Amazon Prime and "Free" Shipping

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Abstract

This thesis outlines how Amazon prices its items differently for Amazon Prime and non-Prime customers. I use data on prices from Amazon.com to show that prices are on average higher for Amazon Prime members than non-Prime customers. I show that selecting Free One-Day Shipping while searching for an item as an Amazon Prime member causes the list price to be on average higher than the list price for the same item for a non-Prime member. So, while one-day shipping is advertised as "free" to Prime members, these customers end up paying for the shipping via higher prices. In addition, searching up an item in the morning increases the likelihood of seeing a higher list price as a Prime member. Consumable items are also more likely to be priced differently for Prime versus non-Prime members than non-consumable items. I find that the pass-through cost of shipping to Amazon Prime customers is positive, further suggesting that Prime customers pay for "free" shipping through higher prices of goods. Amazon engages in price discrimination towards Prime members based on the type of item, the time the item is searched up, and the mode of shipping the customer selects for the item.

Introduction

An Amazon Prime membership costs $99 per year. The Prime membership is advertised as allowing members to have free two-day shipping on many items and also Free One-Day Shipping on some items. In addition, members are given access to music, TV shows, and movies. Customers who buy Prime memberships are under the impression that there are no fees on top of the upfront $99. But, with some preliminary data collection and analysis, I have found that prices are on average higher for Prime customers than non-Prime customers.

Amazon evidently uses dynamic pricing, "a pricing strategy which applies variable prices instead of fixed prices" (Kuiper). In 2000, an Amazon customer found that when he cleared his cookies on his computer, the price of a DVD on Amazon.com dropped from $26.24 to $22.74 (Ramasastry). The customer made this observation known to the greater public, inciting a public outcry. A few days later, Amazon CEO Jeff Bezos made a public announcements saying, "We've never tested and we never will test prices based on customer demographics. What we did was a random price test, and even that was a mistake because it created uncertainty for customers rather than simplifying their lives" (Ramasastry). He added that if they ever test different prices again they will charge all buyers the lowest price. Following this pricing scandal, Amazon refunded an average of $3.10 to 6,896 customers who bought the DVD at the increased price (Ramasastry).

Seventeen years later Amazon is being investigated by the FTC due to allegations that Amazon misleads customers about pricing discounts. The allegations came up following the Whole Foods and Amazon merger. Consumer Watchdog, a consumer advocacy group, claims that Amazon

"routinely uses inflated and fictitious previous prices to give customers the misleading impression they're getting a bargain" (Picchi). Amazon clearly has a strategy to determine prices; and contrary to what Bezos said in 2000, Amazon.com prices are different depending on who's buying.

I will address the following question: Are items priced differently for Prime and non-Prime customers? I use data that is hand-scraped from Amazon.com to address this question. The dataset I use is comprised of item names and the corresponding prices for Prime and non-Prime customers. In addition, I use this data to estimate the pass-through of shipping costs for Prime customers.

Ultimately I find that list prices are different for Prime and non-Prime members. More specifically, the following three variables are correlated with higher list prices for Amazon Prime customers: selecting Free One-Day Shipping, searching up an item in the morning, and searching up a consumable item.

Literature Review

There is currently no literature on the difference in pricing for Amazon Prime and non-Prime members. There is some literature on Amazon's pricing scheme in general, though. For example, there is a paper that discusses how algorithmic pricing on Amazon Marketplace has resulted in price fixing and unpredictable prices (Chen, 2016). Amazon Marketplace allows third-party sellers to sell products alongside Amazon's offerings. This paper delivers insight on how these third party sellers determine their prices (Chen, 2016). While this strengthens my understanding

of pricing trends within the Marketplace, it does not address the issue I am looking at: the difference in pricing for Prime versus non-Prime customers.

There is another piece of literature that discusses consumer behavior in online auctions. The paper posits that while shopping on eBay, consumers are anchored to a certain price that they are willing to pay and adjust their bidding on the product accordingly. This leads many of the customers to ignore the "less-salient" costs of the items, namely the shipping cost. Both inexperienced and experienced bidders exhibit this behavior. The authors conclude that customers do not consider shipping costs when deciding how much to bid for an item (Clark, 2008). This is in the context of bidding so it doesn't necessarily describe consumer choices on Amazon.com, where there is a fixed price and no bidding. It's relevant, though, because if an Amazon Prime shopper notices an abnormally high price and the shipping cost is built into that price, the consumer might still choose to purchase the item because the customer believes there is "free shipping." In reality, the shipping cost is hidden, causing the consumer to not consider the premium on the item he or she is paying for "free shipping."

