Food Distribution Research Society

Journal of Food Distribution Research
Volume 55, Issue 1, pp. 15–31

Measuring Brand Equity on Amazon.com: The Case of Starbucks

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Abstract

This study uses novel data to estimate the price and sales rank premium for Starbucks ground coffee on Amazon.com and compares this premium with that of other major ground coffee brands. We find that the price premium for Starbucks ground coffee is 13%–42%, which is higher than the price premium for Dunkin' Donuts, Folgers, and Lavazza brands. We also find that Starbucks commands a sales rank premium of 52%–64%, but the other three premium brands challenge it as the top-selling ground coffee. These results show that Starbucks differentiates itself among major coffee brands, even on Amazon.com.

Keywords: Amazon, brand equity, hedonic analysis, price premium, Starbucks

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Introduction

In retailing, having an online presence is increasingly vital, and there is no other place that is more important to establish that presence in the United States than on Amazon.com. Amazon is the largest e-commerce platform in the world, with $220 billion in revenue in 2022 (Amazon, 2023). Many food companies recognize this, but there is limited evidence of how these brands perform on e-commerce platforms. Amazon and other e-commerce platforms feature metrics that are visible to consumers, such as sales rankings for brands, which are highly influential to customers (Ahmad and Guzman, 2021). The economic and managerial implications of these e-commerce metrics remain largely unexplored. However, a growing body of empirical research uses data from e-commerce platforms to measure factors such as returns to reputation (Fan, Ju, and Xiao, 2016) and hedonic pricing (Carlucci et al., 2014).

Moreover, the transparency of prices in e-commerce allows for estimating price premia relative to other brands. Li (2022) used data from the Chinese e-commerce platform Taobao to investigate the role of place-of-origin claims in determining price premia. Wang (2018) used data from Amazon.com to study the price premia of used books. We contribute to the broader literature on price dispersion by highlighting brand-level price premia as a factor that helps explain price variation within product categories.

As a case study, we focus on Starbucks coffee. Starbucks began operating in Seattle in 1971. Since then, the company has grown exponentially, and as of May 2022, it operates more than 34,000 stores in 84 countries (Starbucks, 2022). The success of Starbucks has aroused widespread interest in the performance of the Starbucks brand. For example, Starbucks owners, partners, and investors often question the relative strength of their brand compared to its past performance and major competitors and how that strength translates across markets and countries (Aaker, 1996; Schultz and Gordon, 2012). Starbucks has not enjoyed the same level of success in all regions it has entered (Patterson, Scott, and Uncles, 2010); the reasons for lack of success are poorly understood. To help understand the determinants of brand-level performance, we measure the price and sales rank premium of Starbucks ground coffee on Amazon.com and compare our estimates with those of other major ground coffee brands.

Due to its global reach and reputation, we expect Starbucks coffee to sell at a price premium compared to other brands. However, few studies have attempted to measure this premium. An example is the work of Vishwarath and Harding (2000), who alluded to the Starbucks Effect in the coffee industry of the United States, arguing that the company's tremendous growth led to a chain of investments and innovations that spanned the U.S. economy. For example, Starbucks has been reported to have a positive cachet effect on the coffee industry and a positive spillover effect on neighboring real estate markets (Zillow, 2018; Vishwarath and Harding, 2000). But despite this exciting insight, Vishwarath and Harding stopped short of providing an exact price and sales premium for the Starbucks brand. Vachon (2022) focused on the store experience, comparing the price of a cup of Starbucks coffee relative to its major competitors, and found that drip coffee prices averaged 20%–27% higher than those at Dunkin' Donuts and 8%–15% higher than those at Caribou. Although physical stores are the main component of Starbucks' revenues, we focus on

online ground coffee markets. We test if price and sales premiums for cups of Starbucks coffee are held for its ground coffee on Amazon.com and contribute to the literature on measuring brand equity.

