The Deadweight Loss of Diwali

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Abstract:
Using survey responses of undergraduate students from a college in India, we conducted an empirical analysis of efficiency of non-monetary gifts exchanged on the occasion of Diwali similar to analysis for Christmas in Waldfogel (1993). We found an average deadweight loss of 15% on all gifts, with gifts of accessories and electronic goods showing a lower loss compared to other types of gifts. We also found that lesser the generational distance between the person gifting and the receiver, lower is the deadweight loss. In addition, there is weak evidence supporting differences in valuation of gifts based on closeness of familial ties as understood in this cultural context. We, however, did not find any systematic difference in valuation of gifts by gender of the recipients.

1. Introduction

Based on survey responses of undergraduate students from a college in India, we conducted an empirical analysis of efficiency of gift giving on the occasion of Diwali similar to analysis for Christmas in Waldfogel (1993). In the competitive equilibrium model of a market, consumption decisions of the buyer do not result in any efficiency loss in equilibrium. This is because an equilibrium price signifies a unified value perception on the part of the buyer as well as the seller. Gift giving, however, differs from such a market transaction as it implies taking consumption decision on behalf of the ultimate consumer in expectation that his or her valuation would be at least the same if not more than that of the buyer. As a result, there is always a high probability of loss of value in gift giving that Waldfogel (1993) calls the deadweight loss of Christmas given the significant number of gifts exchanged on the occasion.

Since Waldfogel (1993) there have been significant contributions to this literature by Waldfogel himself and in the form of several comments and replies to the original paper (for e.g. Solnick & Hemenway, 1998; List & Shogren, 1998; Bradley & Ruffle, 2000 among others) and including a short book *Scroogenomics* by Waldfogel. Overall, there have been differences in the estimated loss of value in these follow up studies. For example, Solnick and Hemenway (1996) found the valuations to be much higher than those in Waldfogel's original article and record substantial welfare gains instead of losses. List and Shogren (1998) also note welfare gains by running an experiment based on n^{th} price auction though their numbers are not as high as Solnick and Hemenway (1996) suggesting gift giving does not always destroy value. As rightly suggested by Ruffle and Tykocinski (2000), these differences between welfare measurements seem to be more due to methodological differences than other factors. In a study, based on experimental evidence they found that order (how cost and value are presented to the survey respondents) and the wording of the questions significantly affect the valuations of gifts by survey respondents. Arguing that often the differences in valuations stem from the fact that gift recipients do not accurately estimate the market price of the commodity they received as gifts, Principe and

Eisenhauer (2008) obtain more objective information on actual market prices for their calculations. Accordingly, they find a deadweight loss that averages more than 7 percent of the market price on gifts in-kind, and more than 14 percent on gift cards.

The reported valuations also depend on if survey questions are based on willingness to pay (WTP) or willingness to accept (WTA). The valuations based on WTP tend to be lower suggesting higher deadweight loss at least when compared against own purchase bench mark of 100% (Waldfogel 2005, Knetsch & Sinden, 1984). A recent analysis by Bauer and Schmidt (2012) reports a deadweight loss of 12 percent below market price based on WTP valuations and on an average 9 percent above the respective market prices based on WTA valuations.

Given that most of the research above has been done in the context of western economies, we decided to analyze the efficiency of gifts exchanged during one of the most widely celebrated festival in India and see how the results compare to the studies done so far for Christmas. As this is the first study of its kind we concentrate on replicating the analysis in Waldfogel (1993). To our knowledge, this is the only attempt so far to do so for Diwali. Needless to say, our survey instrument and methodology are similar to the one used by Waldfoegel. Our data on the kind of commodities purchased and amount spent on gifts and purchases on the occasion of Diwali comes from survey of 74 students from the Kohinoor Global Campus in India[1]

Diwali and Gift giving: Although one could argue that there are significant differences in celebratory norms and practices across regions, in general, Diwali involves purchase of new clothes, special food items, and fire crackers. In addition to these common purchases it also involves some gift giving- specifically from a brother to the sister for *Bhaubij (*or *bhaiduj* in the Northern parts of India); from a husband to the wife on *Padva; and from elders to their younger generation relatives*. Gift giving has also been quite pervasive in the form of corporate gifts on the occasion of Diwali. While, there is no concrete evidence as far as we know, casual observation suggests that gift giving to non-family members on such festive occasions is also becoming a norm at least in certain sections of the society. This could be the result of substantial increase in per capita incomes in the post liberalization period as well as increased influence of advertising and other media.