Contrary to Clark's findings, another paper asserts that consumers are hyperaware of shipping costs and do base their consumption choices with shipping costs in mind. The paper discusses the importance of online retailers choosing appropriate shipping and handling costs to optimize profits. The authors discuss how there is a relationship between the cost of shipping and the order size in the context of consumer decision making. Over 60% of online shoppers don't continue with their order when they are shown the shipping costs (Lewis, 2006). Furthermore, 50% of online shoppers say that their main complaint about online shopping is the shipping fees

(Lewis, 2006). This piece of literature is important because it provides insight on the motivation Amazon has to offer free shipping. If the shipping costs end up being hidden in the price of the item but Amazon can offer free shipping, Amazon could avoid the problem of customers not going through with their purchase upon seeing shipping fees.

Lastly, there are multiple papers on pricing strategies for e-commerce. In one paper, researchers discuss how e-commerce companies are using auction models in consumer markets to sell different items. The authors also share that marketers use dynamic pricing because of the low cost of changing prices online. Furthermore, consumers are more easily able to compare prices, making it so suppliers need to be more conscious about the prices they offer (Kannan, 2011). This paper provides context for how e-commerce companies price different goods.

This paper will contribute to the literature on pricing strategies in e-commerce. It will give insight into how Amazon determines prices and the level at which Amazon price discriminates. In a broader sense, my research will help Amazon customers and online shoppers in general become more informed and might even cause some to consider whether an Amazon Prime account is worth it or not.

Economic Theory and Background Research

Classic economic theory would suggest that online shoppers seek to maximize their utility subject to their budget while shopping on an online platform such as Amazon. Since one of the main attractions of Amazon Prime is the free two-day shipping, a customer who is a Prime member may value the two-day shipping so much that the premium they pay on an item as a

Prime shopper is worth the convenience of two-day shipping and other Prime benefits. More likely, the Prime customer doesn't know that his price is actually higher than the price for someone without an Amazon Prime account. Without full information, the consumer is unable to make an efficient utility-maximizing decision.

One reason why Amazon Prime members may be paying more on average for a given item than non-Prime members is that there is not perfect informational efficiency for Prime members. If consumers don't know that they are paying more than necessary there's no reason to expect them to not purchase a given item. The consumer is maximizing her utility with the information she has at the time. The non-Prime member does not have access to the prices that the Prime member has so also assumes that he is paying the lowest price that Amazon is offering and maximizing his utility with the present information.

Economic theory would also suggest that perfect competition leads to a universal price for an item; this is called the Law of One Price (Kumar). But, price dispersion is evident in e-commerce, suggesting that the Law of One Price might not hold in the context of e-commerce. For example, researchers have found that search cost is correlated with willingness to pay and that e-commerce platforms that offer convenience to customers can charge a premium to time-sensitive customers (Kumar).

Amazon-Prime members are arguably time sensitive since the main attraction of Prime is the free two-day shipping. If a Prime member was willing to pay for the membership, he clearly holds some value in convenience. Conversely non-Prime members might not value convenience as

much. So, considering the theory that e-commerce consumers pay more for convenience, it is sensible that Amazon can charge Prime members more than non-Prime members for the same item. Furthermore, Prime members might be so loyal to Amazon that they wouldn't consider looking for lower prices on another site; after all, Prime members did pay the $99 upfront cost of Prime. A non-Prime member might spend more time trying to find a lower price. So to stay competitive, Amazon has to make the list price closer to that of its competitors.

Amazon presumably uses this pricing strategy to maximize its profits. Amazon is incentivized to charge a higher price for Prime members to make more money, but risks a bad reputation and potentially losing business if customers feel that Amazon is being deceitful.

Hypotheses

Hypothesis 1: Amazon charges higher prices for Amazon Prime users. Amazon has a history of purchases by this user and has insight on the consumer's spending habits and a general profile of the user. Amazon offsets the cost of the free two-day shipping it offers customers by charging those who utilize the free two-day shipping and in turn cost Amazon more.

Hypothesis 2: Amazon charges higher prices for Amazon Prime users who specifically select the Free One-Day Shipping option. One perk of having Amazon Prime is that the member gets free two-day shipping on most products. Free One-Day Shipping is sometimes available but the user must indicate that he/she needs one-day shipping when the user searches up the product. Amazon might claim that the shipping is free and then offset the cost of it through the form of higher prices.

