examine the prices charged for a popular Canon camera by select competitors in the market over a two week period in January of 2005.

Note Amazon’s pricing behavior in Figure 1. Amazon, a market leader, is initially charging a high price for this Canon digital camera when we first started collecting data. This is consistent with most literature on market leadership, where Amazon is considered to be a well-known and trusted online vendor, and is taking advantage of their reputation and name recognition to charge a price premium.

The price drop in day 8 raises two questions: First, why would Amazon abandon its price premium? Second, why does Amazon price so incredibly low, when they could have the lowest price for several hundred dollars more? There could be several answers to this, including using this camera as a loss leader in order to sell other products, or possibly a hyper-competitive move that attempts to erect barriers to entry and continued existence in the market. However, these explanations bring two other questions to mind. First, if Amazon is acting competitively or using the camera as a loss leader, why not price closer to the rest of the market in these situations? As a market leader, Amazon would still profit from a $700 price and still be the low price leader, and its low price would still attract those who wish to pay the least for this camera. Instead, Amazon charges several hundred dollars less, apparently forgoing a large profit. Second, why didn’t any competitor respond? Here, we have a market leader making a very competitive move on a popular product, and no other firm in our observation responds with any type of similar low price.

Figure 1 shows an example of an asymmetric price pattern, where the market leader, Amazon, charges at the highest level for a product but then initiates a price reduction to price far below any competitor. The situation in Figure 1 prompts us to ask several research questions. What market factors
would cause a market leader to abandon its price premium and charge an extremely low price in an electronic market? What market factors would cause market followers and to avoid responding to such a competitive move? How can we theoretically and empirically examine the pricing patterns of these market leaders and followers?

This research is the first to illustrate how decaying demand motivates a market leader’s choice to capture the entire market. We examine 475,866 prices and 51,260 price changes for 810 high-tech products from 26 vendors over 283 days to show that the situation in Figure 1 is quite common, and the combination of decaying demand and market power can motivate a market leader to “leave the tier” and price below the rest of the market in order to maximize profit. We contribute to the marketing, economic, and IS pricing literature by discussing the impact of decaying demand on pricing decisions.

2. Related Literature

In this section we discuss referent literature on how market power and demand interact.

2.1. The Effect of Market Power on Demand

Many marketing and economics researchers (e.g., [16]; [15]) describe how recognized market leadership is an indicator of higher product quality or service, and that because of this, market leaders can demand a price premium over and above the prices charged by competitors. Sullivan ([17]) describes how market leaders can increase demand for nearly identical automobiles marketed by different automotive companies. Landes and Posner ([9]) analytically examine how consumers are willing to pay more for recognized names since brand names can reduce search costs and reduce the cognitive effort required to make buying decisions.

We build on these results by showing how well-known market leaders can leverage their price premium to affect the competitive market structure with regard to price, where a price premium can not only be used to charge a price above the competitive price but also be used to capture an entire market, especially in a market where demand is decaying.

2.2. Asymmetric Competition and Price Tiers

Carpenter et al. ([3]) show how market leaders compete asymmetrically. Price promotions of the market leaders can steal customers from market followers, but smaller firms’ price promotions have little effect on the leaders. Blattberg and Wisniewski [1] show how industries form price tiers: leaders compete with each other at a higher price level, and market followers compete with each other at a lower level. Narasimhan [11] discusses how firms promote based on the utility of attracting new customers compared to the economic utility of aggravating existing customers. In this research, we take their logic of popular market leaders to examine how a willingness to pay a price premium to a market leader can lead to a leader reducing their prices in order to capture the entire market.

2.3. Market Friction in Electronic Commerce

Recent research has challenged the conventional wisdom that electronic commerce will lead to intense competition. Brynjolfsson and Smith ([2]) empirically demonstrate that market friction exists online and where market leaders can charge a price premium. Clemons et al. [5] also show that more price dispersion exists in online environments than is explained by pure competition. In another empirical study that examines books and CDs sold over the Internet, Kauffman and Wood ([8]) apply Carpenter et al.’s ([3]) research to point out that asymmetric competition can lead to tacitly collusive situations.