Given this background, the remaining paper is organized as follows: Section 2 talks about the methodology, section 3 presents the empirical results and analysis of deadweight loss realated to type of gift, the relationship of the person gifting, and gender of the recipient. Section 4 provides concluding comments and discussion.

2. Data and Methodology

For the purpose of the empirical analysis, the deadweight loss from a gift exchange is defined as follows:

$$Deadweight\ Loss\ from\ a\ gift\ exchange$$
$$= \frac{Market\ Price\ of\ the\ gift - Gift\ Recipient's\ own\ valuation\ of\ the\ gift}{Market\ Price\ of\ the\ gift} \times 100$$

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[1] The students surveyed were from Kohinoor IMI School of Hospitality Management and Kohinoor Business School at Kohinoor Global Campus, Khandala, Maharashtra, India during the academic year 2005-2006. Most of the students came from a similar income group ruling out any differences in valuation of gifts based on income.

The yield is the ratio of gift recipient's own valuation of the gift to its market price and hence can bee understood as gross deadweight loss with a ratio close to 1 or 100% suggesting little or no deadweight loss.

The survey was conducted on the Kohinoor Global Campus, Khandala, Maharashtra, India. There were approximately 300 students on the campus at the time of the survey. We have responses from 74 students who were willing to share the information. We asked students surveyed to list the gifts that they received and estimate its market value. In addition, they were asked to put their own valuation on these gifts and indicate the relationship to the person giving the gift. The concept of own valuation was explained to them as the amount they would be willing to pay if they were window shopping and happen to see the commodity they got as a gift without a price tag. As a result of being explained the concept of own valuation this way, the reported valuations are be based on WTP rather than WTA.

The gifts reported in the survey were categorized as *Food Items*, *Clothes*, *Electronic Goods*, *Accessories*, *Cash*, and *Others*. The people gifting were categorized as Parents, Siblings, Friends, Uncle/Aunt, Grand Parents, Cousin, and Others.

3. Analysis and Results

Based on the responses of 74 students, we found the average deadweight loss on all the gifts given during Diwali to be 15%. This is lower than the 33% loss reported by Waldfogel (1993) for the survey of undergraduate students at Yale University based on WTP but closer to the 13% estimate based on WTA. On an average students received a gift worth Rs. 16,903 and they valued it at Rs. 14,516 contributing the overall deadweight loss of 15%. This deadweight loss for the Diwali gifts is proportional to the market price of the commodity, i.e. higher the market price higher is the valuation by the gift recipient and lower is the deadweight loss. A regression of log of own valuation on log of market price, yields the following equation confirming this phenomenon (see Table 3 for details).

$$\ln(own\ value_i) = -0.3252 + 1.02 \ln(market\ price_i)$$

This estimated relationship of own valuation of the gift to its market price is in line with the one in Waldfogel (1993); Apart from this, there is significant variation in the deadweight loss according to type of gift as well as the relationship with the person(s) giving the gift. We discuss this in detail in the subsections that follow.

3.1 Type of Gifts and Yield

Is a gift of a food item valued differently than an accessory? Table 1 sheds some light on this aspect. It shows the yield or the extent of deadweight loss by type of commodities.

Table 1: Deadweight Loss by Type of Gifts

Description	N	Mean (std. dev)
Yield on Food Items	19	86 (27)
Yield on Clothes	55	82 (25)
Yield on Electronic Goods	32	87 (17)
Yield on Accessories	30	92 (35)
Yield on Others	12	88 (31)
Yield on Cash	6	100 (0)

Clearly, cash gifts get the highest ranking suggesting that this is the most efficient gift type[2]. Accessories follow cash with a yield of 92% with the third rank going to Others and Electronic Goods at roughly 87%. This seems obvious as the people receiving these gifts are in the age group of 18-20 years. They are more likely to be sensitive to fashion trends as well as to be at the frontier of consumption for electronic goods. Further, the yield on electronic goods has lowest variability among all gift items signifying that consumers' valuations cluster more closely on commodities that are found desirable by many.

3.2 Yields and the Person Giving the Gift

If we accept that consumers are perfectly informed about their preferences at least when it comes to current consumption choices and commodities familiar to them, then it will be impossible for the gift-givers to match the recipient's preferences or choices. Given this, what can we say about the relationship between recipient's valuation of gifts and from whom he or she receives the gift? Put differently, how do different people giving a gift fare on approximating gift recipient's preferences over commodities?

