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# **Markups and Promotional Patterns of California WIC- Authorized Foods**

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## **Markups and Promotional Patterns of California WIC- Authorized Foods**

The Woman, Infants, and Children (WIC) program is an integral component of America's societal safety net. The third largest food assistance program in the United States as measured by expenditure, the WIC program serves nearly half of all infants born in the U.S. (Davis 2007) and about one-quarter of children ages 1 – 4 (Oliveria et al. 2002). The WIC program supports food access, health care, and nutritional education for low-income, pregnant, and postpartum women, infants, and children up to five years of age.

The WIC program is administered by the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS), as authorized under the Child Nutrition Act of 1966 and subsequent re-authorizations of said Act.<sup>1</sup> Although WIC is a federal program, it is administered by 90 local WIC agencies that receive grants based on Congressional Appropriations (Abt Associates 2011).<sup>2</sup> FNS guidelines apply to all local WIC agencies and are in place to promote competitive pricing and program cost containment. Given that program funding is not entitlement-based, participant access is determined in part by appropriations and in part by the cost containment practices of each local agency on an annual basis, thus making cost containment a crucial element of program effectiveness.

Local WIC agencies provide food instruments (FI) (checks and/or vouchers) to participants who exchange them for specific supplemental foods at authorized retailers. Each FI specifies the type and amount of supplemental food items that the participant can

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<sup>1</sup> The WIC program began in 1972 with an amendment to the Child Nutrition Act of 1966.

<sup>2</sup> The 90 WIC agencies include the 50 states in the U.S., the District of Columbia, Guam, the American Virgin Islands, American Samoa, the Commonwealth of Puerto Rico, the Northern Mariana Islands and 34 Indian Tribal Organizations (Abt Associates 2011).

purchase. By specifying a specific set of food products a participant is able to obtain, rather than a fixed-dollar voucher, the WIC program operates in a fundamentally different way than the more familiar Supplemental Nutrition Assistance Program (SNAP), formerly known as the food stamp program.

The California WIC program is the largest in the nation, with over \$1.156 billion allocated to the state in 2012 (WIC 2012). California was home to 16.1% of total WIC participants in the U.S. in 2010 (Abt Associates 2011). Given the size and prominence of the California WIC program, this paper focuses on cost containment for the California WIC program, but, given that FNS oversight and regulations are uniform across local agencies, the results are expected to apply broadly to WIC programs in other localities.

Because foods offered under the program are provided at no charge to program participants, these individuals have little, if any, incentive to be price conscious in their purchase decisions. In essence, WIC participants' demands for the products offered through WIC food instruments are perfectly inelastic (i.e., through their FI, WIC participants have access to a fixed quantity of specific food products at no cost to them), creating the potential for WIC vendors to charge non-competitive prices for these products. And, while the focus of FNS guidelines and regulations is to ensure competitive pricing and program cost containment, the effectiveness of cost-containment strategies employed by local agencies is not clear.

The majority of prior research on WIC and cost containment has focused on manufacturer behavior, ignoring the potential role of retailers in affecting program costs. The omission of the role of retailers in affecting the costs of WIC-eligible products is

surprising, given the emerging perception that major retailers are dominant players in the food chain.<sup>3</sup>

This paper seeks to fill the void in knowledge regarding retailers' pricing and promotions for WIC-eligible products. Specifically, we ask whether retailer markups and product promotional depth and frequency differ for WIC-authorized products relative to a carefully chosen control group of similar products that are not WIC authorized. The extent to which a product's WIC-eligible status influences retailer markups and promotional strategies is an important, but previously unexplored, research question. If retailers set higher markups for WIC-authorized products and/or promote them less frequently, then (i) given WIC's fixed budget, the program's ability to serve participants is diminished, and (ii) food costs are increased to non-WIC participants.

