

## Double Couponing: Pricing and Consumer Perspectives

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### *Abstract*

Many supermarkets double manufacturer coupons. Are consumers' grocery bills lowered as a result? Our study of two double coupon supermarkets shows that for every ten cents of double-coupon value redeemed, the corresponding shelf price at a double coupon supermarket is higher by an estimated 3.5 cents compared to the price at other supermarkets. Given the higher shelf prices, the data also suggest that the majority of customers do not save money at double coupon stores, and adjust their shopping to account for the retail promotion.

Manufacturers distributed 292 billion coupons in 1991, and many grocery stores redeemed them at double their face value. The percentage of stores that offer such bonus coupons varies across U.S. cities, as table 1 shows. In Raleigh, North Carolina, for example, two supermarket chains with market shares of 8.3 and 5.7 percent continually double coupons that do not exceed 50 cents in face-value. The three other major supermarket chains in the city refund only the face value of the coupons.

The extra coupon value paid by a double coupon supermarket is dictated to a large degree by the manufacturer, so the retailer is vulnerable to large promotional expenses if many manufacturers issue high value coupons. Moreover, some con-

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Table 1. Double couponing across the United States

City	Percent of all commodity volume Double coupon stores, 1st half, 1991
Atlanta	77
Boston	46
Chicago	5
Cleveland	3
Los Angeles	58
New York	4
Philadelphia	87
San Diego	68
St. Louis	70
Washington, D.C.	22

Source: 1991 Nielsen Review of Retail Grocery Trends.

sumers accumulate coupons and bring them to a double coupon supermarket to obtain added savings. Such cherry picking behavior can be very costly to a double coupon store. How do supermarkets recoup their large expenses for this widespread promotion? Do the promoting stores significantly increase sales volume, or do they simply subsidize the promotion through higher prices?

Varadarajan (1986) and Bhasin and Dickinson (1987) suggested that stores continually double coupons because they are caught in a prisoner's dilemma. When one store promotes double coupons, it may temporarily gain market share, but this forces other stores to mimic the promotion. Eventually no store can build market share because all stores offer equivalent promotions, and profits are reduced. However, Walters and MacKenzie's (1988) empirical study argued that double couponing increases profit.

These researchers did not consider price adjustments of double coupon supermarkets, which this paper does. A unique primary data set shows that not only do double coupon supermarkets have higher shelf prices than single coupon supermarkets, but the price differences are proportional to the intensity of the promotion. The larger the doubleable coupon, the larger the price difference.

We also find that because of the higher prices paid at the double coupon stores, to save money a customer must use at least one doubleable coupon for every 13 items bought. Only one out of four shopping trips to double coupon stores leaps this hurdle; that is, three out of four pay more. Details of the consumer study are described next.

### 1. Consumer response to double couponing: stylized facts

To estimate how costly double coupon promotions are to stores, we collected receipts from shoppers leaving five major North Carolina supermarkets. Equal numbers of receipts were collected from each store type: 483 from the double

coupon supermarkets and 484 from the single coupon supermarkets. Only 60 subjects (about 6 percent) refused to participate. The primary variables coded for each shopping trip were the numbers and values of doubleable coupons used, the number of items bought, and total expenditure for the purchased market basket.

Table 2 shows that the typical consumer's financial savings from double coupons is 1.5 percent of spending (row 2). Given that U.S. supermarkets have net margins of about 2 percent, double couponing is very costly; half or more of the profits could be dissipated by the promotion. How does the supermarket recoup its promotional expense?

Table 2 suggests that there is little difference in average expenditure between double and single coupon supermarkets (the difference in Row 3c is not statistically significant). The double coupon store is not recouping the cost of the promotion through greater spending by consumers. In fact, when the shopping trips in which coupons are used are distinguished from those without coupon redemptions, the expenditure differences are more pronounced, although still not statistically significant. Surprisingly, *less* money is spent at double coupon stores for both coupon trips (\$50 versus \$58, row 3a) and noncoupon trips (\$26 versus \$29, row 3b).

What explains this? Customers are more likely to use coupons in their major "stock-up" shopping trips and are less likely to use them in "fill-in" shopping trips. Table 2 shows that customers spend almost twice as much money in trips in which they use coupons (compare rows 3a and 3b). The double coupon stores attract over double the percentage of shopping trips where coupons are used (26.5 percent compared to 12.2 percent, row 4). This explains the smaller difference in average expenditure (between double and single coupon supermarkets) compared to the differences in expenditure when broken down by coupon usage.