We adopt a straightforward technique for estimating price and sales rank premia using e-commerce data. Applying our methods to a sample of 23,145 observations from Amazon.com, we find that Starbucks commands a price premium of 13%–42%, which is higher than the price premium of other major ground coffee brands. Starbucks' major competitors in the ground coffee market on Amazon.com are Dunkin' Donuts, Lavazza, and Folgers, and the price premium for Starbucks is higher than those of these competing brands. Despite the high price premium for Starbucks, we also find that the brand commands a significant sales rank premium of 52%–64%, relative to the three major premium brands, and is the top-selling ground coffee brand. We conclude that Starbucks has succeeded in differentiating itself even in the online ground coffee market. Starbucks' high price and sales rank premium suggests that the in-store experience translates into the online markets, a testament to customer loyalty and the company's reputation.

Our study contributes to the literature strand that focuses on using web-scraped data for economic analyses, which is becoming an integral component of the more extensive literature of the broader field of economics. Edelman (2012), in a highly influential article, predicted the possible boom of using web-scraped data for economic analyses. He noted that government agencies and large institutions dominate traditional methods of collecting economic data, which are often very expensive. He also recognized that researchers usually collect their data mainly because of the Internet. Edelman's insights have provided the foundation for many economic studies (Cavallo and Rigobon, 2016; Cavallo, 2017; Hillen, 2019; Etumnu and Noumir, 2023). For example, Cavallo (2017) and Cavallo and Rigobon (2016) used web-scrapped data from a project that aimed to collect over 1 billion price observations from the Internet across the globe. A few studies using web-scraped data exist in agricultural and applied economics. Volpe (2011) used web-scraped data on two supermarket chains to evaluate intrastore price competition among national brands and private labels. Hillen (2019) provides a step-by-step approach to carrying out web scraping for research and provides the pros and cons of doing so. Hillen (2021) used a similar strategy to study food prices during COVID-19. Etumnu et al. (2020) also used web-scraped data to study the effect of online consumer ratings on ground coffee sales ranks. We apply web-scraped data to a novel purpose as we study the brand equity of major coffee brands, notably Starbucks, using data from Amazon.com.

Data

The dataset used in the study was collected from Keepa (www.keepa.com)—a subscription-based company that scrapes Amazon websites around the globe. The process by which Keepa collects data is also feasible using Python or other tools such as Octoparse (www.octoparse.com) and Parsehub (www.parsehub.com). Using Keepa is advantageous for this study for at least two reasons. First, Keepa was explicitly developed for Amazon, making it one of the best data sources for products sold on its marketplaces. It is also available for Amazon's website in the United States and across the globe, including Canada, Mexico, the United Kingdom, France, Germany, and many other countries. Thus, it is an essential source of comparable data for Amazon research. Second,

Keepa users are not expected to be programmers unless they want to access the website's application programming interface. For this study, we downloaded the data that we needed from Keepa's website as we needed it. Despite these two advantages, Keepa has limitations, such as missing data, data cleaning challenges, and a lack of important Amazon product variables, such as answered questions.

We collected product listing data for five months, from October 2021 to February 2022. The dates we collected the data were as follows: October 7, 2021; November 11, 2021; December 13, 2021; January 12, 2022; and February 9, 2022. For each day, we selected ground coffee products from Keepa's website following this channel: www.Keepa.com—Data—Category Tree—Grocery & Gourmet Food—Categories—Beverages—Coffee—Ground Coffee. Then, we used the search button to view and download up to the 10,000 allowable ground coffee products. Each download contains hundreds of variables, from which we selected the following: brand, sales ranks, BuyBox price,[1] seller type, stockout rate, ASIN, item weight, average star rating, and number of ratings. A summary of these variables is shown in Table 1.

Table 1 reports the summary statistics of 23,145 observations from 4,629 products in 5 panel periods. Among the variables reported in Table 1 are the sales ranks and BuyBox price, the dependent variables used in the study. The average sales rank is 78,715, with a minimum of 11 and a maximum of 340,456. However, lower sales ranks imply higher sales performance and vice versa. The average BuyBox price is $25.51, with a minimum of $3.38 and a maximum of $519.99. The key independent variable in the study is the Starbucks brand, representing 1% of the sample. The proportion of other major brands, such as Dunkin' Donuts (1%), Lavazza (1%), and Folgers (2%), is like that of Starbucks. We chose these three brands mainly because of two reasons. First, in several assessments, these brands are listed as one of Starbucks' main competitors (Bhasin, 2023; Pereira, 2023). Second, these brands appear to have similar relative frequencies in our data. Specifically, the sample size of Starbucks (301), Dunkin' Donuts (275), Folgers (385), and Lavazza (313) products in our data are not too distant apart. In addition, our control variables are summarized in Table 1. These control variables include average rating, with a mean of 4.33; number of ratings, with a mean of 1,288; stockout rate, with a mean of 2%; and item weight, with a mean of 22 ounces. We standardized the prices and weight to obtain the price per ounce variable, with a mean of $2.61/ounce. We also have an indicator variable for seller type (Amazon, FBA, and FBM sellers), with a mean of 1.86. Although these control variables are not the focal point of our research, their associations with the dependent variables will also be examined.

