

Retail Food Prices and Retailer Market Power: Evidence from the Greater Los Angeles Area

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Our analysis of transaction-level data for the Greater Los Angeles Area shows that relatively small food retailers charge substantially higher prices than supermarkets. Higher market concentration and sales shares in local food markets also allow small food retailers to raise prices, especially when those small retailers do not directly compete with supermarkets. Supermarkets tend not to adjust prices according to competitive conditions in local markets. These results present a policy concern, because low-income consumers often live in “food desert” areas without ready access to supermarkets.

The share of food expenditure has fallen to 12.4% of annual expenditure of U.S. households or \$7,023 in 2015. Relative to income, U.S. consumers enjoy the most affordable food in the world. However, the aggregate statistics hide some important differences in the budget share of food expenditure across income levels: in 2016, households in the top income quintile spent nearly \$13,000 per year on food, which only comprises 8% of their income, while the lowest quintile spent merely \$3,862, which represents as much as 33% of their income.

Although low-income households allocate large shares of income to food, they still tend to fail to obtain sufficient and nutritious food. The USDA reports that over 18 million Americans live in neighborhoods with limited access to supermarkets or large grocers, neighborhoods referred to as *food deserts*, where shoppers have difficulty getting fresh vegetables and fruits.

An estimated one in eight Americans, or 42 million including 13 million children, were food insecure (i.e., reduced diet quality, hunger, and/or malnutrition) in 2016. Food insecurity has been shown to be associated with poor health status among children and adults, including stunting, chronic diseases, obesity, and mental problems.

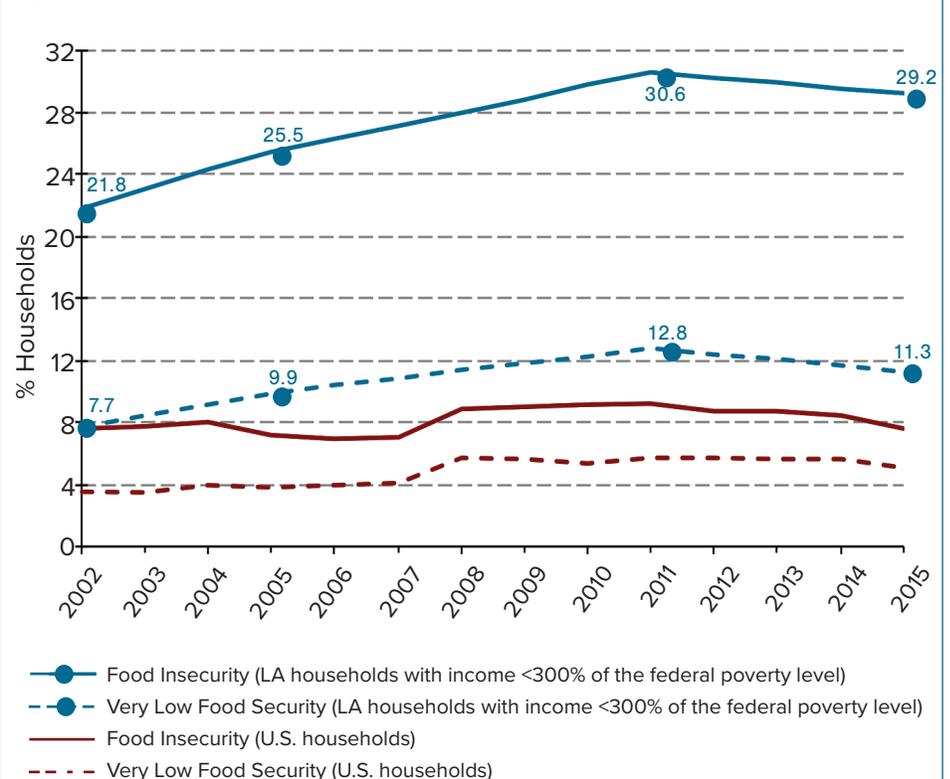
The Los Angeles metropolitan area is home to the largest number of people living below the poverty line and, not surprisingly, also the largest food insecure population among major U.S. cities. Nearly 16% of its 13 million residents were in poverty in 2015, a considerable portion of whom suffered from food insecurity.

In Los Angeles County alone, food insecurity affected 29.2%, or over half

a million, of households with incomes lower than 300% of the federal poverty level as of 2015. Another 11.3% of these households experienced very low food security (insufficient food intake). Figure 1 gives more information on food insecurity in the county and the United States since 2002.