In summary, double couponing by a supermarket leads to the following stylized facts about the shopping behavior of consumers.

Table 2. Double coupon savings, expenditure, and coupon use per shopping trip

	Double coupon stores 483 shopping trips	Single coupon stores 484 shopping trips
1. Double Coupon Savings	\$0.51	NA
2. Double Coupon Savings as a Percent of Expenditure	1.5	NA
3. Expenditure		
a. Coupon Trips*	\$50.33	\$57.51
b. Non-Coupon Trips	\$26.16	\$28.74
c. Average	\$32.57	\$32.34
4. Percent of Coupon Trips	26.5	12.2
5. Percent of Transactions with Doubleable Coupons	5.6	1.5

\*Coupon Trip – shopping trip where at least one doubleable coupon is used.

- **Double Rule of Spending in Coupon Trips:** In shopping trips in which coupons are used, consumers spend twice as much money.
- **Double-Double Rule of Coupon Use:** Shoppers at double coupon supermarkets are twice as likely to use at least one doubleable coupon, and they use twice as many coupons if they do, so total coupon use is four times larger.
- **Holding Back Spending at Double Coupon Stores:** Less money is spent at double coupon stores by both coupon users and noncoupon users.

This last stylized fact shows that customers hold back their spending at double coupon stores. Our main hypothesis in the next section will be that double coupon supermarkets raise shelf prices for brands with doubleable coupons to recoup part of their promotional costs. If this is the case, consumers might recognize that the prices for some items are higher at the double coupon store and choose to defer some of their purchases until their next shopping trip to a single coupon store.

## 2. Double coupons and price discrimination

Theoretical and empirical studies have shown that manufacturers with monopoly power may use coupons to target price-sensitive consumers, and raise price to take advantage of loyal customers (Narasimhan 1984, Levedahl 1986, Vilcassim and Wittink (1987), Gerstner and Holthausen 1986 and Gerstner and Hess 1991, Gerstner, Hess, and Holthausen 1992).

Double coupons can be viewed as retail coupons offered to match all manufacturer coupons penny for penny, with advantages over regular press-run retail coupons of not requiring printing, advertising or extra processing costs. Like manufacturers, supermarkets also have limited monopoly power because of store location, so they may also price discriminate by using the double coupons to attract price-sensitive customers and raising shelf price to loyal customers, who trade convenient location for higher prices. Double coupon supermarkets may price discriminate by raising shelf price only for the doubleable brands (in Raleigh, brands with coupons below 50 cents), only for non-doubleable brands (brands without coupons or brands with coupons above 50 cents), and for all brands. Which of the three pricing strategies is most likely to be pursued?

Setting high prices only for non-doubleable brands would leave the supermarket especially vulnerable to cherry pickers, who will bring all their coupons to the double coupon store but purchase items without double coupons at other stores. Cherry picking is less viable if the double coupons stores also raise prices on the doubleable brands.

An especially appealing strategy is to raise prices in proportion to the values of the manufacturers' doubleable coupons. The proportional price increases automatically protect the double couponing supermarket from floods of large manufacturer coupons that must be doubled (coupons less than or equal to 50 cents) and the resulting large promotional costs. The protection occurs because the ad-

justment in shelf price is more substantial when the bonus coupon is larger, so the store collects more money when the doubled coupon is larger.

Of course, supermarkets may have higher prices for reasons other than the double coupon promotion, such as more costly locations, wider merchandise assortments, and cleaner produce. Therefore, evidence that double couponing itself induces higher prices must either hold all these other reasons constant or be directly linked to the intensity of the promotion. Because the intensity of the double coupon promotion can be measured by the value of the doubleable coupon, the following proportional price difference hypothesis will be tested. This hypothesis follows from a competitive theory of the limits of price discrimination described in the appendix.

**Proportional Price Difference Hypothesis:** Price differences between double and single coupon supermarkets are proportional to the value of the doubleable coupons.