Economic theory predicts that retailers may markup WIC items more than comparable non-WIC products because the presence of an inelastic demand segment of customers (i.e., the WIC participants) means the overall demand for the product facing the retailer is less elastic than for a comparable product that is not WIC eligible. The same considerations may also cause retailers to promote WIC-eligible products less frequently or not at all. Economic theory offers two main motivations for sales: i) to attract the patronage of elastic-demand customers, and ii) to attract customers to the store in expectation that they will purchase regular-price items in addition to the sale item (Blattberg, Briesch, and Fox 1995). Either motivation is attenuated for WIC-eligible products because WIC customers' demands are perfectly inelastic and WIC customers

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<sup>3</sup>Concentration among food retailers has risen considerably in recent years. National CR4 in food retailing, only 16.8% in 1992, increased almost continuously to 35.5% in 2005. However, because consumers are distributed geographically and incur significant transaction costs, retail markets are localized in geographic scope and fit the model of a spatial oligopoly (Ellickson 2007). Average grocery retailing CR4 in 2006 for 229 metropolitan statistical areas based on analysis of Nielsen Market Scope data was 79.4%.

will not be induced to visit a store due to sales of WIC items, which they can obtain for free through the program.

In this paper we use data on wholesale and retail prices of WIC-eligible and control products to investigate whether or not large California retailers (i) set higher markups for WIC-eligible products relative to control products in the same product category, and (ii) promote WIC-eligible products less frequently or to a lesser degree (i.e., less price discount when sales do occur). Effective controls for the analysis are provided by the fact that, for many product categories (e.g., infant formula, ready-to-eat breakfast cereals, and infant cereals), only selected brands and sizes are WIC eligible and relatively closely comparable products are not eligible.

Our results suggest that large retailers are not systematically engaged in setting higher markups for WIC-eligible products, relative to control-product counterparts. WIC participant purchases may constitute a relatively small share of product category purchases in many cases, thereby mitigating retailers' incentives to exploit the inelastic demands of WIC participants. However, the conclusion holds true for formula sales as well, and here WIC sales comprise about half of total formula sales.

When evaluating the promotional frequency and depth of WIC-eligible products, relative to non-WIC control products, results indicate that for the most of product categories retailers do not systematically promote WIC-eligible products less frequently and the sales that are conducted for WIC-authorized items do not necessarily offer shoppers less substantial discounts. In some product categories WIC-eligible products are actually promoted more frequently and with greater depth. In these situations, we posit that these are food categories where the WIC-authorized product(s) are the most popular

(i.e., largest sellers) among all shoppers and are thereby promoted more often by both manufacturers and retailers who are likely not influenced by WIC eligibility.

These results are prospectively important for the effective operation of the WIC program. Many smaller food vendors target the WIC program; indeed many vendors specialize in selling to WIC participants. It is well known that these vendors charge considerably higher prices for WIC FI than supermarkets. Results demonstrating that large supermarkets do not markup WIC products, relative to closely related control products, suggests that WIC products are priced competitively in large supermarkets and that the program's effectiveness will be enhanced to the extent participants are encouraged to shop at supermarkets instead of small vendors specializing in WIC sales. The results also mean that large supermarkets' prices for WIC products can be used as a benchmark to gauge the competitiveness of the prices set by smaller vendors.

### **Grocery Retailer Markup and Promotional Strategies**

Using inferred price-cost margins for supermarkets, Villas-Boas (2007) showed that manufacturer wholesale prices are close to marginal cost and that the pricing power in the food retail vertical chain lies with the supermarkets. This result is consistent with other results in the literature on the relationship between supermarkets and manufacturers in the supermarket supply chain (e.g. Mills 1999), which indicate a transfer in market power from manufacturers to retailers. As a consequence price changes implemented by supermarkets are largely the result of their own independent strategies, rather than reflecting cost changes stemming from the manufacturing sector. Thus, how retailers markup and promote WIC-eligible items is of fundamental importance to WIC state

agency cost containment as well as non-WIC participants who are subject to the same retail prices and supermarket promotion schedules as WIC participants.

Promotional pricing is an essential tool for food retailers. Over the past 20 years, promotions have accounted for an increasing share of supermarkets' advertising budgets relative to non-price advertising (Zenor 1994; Blattberg, Briesch, and Fox 1995; Mela, Gupta, and Lehmann 1997; Jedidi, Mela, and Gupta 1999). Virtually all supermarkets engage in promotional pricing. Under the strategy of high-low pricing (HLP), revolving selections of products are advertised at low prices with the markups on these products set at very low, possibly negative, levels while the remaining products offered in the store are sold at significantly higher markups.

