



# Agricultural and Resource Economics ARE UPDATE

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## Are Marketing Orders and Checkoffs in Legal Trouble Again?

John M. Crespi

**A recent Supreme Court ruling against fees collected by public-employee unions from non-union members may lead to litigation of commodity checkoff program assessments. Marketing boards that considered this issue settled long ago should look closely at the similarities between this case and decades-old cases involving generic advertising.**

On June 27, 2018, the U.S. Supreme Court handed down a decision on the constitutionality of compelled union dues. In a 5-4 opinion in *Janus v. AFSCME* [585 U.S. \_\_\_\_ (2018)] (see reference on page 4), the Court found that public employee unions could not compel non-union members to pay assessments called “agency fees” to support the union; something public employee unions across the country have regularly been doing for nearly half a century.

The controversy is not new, and in 1977, a very similar case against these compelled dues also made it to the Supreme Court. In *Abood v. Detroit Board of Education* [431 U.S.

209 (1977)], the Court had held that because collective bargaining by the teachers’ union benefited non-union members and because Congress and the state of Michigan had determined that collective bargaining was important for labor relations, public unions could compel non-union members to support the part of the union’s activities related to collective bargaining. Hence, non-union public employees find part of their paycheck going to support union activities.

***Agricultural boards and commissions representing farmers in dozens of industries spend nearly \$1 billion per year on generic advertising.***

The *Janus* case was very similar to the *Abood* case (both were brought by non-union public employees who objected to the compelled support of union activities with which they disagreed); in fact, so similar that a lower court ruled against the plaintiffs citing the *Abood* ruling. Nevertheless, the plaintiffs in *Janus* appealed and, on June 27, 2018, the Court overturned this long-standing *Abood* ruling. The Court held that the 1977 *Abood* decision was

flawed, and negated it in their *Janus* decision. Non-union public employees may no longer be compelled to support the union’s activities even if those activities benefit them.

The Court cited the First Amendment of the U.S. Constitution, which has long been held not only to protect a citizen’s freedoms of speech and association, but freedom from compelled speech and compelled association. Since a union was using the non-union employees’ fees to promote collective bargaining, the Court ruled that they were compelling those employees to send a message with which the employee might not agree and the First Amendment strictly forbids this.

### **Marketing Boards Should Take Heed**

Generic advertising and promotion is marketing that does not promote a particular brand of a good, but instead promotes the entire industry. “Got Milk?” is likely the most famous of the generic campaigns. The collection of dues to pay for generic marketing has always been controversial and became especially litigious in the farming community in the 1990s and early

**Figure 1.** Timeline: United States Supreme Court Decisions

1977 – ●	<i>Abood</i> . Held that compelled assessments from non-union members was legal if the assessments supported a greater regulatory need.
1997 – ●	<i>Glickman</i> . Used <i>Abood</i> as basis for compelled assessments in agricultural marketing orders.
2001 – ●	<i>United Foods</i> . Limited <i>Glickman</i> to cases where regulatory need was broader than promotion alone.
2005 – ●	<i>Johanns</i> . Turned promotion from checkoff into government speech thus shielding checkoffs from free-speech attacks. <i>Johanns</i> would seem to make <i>United Foods</i> moot.
2005-2018 – ●	Generic promotion supported in courts by either applying <i>Glickman</i> , <i>Johanns</i> , or both.
2018 – ●	<i>Janus</i> . Throws out <i>Abood</i> and by implication <i>Glickman</i> . Uses <i>United Foods</i> as support in ways that call into question whether <i>Johanns</i> is now implicated.

2000s. In an earlier *ARE Update* (2015), I, along with co-authors Saitone and Sexton, summarized the three most recent court cases concerning generic advertising or “checkoff” assessments and concluded that future litigation on the constitutionality of generic advertising is not likely or, at least, not imminent. Today, I am not so sure.

Agricultural boards and commissions representing farmers in dozens of industries spend nearly \$1 billion per year on generic advertising. In 2005, the U.S. Supreme Court ruled in *Johanns v. Livestock Marketing Association* [544 U.S. 550] that generic advertising was different from other forms of advertising and not compelled speech. Its assessments were more like taxes collected by the government to put forward a government-backed message. Thus, as government speech, it was not the same as other types of compelled advertising.

Since that 2005 *Johanns* decision, I have believed and often stated that litigating over the First Amendment issues of marketing orders was moot. It was a settled issue in my opinion. Checkoffs for advertising and promotion are government speech, and hence not part of a First Amendment issue. I am not a lawyer, but this recent *Janus* decision has me reconsidering the conclusiveness of *Johanns*.

The 2018 *Janus* decision raises five important legal questions pertaining to the agricultural checkoff programs. The starting point for these five questions is understanding that to date, the roughly two-dozen federal agricultural marketing orders that can undertake advertising and promotion, along with the various state orders and stand-alone checkoff programs (like those for beef and pork), have been justified either on the basis of the 1977 *Glickman v. Wileman Brothers & Elliott, Inc.* [521 US 457] decision, the 2005 *Johanns* decision, or both.

***The 2018 Supreme Court did not casually reverse Abood in the Janus decision; they very forcibly reversed that earlier opinion. This Court took great care to explicitly say the earlier Court was greatly in error.***

### **Question 1. Does legal longevity mean anything for the programs?**

The biggest question that *Janus* raises for me when considering its impact on agricultural marketing orders and checkoffs is why the Court took up the *Janus* case at all. The *Abood* decision in 1977 made agency fees the law of the land ... until it didn't. Few expected *Abood* to be overturned, and it has been used regularly in lower court decisions in similar cases for

nearly half a century, and agency fees had existed prior to 1977. Thus, the policy upheld in *Abood* has been part of American labor law for a very long time.