This hypothesis is tested by estimating the following equation across a variety of brands:

$$P_{\text{double}} - P_{\text{single}} = \alpha C D + \beta (1 - D). \quad (1)$$

$P_{\text{double}}$  and  $P_{\text{single}}$  measure the brand's price at double and single coupon supermarkets. The variable  $D$  is a dummy variable that equals 1 for doubleable brands and 0 for non-doubleable brands, and  $C$  is the face value of coupon or zero if there is no coupon. Notice that if a brand has a coupon that exceeds 50 cents, the first term is zero because the coupon is not doubleable. The coefficient  $\alpha$  measures the proportional price difference for doubleable brands and the coefficient  $\beta$  measures the average price difference for non-doubleable brands.

The proportional price difference hypothesis specified above predicts a positive coefficient,  $\alpha$ . Such a result will provide convincing evidence that the discriminatory pricing is linked to the double coupon promotion. For non-doubleable brands, a negative coefficient  $\beta$  contradicts the theoretical link between pricing and double coupon strategy. However, a positive  $\beta$  cannot be attributed directly to the double coupon promotion because we are unable to hold constant other factors that might create higher prices. To test the price adjustment, primary data were collected as described next.

### 3. Estimating price differences

To test the proportional price difference hypothesis, all coupons from the free-standing inserts distributed with the Sunday edition of the local Raleigh, North Carolina newspaper for five weeks in 1990 were clipped and the shelf prices for these brands collected for the five major supermarket chains. According to NCH

Promotion Services (1992), 77.8 percent of all manufacturers' coupons were distributed by this method in 1990. Because coupons typically may be used for several sizes of a brand, the smallest size that qualified for the coupon was selected. All stores were located within a radius of 5 miles.

The number of doubleable coupons collected was 284 and the number of non-doubleable coupons (above 50 cents) was 65. Our main interest is the relationship between pricing and the intensity of the promotion as measured by the value of double coupons, so we concentrate our data collection effort on doubleable coupons. For purposes of comparison, in addition to the 65 non-doubleable coupons, we also priced 19 products judged to have no coupon.

The five stores studied do not have identical brand assortments. We found 270 items in double coupon supermarket 1 and 288 in supermarket 2. Only about one-third of the brands were found in all five stores. To mitigate the loss of observations that occurs when one of the single coupon stores does not carry a brand, the price is averaged across all those stores that carry the brand. That is, if all three single coupon stores carry the item, the three shelf prices are summed and divided by three; if only two stores carry the product, two prices are summed and divided by two; and if only one store carries the product, the store's price is used. Because the double coupon store is in competition with all single coupon stores, this procedure maximizes the number of usable observations without biasing the results.

Using Glesjer's (1969) test for heteroscedasticity, brands with higher prices were found to have larger error terms. Generalized least squares is used to estimate the model (equation (1) was divided by the square root of the price at the single coupon stores to standardize the error variance). The intercept was first included but found to be statistically insignificant, so was dropped from the regression. The equation was estimated for each double coupon store separately, but a Chow test indicated that the two samples could be pooled, so table 3 also reports the pooled regression. In this regression, some coupons appear twice because price differences occur for both double coupon supermarkets. The total number of observations is 558.

Table 3. Generalized least squares regression results

Variable	Dependent variable: price difference $P_{\text{double}} - P_{\text{single}}$		
	Double coupon Supermarket 1	Double coupon Supermarket 2	Double coupon Supermarkets pooled
Doubleable Coupon	0.36	0.35	0.35
Value, CD	(5.69)	(6.73)	(8.70)
Non-Doubleable	0.08	0.12	0.11
Coupon Brands, I-D	(1.96)	(3.99)	(4.12)
R <sup>2</sup>	0.12	0.18	0.17
Sample Size	270	288	558

Numbers in parentheses are t-statistics. R<sup>2</sup> is calculated from deviations from zero, rather than the mean, due to the missing intercept.

The evidence strongly supports the proportional price difference hypothesis. The coefficient  $\alpha$  of doubleable coupon value is positive and significant at the 1 percent level. The estimated coefficient implies that for every 10 cents of double coupon value paid by the promoting store, shelf price is 3.5 cents higher for the doubleable brand. Because the supermarket makes a larger adjustment for brands with larger coupons, we infer a linkage between the double coupon promotion and retail pricing.

The estimates show unambiguously that these two double coupon stores have higher prices than their single coupon rivals. According to the pooled equation in Table 3, the non-doubleable brands are priced about 11 cents higher at the double coupon stores than at single coupon stores, or about 5 percent more. Although we cannot attribute this solely to double couponing, we certainly cannot reject a price adjustment theory based on this estimate of  $\beta$ .