The alternative to HLP is the so-called everyday low pricing (EDLP) strategy. Under strict EDLP, all products in the store are assigned a percentage markup and the resulting shelf prices change infrequently. True EDLP stores offer no temporary price reductions (Bell and Lattin 1998). Despite the increasing popularity of EDLP among conventional supermarkets, there are virtually no "true" EDLP supermarkets in the US, in that even those chains that describe themselves as EDLP offer and advertise promotions (Hoch, Dreze, and Purk 1994; Lal and Rao 1997).

The items that supermarkets place on promotion are often intended to act as loss leaders. Loss leaders are sold at or below marginal cost, and therefore are not profitable as stand-alone products. The primary motivation for supermarkets to offer products as loss leaders is the anticipated resulting increase in consumer traffic in store (Walters, 1988). Consumers are drawn in by advertised product promotions and proceed to purchase fully priced products, in addition to the promoted items. Lal and Matutes (1994)

studied loss leader pricing and found that for supermarkets to maximize profits using this strategy it is key that the complements to loss leaders are sold at full price. Moreover, the optimal products to be chosen as loss leaders are those with high purchase frequency and high storage costs on the part of consumers. Therefore, when examining the impact of WIC eligibility on pricing, it may be important to also keep in mind the popularity of products within categories and the likelihood of their use as loss leaders.

Levy et al. (1998) calculated that on average supermarkets change 4,000 prices per week in store, while manufacturers change between 1,000 and 1,500 wholesale prices. The authors concluded that the major determinants of price changes in supermarkets are, in order of decreasing importance, competitive factors, consumer price sensitivity, and price changes on the part of manufacturers. Dutta, Bergen, and Levy (DBL, 2002) found that the primary determinant of changes in retail margins is not changes in wholesale costs. Further, DBL find that promotions at the retail level do not result from trade deals, but rather are indicative of retailer strategies.

### ***WIC-Eligible Infant Formula and Retailer Markups***

Formula comprises the largest share of food expenditures under WIC, and local agencies have also used sole-source contracts with formula manufacturers, who provide rebates to the local WIC agencies, often in the range of 85-90% of cost, as an inducement to obtain the sole-source contract. These rebates supplement federal allocations to represent the two main revenue sources for funding state WIC programs. Use of sole-source contracts is now expanding to some baby foods and infant cereals in some areas of the U.S.

Sole-source contracts with rebates may contain costs for the WIC program from a wholesale price perspective but likely raise costs to non-WIC consumers through high markups charged by the sole-source supplier (Davis 2011). Further, if retailers have incentives to impose supra-competitive markups on WIC-eligible products, including sole-source formula, program costs are increased, as are food costs for non-WIC consumers.

Most prior work on WIC has focused on formula and manufacturer incentives under sole-source contracting. Early work by the U.S. Government Accountability Office (GAO 1990) suggested that sole-source supply contracts with accompanying rebates were an effective cost-containment strategy for WIC agencies. Oliveira and Davis (2006) documented increases in both net wholesale prices (wholesale price less rebates) and retail markup for infant formula. Oliveira et al. (2004) and Betson (2009) suggested that the explanation for the higher markups is that the WIC program effectively removes formula consumers with relatively elastic demands from the market.

Several studies have examined manufacturer incentives under the sole-source contract system for formula and whether or not “spillover benefits” associated with being the sole-supplier of infant formula are sufficient to compensate the manufacturer for selling WIC formula at low price-cost margins (Betson 2009; Davis 2011). The GAO (1998) identified two specific spillover effects to the sole-source WIC supplier: i) pediatricians likely recommend the formula made by the manufacturer chosen by the WIC state agency, and ii) additional and more prominent shelf space in the grocery store will likely be allocated to the WIC authorized formula.

Oliveira et al. (2004) provided empirical evidence that if a manufacturer is selected as the WIC-authorized formula supplier, the manufacturer's price increases. On average, the formula supplier who won the contract would experience retail price increases of 10 cents per can while the loser of the contract would, on average, have an increase in retail price of 3 cents per can. Further, the authors show that the larger the size of the WIC market, relative to the non-WIC participant market, the higher the price of infant formula sold by *all* manufacturers. Huang and Perloff (2007) confirmed the importance of the spillover effects associated with sole-supplier status. They found that if a manufacturer wins the WIC contract, its market share grows from less than 20 percent to over 70 percent in just two years.