Kauffman and Wood ([8]) illustrate the importance of considering asymmetric competition when studying pricing on the Internet by pointing out that the way the market leaders choose to interact with their competitors can have an impact on the competitive patterns of an entire market. This is particularly interesting in this context, where we contend that decaying demand can motivate market leaders to attempt to capture an entire market.

3. Theoretical Development

In this section, we theoretically examine price changes with decaying demand when there is a market leader to ultimately show how leading vendors will be motivated toward drastic price cuts far below their market follower competitors. To aid us in our analysis and to give some direction to our analysis, we developed a simulation of a market with price premiums and demand decay. We include selected charts from our simulation that help to graphically illustrate the theoretical implications driving our empirical analysis.
3.1. Defining the Decaying Demand Structures

The demand curves illustrated in Figures 2 and 3 are in the demand and profit curves from our simulation, we simulate a decaying demand using $p_t = (sp)(q^d)(t^{d\text{Decay}})$ where $p$ is price, $sp$ is starting price, $q$ is quantity, and $t$ is the elapsed time. The $d$ exponent forms a downward-sloping demand curve by forcing a decreased demand as price increases ($0 < d < 1$), consistent with economic theory, and decay forces a demand decay as time elapses (between $t$ and $t+x$ periods), as other research indicates is often seen with high-tech and informational products (e.g., [12], [4], [14], [10], and [16]). This demand decay is essential in describing some of the actions of the firms within a high-tech industry in this research.

![Figure 2. Market Leader and Follower Demand Curves in Period $t$](image1)

![Figure 3. Market Leader and Follower Demand Curves in Period $t+x$](image2)

The demand decay shown in Figures 2 and 3 illustrates how profit can be reduced for firms that compete within the industry. Using a simple profit formula of $\pi_t = (p_t-c)q^d$, where $c$ is the marginal costs, assumed static for this example, Figure 4 graphically describes how, in a market where demand decays, profit is reduced for market leaders who charge a price premium over time at every quantity point.

![Figure 4. How Market Leader Profit Decreases over Time with Decaying Demand](image3)

3.2. Analyzing Motivation to Capture the Entire Market when Demand Decays

Carpenter et al. ([3]) describes how asymmetric competition occurs because price promotions of market leaders affect market followers but that the opposite is not true. Other researchers point out how reputable market leaders can reduce prices, where market followers must match in order to compete, especially in electronic markets ([15], [2]).

We point out that in situations where a market leader can demand a price premium, that market leader is faced with a decision – whether to (a) take advantage of the price premium by charging an amount higher than the competitors, but capturing only part of the market, or (b) charge a low price to capture the entire market at a point where market followers cannot compete because it would be unprofitable to sell at a discount or that the market leader has a cost advantage due to economies of scale. In effect, market leaders can “leave the tier” and instead of using their price premium to sell at a higher price, they use their price premium advantage to make profitable competition impossible for market followers. We posit that, as demand continues to decay for high-tech products, capturing the entire market becomes more and more attractive, and market leaders will forgo price premiums, but rather market leaders will maximize profit by leveraging their reputation and name recognition to charge and extremely low price and capture the entire market.

As demand decays, market leaders will be motivated to reduce their prices (from $P_{M_0}$ to $P_{M_{t+1}}$ in Figure 5). Because market leaders can charge a price premium, there is some low price point where market
leaders can profitably capture the entire market ($P_E$ in Figure 5) where market followers will be unable to profitably compete.¹

Figure 5. Profit Reduction for Market Leaders when Demand Decays

Figure 5 shows a situation where profit from capturing the entire market decreases at a slower rate than profit for taking advantage of a price premium. In this situation, the seller will be more motivated to capture the entire market. If this situation occurs and persists, the profit from capturing the entire market can eventually exceed that of capturing only part of the market and charging a price premium.

Figures 6 and 7 from our simulation assume a static price to capture an entire market defined by $l = c + x$ where $l$ is the lower price required to capture a market, priced at a point of unit cost, $c$, and the price premium commanded by the market leader, $x$. At this point, market followers cannot compete without charging below costs, but a price premium allows market leaders to make a profit. As demand decays (as illustrated in Figures 2 and 3), the quantity sold and the prices charged by firms in an industry decrease over time, illustrating how demand decay lead to maximum profit. Figures 6 and 7 show how profit for both charging price premiums and profit from capturing the entire market both decrease, but, depending on the initial demand structure, profit for charging price premiums can decrease at a faster rate than profits for capturing the entire market, eventually motivating the market leader to reduce prices to a level where, given a price premium, the market followers cannot compete.