The proportional pricing rule allows the promoting supermarkets to price discriminate and simultaneously protect themselves against huge unexpected promotional expenses resulting from large manufacturer coupons or from excessive cherry picking. By raising prices in proportion to the intensity of the promotion, the store recoups part of the double coupon money paid to consumers. Does the typical coupon user save money at double coupon stores? This question is addressed next.

#### 4. Who saves at double coupon supermarkets?

The higher prices at double coupon supermarkets explain why both coupon users and noncoupon using shoppers reduce their expenditures at double coupon stores, as previously shown in table 2. How many doubleable coupons must a customer use to save money by shopping at a double coupon store? We will use the above data to answer this for the Raleigh double coupon stores.

Suppose a shopper buys  $N$  products, using  $L$  double coupons. Some of the  $N-L$  brands purchased without using a doubleable coupon, may still have a coupon available. The shopper could have missed the coupon or used it in an earlier purchase. We estimate that 13 percent of these  $N-L$  items have an outstanding doubleable coupon.<sup>1</sup> Hence  $L + 0.13(N-L)$  of the items have doubleable coupons. The average doubleable coupon in our sample has a face value of \$.34, so according to Table 3 its shelf price is higher by  $0.35 \times \$.34 = \$.12$ .

Total added expenses at the double coupon store for these  $N$  items is therefore  $0.12(L + .13(N-L))$ . This must be compared to the bonus coupon value of  $.34L$ . A shopper benefits from choosing the double coupon store if this bonus coupon value exceeds the total added expenses or if the doubleable coupons used per item bought satisfy

$$\frac{L}{N} > 0.076. \quad (2)$$

This implies the following:

**Double Coupon Savings:** A customer saves money by using a doubleable coupon for at least 7.6 percent of the items bought.

It is still problematic whether the higher price of *non*-doubleable brands should be attributed to the double coupon promotion, and conservatism dictates that we lean toward the assumption that these specific price differences are not attributable to the double coupon promotion. If they were attributed, the usage rates would have to be much higher.

Figure 1 describes the distribution of doubleable coupons used per item bought from the receipt data reported in section I. In a typical shopping trip to a double coupon store, 5.6 percent of the transactions involved a doubleable coupon. This typical shopping trip would have been slightly cheaper at a single coupon store. Since 73 percent of shopping trips are couponless, the vast majority of trips are more costly at double coupon stores. However, looking only at the coupon-trips, almost all coupon users exceed the critical 7.6 percent usage rate (mean usage rate is 21.1 percent). In summary, at best only 26 percent of the shoppers benefit financially from double couponing (not counting the problematic 11-cent differential for non-doubleable brands).

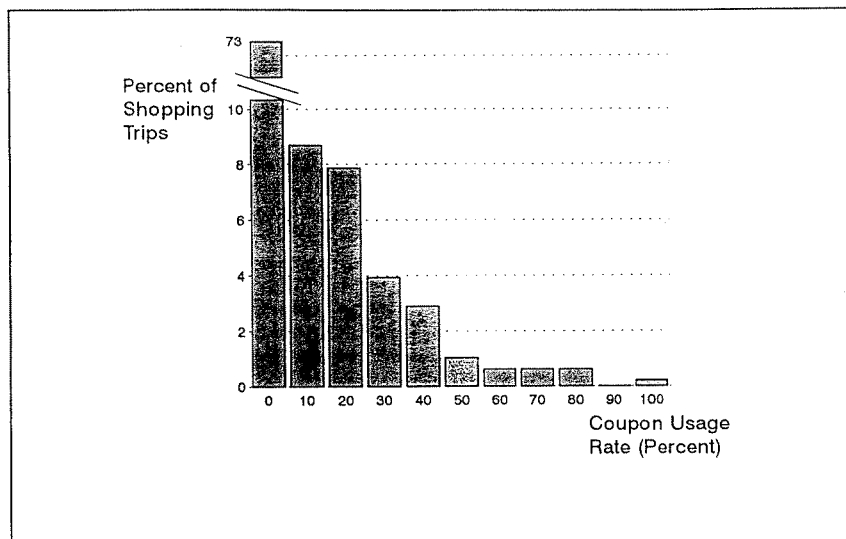


Figure 1. Distribution of coupon usage rates.