Betson (2009) constructed a theoretical model that ignores these potential spillover effects, assuming instead that manufacturers who do not win a WIC contract retain their non-WIC customer base. The results of the model suggest that increases in the wholesale price would cause the WIC manufacturer to increase the rebate it offers to the state agency by an equal amount. Using data from Mead Johnson and Ross Labs, Betson found that for a 1-percentage point increase in the number of WIC infant participants would cause a 0.22 percent reduction in the wholesale price. Using a separate set of bid data, Benton found a one-to-one correlation between a manufacturer's wholesale price and its rebate offer.

Davis (2011) investigated the effect that WIC has on formula pricing, including incorporating the possibility for spillover effects to offset low margins or losses for WIC-participant sales. Davis finds that, on average, the marginal cost of milk-based concentrate is \$0.37, while the wholesale price is approximately \$3.02 per can. Thus,

manufacturers are setting price well above marginal cost. Further, the estimated spillover effect (increase in sales) is approximately 35%. Finally, Davis shows that in *most* model specifications, the WIC program rebates do not affect price-cost markups at the wholesale level.

### **Grocery Retailer Markups of WIC-Eligible Products**

The data set utilized to investigate grocery retailer markups of WIC-eligible and select control products include wholesale cost and retail prices for three large supermarket chains in Northern California and four large supermarket chains in Southern California.<sup>4</sup> The data are available weekly for the time period beginning August 2011 and continuing through May 2012. The group of Northern California supermarkets includes Raley's (18 stores), Lucky's (5 stores in the San Francisco Bay Area), and Safeway (26 stores in the Sacramento area and 18 stores in the San Francisco Bay Area). The stores comprising the Southern California supermarket chains consist of Slater Brothers (41 stores), Albertsons (37 stores), Ralph's (30 stores), and Vons (32 stores). Wholesale costs and retail prices are averaged for each supermarket chain and location in each week. In addition to wholesale costs and retail prices, the data contain product description, package quantity, product size, and UPC code.

The California WIC Agency is in the process of compiling a database of UPC codes of authorized WIC products but that information is unavailable at present. Thus, it was necessary to identify WIC-eligible and control products using the product description field in the dataset. As a consequence, in order to facilitate the identification of WIC-eligible and control products, we focused on food categories where WIC-authorization

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<sup>4</sup> According to the data providers, the Kern County line separates Northern and Southern California supermarkets.

criteria are very specific (e.g., specific brands and package sizes are indicated). The products analyzed under this criterion included ready-to-eat breakfast cereal, formula, and infant fruit, vegetables, cereal, and meat.

Selection of control products was based upon the following criteria. A product was included as a control if it was not WIC-eligible based upon one of three product dimensions: size, type, or form. For example, the California WIC Agency stipulates that only 16-ounce blocks or rounds of cheddar, colby, jack, mozzarella, or some combination thereof constitute a WIC-eligible product. Thus, a 32-ounce block of cheddar would be coded as a control product as it was eliminated from WIC-eligibility based only upon its size. Also, a 16-ounce block of Swiss cheese would be included as a control as it would be WIC-eligible if it were a different type (i.e., flavor/variety), yet all of the other product characteristics are consistent with WIC-authorizing criteria. Conversely a 32-ounce block of Swiss cheese would be excluded as a control because it differs from WIC-eligible products on two dimensions. Each group of WIC-eligible products, in a given food category, is compared to the selected group of control products in the same food category.

We computed product markups in terms of the Lerner Index for each product, computed as the difference between retail price and wholesale price, divided by the retail price. Table 1 examines markups for the eight chains in the dataset for several ready-to-eat breakfast cereals and their control products. The average markup for treatment and control is also indicated.<sup>5</sup> The results clearly suggest that the WIC-eligible cereals are not marked up more than their control-product counterparts. Indeed, in each instance, the markups are almost identical.

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<sup>5</sup> A missing value in tables 1 – 3 means that prices were not reported by the chain in that category.