Empirical Strategy

My dataset includes the following variables:

1. The name of the item
2. The number of reviews
3. The Prime price
4. The non-Prime price
5. Consumable or non-consumable
6. Purchased before or not
7. Date and time of searching up the item
8. Type of product
9. Whether Free One-Day Shipping was selected or not

The name of the item and the number of reviews are included because they together identify a specific product. The Prime price is the list price for each item that is displayed when a Prime user searches up the product. I define consumable as an item that can be used up quickly. Purchased before is a dummy variable that takes the value 1 if the Prime customer has bought the item before and 0 if not. The date and time of searching up the item is self explanatory. Type of product is defined as the product I initially searched up in the Amazon search bar to get my results. Finally, Free One-Day Shipping is a dummy variable indicating whether I selected Free One-Day Shipping as an option or not.

I'm including consumable because I've noticed that many products such as candles and lotions are priced higher while I'm on my Prime account—this may be because Amazon knows that

even if I've bought lotion before, it is likely that I will need more once I use it up. I am including "purchased before" because one thing that makes Prime unique is that Amazon has such a clear picture of the customer who's browsing. This includes all of the customer's purchase history. Amazon could look at what a customer has bought before and, based on trends they see with other customers, predict your willingness to pay and likeliness to buy and then price the item accordingly.

I am including Free One-Day Shipping because this could be the driving force of higher prices for Prime customers. I assume one-day shipping is expensive for Amazon but to make Prime more appealing, Amazon offers it for "free" for Amazon Prime members. So once Amazon knows you're looking to get one-day shipping, they include the shipping costs in the price of the item, unbeknownst to the customer. Lastly, I included AM/PM to understand if the time of day that the search is performed has an effect on whether there is a price difference or not.

I use the log of prices throughout my analysis to account for the fact that some items are more expensive than others. I also use robust variance estimates throughout my analysis to account for the possibility that the error terms are homoscedastic.

To begin my analysis, I perform a basic t-test to test the difference in means of the Amazon Prime prices and the non-Amazon-Prime prices.

Then, I attempt to understand what determines whether there is a difference in price or not for Prime and non-Prime customers. In my analysis "difference" is a dummy variable that indicates

whether there is a difference in the price of an item for a Prime and non-Prime customer. It takes the value 1 if there is a difference in the prices and 0 if there is not. "FreeOneDayShip" takes the value 1 if I selected Free One-Day Shipping in my search and 0 otherwise. The first regression I run is the following:

$$Difference = \beta_0 + \beta_1 FreeOneDayShip + \epsilon$$

Equation 1

This regression does not consider the magnitude of the difference; it simply considers whether there is a difference for Prime/ non-Prime customers or not. I then add more independent variables, namely whether the item is a consumable or not (Consumable), whether I have purchased it before or not (Purchased_Before), and a time indicator (Time_Indicator). Consumable takes the value 1 if the item is a consumable and 0 if not. Purchased_Before takes the value 1 if the customer has bought the item before and 0 if not. Time_Indicator takes the value 1 if the item was searched up in the morning (AM) and 0 if it was searched up in the afternoon/evening (PM). I regress whether there is a difference in price or not on these variables using the following model:

$$difference = \beta_0 + \beta_1 Consumable + \beta_2 Purchased\_Before + \beta_3 Time\_Indicator + \beta_4 FreeOneDayShip + \epsilon$$

Equation 2

Then, in addition to estimating what determines whether there is a difference or not, I attempt to measure the magnitude of the difference in price. The variable "difference_magnitude" is the difference in price for Prime versus non-Prime customers:

$$difference\_magnitude = price_{prime} - price_{nonprime}$$

Equation 3

I first run a regression of the log difference in prices on just Free One-Day Shipping to understand how much of an effect selecting Free One-Day Shipping has on the magnitude of the difference in prices.

$$log(difference\_magnitude) = \beta_0 + \beta_1 FreeOneDayShip + \epsilon$$

Equation 4

I then run another regression of the log difference in prices on Free One-Day Shipping and include more independent variables as controls.

$$log(difference\_magnitude) = \beta_0 + \beta_1 Consumable + \beta_2 Purchased\_Before + \beta_3 Time\_Indicator + \beta_4 FreeOneDayShip + \epsilon$$

Equation 5

Finally, I estimate the pass-through of shipping costs into the Prime price. The pass-through is measured as a percentage, and is the difference in the Prime price and non-Prime price divided by the cost of shipping.

$$passthrough = \frac{price_{prime} - price_{nonprime}}{shippingcost}$$

Equation 6

Understanding the pass-through is important because it explains what fraction of the list price is determined by the shipping costs.

