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Effects of gift cards on optimal order and discount of seasonal products[☆]

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ABSTRACT

Gift cards are replacing cash and holiday products as gifts for many consumers. We analyze the effect of gift card sales on a retailer's optimal stocking level of holiday products and his expected profit within the newsvendor model framework. We derive the sufficient condition for the optimal stocking level of holiday products. We find that increased gift card sales decrease the retailer's optimal stocking level. The effect of gift card sales on the expected profits depends on treatment of unredeemed gift card balances by the state and the type of non-holiday products gift card redeemers buy with gift cards. When these balances remain with the retailer, even small non-redemptions of gift cards will cause gift card sales to increase most retailers' expected profit. When balances are treated as abandoned property which must be turned to the state after a specified period of time, gift cards sales may increase or decrease the retailer's expected profit. If gift card redeemers buy products with gift cards they would not have bought from the retailer in cash, then the optimal expected profit is likely to increase. Gift card profitability increases with demand variability and the post-holiday markdown required to sell holiday products to bargain hunters. The performance of gift cards also depends on consumers' reservation prices for non-holiday products. If unredeemed gift card balances are collected by the state, then profitability of gift cards increases with increased consumer reservation prices for non-holiday products.

1. Introduction and literature review

Gift card sales in the USA grew to 91 billion dollars in 2010 (Mui, 2010), a 3 billion dollars increase over their previous peak of 88 billion dollars in 2007 (Horne, 2007a). More than half of these gift cards are typically redeemed in the month after Christmas (Mui, 2010). Gift cards redemption in the post-holiday[1] period can make a substantial positive impact on sales (Anonymous, 2006) and may give retailers healthy store traffic (Anonymous, 2008). Some retailers express preference for gift card redeemers since they are more likely to buy regular-priced items (Goldeen, 2003). The existence of a large amount of gift card balances and their eminent redemption in the post-holiday period may enable retailers to avoid deep discounts on holiday products.

In this paper, we investigate the implications of gift card sales on the optimal stocking level of holiday products in the pre-holiday period and the pricing of these products in the post-holiday period from a retailer's perspective. We analyze the problem for a retailer who sells holiday products in the pre-holiday period and discounts any remaining inventory of these products in the post-holiday period. The retailer also sells non-holiday products and gift cards throughout the year. While gift cards are sold and redeemed throughout the year, the holiday season accounts for about half of their sales (Horne, 2013). We, therefore, focus on gift cards sold as holiday gifts, which make up most of the gift cards redeemed in the post-holiday period. Gift card holders can redeem their gift cards any time on any product in inventory. Some gift cards are never redeemed and unredeemed gift card balances may be taken by the state or may remain with the retailer.

An important distinction of holiday products is that these products are used as gifts and therefore consumption choices are made by the gift-giver and not the final consumer (she), i.e. the gift-recipient (Waldfogel, 1993). This raises the potential of mismatch between gifts and the recipients' preferences. The gifts, therefore, may leave the recipient worse off than if she had made her own consumption choices. The amount of cash spent on a gift above the value the recipient places on it is known as deadweight loss (Waldfogel, 1993). Waldfogel (1993) estimated that compared to cash, gifts in-kind lose between 10 percent and 33 percent of their value by the time they reach the recipient. This deadweight loss has led

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[1] We use holiday instead of Christmas, which is the major gift-giving time in the USA and western Europe, to include other cultures and countries with a different major gift-giving holiday.

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many gift-givers to give cash and checks instead of physical gifts (Principe & Eisenhauer, 2009). In a sample of 455 students from three universities, Waldfogel (2002) found that 13.5 percent of all gifts were cash or gift certificates. Waldfogel (2002) also found that the appeal of cash increases as the personal familiarity between the gift-giver and the gift-recipient decreases.

While giving cash avoids deadweight loss, cash is viewed by many consumers to be inappropriate as a holiday gift (Offenberg, 2007; Waldfogel, 2002). Gift cards are viewed as a more appropriate alternative to cash. Gift cards are becoming the choice of many consumers as holiday gifts. From a consumer's view point, gift cards reduce the risk of poor gift selection (Horne & Kelly, 1995), allow the recipients to select their own gifts from a set of alternatives which increases their utilities (Horne, Craddock, & Norberg, 2005), and reduces the deadweight loss of gifts that do not fulfill the needs and desires of recipients (Waldfogel, 1993). Gift card sales have been increasing since 1997 with the exceptions of 2008 and 2009 due to the recession (Mui, 2010). About 30 percent of gift cards are purchased for gifts at the end-of-year holiday season. The low cost of producing plastic cards with magnetic strips to keep track of card balances instead of the old paper gift certificates, and the rapid growth of chain stores have significantly contributed to this growth (Offenberg, 2007).