**Table 1. Grocery Retailer Ready-to-Eat Breakfast Cereal Markups for WIC-Eligible and Control Products**

WIC-Eligible		Control		WIC-Eligible		Control	
<b>General Mills Cheerios</b>				<b>Quaker Life</b>			
STORE 1	0.186	STORE 1	0.171	STORE 1	0.210	STORE 1	0.234
STORE 2	0.183	STORE 2	0.178	STORE 2	0.257	STORE 2	0.180
STORE 3	0.193	STORE 3	0.199	STORE 3	0.213	STORE 3	0.154
STORE 4	0.152	STORE 4	0.166	STORE 4	0.242	STORE 4	0.249
STORE 5	0.174	STORE 5	0.169	STORE 5	0.261	STORE 5	0.263
STORE 6	0.191	STORE 6	0.170	STORE 6	0.245	STORE 6	0.247
STORE 7	0.093	STORE 7	0.098	STORE 7	0.171	STORE 7	0.154
STORE 8	0.137	STORE 8	0.116	STORE 8	0.193	STORE 8	0.157
TOTAL	0.164	TOTAL	0.162	TOTAL	0.215	TOTAL	0.212
<b>General Mills Kix</b>				<b>Bran and Corn Flakes</b>			
STORE 1	0.243	STORE 1	0.211	STORE 1	0.247	STORE 1	0.411
STORE 2	0.208	STORE 2	0.233	STORE 2	0.273	STORE 2	0.256
STORE 3	0.226	STORE 3	0.234	STORE 3	0.277	STORE 3	0.401
STORE 4	0.226	STORE 4	-	STORE 4	0.240	STORE 4	0.291
STORE 5	0.237	STORE 5	-	STORE 5	0.255	STORE 5	0.334
STORE 6	0.222	STORE 6	-	STORE 6	0.266	STORE 6	0.344
STORE 7	0.203	STORE 7	-	STORE 7	0.216	STORE 7	0.266
STORE 8	0.254	STORE 8	0.304	STORE 8	0.260	STORE 8	0.361
TOTAL	0.227	TOTAL	0.246	TOTAL	0.251	TOTAL	0.330
<b>Kellogg's Mini Wheats</b>				<b>Kellogg's Special K</b>			
STORE 1	0.237	STORE 1	0.230	STORE 1	0.188	STORE 1	0.214
STORE 2	0.164	STORE 2	0.170	STORE 2	0.180	STORE 2	0.183
STORE 3	0.196	STORE 3	0.235	STORE 3	0.150	STORE 3	0.167
STORE 4	0.221	STORE 4	0.206	STORE 4	0.182	STORE 4	0.191
STORE 5	0.168	STORE 5	0.104	STORE 5	0.194	STORE 5	0.148
STORE 6	0.192	STORE 6	0.189	STORE 6	0.194	STORE 6	0.210
STORE 7	0.080	STORE 7	0.085	STORE 7	0.190	STORE 7	0.151
STORE 8	0.116	STORE 8	0.100	STORE 8	0.181	STORE 8	0.211
TOTAL	0.174	TOTAL	0.166	TOTAL	0.182	TOTAL	0.184

To analyze retailer markups for infant formula, we divided the formula category into three subcategories: i) milk-based powder, ii) milk-based concentrate, and iii) soy-based powder, as each of these subcategories have different retail prices and different wholesale costs.<sup>6</sup> Overall the results for formula displayed in table 2 show that across all three subcategories retailers do not systematically markup WIC-eligible formula, relative to control products. Both the milk-based powder and milk-based concentrate subcategories exhibit extremely close markups for WIC-eligible and control products,

<sup>6</sup> Given that the California Agency does not authorize the procurement of ready-to-use formula, all brands of ready-to-use formula are dropped from the analysis.

both at the individual chain level and in total. The differences in markups for soy-based powder differ more across individual chains and in total, relative to the milk-based formula subcategories, but more often than not, control products have a higher markup than WIC-eligible products. In general the markups for both WIC and control formula are very low—5.4% on average for the WIC-contracted milk-based powder formula and 5.2% for the control formulas in the same subcategory.