[1]The BuyBox is the box-like feature on the top right side of Amazon product pages where customers can add products to their cart and where further information is provided. This information might include the BuyBox price, whether the product is eligible for Amazon Prime, Subscribe and Save, in Stock, delivery date, add to cart feature, and who the seller is. Interestingly, the BuyBox price and the listing price are the same most often. Hence, our decision to choose the BuyBox price was not arbitrary. It was borne out of the relevance of knowing who the BuyBox seller is and the importance of the BuyBox in the successes of Amazon and its third-party seller. Some estimates suggest that about 80% of Amazon's sales go through BuyBox (Vamanan, 2023).

Table 1: Variables and their Descriptive Statistics

Variable	Description	Mean	Std. Dev.	Min	Max
Sales rank	Best sellers rank of the product	78,715.951	7,3833.818	11.0000	34,0456
Log sales ranks	Natural logarithm of best sellers rank	10.4600	1.7254	2.3979	12.7380
BuyBox price ($)	Unit price in dollars in BuyBox	25.5084	20.6606	3.3800	519.990
Log buybox price	Natural logarithm of BuyBox price	3.0476	0.5829	1.2179	6.2538
Item weight (ounces)	Per product weight in ounces	22.3181	29.8475	0.1058	1279.9876
Price per ounce ($/ounce)	BuyBox price per item weight	2.6074	11.6923	0.0372	283.7784
Log price per ounce	Natural logarithm of price per ounce	0.2428	0.8647	-3.0604	5.6482
Average rating	Average star rating per product	4.3733	0.5160	0	5.0000
Number of ratings	Number of ratings per product	1288.4604	3673.8583	0	59,300
Stockout rate	Average 90-days out-of-stock percentage	0.0187	0.0749	0	1
Sellers	1 = Amazon, 2 = FBA seller, 3 = FBM seller	1.8608	0.7805	1	3
Starbucks	Dummy variable for the Starbucks brand	0.0130	0.1133	0	1
Dunkin' Donuts	Dummy variable for Dunkin' Donuts brand	0.0119	0.1084	0	1
Lavazza	Dummy variable for Lavazza brand	0.0135	0.1155	0	1
Folgers	Dummy variable for Folgers brand	0.0166	0.1279	0	1
Month	1 = Oct 21, 2 = Nov 21, 3 = Dec 21, 4 = Jan 22, 5 = Feb 22	3.0000	1.4100	1	5
Observations	Number of observations	23,145			

Figure 1 provides a comparison of the average prices of the major brands. The figure shows each major brand's average BuyBox prices per ounce over time. Specifically, it shows that Starbucks's average price per ounce is the highest, followed by the price per ounce of Lavazza, Folgers, and Dunkin' Donuts. The margin between the price per ounce of Starbucks and the other brands is also vast. This suggests that the expected price premium for Starbucks would be higher than those of the major brands. However, the comparison does not consider the possible correlations of the control variables and how that could affect the price premia, which warrants further empirical analysis.