Gift cards account on average for about 5 percent of retail holiday sales and for some retailers can account for as high as 15 percent of sales (National Retail Federation, 2006). Gift cards are not counted as sales until they are redeemed. Keeping this drawback in mind, the reason for the popularity of gift cards among retailers is not clear. One argument is that many consumers may only redeem part of the cards' full value and others may not use the card at all (Thomas & Dillenbeck, 2004), thus leaving the retailers with the cash. Reasons for partial or no redemption include loss of cards, expiration of cards, and consumers' forgetting. We refer to this partial redemption as *slippage*.[2] However, an examination of regulations on gift cards shows that the above argument may not be very convincing. Several states treat unredeemed gift card balances as abandoned property which must be turned in full or in part to the state after a specified period of time. Other states exclude gift certificates and cards from abandoned property definitions (Horne, 2007b). As of 2008, at least 39 states have laws addressing issues relating to unredeemed gift card balances and more state legislatures are enacting laws affecting gift card non-redemptions (Feinson, 2008). New York State for example collected 9.6 million dollars in unredeemed gift cards in 2008 and these collections are on the rise as states face declining tax revenue (Alini, 2009). Therefore, the advantage of gift cards leaving retailers with a large amount of unredeemed gift cards balances may not be as important as one would expect, particularly because many retailers are domiciled in Delaware where unredeemed cards are treated as abandoned property (Horne, 2007b).

Gift cards have other advantages for the retailer (he) besides slippage. Whether the cash from unredeemed cards is kept by the retailer or turned over to the state, the retailer has the use of that cash until cards are redeemed or the money is taken by the state. Gift cards may also bring new consumers to the store who would not have visited the store without receiving gift cards. Consumers redeeming gift cards may also spend more than the value of the gift card which creates additional sales. In a survey of more than 500 U.S. consumers conducted by Accenture, 48 percent of respondents said they spend more than the value of the gift card (Accenture, 2006). One estimate of the average spending of consumers beyond the card value is about 20 percent of card value (Thomas & Dillenbeck, 2004).

One hidden advantage of gift cards may be in increasing the retailer's ability to deal with demand uncertainty. The retailer may be able to change the order quantity and the pricing strategy in such a way that the expected profit is increased even if all gift cards are redeemed. At the holiday time of the season, the retailer has better information about the demand in the post-holiday period, knows the exact amount of gift cards that has been sold, and can use this information to make a holiday products discounting decision which maximizes his expected profit in the post-holiday period. In addition, this ability to make better discounting decisions in the post-holiday period may decrease the penalty from overstocking or understocking in the pre-holiday period.

Consumers may use gift cards to buy holiday products (most likely discounted) or non-holiday products (regularly-priced) in the post-holiday period. An important determining factor of the profitability of gift cards is the type of non-holiday products consumers purchase with gift cards. When consumers use gift cards for purchases they would have made with cash in the future at the retailer, future cash sales decrease, which causes future profit to decline. We refer to the reduction of future cash sales due to gift cards redemption as *the future cash sales offset*. In the survey conducted by Accenture, 67 percent of respondents stated that when redeeming gift cards, they buy themselves something they would not normally buy (Accenture, 2006). We anticipate that gift cards are most effective for a retailer when consumers use them to buy products they would not buy without gift cards or to buy products they would buy with cash at another retailer.

Previous analytical models on the use of gift cards are few and are focused on the use of "free" gift cards. Khouja, Pan, Ratchford, and Zhou (2011) analyze the decision of a retailer giving consumers a "free" gift card if their purchase amount of all products in a single visit exceeds a threshold amount. Khouja, Park, and Zhou (2013) analyze the retailer's decision to use "free" gift cards to sell a particular product within the newsvendor model framework. Khouja, Rajagopalan, and Zhou (2013) address a similar problem in which the consumer gets a "free" retailer gift card for buying particular manufacturer's product in a single-retailer single-manufacturer supply chain where the manufacturer bears the cost of the card. Khouja and Zhou (2015) analyzed the decision of a service provider to sell gift cards for his services through an independent retailer.

Gift cards are a form of advance selling which may provide a powerful tool to improve profits (Shugan & Xie, 2000; 2005). Fay and Xie (2010) define "advance selling" as a marketing practice in which the seller offers buyers opportunities to make purchases before the time of consumption. Gift cards create another twist on advance selling in the sense that in addition to the temporal separation (Shugan & Xie, 2000) between purchase of the card and the selection of goods, the selection is made by persons other than the card buyers.

We analyze the optimal stocking level of holiday products of a retailer who also sells gift cards, and his optimal pricing decision for the leftover holiday products after the holiday. We use the newsvendor problem framework because it is most suitable for products carried for one season. Previous research on extensions of the newsvendor model is extensive and reviews of this research can be found in Khouja (1999) and Petruzzi and Dada (1999).

We investigate the following questions: (1) How does the use of gift cards change the retailer's optimal stocking level and pricing decisions for holiday products? (2) Does the use of gift cards benefit the retailer? (3) How does the treatment of unredeemed gift card balances by the state affect gift card profitability? (4) Are gift cards more suitable for some type of retailers than others?

The rest of the paper is organized as follows. In Section 2, we analyze consumer choice and demand when the retailer sells gift cards. We also provide a benchmark where no gift cards are sold. In Section 3, we solve the retailer's problem: finding the optimal pricing of holiday products in the post-holiday period and the sufficient

[2] Estimates of unredeemed cards nine month after issuance is 19 percent (Horne, 2007b). Efforts to eliminate expiration dates on gift cards (Horne, 2007b) were anticipated to improve redemption rates. However, research indicates that gift cards with longer expiration dates are less likely to be redeemed (Shu & Gneezy, 2010).