**Table 2. Grocery Retailer Infant Formula Markups for WIC-Eligible and Control Products**

WIC-Eligible		Control		WIC-Eligible		Control	
<b>Milk Based Powder</b>				<b>Milk Based Concentrate</b>			
STORE 1	-0.016	STORE 1	0.042	STORE 1	0.103	STORE 1	-
STORE 2	0.072	STORE 2	0.068	STORE 2	0.100	STORE 2	0.090
STORE 3	0.064	STORE 3	0.089	STORE 3	0.153	STORE 3	-
STORE 4	0.073	STORE 4	0.081	STORE 4	0.073	STORE 4	0.120
STORE 5	0.063	STORE 5	0.068	STORE 5	0.113	STORE 5	0.090
STORE 6	0.047	STORE 6	0.065	STORE 6	0.113	STORE 6	0.090
STORE 7	0.063	STORE 7	-0.018	STORE 7	0.047	STORE 7	-
STORE 8	0.075	STORE 8	0.034	STORE 8	0.113	STORE 8	0.100
TOTAL	0.054	TOTAL	0.052	TOTAL	0.102	TOTAL	0.098
<b>Soy Based Powder</b>							
STORE 1	-0.016	STORE 1	0.070				
STORE 2	0.072	STORE 2	0.060				
STORE 3	0.064	STORE 3	0.100				
STORE 4	0.073	STORE 4	0.110				
STORE 5	0.063	STORE 5	0.130				
STORE 6	0.047	STORE 6	0.060				
STORE 7	0.063	STORE 7	0.070				
STORE 8	0.075	STORE 8	0.100				
TOTAL	0.054	TOTAL	0.088				

Table 3 compares grocery retailer markups across individual chains and in total for infant cereals, infant fruits, infant vegetables, and infant meats. The California WIC Agency authorizes specific brands, types (e.g., rice, oatmeal, multigrain, etc.), and sizes of infant cereals. Alternatively, the California WIC Agency authorizes all brands of infant fruits, vegetables, and meats but imposes restrictions on the size, type (e.g., fruit, vegetable, or meat), and additives (e.g., rice, oatmeal, etc.) contained in the product.

Authorized brands include the market leaders Beech-Nut, Gerber, and Earth’s Best. While, in total, WIC-eligible infant cereals and meats were marked-up somewhat relative to the control products in the category, when looking at individual chain markups the results are less clear for infant cereals. Four of the eight chains have higher markups for control products when compared to WIC-eligible infant cereals. For infant vegetables and fruits, results show that on average control products were marked up higher than WIC-eligible products, a result that held consistently across individual chains. In general, markups are low for these infant foods, and in the case of store 7 often are negative, meaning store 7 often uses infant foods as a loss leader and other chains set low markups as a way to attract customers to their stores.

**Table 3. Grocery Retailer Infant Cereal, Fruit, Vegetable, and Meat Markups for WIC-Eligible and Control Products**

WIC-Eligible		Control		WIC-Eligible		Control	
<b>Infant Cereal</b>				<b>Infant Vegetables</b>			
STORE 1	0.2853	STORE 1	0.298	STORE 1	0.192	STORE 1	0.261
STORE 2	0.0812	STORE 2	0.144	STORE 2	0.109	STORE 2	0.119
STORE 3	0.1327	STORE 3	0.245	STORE 3	0.090	STORE 3	0.166
STORE 4	0.1879	STORE 4	0.018	STORE 4	0.053	STORE 4	0.064
STORE 5	0.0241	STORE 5	0.054	STORE 5	0.065	STORE 5	0.111
STORE 6	0.0573	STORE 6	0.056	STORE 6	0.082	STORE 6	0.121
STORE 7	0.0804	STORE 7	-0.031	STORE 7	-0.190	STORE 7	-0.147
STORE 8	0.0657	STORE 8	0.032	STORE 8	0.045	STORE 8	0.083
TOTAL	0.1081	TOTAL	0.082	TOTAL	0.043	TOTAL	0.080
<b>Infant Fruits</b>				<b>Infant Meats</b>			
STORE 1	0.160	STORE 1	0.267	STORE 1	-	STORE 1	0.237
STORE 2	0.111	STORE 2	0.132	STORE 2	0.191	STORE 2	0.112
STORE 3	0.066	STORE 3	0.143	STORE 3	0.254	STORE 3	0.188
STORE 4	0.054	STORE 4	0.069	STORE 4	0.095	STORE 4	0.050
STORE 5	0.059	STORE 5	0.133	STORE 5	0.136	STORE 5	0.070
STORE 6	0.076	STORE 6	0.155	STORE 6	0.136	STORE 6	0.069
STORE 7	-0.205	STORE 7	-0.118	STORE 7	-0.018	STORE 7	-0.202
STORE 8	0.020	STORE 8	0.115	STORE 8	0.188	STORE 8	0.025
TOTAL	0.027	TOTAL	0.094	TOTAL	0.140	TOTAL	0.054

## **Promotional Frequency and Depth of WIC-Eligible Products**

When investigating supermarkets' promotional activity, the principal variables of interest are promotional frequency and promotional depth. Promotional frequency is the percentage of time that a given product is on promotion. Promotional depth measures the extent to which shelf prices are reduced during promotions, and is often presented in percentage form to facilitate comparisons across different products.