## 5. Conclusion

Previous research on couponing suggests that supermarkets might charge higher prices to take advantage of local monopoly power and then offer double coupons to target price-conscious consumers. The double coupon supermarkets studied here seemed to set prices higher than single coupon stores. It is important to remember that our findings not only predicted higher prices for doubleable coupon products but also predicted a pricing rule that states that price differences between double and single coupon supermarkets will be proportional to the intensity of the promotion, as measured by the coupons' face values. Other reasons why double supermarkets may have higher prices, such as costly locations or wider assortments, do not predict a price difference proportional to the coupon under promotion.

Because shelf price is automatically adjusted upward proportional to coupon values, the double coupon store protects itself from coupons drops with large numbers of doubleable coupons and from excessive cherry-picking behavior by consumers. To adjust shelf prices, stores do not have to wait until coupons are distributed. Manufacturers typically notify grocers in advance about coupon drops to assure sufficient stocks in their stores. Moreover, coupons often are valid for several months so that supermarkets have ample time to implement this rule.

Consumers and manufacturers should pay attention to pricing by the growing number of double coupon stores. Non-users and light-users of coupons pay a higher net price at the double coupon supermarkets. To financially benefit from double couponing, a shopper must use at least one doubleable coupon for every 13 items bought. Even heavy coupon users will want to consider the price adjustments before making store choice decisions. Manufacturers may want to adjust their coupon values to take into account not only the higher redemption rates on their coupons but also the higher shelf prices that result from double couponing.

Double coupon supermarkets may cover their hefty promotional expenses in other ways than raising prices. First, revenue at the double coupon supermarkets may increase if the promotion attracts a larger number of shoppers to the store or if it causes customers to buy more products without coupons than they otherwise would have bought (Walters and MacKenzie (1988) found that this was not the case). Second, the double coupon promotion may lead consumers to inspect coupons, and through some advertising effect to shop at the double coupon supermarket and buy the brands without using the coupon. Third, double couponing may attract a mix of customers that is more profitable. Fourth, double couponing may substitute for advertising and other forms of promotion and therefore reduce the total costs of marketing. Fifth, double coupon promotions may reduce the stores' dependence on weekly advertised special sales (Krishnan and Rao 1992). Future research should investigate these ways for supermarkets to recoup double coupon expenses.

## Notes

1. Each week 65 doubleable coupons were issued with an average expiration date 120 days in the future. Coupons may be used typically "on any size," so based upon 1.16 package sizes (Gerstner and Hess 1987), 1,293 items have an unexpired doubleable coupon at any given time. This is 13 percent of the 10,000 stock-keeping units considered by most consumers. Similarly, 2 percent of all items have a single coupon and 85 percent have no coupon.

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## Appendix: Derivation of the proportional price difference equation

Let upper-case  $P$  denote the price of a doubleable coupon brand, lower-case  $p$  denote the price of non-doubleable brand, and  $P_w$  denote the wholesale price, assumed to be the same for both types of brands. Suppose that a proportion  $k$  of the assortment are doubleable brands. Let  $\rho$  be the probability, conditional upon

the existence of an unexpired doubleable coupon, that the brand will be bought and let  $q$  denote the probability, conditional upon a purchase being made, that a coupon is used in the transaction. The probability that a brand has a doubleable coupon and the brand is bought and the coupon is redeemed is  $k\rho q$ . Let  $\gamma$  be the probability, conditional upon no doubleable coupon, that the brand will be bought. Assume that  $k$  and  $\rho$  are identical across stores.

The expected contributions of a brand at the single and double coupon stores respectively are

$$k\rho(P_{\text{single}} - P_w) + (1 - k)\gamma(p_{\text{single}} - P_w), \text{ and} \quad (\text{i})$$

$$k\rho(P_{\text{double}} - qC - P_w) + (1 - k)\gamma(p_{\text{double}} - P_w). \quad (\text{ii})$$

Although the double coupon store may want to raise its prices to offset costs of its promotion, it cannot do this in excess because of the competition from single coupon rivals. Equilibrium is found by setting contributions (i) and (ii) equal and solving for  $P_{\text{double}} - P_{\text{single}}$ :

$$P_{\text{double}} - P_{\text{single}} = (1 - k)\gamma/(k\rho) (p_{\text{single}} - p_{\text{double}}) + qC. \quad (\text{iii})$$

If  $p_{\text{single}} - p_{\text{double}}$  is zero for brands where  $P_{\text{double}} - P_{\text{single}} > 0$  and vice versa, then (iii) reduces to equation 1.