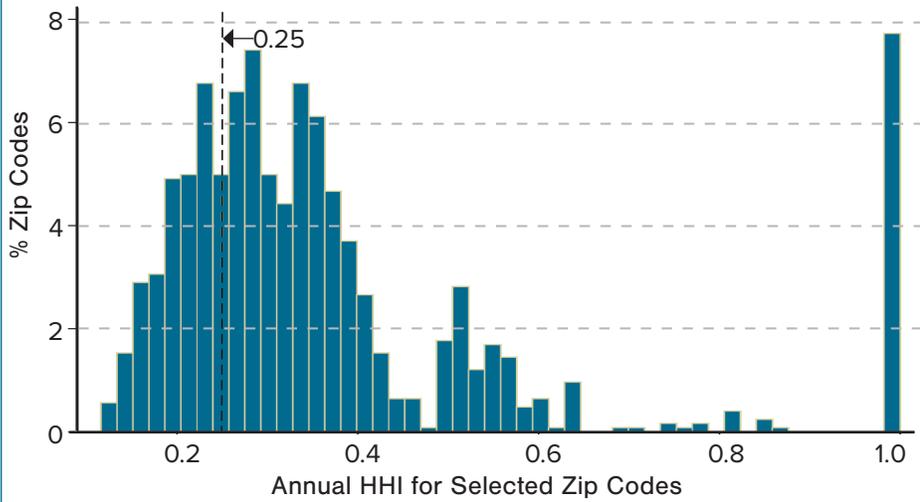
The United States is relatively unique among Western economies in terms of having specific policies designed to address food insecurity, with key examples being the SNAP (food stamp), Women, Infants, and Children (WIC), and School Lunch programs. However, not all low-income consumers access these programs, either because they earn too much to qualify, or they are unable or unwilling to participate for other reasons. For example, California’s SNAP program, known

Figure 1. Food Insecurity in the United States and Los Angeles County



Sources: USDA, <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/interactive-charts-and-highlights/>.
LA Food Bank, https://www.lafoodbank.org/wp-content/uploads/FINAL_LA-Health_FoodInsecurity_Sept-2017.pdf.

Figure 2. Distribution of Zip-Code-Level HHI in GLA in 2009–2012



Source: Calculated and drawn by the authors.

Notes: The horizontal axis measures the value of HHI, ranging from 0.1 to 1. The vertical axis is the percentage of zip codes for each bin of HHI values.

as *CalFresh*, only served two-thirds of eligible households in the Los Angeles County in 2015.

Food prices, and food retailers’ ability to raise them in settings of limited competition, thus raise substantial concerns in terms of low-income consumers’ ability to attain sufficient and nutritious supplies of food at reasonable prices. In a recent study, we analyzed food costs in the Greater Los Angeles Area (GLA) using a unique dataset, namely, individual transactions made under California’s WIC program.

WIC provides nutritious foods at no cost to low-income pregnant and postpartum women, as well as infants and children up to 5 years old. California has the largest number of consumers

and food retailers participating in WIC among the 50 U.S. states. GLA alone is home to half of California WIC participants, or over 700,000, and approximately 1,800 WIC-authorized food retailers, known as WIC vendors.

WIC vendors include nearly all supermarkets and supercenters, as well as a number of smaller retail outlets. There is also a set of vendors whose primary purpose is to serve WIC participants and are known as “above 50,” or A-50 vendors, as at least 50% of their food sales are made to WIC participants. Having this wide array of food retailers in our study was a key advantage, because most prior studies of food retail prices have relied on scanner data supplied by large data-collection firms that obtain data almost

exclusively from large supermarkets, leaving the pricing behavior of smaller food retailers (SFRs), such as convenience outlets, largely unstudied.

We studied the pricing strategy of SFRs and supermarkets in GLA based upon transaction-level data of the WIC program for the 31-month period from October 2009 to April 2012. We asked two questions: 1) whether SFRs and supermarkets raise prices when having market power, and 2) whether cost-leading supermarkets affect SFRs’ pricing if the two types of retailers compete head-to-head.

We found that SFRs charged significantly more than supermarkets and, further, raised the price as a function of their market power. Supermarkets charged lower prices and tended not to raise prices in settings when they had market power. Furthermore, supermarkets tended to restrain SFRs from exercising their market power when the two types of stores competed in the same local food market.

Data and the Measurement of Market Power

Though all states will soon begin using Electronic Benefit Transfer (EBT) for WIC foods, during the period of our study California WIC participants received paper food vouchers, or food instruments (FIs), based on their nutritional needs and could redeem the vouchers at no cost to obtain eligible foods at any WIC vendor. The FIs were provided to participants on a monthly basis. Vendors were reimbursed by the state for the total value of each FI according to store-specific prices. Importantly, WIC vendors must charge the same price to WIC participants and other consumers.