The data set used to investigate the heretofore unexplored issue of promotional differences for WIC-eligible products includes prices and promotions for over 2,699 (WIC-Eligible and control) products in 11 WIC-eligible food categories (infant fruits and vegetables, canned fruits, canned vegetables, cheese, dried beans, eggs, canned fish, infant formula, milk, cereal, and peanut butter) offered at Safeway and Albertsons stores in selected metropolitan regions of California.<sup>7</sup> The data are weekly and cover a period of time spanning June 2008 through August 2010.

Both Safeway and Albertsons offer online retail and home delivery on all purchases. Therefore the data used in this paper cover only the cities in California for which these services are available, and only those products that can be purchased online. The cities (chains) included in the California dataset include: Palm Springs (Albertsons), Los Angeles (Albertsons and Safeway), San Diego (Albertsons and Safeway), Sacramento (Safeway), San Jose (Safeway), San Francisco (Safeway) and Fresno (Safeway).

The data obtained from the two chains collected each week contain the full name, including product size, of every product offered online for each chain/city combination,

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<sup>7</sup> The Albertsons name today applies to two distinct supermarket chains, resulting from a major buyout of Albertsons Inc. in 2006. The supermarket conglomerate Supervalu now owns over 450 stores under the name Albertsons, primarily in the western U.S., including southern California.

as well as prices and promotional information, if applicable. The term “promotion” refers to temporary and advertised reductions in price that are redeemable through consumer club cards.

Every product sold online for each chain has four key variables: i) shelf price, which is the undiscounted price or the price affixed to the shelf on which the product is sold, ii) promotional price, defined as the price of the product incorporating any relevant promotions,<sup>8</sup> iii) promotion, an indicator variable equal to one if the product in question is on promotion and zero otherwise, and iv) promotional depth, which gives the percentage difference between the shelf price and the promotional price during times of promotions.

Conversations with professionals from both chains confirm that the prices gathered electronically for online retailing are identical to the prices available in store. Thus, results reported here apply to both online and in-store sales.<sup>9</sup> Further, representatives of both chains indicated that prices and promotions change very little, if at all, within pricing zones, where pricing zones are generally defined as metropolitan areas.

Safeway and Albertsons both utilize the high-low pricing (HLP) strategy. This pricing strategy is defined by relatively high and heterogeneous markups across the supermarket, accompanied by deep and advertised price cuts for a selected subset of products that is typically adjusted on a weekly basis. California WIC authorized vendor agreements require that all vendors charge the same price to WIC-participants as to the general public. For most conventional supermarkets, including Safeway and Albertsons,

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<sup>8</sup> When products are not on promotion, the promotional price is equal to the shelf price.

<sup>9</sup> Both chains occasionally offer discounts and promotions available to online customers only. The total incidence of these online-only promotions accounts for less than one percent of all promotions available to customers in the dataset utilized. These online-only promotions were excluded from this analysis.

consumers can take advantage of promotions by swiping their club cards. Unlike the case with warehouse-format stores such as Costco or Sam’s Club, which charge membership fees, the club cards at conventional supermarkets such as Safeway and Albertsons are free. Given that club cards are available free of charge, most WIC-participants who shop at these locations are likely to have them and thereby their WIC food purchases would receive the same promotional discounts as those discounts received by non-WIC shoppers. As of 1998, consumers obtained 90 percent of all price discounts at supermarkets in the U.S. by swiping club cards (Lal and Bell, 2003).

Table 4 compares the promotional frequency and promotional depth of WIC-eligible and control products. Promotional frequency is defined as the percentage of time a product is on promotion and promotional depth is the percentage difference between the shelf price and promotional price, when the product is on promotion. When considering all available WIC-eligible food categories, results indicate that WIC-eligible items are on sale more frequently (7% more than control products) and are offered at slightly larger discounts than their control counterparts on average, WIC-eligible products are discounted by an additional 1.3% relative to control products when on promotion.