Figure 6. Market Leader Profit with Decaying Demand (Period $t$)

Figure 7. Market Leader Profit with Decaying Demand (Period $t+1$)

The implications from the situation shown in Figures 5, 6, and 7 are counter-intuitive. Much of the price premium research (e.g., [15], [1]) contends that the purpose of a high reputation and name recognition is so that the companies can leverage their superior reputation and charge a price premium beyond what their competitors charge. Our results show that with the existence of a price premium, decaying demand may lead to a change in strategy, where it can be profit-maximizing for the market leader to eventually leave its current competitive tier and make drastic price cuts in order to capture the entire market without the possibility of a profitable competitive response from the market followers.

¹ Note that this is especially true for informational goods with low or no production costs, such as financial information or online music. We assume identical costs in this part of our simulation, so goods easily transmitted over the Internet, where value decays rapidly. Informational goods will be particularly susceptible to a market leader who charges much less for an informational good as demand rapidly decays.
### 3.3. Price Premium Levels and the Motivation to Capture the Entire Market

![Figure 8. Market Leader Profit with a Low Price Premium](image)

![Figure 9. Market Leader Profit with a High Price Premium](image)

Figures 8 and 9 show that profit increases as price premiums increase, as can be expected. However, the profit for capturing an entire market also increases, **possibly at a faster rate**, and thus increases in price premiums can motivate the market leader to reduce prices in order to capture the entire market. (Again, note that market followers cannot profitably compete because customers to gravitate toward the market leader unless the market follower prices at a point below the market leader’s price adjusted for the price premium.)

Figures 8 and 9 show this insight by providing a scenario from our simulation where demand is assumed to be constant but the price premium commanded by the market leader changes from low to high. With a low price premium, there is less motivation to capture the entire market and more motivation to take advantage of the price premium and charge an amount above the prices of market followers. As the price premium increases, the profit for market leaders also increases, as is expected. However, the profit for capturing the entire market increases at a faster rate, so that a large enough price premium will motivate the market leader to charge a low price in order to maximize profits by capturing the entire market.

### 4. Data, Empirical Model and Hypothesis

Here, we describe the data collection and develop and test hypotheses implied by our simulation.

#### 4.1. Data

Following techniques described by Wood and Ow ([18]) and Kauffman and Wood ([7]), we used a customized Internet agent to collect data for this study that retrieved data from a Shopping.com, a popular shop ’bot at www.shopping.com where thousands of vendors provide daily (or more frequent) information. We gathered prices from the following Shopping.com categories:

- Cameras with at least 8.0 megapixel resolution
- Computers with, at minimum, a Pentium 4 chip (or equivalent, as determined by the shopping.com) and a DVD / CD with read/write capability
- Computer monitors with a viewing area of at least 25” and at least a maximum resolution of at least 1280x1024
- PC sound cards (circuit cards) with 7.1 channel surround and a max sample rate of at least 192 khz
- PC graphics cards with installed memory of at least 256 MB
- Camera zoom lenses with a maximum focal length of at least 300 mm
- Computer flash memory sticks with a capacity of at least 128 MB
- Camera flashes with power output of a flash unit rated with at least an 150 guide number

We also collect the number of unique visitors for each vendor, from Ranking.com (www.ranking.com), which ranks visits from over 900,000 sites.

We collected daily pricing data for 283 days, from 1/18/2005 to 10/28/2005. We exclude any vendor who did not sell at least five distinct products in our study and any vendor that did not sell a product at least one product for at least ten days. Furthermore, we exclude any vendor who was not listed in Ranking.com’s visitor list. We also exclude
any product that was sold by less than five vendors, and any product that was sold for less than ten days during this period. Our resulting dataset contains 475,866 price listings over a 283-day period, with 51,260 price changes for 810 high-tech products from 98 vendors.