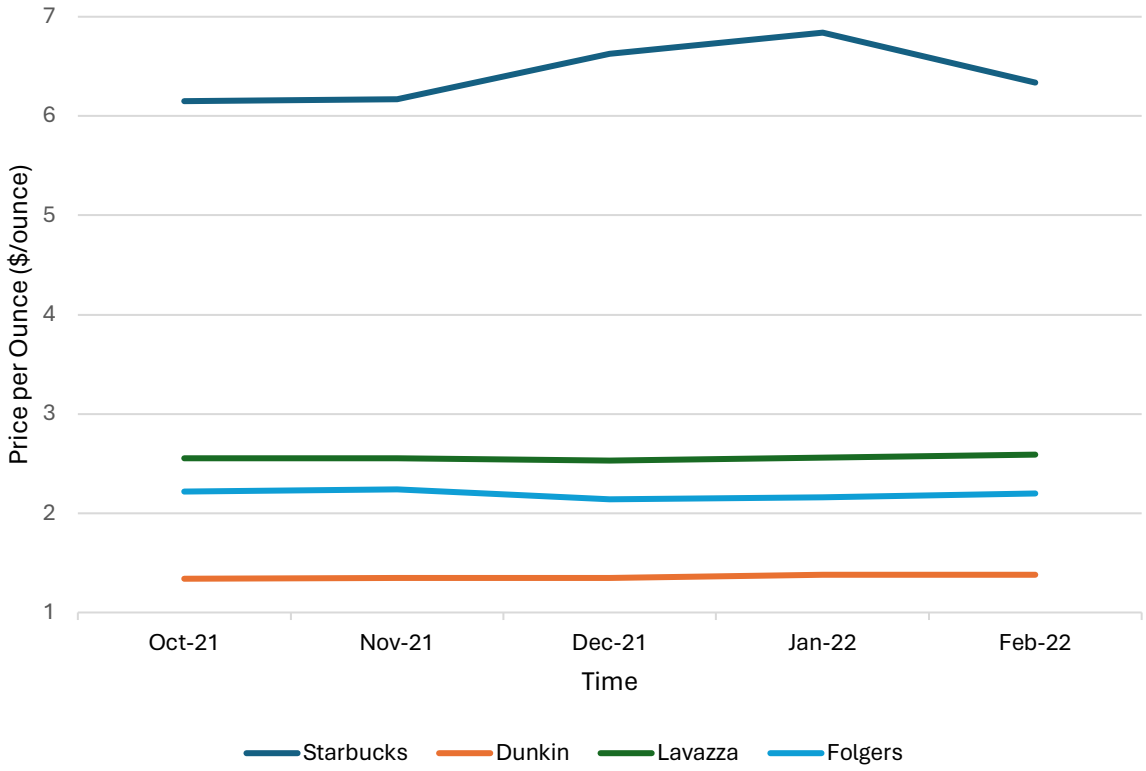

Figure 1: Price per Ounce of Major Brands over Time

Empirical Strategy

To estimate the price premium for Starbucks and compare the premium with that of other major brands, we estimate a hedonic regression model following Roheim, Asche, and Santos (2011):

$$\ln(Price_{it}) = \alpha Starbucks_i + \boldsymbol{\beta X}_i + \boldsymbol{\gamma Y}_{it} + \boldsymbol{\delta Z}_{it} + \varepsilon_{it} \quad (1)$$

where $\ln(Price_{it})$ is the natural logarithm of price per ounce for product i in period t, $Starbucks_i$ is a dummy variable indicating whether the product brand is Starbucks, $\boldsymbol{X}_i$ is a vector of other major brands, including Dunkin' Donuts, Folgers, and Lavazza, $\boldsymbol{Y}_{it}$ is a vector of product attributes such as the number of ratings, average rating, stockout rate, and $\boldsymbol{Z}_{it}$ is a vector indicating the type of seller for the products—Amazon, FBA sellers, or FBM sellers. We hypothesize that α is

positive, which shows that Starbucks commands a price premium on Amazon.com. We also hypothesize that each of the parameters in $\boldsymbol{\beta}$ is positive, suggesting that the other major brands command a price premium. Finally, because we believe that Starbucks' offline reputation translates into premium prices online more than the other major brands, we also hypothesize that α is greater than or equal to the parameters of each of the other brands.