Data

I manually collected the following data from Amazon.com: item name, number of reviews, Prime price, and non-Prime price. The dataset also includes the date and time that I looked up the product and the type of product. After collecting these data, I created the following indicator variables: consumable, purchased before, time indicator (AM or PM) and Free One-Day shipping.

To collect data on the specific price for an item, the first thing I did is open two Safari windows—one is in private browsing mode and the other is a generic webpage. Private browsing mode disables browsing history and clears the web cache so websites do not have information on the user. I used private browsing mode to isolate the effects of having a Prime account. Within the private browsing window, I am a random user with no history or background for Amazon to use to determine a price. Next I opened Amazon (while logged into my Prime account) and searched up a product.

Within seconds of searching up the product when I am logged in to my Prime account, I search for the same product on Amazon.com in my private browsing window. Searching them up simultaneously eliminates the chance that it could be the time of the search that is affecting the price. The next step is recording the data (further information about recording the data can be found in Appendix A).

I initially collected data on six items that I thought of to search up on Amazon. This includes: a spatula, caffeinated black tea, a cookbook, hand lotion, nail polish, a hair mask, an iPhone case, mascara, and dog beds. This brought up concerns about possible biases in my results because the items I searched up were not truly random. 295 observations are from these items.

To address this concern and eliminate possible bias for future observations, I identified the frequency of each letter in the alphabet and generated eight random strings of two letters to search up in the Amazon search bar. When two letters are put into the search bar, Amazon populates a drop down menu with ten recommended searches. So, I used a random number generator to determine which out of the ten recommended searches I would select. The random strings of letters, based on the frequency of the alphabet, that I generated are: sc, is, tf, ts, oo, rh, cu, and ra. These strings combined with the random number generator gave me the following items to search up: scissors, isopure zero, tf card 32gb, tsa luggage locks, oontz angle 3 ultra, rhodiola rosea, cupshe swimsuit, and raw cones.

While collecting data on these items, I randomized whether I selected Free One-Day Shipping or not by using a coin flip simulation. If the coin was heads, I selected Free One-Day Shipping and if the coin was tails, I did not.

Searching these items up gave me an additional 205 data points for a total of 500 observations. Some items only showed up in the search results for the Prime user and vise-versa. Since I only had information one price in this instance, I dropped these observations from my dataset. In addition, I found that I had recorded the data for two of my observations incorrectly which I realized while looking at a summary of my data and seeing two outliers. Instead of recording the Prime price, I had recorded the number of reviews. So when I went to look at the difference in price for the Prime and non-Prime accounts, the difference was $400. I dropped these two observations from my dataset and was ultimately left with 398 observations.

After manually collecting the data, I realized an important part of understanding whether Amazon prices differently for Prime versus non-Prime customers is how much shipping costs for non-Prime members. I used Upwork, a global freelancing platform, to hire someone to collect data on how much each of these items costs to ship to a non-Prime user. I obtained data on shipping costs for 296 observations (further information about this can be found in Appendix B). Since some of the prices of the items changed since I originally collected the data, I ran two separate analyses. The analysis denoted “restricted” indicates that I restricted the sample size to just the observations that had the same price in both data collection processes.

A summary of the data is shown below.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Number of Reviews	394	739.7	2,291	1	29,328
Prime Price	398	15.28	11.86	1.930	130.0
Non-Prime Price	398	15.02	11.54	1.490	130.0
Consumable	398	0.500	0.501	0	1
Purchased Before	398	0.0126	0.112	0	1
Time Indicator	398	0.859	0.348	0	1
Free One-Day Shipping	398	0.425	0.495	0	1
Difference	398	0.0578	0.234	0	1
Amount Difference	398	0.260	1.718	0	23.74

Table 1: Summary Statistics

The least expensive item I looked at is $1.49 and the most expensive item I observed is $130. Half of my observations are consumables and I've purchased around 1% of them. I searched up the majority of items during the morning and I selected Free One-Day Shipping for almost half of the items I searched up.

A little under 6% of observations have a difference in price for Prime and non-Prime. The smallest difference in price is no difference and the most extreme difference in price is $23.74. Since the minimum difference is 0, for every item that had a difference in price for Prime and non-Prime, the Prime customer always had the higher price.

Results

A t-test to measure the difference in means of prices for Amazon Prime members and non-Prime members shows that Prime-prices are on average 26 cents more than the prices for non-Prime members.