4.2. Descriptive Statistics Examining the Major Assumptions

The major theoretical assumptions that we make are that (a) market leaders can charge a price premium for the products they sell and (b) prices for high tech products decay over time. In this section, we discuss these two major assumptions, and follow with the implications that these assumptions suggest.

4.2.1. Examination of Price Premiums. In our model, market leaders will not always charge a price premium, but can charge an extremely low amount in order to capture the entire market. Thus, we should see (a) market leaders charging a higher maximum price for items than market followers and (b) the minimum price that market leaders charge for an item should be less than the minimum price charged by market followers. This is because, at times, a market leader is motivated to price at an extremely low level in order to capture an entire market.

Table 1. Descriptive Statistics of the Most Visited Web Sites in Our Study

<table>
<thead>
<tr>
<th>Store</th>
<th>Unique Visitors</th>
<th>Average Price Premium</th>
<th>Lowest Discounted Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>25,207</td>
<td>102%</td>
<td>81%</td>
</tr>
<tr>
<td>Dell</td>
<td>14,035</td>
<td>111%</td>
<td>102%</td>
</tr>
<tr>
<td>Wal-Mart</td>
<td>12,225</td>
<td>98%</td>
<td>103%</td>
</tr>
<tr>
<td>Hewlett Packard</td>
<td>11,396</td>
<td>100%</td>
<td>101%</td>
</tr>
<tr>
<td>Overstock.com</td>
<td>10,636</td>
<td>90%</td>
<td>88%</td>
</tr>
<tr>
<td>Best Buy</td>
<td>9,488</td>
<td>107%</td>
<td>109%</td>
</tr>
<tr>
<td>Circuit City</td>
<td>8,001</td>
<td>108%</td>
<td>101%</td>
</tr>
<tr>
<td>Sony</td>
<td>6,720</td>
<td>116%</td>
<td>112%</td>
</tr>
<tr>
<td>TigerDirect.com</td>
<td>6,289</td>
<td>97%</td>
<td>99%</td>
</tr>
<tr>
<td>Buy.com</td>
<td>6,167</td>
<td>101%</td>
<td>99%</td>
</tr>
<tr>
<td>IBM</td>
<td>6,139</td>
<td>101%</td>
<td>98%</td>
</tr>
<tr>
<td>Average</td>
<td>103%</td>
<td>99%</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 lists 11 (out of 98) of the most popular sites in our study, showing the top firms in our study that received the most Web site visits using data from Ranking.com. Table 1 shows the price premium, which is the average maximum price charged by a company compared to the average maximum price across all vendors who sell the same product, and the discounted price, which is the lowest amount charged by a company compared to the average lowest amount charged by all vendors who sell the same product. For example, Circuit City charges a price premium at 108% of other firms. However, their lowest discount price is, on average, 101% of other firms’ lowest discount price.

Descriptively, we can see that, on average, market leaders do charge a price premium. However, they also discount at a level below market followers. In particular, Amazon charges a price premium, but is willing to discount far below other companies. Amazon prices at 102% of the average price, but their discounts are at 81% of the lowest discounts charged by other companies. Dell charges 11% above other vendors, but, on average, this price premium drops to 2% above other vendors.

4.2.2. Examination of Price Decay Consistent with Demand Decay for High Tech Products. In our simulation analysis, we make an implicit assumption of decaying demand, which has been noted for high-tech products by other research. We contend that falling prices are consistent with demand decay, and so that an overall reduction in average price charged for a product across vendors (price decay in this research) can act as a proxy for the level of demand decay for a product. To test this assumption, and thus to examine demand decay, we examine the 51,260 price changes that occur in our dataset. We find that, overall, vendor price changes implement price reductions of 3.6% from the vendor’s previous price, within a 95% confidence interval of \{3.4%, 3.7%\}. With the examination of each vendor’s price change, we see overall support of decaying demand, thus supporting the widely-accepted contention that high-tech products, as a rule, have a decaying demand curve that forces a reduction in prices.

4.2.3. Implications of our Examination of Assumptions. Evidence from examination of our data is consistent with both of our major assumptions, specifically the existence of a decaying demand and the existence of an overall price premium. Since this evidence indicates that the assumptions we use in our simulation analysis are consistent, it follows from this that the predictions from our analysis are also consistent. In the next section, we empirically test our theoretical predictions to see if our empirical analysis is consistent with our simulation results.