Most foods contained in FIs are staples such as milk, eggs, bread, 100% fruit juice, breakfast cereal, and infant formula, with infant formula being the largest single item redeemed by WIC participants measured by value of

Table 1. Food Items Contained in FIs 6003, 6011, and 6012

FI No.	Low/ Nonfat Milk	Whole Grains	Breakfast Cereals	Choose Either		Eggs	Cheese	Choose Either	
				Bottled Juice	Concentrated Juice			Dry Beans	Peanut Butter
6003	1 gl	16 oz	36 oz	\	\	\	\	\	\
6011	1 gl	16 oz	\	64 oz	11.5/12 oz	\	\	\	\
6012	1 gl + 1 qt	\	\	\	\	1 dz	16 oz	16 oz	16-18 oz

Source: USDA

Notes: dz stands for dozen, gl for gallon, qt for quart, oz for ounce, and \ for not available.

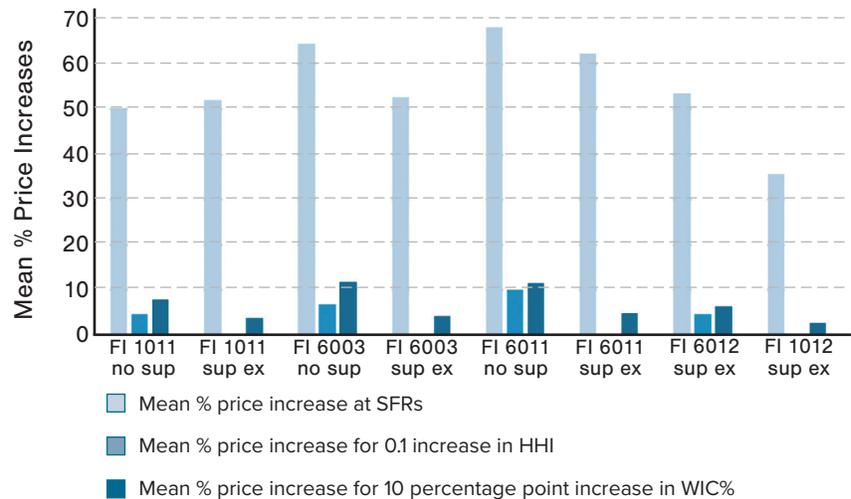
sales. In the study, we focused on the three most frequently redeemed FIs—FI 6003, FI 6011, and FI 6012—and an infant formula FI, FI 1011. Table 1 summarizes the foods contained in these FIs.

We used zip codes to define local markets. Zip codes in our sample had an average size of 6.9 square miles or a circle with a radius of 1.5 miles. Almost all zip codes had sizes within the range of 0.9 square miles (e.g., a circle with a radius of 0.5 miles) to 40.1 square miles (e.g., a circle with a radius of 3.6 miles). Given that a number of studies have shown that urban consumers typically travel 1–3 miles to do food shopping, the market areas defined by zip codes coincide closely with actual grocery-shopping distances for urban consumers. Smallest zip codes were concentrated in the core of downtown LA, where consumers tend to travel even shorter distances for grocery shopping.

At the zip code level, we measured the market power of food retailers in two ways. First, we used store-level annual food sales to compute the Herfindahl-Hirschman Index (HHI). HHI is the sum of the squared sales share of firms operating in a local market. It varies from near zero (a market with a large number of small competitors) to one (a market dominated by a monopoly). For example, four firms operating in a market, each with 25% share, would have an $HHI = 0.25^2 \times 4 = 0.25$. In our context, the closer HHI is to 1.0, the more concentrated a market is and the more likely that major food retailers in that market can raise food prices due to a lack of competition.

The distribution of HHI is shown in Figure 2 and suggests that local food markets in GLA have high levels of market concentration in general. HHI has a mean of 0.38 and a standard deviation of 0.22. Over 70% of the zip codes have HHI values

Figure 3. Mean Percentage Price Increase for WIC Food Instruments Sold by SFRs Compared to Supermarket Mean Price



Source: Estimated and drawn by the authors.

Notes: *No sup* refers to zip codes where no supermarket exists, and *sup ex* refers zip codes with supermarkets. Out of the 315 zip codes studied, 22 had no supermarket operating in at least one month over the 31-month period from October 2009 to April 2012. Each bar represents the mean percentage price increase compared to the mean price charged by supermarkets as a particular variable changes.

larger than 0.25 and constitute highly concentrated markets based on U.S. Department of Justice merger guidelines.