Despite the plausibility of using the hedonic price method in economic analysis, several challenges emerge. Some of these challenges were highlighted by Graves et al. (1988). They include the selection and treatment of variables, the function form of the models, measurement error, and error distribution assumptions. Each of these challenges could bias our results, so we took steps to justify how we navigated the challenges. First, we carefully selected the variables in the study to have both economic and practical relevance. For example, our focal variables are the four major brands we considered (dummy variables for Starbucks, Folgers, Dunkin' Donuts, and Lavazza brands) and our dependent variable—ground coffee BuyBox prices per ounce. We also carefully selected meaningful control variables in the study, such as types of sellers, number of ratings, average ratings, and stockout rates. Second, we selected the log-linear functional form because it normalizes the distributions of variables, and prices are often one such variable that becomes better distributed through logarithmic transformation. An additional advantage is that the Interpretation of our estimated coefficients becomes more intuitive with natural logarithms of price. With log-linear models, we can now interpret the coefficients as percentages and easily compare them among the four major brands. Third, we carried out the regression analysis stepwise, including the Starbucks variable first, Starbucks and the other major brands, and finally including Starbucks, the major brands, and the control variables. This stepwise analysis allows us to focus on how the coefficient of Starbucks changes with additional variables. Minor changes in the Starbucks coefficient are more desirable than sporadic coefficient changes. We believe these three steps minimized the possibility of biases in our hedonic price models.

To ascertain whether Starbucks commands a sales premium, we also estimate the following regression using sales ranks as a proxy for sales due to data limitations following Etumnu (2022b):

$$\ln(SalesRank_{it}) = \theta Starbucks_i + \boldsymbol{\vartheta} \boldsymbol{X}_i + \boldsymbol{\pi} \boldsymbol{Y}_{it} + \omega \boldsymbol{Z}_{it} + \mu_{it} \quad (2)$$

where $SalesRank_i$ is a number assigned to actively selling products by Amazon, which shows their relative sales level at a particular time t. The independent variables remain the same as in Equation 1, but their coefficients have different meanings and interpretations. For example, we hypothesize that the coefficient of Starbucks (θ) is negative, suggesting that Starbucks commands a sales rank premium relative to the other ground coffee brands. We also hypothesize that each of the parameters of the other major brands ($\boldsymbol{\vartheta}$) is negative, suggesting that the other major brands command a sales rank premium. Our final hypothesis is that the absolute value of θ is greater than or equal to the absolute values of each of the parameters of the other major brands. This hypothesis suggests that Starbucks's sales rank premium is higher than the sales rank premium of the other major brands.

The expectations for the signs of coefficients for Starbucks and the other major brands are ambiguous. Recall that sales ranks are assigned such that 1 represents the highest sales performance for a given product, and higher incremental numbers represent lower sales performance relative to the number 1. This ranking style suggests that the sales rank is inversely related to sales. However, a relationship between sales ranks and sales has been established in the literature (Schnapp and Allwine, 2001; Chevalier and Mayzlin, 2006). Specifically, the natural logarithm of sales ranks is linearly and inversely related to the natural logarithm of sales plus a constant. This relationship has enabled several researchers to use sales ranks as a proxy for sales in economic literature (Sun, 2012; Reimers and Waldfogel, 2017; Etumnu et al., 2020; Reimers and Waldfogel, 2021; He, Reimers, and Shiller, 2022; Etumnu, 2022a; Etumnu, 2022b).

We estimate equations 1 and 2 with time-fixed effects using the Stata command reghdfe, developed by Correia (2017a; 2017b), to control time trends, seasonality, and inflation. However, we do not include product fixed effects because the brand variables are time-invariant. Hence, we do not claim that the relationship between the brand variables and our price and sales rank dependent variables that we estimate are causal. However, we argue that the estimates provide precise estimates of the price premia and sales rank premia for the major ground coffee brands. This conviction leads to our discussion of the results in the next section.

Results and Discussion

This section presents the study's results. The first part focuses on Table 2, which reports the price premia of Starbucks and the other major ground coffee brands. The second part focuses on Table 3, which reports the sales rank premia of Starbucks and the major brands. Each table also reports the associations of the control variables, prices, and sales ranks and discusses how the results relate to and contribute to the literature.

