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Title: Internet Auctions and Frictionless Commerce:
Evidence from the Retail Gift Card Market

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Abstract

This study investigates the pricing of retail gift cards on eBay. Our results indicate that substantially less price dispersion exists than previously documented in other online markets for consumer goods. As gift cards are homogenous goods with clearly defined value, this suggests that online price dispersion in other markets may be due to unobservable differences in product characteristics or the competitive nature of auction environments. Additionally, gift cards for the discount retailer Wal-Mart exhibit less price dispersion than other large retailers' gift cards, consistent with the perception that greater search by price-sensitive shoppers can lead to less friction in markets.

Keywords: auctions, e-commerce, gift cards, Internet, price dispersion

systematically exhibit less dispersion than do other retailers' gift cards, even after controlling for auction and seller characteristics. This is consistent with the perception that Wal-Mart shoppers are more price-sensitive and engage in greater search and also supports the theory that greater search leads to reduced levels of price dispersion.

This study investigates the question: Do Internet auctions for homogeneous goods exhibit price dispersion? Furthermore, if the relative quantity of goods sold in an auction setting increased, would prices converge to support the law of one price? Based on a study of homogeneous goods on eBay, our results suggest that online price dispersion is clearly related (negatively) to the homogeneity of the good being studied.

2. Previous Literature

time period; the retailers ranked by most gift cards sold to least were Home Depot, Wal-Mart, and Best Buy (Offenberg, 2007). The dollar amounts were chosen to allow for different levels of price dispersion at different price levels, as well as to avoid any unrelated issues such as analyzing gift cards in uneven values, like \$34.56. As our primary interest is to investigate the extent of price dispersion, we restrict our sample to transactions that occur on days where at least two gifts cards were sold within a given category.³ We define a “category” as a particular retailer and face value combination – e.g., Wal-Mart gift cards for \$50. The retailers in our dataset have no maintenance fees or expiration dates for their gift cards. Our measures of price include the total price of the good, which is the item price plus any shipping or handling fees.

Table 1 gives summary statistics for the final sample. Gift cards are sold on average at 10% below their commodity value. We also coll

4. Empirical Analysis

4.1 Overall Price Dispersion

To investigate the extent of price dispersion, we calculate four different measures for each category of gift cards on a given day: the standardized absolute deviation (which we define as the absolute difference between a gift card's payment price on a given day and the average price for its category on that same day, divided by that average price); the standardized range (i.e., the difference between the maximum and minimum price within a category on a given day, as a fraction of the mean price on that day); the standard deviation (for each day); and the coefficient of variation (for each day). Table 2 contains the average values of these dispersion measures across the different days of our sample and the average price across all gift cards within a category.

We find that our sample exhibits less price dispersion than has been previously reported in other online markets. Across the different categories, the average daily absolute deviation is anywhere from 1-3% of the mean price. The average daily range across the categories varies from 4 to 8% of the overall mean price. The average daily standard deviation and the average daily coefficient of variation across the categories vary from 2 to 4% of the overall mean price.

We provide a summary of the dispersion results from previous studies of online markets in Table 3. In contrast, previous work on online prices for books and CDs find that the range is anywhere from 25 to 40% of the mean price, and the standard deviation is 10% of the mean price (Ellison and Ellison, 2005, Brynjolfsson and Smith, 2000). The results from Baye, et al (2004) suggest that for online computer products, the average range in prices is approximately 20-30% of the mean, while the coefficient of variation is 9.5%. In particular, they find that with only two firms that post prices, the gap between the two lowest prices is approximately 23% of the mean, and the gap falls to 3.5% for products with 17 firms that

Our results also suggest that price dispersion

Across the three different specifications in Table 3, we still find that Wal-Mart gift cards systematically exhibit less price dispersion even when controlling for seller and auction characteristics.⁹ The negative coefficient on the Wal-Mart dummy variable indicates that Wal-Mart gift cards exhibit slightly less dispersion relative to Best Buy and Home Depot gift cards. On average, the price of a Wal-Mart gift card is 1% closer to its mean compared to the

CDs, DVDs, and computer parts. In this study we consider whether this price dispersion persists in an auction setting of a homogeneous good – retail gift cards. We document substantially lower levels of price dispersion,

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Table 1. Summary statistics

Variable	Number of observations	Mean	Standard Deviation
Payment price			

Table 2. Measures of Average Dispersion and Price

	price	standardized absolute deviation	standardized range	standard deviation	coefficient of variation
Best Buy \$50	45.05 (2.15)	0.02 (0.03)	0.08 (0.08)	1.67 (1.75)	0.04 (0.05)
Best Buy \$100	89.63 (4.37)	0.03 (0.03)	0.07 (0.06)	3.04 (2.20)	0.03 (0.03)
Best Buy \$200	178.29 (11.68)	0.02 (0.03)	0.06 (0.06)	6.12 (5.24)	0.04 (0.03)
Home Depot \$50	45.51 (2.83)	0.03 (0.04)	0.08 (0.09)	2.08 (2.05)	0.05 (0.05)
Home Depot \$100	90.34 (4.35)	0.03 (0.03)	0.08 (0.06)	3.18 (2.36)	0.04 (0.03)
Home Depot \$200	182.78 (7.01)	0.02 (0.02)	0.05 (0.05)	5.42 (5.70)	0.03 (0.03)
Wal-Mart \$50	46.83 (4.31)	0.01 (0.02)	0.04 (0.04)	1.23 (1.33)	0.03 (0.03)
Wal-Mart \$100	92.51 (5.15)	0.01 (0.02)	0.05 (0.04)	3.07 (2.98)	0.03 (0.03)
Wal-Mart \$150	185.99 (6.28)	0.01 (0.01)	0.04 (0.03)	4.60 (3.87)	0.02 (0.02)

Note: All reported prices are inclusive of shipping and handling costs. Averages are reported with standard deviations in parentheses. The standardized absolute deviation is defined as the absolute difference between a

Table 3. Measures of Price Dispersion from Previous Studies of Online Markets

Study	Data Period	Product Category	Dispersion Measure
Baye, et al. (2004)	2000-2001	consumer electronics consumer electronics	coefficient of variation: 0.09 range: 24%
Brynjolfsson and Smith (2000)	1998-1999	books CDs	price range: 33% price range: 25%
Clay, et al. (2001)	1999-2000	books books	standard deviation as % of average price: 12.9% - 27.7% range: 31.9% - 65.2%
Pan, et al. (2002)	2000	books	coefficient of variation: 1.5