Table 2 gives the deadweight loss on gifts according to the type of person gifting, helping answer this question. Yield on gifts given by siblings is the highest at 100% followed by yield on those given by cousins and friends at 92% and 89% respectively. Yield on gifts given by others include data for only two cases therefore we don't use it in comparison. Gifts by parents get a 4th rank at 85% followed by those from Uncle and Aunt. Grandparents get the lowest ranking with mean yield 69%. This suggests that generational distance of the person giving the gift is an important determinant in gift recipient's own valuation of gifts. Accordingly, the smaller the generation gap higher is the yield on the gift and lower is the deadweight loss.

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[2] The students may have used cash as a benchmark to evaluate other gifts. However, that only highlights the inefficiency of non-cash gifts compared to cash gifts.

Table 2: Deadweight Loss by Type of Person

Yield by relation of the gift giver	N	Mean (std.dev)
Yield on Gifts given by Parents	54	85 (18)
Yield on Gifts given by Siblings	20	100 (42)
Yield on Gifts given by Friends	27	89 (23)
Yield on Gifts given by Uncle and Aunt	23	74 (17)
Yield on Gifts given by Grand Parents	5	69 (12)
Yield on Gifts given by Others	2	101 (07)
Yield on Gifts given by Cousins	6	92 (20)

To further explore the deadweight loss variation according to the receiver's relationship to the person(s) gifting, we regressed recipient's own valuation of the gift (ln(value)) on relationship dummies. Table 3 below gives the results.

In Waldfogel (1993) gifts from siblings recorded lowest loss and that from grandparents the highest loss. In our analysis gifts from siblings actually show a gain in valuation and that from grandparents a considerable loss. On the other hand, gifts from uncles/aunts and friends add to the valuation- although marginally and with lower level of significance. This is opposite of gifts from uncles/aunts in Waldfogel (1993) that suffer from largest losses along with those from the grandparents. This may be because of the differences in the nature of relationship the Indian gift recipients enjoy with their uncles/aunts compared to the gift recipients in the US, providing some evidence for culture dependent variations in valuations of gifts from similarly related people.

Table 3: Determinants of Deadweight Loss

VARIABLES	Dependent Variable ln(value)	
	Model 1	Model 2
Sibling		0.110[*]
		(0.0604)
Friend		0.0624
		(0.0442)
uncle & aunt		0.00816
		(0.0606)
Grandparents		-0.187[**]
		(0.0910)
Other		0.106
		(0.0699)
Cousins		0.00882
		(0.0665)
Cash[a]		0.139[***]
		(0.0500)
ln (price)	1.016[***]	1.010[***]
	(0.0145)	(0.0142)
Constant	-0.325[**]	-0.327[**]
	(0.131)	(0.130)
Observations	74	73
R-squared	0.980	0.984

Robust standard errors in parentheses

[***] $p<0.01$, [**] $p<0.05$, [*] $p<0.1$

a. The cash dummy has a positive impact on proportionality of own valuation to the market price of the gift similar to the finding in Waldfogel (1993).

3.3 Gender & Valuation

We also thought it worthwhile to check if there is any difference in valuation of gifts according to gender of the recipient. Table 4 shows the comparative yields across type of gifts and relationship of the gift giver to the recipient.

Table 4: Difference in Valuation of Gifts according to Gender

| | N | | Mean Yield (std. dev) | |
	Female	Male	Female	Male
Yield on Food Items	8	11	90 (35)	83 (21)
Yield on Clothes	18	37	82 (36)	82 (19)
Yield on Electronic Goods	9	23	90 (17)	86 (18)
Yield on Accessories	5	25	92 (11)	92 (38)
Yield on Gifts given by Parents	15	39	83 (22)	86 (17)
Yield on Gifts given by Siblings	7	13	90 (21)	105 (50)
Yield on Gifts given by Friends	8	19	93 (37)	88 (15)
Yield on Gifts given by Uncle and Aunt	8	15	71 (14)	75 (18)

The occasional difference between the yields on gifts as perceived by males versus female gift recipients is not statistically significant according to the difference of means analysis we conducted[3]. Accordingly, there is considerable homogeneity in perceptions of male and female gift recipients towards the person from whom the gift originated and the nature of commodity exchanged as a gift.