Table 2 reports the price premium for Starbucks in three log-linear regressions. The first regression is that of log price per ounce on the Starbucks brand only (column 1). The second regression is that of log price per ounce on the four brands—Starbucks, Dunkin' Donuts, Lavazza, and Folgers (column 2). The third and final regression reported in Table 2 is that of log price per ounce on the major brands and the control variables. By carrying out these three stepwise regressions, we pay close attention to how the coefficient of Starbucks varies. Because the coefficient of Starbucks is stable in the three regressions and the third regression includes the control variables, we focus our reporting on this regression. Hence, in column 3 of Table 2, the coefficient of Starbucks is 0.23, which is highly significant. The 95% confidence interval of the coefficient is 0.12 to 0.35.[2] Transforming the coefficient implies that the average price premium for the Starbucks brand is 26%, with a range of 13% to 42%.

[2] To obtain precise estimates of the premium values, we adopted a simple transformation of the coefficients because of the log-linear form of our regression models. Thus, the exact percentage premium for Starbucks in both regression models is given by $100 * (e^{coefficient} - 1)\%$ (Roheim, Asche, and Santos, 2011).

Table 2: Estimation of Price Premia with a Focus on Starbucks

	(1) Log Price per Ounce		(2) Log Price per Ounce		(3) Log Price per Ounce	
Starbucks	0.3141***	(0.0547)	0.3122***	(0.0548)	0.2349***	(0.0580)
Dunkin' Donuts			-0.1502***	(0.0395)	-0.2768***	(0.0330)
Lavazza			0.2209***	(0.0526)	0.2112***	(0.0532)
Folgers			-0.1865***	(0.0495)	-0.2427***	(0.0501)
Average Rating					-0.0144	(0.0108)
Number of Ratings					0.0000***	(0.0000)
Stockout Rate					0.0763	(0.0778)
Amazon					-0.7659***	(0.0154)
FBA Seller					-0.2401***	(0.0161)
Constant	0.2388***	(0.0057)	0.2407***	(0.0058)	0.6787***	(0.0502)
N	23,145		23,145		23,145	
R^2	0.0018		0.0038		0.1341	

Note: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% levels.
We transformed the coefficients of the dummy variables to their exact percentage values. $(100 * e^{coefficient} - 1)\%$.

The estimated Starbucks price premium is higher than those of other major brands. Following the same procedure, column 3 of Table 3 also shows that the average price discount for Dunkin' Donuts is 24%, with a range of 19%–29%. For Lavazza, the average price premium is 24%, with a range of 11%–37%, whereas for Folgers, the average price discount is 22%, 13%–29%. The average price premia and their ranges for each of these major brands is lower than that of Starbucks, which suggests that Starbucks has succeeded in differentiating itself even on Amazon.com. These findings also indicate that Starbucks has substantial brand equity in online markets, which may be an extension of the customer loyalty associated with the in-store experience cultivated over time. Given the reputation and longevity Starbucks enjoys in the coffee market, these estimates conform to our expectations and verify that applying equation (1) to prices in e-commerce is a valid approach for measuring price premia for brands.

The control variables also have essential associations with product prices per ounce, which lead to managerial implications and motivate future work. For example, the coefficient of average rating is negative and insignificant, whereas the coefficient of number of ratings is positive and significant. This result suggests that an increase in consumer perception of product quality is associated with lower prices per ounce. In contrast, the product's visibility is associated with higher prices per ounce for the products. Although several strands of the economic literature have examined price-quality relationships (Shapiro, 1983; Bagwell and Riordan, 1991; Jin and Kato, 2006; Li and Hitt, 2010; Luca and Reshef, 2021), the associations between prices per ounce of ground coffee and average rating and number of ratings are unexplored. It seems intuitive for a higher number of ratings to lead to higher product prices per ounce. After all, a higher rating signals to a consumer that a product is popular with other consumers, and the seller can then capitalize on that perceived value to raise product prices. However, in another scenario, a product with higher or higher average ratings also becomes more visible to the seller's competitors, potentially resulting in price wars that lead to lower prices. That said, because of our non-experimental or non-quasi-experimental settings, we are cautious about making any causal claims about our estimated relationships.