Second, for each FI, we computed WIC sales shares of vendors in each zip code in each month (WIC%). Large WIC% also reflects a vendor’s power in the local market and its ability to increase food prices. The transaction-weighted mean of WIC% ranges from 22.44 to 24.84 across the four FIs. The standard deviation is high, ranging from 23.10 to 26.08, which indicates considerable variability of vendors’ WIC sales shares in our study.

Findings

We defined SFRs as WIC vendors that have one to four cash registers and supermarkets operating seven or more registers. Some supermarkets belong to two prominent supercenter chains in GLA. A-50 vendors were excluded from our analysis, because their pricing is restricted by federal rules and not determined by market forces.

Our findings are summarized in Figure 3. First, SFRs charged

substantially more than supermarkets, regardless of whether the two types of retailers competed head-to-head. Across the four FIs studied, SFRs on average charged 40%–70% more than the mean price of supermarkets and even more compared to the mean price charged by supercenters. Such price differences are represented by light blue bars in the figure and are not statistically different for market with and without supermarkets.

Second, SFRs raised prices as a function of market concentration and sales shares if supermarkets did not operate in the market. Figure 3 indicates that, as HHI increases by 0.1, SFRs raise prices by 5%–10% of the mean price charged by supermarkets across FIs. When WIC% goes up by 10 percentage points, SFRs raise prices of FIs by 6%–12% of the mean supermarket price. However, if competing with supermarkets in the same local market, SFRs no longer raised prices as HHI increased. Neither did SFRs raise prices in WIC% by as much: as WIC% increases by 10 percentage points, prices of FIs sold by SFRs only increase by 3%–5% of the

mean supermarket price when SFRs engage in direct competition with supermarkets.

The price charged by supermarkets did not change as a function of HHI or WIC%. These results indicate that supermarkets not only charged considerably lower prices than SFRs, they also maintained low prices regardless of their market power. Moreover, they tended to limit how much SFRs exercised their market power through exerting competitive discipline over SFRs, which economists sometimes call a *competitive yardstick effect*.

We found no additional yardstick effect imposed by supercenters competing with SFRs in the same local market. Furthermore, the intensity of supermarket competition did not increase the yardstick effect of supermarkets, meaning that it only takes one supermarket in a market to limit the strategic pricing of SFRs.

Interpretation

Our data show that GLA consumers paid considerably more when shopping at SFRs. We also found that SFRs were able to take advantage of higher market concentration and larger sales shares of an FI to raise prices, as long as they did not face direct competition from supermarkets.

Supermarkets did not adjust prices according to competitive conditions of local markets. Most supermarkets in the study were part of larger chains. Recent evidence has shown that supermarkets charge fundamentally the same prices in all their stores over broad geographic regions, a phenomenon known as *zone pricing*. Zone pricing, of course, means that the chains are choosing not to exploit their power in local markets.

Other factors keeping prices low in supermarkets are the large number of products carried in modern supermarkets (70,000 or more distinct product codes) and the importance of *one-stop*

shopping for many consumers. By charging low prices, a supermarket can attract consumers to patronize and fill their entire market baskets during one shopping trip. Conversely, charging high prices to exploit market power for staples like milk, eggs, and bread could drive consumers away to other stores, causing the supermarket to lose the entire market basket of sales.

SFRs, in contrast, are often not part of chains and carry fewer products, so that they can adjust prices more readily in response to market conditions. In our sample, only one-fifth of SFRs were chain stores, compared to over 90% for supermarkets. We found evidence that non-chain SFRs raised prices to exploit market power more than chain SFRs did.

Because nearly one-fifth of WIC transactions were made at SFRs, strategic pricing by SFRs can increase WIC program costs significantly and potentially reduce the program's ability to serve participants. Most concerning, SFRs can make costs of staple foods considerably higher for low-income consumers who are not covered by food programs and live in areas far away from supermarkets. Indeed, in response to high prices charged for WIC foods by SFRs, the California WIC agency imposed strict price ceiling on the FI redemption values allowed for SFRs in May 2012. Our study, which involved data prior to this price-ceiling policy, hence examined SFRs' pricing of WIC foods under no restraining policies set by the program.

Our findings also suggest that supermarkets play a crucial role in providing affordable food to low-income consumers and highlight the efficacy of former First Lady Michelle Obama's well-publicized 2011 initiative to encourage supermarket entry in food desert areas as part of her "Let's Move" campaign. Unfortunately, the

Associated Press reported that only 1.4 million of 18 million food-desert residents had experienced entry by a supermarket by 2015, meaning that the policy issue remains largely unresolved.

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Authors' Bios

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For additional information, the authors recommend:

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