3.4 Gift Preferences, Relationship, and Implications for Advertising

From the point of view of advertising or marketing, it might be interesting to see if there are any significant differences in preferences over gifts according to the relationship of the gift giver to the gift recipient. Table 5 gives the data relating to this phenomenon. While parents gave 44 % of the total gifts received, 41 % percent of those gifts comprised of clothes, 32% of electronic goods, and 19% of accessories. Considering that clothes as gifts may constitute the regular wardrobe replenishment and that electronic goods as gifts have a relatively higher yield it makes sense for concerned companies to target parents in their advertisements, especially on festive occasions.

Siblings seem to show an almost equal preference for gifts of different types with no cash gifts at all. Of the total gifts given by friends, 41% comprised of accessories followed by 24 % of clothes. Again for the companies manufacturing accessories, it might help to target the friend relation in their advertisements.

Gifts given by uncles/aunts mainly comprise of food items and clothes. Considering that yield on food and clothes as gifts is considerably lower and gifts from uncles/aunts add to the valuation for a given market price, at least some part of the gift recipient's own valuation of the gift seems to be from non-WTP or non-monetary considerations. Who gives the gift seems to matter at least to some degree along with what the gift recipient's willingness to pay for the item might be[4].

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[3] Due to consideration of space we do not give the detailed results here but they are available on request.

[4] Kolm and Ythier (2006) present a comprehensive coverage of different aspects of altruism and gift giving.

Table 5: Type of Gifts by People

	Food	Clothes	Electronic Goods	Accessories	Cash	Others	Proportion of total
Parents	1	32	25	15	1	4	0.44
Siblings	2	8	6	5	0	4	0.14
Friends	5	7	4	12	0	1	0.16
Uncle/Aunt	9	8	1	3	3	1	0.14
Grand Parents	2	2	0	0	1	1	0.03
Others	1	1	0	0	1	1	0.02
Cousins	1	3	1	1	0	3	0.05
Proportion of total	0.12	0.35	0.21	0.20	0.03	0.09	

4. Concluding Discussion

Economics of gift giving is a very under researched area in India. This paper tries to fill the gap in a small way. Using a survey sample of undergraduate students, we conducted an empirical analysis of efficiency of gift giving on the occasion of Diwali. At 15%, the average deadweight loss on gifts for Diwali was little over the lower bound of 13% in Waldfogel (1993). The gift recipient's own valuation was proportional to the market price. Following cash as gift, accessories and electronic goods as gifts had higher yield compared to gift of clothes and food items. The rankings of deadweight loss according to the relationship of the gift giver suggests that lesser the generational distance between the person gifting and the receiver, lower was the deadweight loss. The analysis based on regression suggests that gifts from siblings entail a gain in valuation and that from grandparents a considerable loss. The differences in valuation of gifts from uncles/aunts in this paper compared to those in Waldfogel (1993) suggest that people might value gifts differently based on closeness of familial ties as prevalent in their culture. We, however, did not find any systematic difference in valuation of gifts by gender of the recipient.

Having said that, it should be noted that gift giving may not always destroy value. This was clear from some of the studies mentioned above where the perceived loss was lower with analysis based on WTA rather than WTP or that it was sensitive to the order and wording of the questions asked. The net valuation of gifts may be positive as the valuations could be based on monetary as well as non-monetary factors. As suggested by Mankiw (2006), gift giving may be valued because it may serve as a useful signaling mechanism- a signal of how closely one knows a person. Failure to give a gift or substituting one with cash may jeopardize the match between parties. Pengrast and Stole (2000) use a game theoretic analysis to demonstrate that under wide variety of circumstances, inefficient non-monetary gifts will be offered by a donor in lieu of cash in order to signal the donor's quality of information about the recipient's preferences. Gifting might be valued positively because of its cultural and ritualistic significance as well. One should also consider the option of not receiving any gift at all versus receiving one. Gift receiver's valuation could be different under such an "all or nothing" proposition. In a nutshell, all these factors suggest that studies solely based on monetary valuations may end up over estimating the deadweight loss.

Lastly, it is important to keep in mind that the findings of this study are based on a sample of students from a relatively homogenous higher income group than the general population. A fuller analysis should be able to account for the differences in valuations according to the income categories of the recipients, the socio-cultural determinants of valuations across gifts and the implied income redistribution in the process of gifting. We hope to pursue these as possibilities for future follow up research.

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