	(1)
	ttestdiff
VARIABLES	Amount_Difference
Constant	0.260***
	(0.0861)
Observations	398
R-squared	0.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: T-Test for Difference in Mean Prices

While the magnitude of the difference is not much, the fact that there is a difference confirms my hypothesis that Prime customers are shown different list prices than the prices shown to non-Prime customers. More specifically, Prime customers are charged on average higher prices.

Estimating Whether There is a Difference in Price for Prime versus Non-Prime

After observing that Prime users are charged higher prices than non-Prime members, I ran a regression to understand if it is specifically Free One-Day Shipping that determines whether there is a difference in price for Prime and non-Prime members or not.

VARIABLES	(1) All observations Difference	(2) Only Random Observations Difference
Free One-Day Shipping	0.0847***	0.106**
	(0.0257)	(0.0453)
Constant	0.0218**	-0
	(0.00968)	(4.71e-10)
Observations	398	141
R-squared	0.032	0.074

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Effect of Free One-Day Shipping on Whether There is a Difference in Price

This model shows that selecting Free One-Day Shipping has a significant effect on whether there is a difference in price or not. Selecting Free One-Day Shipping increases the probability of a difference in price by 8.5%. The "all observations" model includes the 398 non-random observations. Restricting the sample to just random items yields even more extreme results. Using only the 141 random observations, this regression specification suggests that selecting Free One-Day Shipping increases the chances of a difference in price by 11%.

When I include more independent variables in my regression I find that consumable items, items with Free One-Day Shipping, and items that are searched up in the morning are the most likely to be priced differently for a Prime user.

VARIABLES	(1) All observations Difference	(2) Only random observations Difference
Consumable	0.0399*	0.0380
	(0.0220)	(0.0905)
Purchased Before	-0.0424	
	(0.0309)	
Time Indicator	0.128***	
	(0.0378)	
Free One-Day Shipping	0.122***	0.0870
	(0.0346)	(0.0594)
Constant	-0.124***	-0***
	(0.0405)	(0)
Observations	398	141
R-squared	0.070	0.077

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Other Factors that Determine a Difference in Price

An item being a consumable increases the chances of a difference in price by 4%. Searching the item up in the morning increases the chance of a difference by 13%. Selecting Free One-Day Shipping increases the chance that there's a difference in price by 12%. Restricting the sample to just random items yields less convincing results. The coefficient on Free One-Day Shipping is smaller and is not significant. Given the limited sample size of random observations, it might be that there is not enough variability within the data to produce sound results.

Both "time_indicator" and "purchased_before" were dropped from the "only random observations" regression because of collinearity. In results from this model, none of the coefficients are statistically significant other than the constant.

Estimating the Magnitude of the Difference in Price

After finding evidence that Free One-Day Shipping increases both the price of an item and the probability that there is a difference in price for Prime and non-Prime members, I sought to estimate the magnitude of the difference. Running a regression on the log difference of prices on Free One-Day Shipping shows the following: the price difference of a specific item for a Prime versus non-Prime member is on average 3 cents higher if the consumer selects Free One-Day Shipping. Including only random observations yields almost identical results.

	(1)	(2)
	All observations	Only random observations
VARIABLES	logdiff	logdiff
Free One-Day Shipping	0.0288**	0.0284**
	(0.0125)	(0.0133)
Constant	0.00538**	-0
	(0.00247)	(9.61e-11)
Observations	398	141
R-squared	0.017	0.061

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Effect of Free One-Day Shipping on Magnitude of Price Difference

Next, I ran a regression to understand if the following independent variables of interest had an effect on the magnitude of the difference in price for a Prime and non-Prime customer: consumable, purchased before, and time indicator. When additional independent variables are included in the regression to determine what affects the magnitude of a price difference, none of the coefficients are significant except for Free One-Day Shipping.

VARIABLES	(1) Without Interactions logdiff	(2) With Interactions logdiff
Consumable	0.0134	0.00350
	(0.00981)	(0.00522)
Purchased Before	-0.0173	-0.00565*
	(0.0107)	(0.00291)
Time Indicator	0.0196	0.0184
	(0.0254)	(0.0257)
Free One-Day Shipping	0.0334**	0.0209
	(0.0150)	(0.0152)
Free One-Day Shipping x Consumable		0.0234
		(0.0228)
Free One-Day Shipping x Time Indicator		-
Free One-Day Shipping x Purchased Before		-0.0159
		(0.0174)
Constant	-0.0199	-0.0145
	(0.0251)	(0.0259)
Observations	398	398
R-squared	0.025	0.028

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Effect of Interactions of Independent Variables on Magnitude of Difference

I also interacted Free One-Day Shipping with other independent variables to further examine what affects the magnitude of a difference in price for Prime and non-Prime customers.