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2 Note that Table 1, some companies, like Wal-Mart and Overstock.com, seem to charge an “everyday low price” (EDLP), so that price discounts with single products do not fit with the overall company strategy. EDLP strategies and motivations are beyond the scope of this study, but these firms are included in the data set.
4.3. Empirical Model and Hypotheses

In our theory, we illustrate a pricing structure where a market leader takes advantage of a price premium to price in a way that profitable response from market followers is impossible. With this, we can empirically test competitive response by examining the market responses from the market leaders and the competitive responses from the market followers. This is described by the following probit empirical model:

\[ Pr(\text{CaptureMarket}_{f_i} = 1) = \alpha + \beta_1 \text{PriceDecay}_{i} + \beta_2 \text{PricePremiumLevel}_{i} + \beta_3 \text{MarketPower}_{f_i} + \beta_4 \text{Competition}_{i} + \epsilon \]

Table 2 describes the variables used in our probit model, while Table 3 shows the descriptive statistics for these variables. The maximum correlation between independent variables is 18%, and no variance inflation factor (VIF) is above 1.05, indicating that there are no multicollinearity issues that can corrupt our coefficient estimates. Note that our empirical model predicts a firm’s decision to capture a market for a specific item, and to adequately predict such a model, we examine data at the firm level (with a subscript \(f\)), at the item/product level (with a subscript of \(i\)), and at the firm/item level (with a subscript of \(fi\)).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture Market (f)</td>
<td>This is a qualitative choice dependent variable that is set to 1 if firm (f) leaves the high tier and prices at the lowest price of all firms in our study for item (i), and at least one standard deviation below the mean price of all prices for all firms for that specific item on a specific day. If not, CaptureMarket (f) is set to zero for that firm/item in our study.</td>
</tr>
<tr>
<td>Price Decay (i)</td>
<td>This is the percentage daily price decay, on average, for item (i).</td>
</tr>
<tr>
<td>Price Premium Level (i)</td>
<td>This is the highest daily percentage above that day’s average price that firm (f) charges for item (i).</td>
</tr>
<tr>
<td>Market Power (f)</td>
<td>This is the number of unique visitors (in thousands) that visit firm (f)'s Web site.</td>
</tr>
<tr>
<td>Competition (i)</td>
<td>This is the number of vendors who sell item (i).</td>
</tr>
<tr>
<td>Price Level (i)</td>
<td>This is the average price charged item (i), and is used as a control variable.</td>
</tr>
</tbody>
</table>

Table 2. Model Variable Description

Our simulation leads to several testable hypotheses. First, our simulation describes how sharp reductions in demand increase the likelihood of a firm pricing low enough to capture the entire market, leading to the following hypothesis:

**Price Decay Hypothesis (H1):** In online high-tech markets, market leaders are more likely to capture the entire market as prices in the overall market decrease.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CaptureMarket (f)</td>
<td>8.89%</td>
<td>0</td>
<td>1</td>
<td>0.28</td>
</tr>
<tr>
<td>PriceDecay (i)</td>
<td>0.0005</td>
<td>-0.005</td>
<td>0.014</td>
<td>0.00</td>
</tr>
<tr>
<td>PricePremiumLevel (i)</td>
<td>1.0000</td>
<td>0.020</td>
<td>7.147</td>
<td>0.13</td>
</tr>
<tr>
<td>MarketPower (f)</td>
<td>5.285</td>
<td>4.753</td>
<td>25.207</td>
<td>2.127</td>
</tr>
<tr>
<td>Competition (i)</td>
<td>19</td>
<td>5</td>
<td>69</td>
<td>14.14</td>
</tr>
<tr>
<td>PriceLevel (i)</td>
<td>1052.65</td>
<td>20.2</td>
<td>8040.1</td>
<td>835.25</td>
</tr>
</tbody>
</table>

Table 3. Model Descriptive Statistics

We also describe how market leaders may find it profit-maximizing to capture the entire market, and that this move is unavailable to market followers because of the existence of a price premium. Thus, the more market power a company has, the more likely it is to price at an extremely low level in order to capture the entire market:

**Market Power Hypothesis (H2):** Firms with more market power are more likely to attempt to capture the entire market.

Our simulation also describes how price premiums can motivate market leaders to capture the entire market, not because of a desire to erect barriers to entry or to drive existing competitors out of the market, but rather because it is profit maximizing. This leads to the following hypothesis:

**Price Premium Hypothesis (H3):** Higher price premiums are more likely to lead to firms that attempt to capture the entire market.