Another control variable included in the regression model is the stockout rate. The stockout rate ranges from 0 to 1, with 0 indicating 100% availability and 1 representing 100% unavailability. A 1-unit increase in the stockout rate is associated with an 8% increase in ground coffee prices per ounce. This sizable association corresponds with the marketing literature on stockouts (Anderson, Fitzsimons, and Simester 2006; Aastrup and Kotzab, 2010). Other control variables, such as the seller type, also significantly correlate with the product prices. Table 2 also shows that relative to FBM sellers, Amazon and FBA sellers' products are cheaper. Specifically, Amazon's products are about 54% cheaper than FBM products, whereas FBA sellers' products are 21% cheaper than FBM sellers' products. These price differences have been examined by Reimers and Waldfogel (2017), who suggest that Amazon sold books at meager prices. A later study (Etumnu, 2022b) also found that Amazon and FBA sellers sold ground coffee and red wine much cheaper than FBM sellers.

Table 3: Estimation of Sales Rank Premia with a Focus on Starbucks

	(1) Log Sales Ranks		(2) Log Sales Ranks		(3) Log Sales Ranks	
Starbucks	-1.2703***	(0.1521)	-1.3044***	(0.1521)	-0.8817***	(0.0781)
Dunkin' Donuts			-0.9185***	(0.1384)	-0.3213***	(0.0663)
Lavazza			-1.2546***	(0.1295)	-0.3020**	(0.1313)
Folgers			-0.3504***	(0.0856)	-0.4845***	(0.0610)
Log Price per Ounce					-0.0578***	(0.0118)
Average Rating					-0.3252***	(0.0201)
Number of Rating					-0.0003***	(0.0000)
Stockout Rate					0.2659**	(0.1201)
Amazon					-0.8090***	(0.0219)
FBA Seller					-0.6299***	(0.0181)
Constant	10.4765***	(0.0113)	10.5107***	(0.0113)	12.8803***	(0.0892)
N	23,145		23,145		23,145	
R^2	0.0083		0.0192		0.5747	

Note: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% levels.
We transformed the coefficients of the dummy variables to their exact percentage values. $(100 * e^{coefficient} - 1)\%$.

Although the control variables ensure that brand price premia are precise, a significant and sizeable price premium on Amazon.com may not be profitable or sustainable for a brand if it comes at the expense of its sales. Hence, we also report the sales rank premia for the major brands. Table 3 shows regressions like Table 2 but with a natural logarithm of sales rank as the dependent variable. Column 1 of Table 3 shows a regression of log sales ranks on the Starbucks brand. Column 2 includes other major brands alongside the Starbucks brand, while column 3 includes the control variables. Because the regression with controls has highly significant variables, our report focuses on that regression. Interestingly, we find that Starbucks commands an average sales rank premium of 59% on Amazon.com relative to every other brand in our sample, with an estimated 52% to 64% range. These findings indicate that Starbucks has significant brand equity across channels, which allows it to enjoy a premium sales rank relative to competing brands.

The sales rank premium for Starbucks is also higher than that of other major brands. Table 3 shows that the average sales rank premia for Dunkin' Donuts is 27%, ranging from 17% to 36%. Lavazza's average sales rank premium is 26%, with a range of 4%–42%. Finally, for Folgers, the average sales rank premium is 38%, ranging from 31% to 45%. The average sales rank premia suggests that the sales performance of the Starbucks brand is much higher than those of the other brands. The higher sales rank premium for Starbucks seems undeterred by its premium prices. This is incredibly insightful, given that the Starbucks Experience is mainly appreciated in its stores (Michelli and Hill, 2007; Schultz, 2012; Schultz and Gordon, 2012). It is, therefore, safe to assume that the Starbucks Experience has also been transmitted to the e-commerce market. Besides, the other major brands also command sales rank premia in the e-commerce market, which shows that these brands are doing well even in the presence of Starbucks.

All the control variables also have significant correlations with the sales ranks. For example, the relationship between price per ounce and sales ranks is negative, suggesting that higher prices per ounce sell more than products with lower prices per ounce. A higher price per ounce could signal higher perceived value, which translates into better sales ranks. This result contributes to previous literature (Koenigsberg, Kohli, and Montoya, 2010; Yonezawa and Richards, 2016; Etumnu et al., 2020; Çakır et al., 2021; Reimers and Waldfogel, 2021), which examined the relationship between product prices, package sizes, and sales. Aside from price per ounce, consumer ratings are associated with improved sales performance (Chevalier and Mayzlin, 2006). Furthermore, an increase in stockout rates is associated with poor sales performance, as expected (Anderson, Fitzsimons, and Simester, 2006). Finally, relative to FBM sellers, the products of Amazon and FBA sellers are associated with improved sales performance (Etumnu, 2022b).