**Table 4. Promotional Frequency and Depth of WIC-Eligible and Control Products (*in percentage terms*)**

	Promotional Frequency			Promotional Depth		
	WIC-Eligible	Control	Percentage Difference ( <i>Non-WIC - WIC</i> )	WIC-Eligible	Control	Percentage Difference ( <i>Non-WIC - WIC</i> )
Infant Formula	0.00	25.63	-	0.00	9.79	-
Milk	41.42	50.66	22.29	15.03	15.37	2.24
Dry Beans	28.35	33.87	19.45	18.48	21.68	17.28
Canned Vegetables	32.07	38.09	18.78	24.99	23.50	-5.95
Cereal	45.34	48.56	7.11	24.11	24.39	1.15
Peanut Butter	31.56	32.41	2.71	20.79	20.17	-2.95
Canned Fruits	48.29	45.91	-4.94	26.45	25.21	-4.68
Canned Fish	41.06	36.14	-11.99	21.56	18.12	-15.98
Cheese	62.66	51.46	-17.87	17.06	19.68	15.38
Eggs	57.32	35.10	-38.77	22.23	14.97	-32.67
Infant Fruits and Vegetables	62.71	37.84	-65.71	21.36	20.58	-3.65
All Categories	45.29	42.07	-7.09	22.27	21.98	-1.30

When considering the 11 food categories independently, in five instances WIC-eligible products are promoted less frequently than their counterpart control products. Infant formula represents a prominent example. WIC-eligible infant formula was never on promotion in the data, while control products were on promotion 26% of the time.

Yet for other food categories such as cheese, eggs, canned foods and infant foods, WIC-eligible products were promoted more frequently than the control products in the same food category. We posit that this occurs in food categories where WIC-authorization covers a broad class of products instead of specific brands and WIC-authorization encompasses the most popular national brands. Consider cheese as an example. The California WIC Agency authorizes the purchase of any brand of 16-ounce blocks or rounds of cheddar, colby, jack, mozzarella, or some combination thereof. These authorization criteria encompass a large proportion of grocer cheese sales and leave only a very specialized set of products available as controls. Such products are likely to have relatively inelastic demands and not be products likely to attract customers to stores, making them unattractive promotion candidates.

A second and complementary explanation for the results indicating that WIC-eligible items in some food categories are promoted more frequently than controls is that Safeway and Albertsons are large supermarkets whereas a substantial amount of WIC-participant purchases are made at smaller retail locations and stores specifically geared toward selling products to WIC participants. Unless WIC-participants comprise a large share of the customer base, large grocery retailer incentives to exploit the perfectly inelastic demands of WIC-participants is mitigated.

Regarding promotional depth, in five of the eleven product categories promotional discounts of WIC-eligible products are smaller than promotional discounts for control products in the same food category. Again taking infant formula as an example, WIC-eligible formula is not put on promotion while when control infant formula products are put on promotion, they are discounted nearly 10%.

The infant formula, milk, dry bean, and ready-to-eat breakfast cereal categories are examples of food categories where WIC-eligible products are *both* promoted less frequently and are offered at less of a discount when placed on promotion. When considering peanut butter and canned vegetables, the results indicate larger discounts are given for WIC-eligible items, although they are put on promotion with less frequency.

## **Conclusion**

Cost containment is a significant issue for the WIC program because participants have no incentive to be price conscious and because small-scale, high-cost and high-price vendors specializing in sales of WIC-authorized products have captured a significant share of WIC sales. Most large supermarket chains are also WIC-authorized vendors, and this study has focused on their pricing and promotional patterns for WIC-eligible products compared to a set of carefully selected control products.

Large supermarket chains might have incentives to set higher markups for WIC-eligible products and promote them less frequently to exploit the inelastic demands of WIC participants. However, we found little evidence of such behavior. On average it appears that WIC products are not marked up more or promoted less frequently or discounted less steeply when on promotion. These results have two important policy

implications for operation of the WIC program: First, to the extent that WIC participants can be encouraged to redeem their WIC food instruments at supermarkets, rather than small vendors specializing in WIC sales, program costs will be contained, enabling more participants to be served. Second, because WIC products are not subject to higher markups in supermarkets, supermarket prices can be used as a benchmark to regulate the prices being charged by smaller vendors.

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