5. Results

Table 4 shows that all of our hypotheses are supported to some degree. In the **Price Decay Hypothesis (H1)**, we contend that the level of price decay (indicative of a decay in demand) experienced by a product in a market significantly impacts the probability of a firm leaving a top tier and trying to capture the market. We show that the firms are more likely to try to price at an extremely low level as
price decays, even below levels that would make that firm the low cost leader.

<table>
<thead>
<tr>
<th></th>
<th>Coeff</th>
<th>Std. Error</th>
<th>z- Stat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-2.5727</td>
<td>0.2012</td>
<td>-12.79 **</td>
</tr>
<tr>
<td>(\text{PriceDecay}_i)</td>
<td>100.6457</td>
<td>41.1108</td>
<td>2.45 ***</td>
</tr>
<tr>
<td>(\text{PricePremiumLevel}_i)</td>
<td>0.5128</td>
<td>0.1979</td>
<td>2.59 ***</td>
</tr>
<tr>
<td>(\text{MarketPower}_i)</td>
<td>0.0627</td>
<td>0.0064</td>
<td>9.79 ***</td>
</tr>
<tr>
<td>(\text{Competition}_i)</td>
<td>0.0081</td>
<td>0.0012</td>
<td>6.85 ***</td>
</tr>
<tr>
<td>(\text{PriceLevel}_i)</td>
<td>0.0001</td>
<td>0.0000</td>
<td>7.74 ***</td>
</tr>
</tbody>
</table>

= p-value < .05; ** = p-value < .01; *** = p-value < .001
Psuedo-R² (Nagelkerke): 3.7%
Observations: 9,143
Dependent Variable: Left Tier to Capture Market

Table 4. Probit Robust Results

However, H1 only describes that some firm will attempt to capture the entire market as price decays, and does not describe which firm is more likely to price at an extremely low level. In our Market Power Hypothesis (H2), we propose that firms with more market power (e.g., market leaders) are more likely to attempt to capture the entire market. Market power, proxied by unique Web site hits, also significantly impacts a firm’s willingness to leave the top tier, thus supporting our second hypothesis.

The Price Premium Hypothesis (H3) contends that larger price premiums motivate market leaders to abandon price premiums in favor of capturing the entire market. We show that this is because the large price premium makes it more difficult for market followers to compete and allows market leaders to price further above costs. Table 4 shows that the larger the price premium, the more willing a firm is to leave their tier and capture the market.

6. Further Analysis

In Figure 10, we divide the products in this study into quartiles based upon the percentage of price reductions for each product over the period of this study, in order to show how price decay correlates with the decision to capture the entire market. We divided our data into quartiles based upon how much price is reduced for any given product over the life of this study. Figure 10 shows how the decision to price below everyone else in the market almost doubles as price decay increases, as stated in our Price Decay Hypothesis (H1).

Figure 10 does not describe who attempts to capture the market, but rather that some vendor is more likely to capture the entire market with an extremely low price for products with high price decay. The Market Power Hypothesis (H2) describes how attempts to capture the market are more likely from market leaders than market followers.

In Figure 11, we divide the 98 stores in this study into quartiles divided by market power to show how market power affects the decision to capture the entire market. In Figure 11, we start to see a more complete story that the probit results shown in Table 4 are driven by a low probability to attempt to price low and capture the entire market when the respective vendor has extremely low market power (the first quartile), and a relatively higher probability to attempt price low and capture the entire market at relatively high market power (the fourth quartile). Of interest is the change in strategy between the first quartile vs. the second and third quartiles, where those with the lowest market power are less than half as likely to attempt to capture the entire market as companies in those quartiles. Note that the highest quartile is still significantly (t-test p-value < .01) more likely to capture the market than the second and
third quartiles, with the market leader showing a 12% higher likelihood of making a move to capture the entire market when compared to the second quartile, and a 22% higher likelihood when compared to the third quartile.