Managerial Implications

Our results suggest that Starbucks and the major brands command both price and sales rank premia, which has implications for brand managers. Each ground coffee brand we examined can be considered a premium brand, which requires marketing strategies tailored to the premium market segment. However, all the major brands are already successful on Amazon based on our sales rank metrics, raising only the question of how to sustain and improve their successes. One key finding of our study is that Starbucks commands both price and sales rank premia, demonstrating that it is

not necessarily the most competitively priced brand that sells the most in e-commerce. Brand reputation, healthy inventory levels, effective advertising, and presence across marketing channels can allow sales to exceed those of competing brands without engaging in price wars.

We argue that Starbucks and the major brands selling on Amazon should constantly evaluate their use of Amazon advertising, the FBA program, and how to improve metrics in our control variables, such as consumer ratings and stockout rates. Given the size of these companies, marginal changes to their operations could be pivotal for their future. For example, while our results do not measure the effect of individual stockouts on performance, we demonstrate that the cost of stockouts online should be internalized by companies, measured carefully, and should include impacts on sales rank premia.

We also argue that the success of Starbucks on the Amazon platform is at least partially a function of the brand's reputation and notoriety in the brick-and-mortar channel. This argument suggests that other food and beverage brands have yet to expand to e-commerce platforms but likely have latent demand that could be capitalized upon. Moreover, it is worth considering if the reverse effect can be identified, in that food and beverage brands with success in e-commerce could leverage their exposure to increase their sales on supermarket shelves or in food service outlets, and vice versa. For example, McDonald's recently unveiled CosMc's as a potential rival to Starbucks' dominance in the coffee industry (Wiener-Bronner, 2023). However, whether such rivalry will enter the online retail market and topple Starbucks will be interesting.

Conclusions and Future Work

This study estimates the price and sales premia for Starbucks and several competing brands on Amazon.com. We find that Starbucks commands a price premium of 13%–42% and a sales rank premium of 52%–64%. The price and sales rank premia are higher than those of other major competing brands such as Dunkin' Donuts, Lavazza, and Folgers. These results contribute to the research that measures brand equity in online markets (Aaker, 1992; Aaker, 2009). Our methods can be applied to any brand for which price and sales rank information is available online, and future research may investigate other brands and product categories. Our study also contributes to the literature on using web-scraped data for economic analysis (Edelman, 2012). We show how to use data from Keepa—a subscription-based company that scrapes Amazon's websites across the globe. However, studies focusing on retailers like Walmart and Kroger can use other web scraping tools like Octoparse and Parsehub.

Our study is not without limitations. We cannot observe actual sales and use sales ranks as a proxy. Our measures of price premia are not intended to measure markups relative to cost but rather price differentials among competing brands. Moreover, our findings are exploratory and intended to demonstrate how empirical insights can be drawn from publicly available e-commerce data. We do not assign causality to the price or sales rank premium for Starbucks or any other brand. A more formal analysis is called for to understand the variation in premia across brands, which controls for additional factors of importance, including costs, total sales, marketing, and more.

Brand-level pricing and sales research for food and beverage products is typically conducted using store scanner data. Such datasets are usually costly and subject to restrictions regarding the identification of brands. We argue that future research is warranted to assess how the findings drawn from e-commerce data corroborate those drawn from analyzing store scanner data. To the extent that findings are qualitatively similar, it may be possible to significantly expand our understanding of brand performance, the impacts of brand introduction, and the determinants of brand exit within product categories. We also hypothesize that Starbucks' online brand equity is a function of its reputation and customer loyalty in brick-and-mortar establishments, and it would be fascinating to study the association between these factors across companies and industries. Finally, it would be interesting to calculate price and sales rank over more extended periods for brands and compare these numbers to data available from earnings reports for publicly traded brands. Particularly during food price inflation in the United States, there is a strong interest in the associations between prices and performance, and our empirical approach facilitates this analysis.

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