When I include interactions between the independent variables, “purchased before” is the only independent variable that is significant. This specification suggests that an item is .5% less expensive if it has been purchased before. The corresponding regression that only includes random observations can be found in Appendix C.

This set of regressions demonstrates that selecting Free One-Day Shipping has the most significant effect on the magnitude of the difference in prices between a Prime and non-Prime shopper. Consumers who are hesitant to pay anything extra for one-day shipping should take this into consideration while shopping on Amazon.com. While the magnitude of the difference is not very much, consumers who select Free One-Day Shipping are not actually getting the convenience of one-day shipping for free.

Estimating Pass-Through Costs

The pass-through cost of shipping to Prime customers can be thought of as the percent of the shipping costs that the Prime customers pay through the cost of the item. Using shipping costs for all of my observations, I find that the pass-through cost of shipping is 4% for Prime members. Restricting the sample to just observations for which the price was the same when the shipping cost data was collected as the original data was, the pass-through cost is almost 1%.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Pass Through	296	0.0400	0.236	0	2.405
Pass Through, Restricted	119	0.000922	0.0101	0	0.110

Table 7: Estimated Pass-Through Costs

So while Prime members do not have to pay the full amount of shipping on top of the cost of the item, they do pay for 4% of it through increased prices for their items. At a rate of only $99 per year for a Prime membership and a pass-through cost of only 4%, a Prime membership would be most valuable to a frequent shopper who would be paying for shipping otherwise.

Revisiting Hypotheses

The data show that there is a difference in price for Prime and non-Prime customers. Amazon Prime users are shown, on average, higher list prices than non-Prime customers. This confirms my first hypothesis.

The data also show that selecting Free One-Day Shipping increases the likelihood of a difference occurring and increases the magnitude of the difference. The results from the majority of my models show this, affirming my second hypothesis.

Conclusion

In this paper I use a t-test and multiple OLS regressions to estimate whether prices are different for Amazon Prime and non-Prime members. I then use different regression models to show what

determines the magnitude of a difference in price for a Prime and non-Prime member. Finally I estimate the pass-through cost of shipping for Amazon-Prime members. I consult previous literature to understand the choices companies face in deciding how to price items and configure shipping prices.

I find that prices are on average higher for Prime customers compared to non-Prime customers. The higher prices for Prime customers are driven by a variety of factors, the most pressing being selecting Free One-Day Shipping. Buying consumable items and searching up the item in the morning also tends to yield higher prices for a Prime versus non-Prime customer. Lastly, I find that the pass-through of shipping costs to Amazon-Prime members is positive, suggesting that Prime members pay for shipping via the higher price of the item.

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Appendix A

Data Collection Process

I have an excel spreadsheet that contains all of my data. I first record all of the names and the number of reviews for each product on the first page. Some types of products have two items that look or sound identical but are not actually the same listing on Amazon. Recording the number of reviews helps me uniquely identify a listing on Amazon. Next I record the price that I am seeing while logged into Prime and then the price on my private browsing window. After this I load the second page of the results (both private and not) and repeat the steps of recording the pricing data.

Appendix B

Using Upwork to Collect Data

This data collection for shipping prices was done after I had gathered my primary data. This could be a shortcoming in my analysis because I did not collect the price of the shipping at the same time as I collected the other data—so if the price of the item changed the price of the shipping could have also changed. To address this issue, the Upwork worker collected the price of the item in addition to the cost of shipping. I account for this by running two separate analyses—one that just includes the items that have the same price today as they did when I initially collected information on them, and one for all of the items irrespective of a change in price.

Appendix C

Table 7 With Only Random Variables

VARIABLES	(1) Without Interactions logdiff	(2) With Interactions logdiff
Consumable	0.0217	0.0217
	(0.0263)	(0.0263)
Purchased Before	-	-
Time Indicator	-	-
Free One-Day Shipping	0.0173	0.0173
	(0.0131)	(0.0131)
Free One-Day Shipping x Consumable		-
Free One-Day Shipping x Time Indicator		-
Free One-Day Shipping x Purchased Before		-
Constant	-0*	-0*
	(0)	(0)
Observations	141	141
R-squared	0.075	0.075

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A1