Our results in Table 4 support the Price Premium Hypothesis (H3). In Figure 12, we divide our 9,143 into quartiles based upon the price premium per store per product. Figure 12 shows a deeper insight, where the weakly significant results are driven entirely by a reluctance of firms to capture the entire market when the price premium of market leaders is extremely low (i.e., in the lowest quartile). A moderate price premium allows a sharp increase in willingness to capture the entire market, followed by a more slight decrease (in comparison) as price premium increases. This runs contrary to our simulation after the first quartile, and we call for future research to examine how price premiums will affect the willingness to price at an extremely low price point.

7. Conclusion

We believe that we are the first to research market power and price premiums in a decaying online market where search costs are low and switching is easy. Our simulation and empirical results indicate that a decaying market motivates market leaders to abandon their tier and attempt to capture the entire market, thus freezing out competitors with lower market power. This situation is especially true in online environments where consumer search costs are low, and thus consumers can easily track prices of market leaders.

Our empirical and simulation results have some surprising implications. First, although it may be counter-intuitive, our simulation and data both show that the larger the price premium, the more likely firms will abandon this price premium and price at an extremely low level because firms will find it profit-maximizing to capture the entire market. Market power will also lead to a motivation in market leaders to price at an extremely low level as prices decay.

Research into electronic market pricing often concentrates on the effect that low search and switch costs will have on competition, resulting in changes in the way market leaders react to competition and price premiums (e.g., [2], [5]) or collusion (e.g., [8]). However, few if any papers are devoted to a changing strategy as a market develops, especially in an electronic market where consumers can be more easily notified and act upon any price promotion. The motivation to abandon the price premium and price at an extremely low level is not often discussed in research, where the concentration is on products with growing or stable demand and research often describes how reputable market leaders can charge a price premium above market followers (e.g., [15], [2]). For markets where demand decays, as marked by average reductions in prices charged by vendors, the motivation may be to price where competition cannot occur.

For practice, especially in markets where demand decays, market leaders should consider changing strategy and pricing extremely low as prices are reduced in order to capture the entire market. Our empirical analysis shows that market leaders should be more prone to reduce prices at an extreme level in order to capture the entire market if either price premiums go from an extremely low point to a moderate or high level or if their market power increases. For market followers, smaller companies, and niche companies, managers should worry about the market power of the market leaders, attempting to increase their own market power and reputation in order to raise their market power in relation to market leaders and to keep price premiums low so as to reduce the possibility of being priced out of the market at some point.

There are some limitations with this work. Our simulation analysis shows that decaying demand coupled with price premiums will motivate market leaders to price extremely low to take over the market. Further, our empirical analysis is consistent with this contention. However, there may be other reasons that a firm may take over an entire market. For instance, we assume that retailers are identical, but some firms are manufacturers (e.g., Dell, IBM), while others are retailers (Best Buy, Circuit City), and others (like Amazon) sell a wide variety of products. Firm type may have an impact on pricing strategy, but is beyond the scope of this study. Also, we assume constant costs across all firms, but costs
can vary between firms, and a firm’s cost may drastically decrease in the middle of a sales cycle. For example, a camera manufacturer may approach Amazon to buy a large lot of cameras for a deep discount in order to liquidate inventory. Amazon, then, would realize a new cost advantage in the middle of the sales cycle that would motivate a move to take over the market. We do not consider cost changes or differentials in this research, but rather our propositions and hypotheses focus on a decreasing demand with price premiums. We call for further study on the effect of cost shifts and price premium shifts on pricing structure.

Another limitation exists in some of the unobservable aspects of Web purchasing. For example, payment method, website usability, Internet security level, or shipping reliability are likely to be incorporated into a price premium, but are not specifically examined in this research. We do not claim that pricing alone the only information to help understand competitive strategies, and in fact, this research points out the importance of developing a brand-name price premium (through easy usability, varied payment methods, high security, reliable shipping, etc.) as a means to reduce a market leader’s price premium (in comparison to your own) or even to become a market leader and thus have more varied competitive options open to the firm.

8. References