Agricultural checkoffs have likewise been around for a very long time. The point here is that just because a ruling has been around for a long time does not make it safe. In the case of *Janus*, the Court is saying very clearly not to tinker with the First Amendment, and a very strong governmental reason is needed for putting constraints on the Constitution. That argument has been raised by plaintiffs in all of the commodity promotion cases to date as well.

### **Question 2. Can programs stand on one leg?**

The *Glickman* case that made the generic promotion of peaches, plums, and nectarines legal is now most likely gone because *Abood* provided the basis for *Glickman*. The 2018 Supreme Court did not casually reverse *Abood* in the *Janus* decision; they very forcibly reversed that earlier opinion. This Court took great care to say explicitly the earlier Court was greatly in error.

*Abood* made compelled speech and assessments legal if a state had an important regulatory need like good labor relations. *Abood* figured heavily in the *Glickman* decision that said tree-fruit assessments to pay for generic promotion and advertising were constitutional because the marketing order was, likewise, satisfying a larger regulatory need of Congress for orderly commodity markets.

The majority in the *Janus* opinion never mentions *Glickman*. However, they most certainly knew about it, as Justice Kagan's dissent mentions *Glickman* twice while arguing *Abood* is a well-established law that has been used to back several other cases and that now all of those cases are going

to be tossed because of the *Janus* decision. If Justice Kagan is correct, then *Glickman* is now out. Many marketing programs had two legs to stand on; *Glickman* is used along with *Johanns* to justify the universal assessments. Now, one of those supporting legs is gone.

### **Question 3. Generic marketing is predicated in part on the fear of free ridership; is the current Court open to that argument?**

The idea makes sense. If one farmer's grapes are indistinguishable from another farmer's grapes, then neither farmer will undertake grape advertising knowing the other farmer will free ride. Generic advertising compels all farmers to pay for advertising because it benefits everyone in the industry.

The free ridership rationale was brought up in the *Janus* labor union case, too, but the majority did not seem very impressed by this very old argument. The majority opinion raises the question and then dismisses it by saying the erroneous *Abood* decision "pinned its result on the *unsupported empirical assumption* [that] 'the principle of exclusive representation in the public sector is dependent on a union or agency shop.' ... But, as already noted, experience has shown otherwise." (*Janus*, p. 42, italics mine). The majority cites studies showing public employee membership has increased relative to private union membership, and the public sector seems to have no problem getting members even in right-to-work states.

Marketing orders and checkoffs also get majority farmer support. Can their boards demonstrate that their advertising programs would succumb to the free-rider effect were some farmers to object to paying?

Another issue with free riders relates to when the agricultural programs were begun (1940s, 50s, and 60s in

many cases). Decades ago, farm products were more easily considered commodities than today when more and more farms and cooperatives brand their products or seek other means to differentiate them from rivals' production. These brands may not wish to pay into a generic program that also helps their non-branded competitors. Product differentiation was a key theme in both *Glickman* and four years later in another generic advertising case: *United States v. United Foods, Inc.* [533 U.S. 405 (2001)]. In both cases, plaintiffs argued their products were different from the wider commodity.

***The Janus v. AFSCME decision has definitely implicated two earlier agricultural commodity cases (Glickman and United Foods); it seems to me only a matter of time before there is a challenge to the remaining generic advertising case: Johanns.***

As more and more companies seek to brand and differentiate their products, the free rider rationale becomes less and less of an issue. The majority rejected free rider rationales in unions. They may also find such rationales that often go back to Depression-era legislation anachronistic.

### **Question 4. How does the United Foods opinion fit in?**

In between *Glickman* in 1997 and *Johanns* in 2005, came the 2001 *United Foods* decision. *United Foods* was a case involving the generic marketing of mushrooms. That program was deemed unconstitutional. The Court majority held that in the particular case of mushrooms, the checkoff only existed for the purpose of promotion and, as such, it lacked the larger regulatory heft of the *Glickman* case. Since the compelled speech was not part of a broader regulatory structure (like efficient fruit markets in *Glickman* or labor relations in *Abood*), then compelled

assessments to support generic marketing of mushrooms violated the First Amendment.

What happened next is that from 2001 to 2005, marketing boards scrambled to present themselves as being part of a broader regulatory scheme to shelter under the *Abood/Glickman* umbrella. The majority in *Janus* never cited *Glickman*, but did cite *United Foods*. What is interesting about *United Foods* is how they cited it. *United Foods* was seen at the time as a very narrow ruling against generic marketing and lower courts seemed to nearly always give deference to Congress that other commodity programs were broader in regulatory scope than the very narrowly tailored mushroom program. And because of that, the *United Foods* decision did not get a lot of traction (except in an important case concerning the beef checkoff, which I shall turn to next). Lower courts from 2001 to 2005 mostly applied *Glickman* in challenges to generic promotion programs. This 2018 Court majority cites *United Foods* positively no less than three times in the *Janus* opinion (and never cites *Glickman*) in order to overturn a case that was similar to *Glickman*.

Here is a particularly interesting quote where the Court majority writes of the First Amendment implications of the *Janus* decision for commercial speech:

"Even though commercial speech has been thought to enjoy a lesser degree of protection, ... prior precedent in that area, specifically *United Foods*, supra, had applied what we characterized as 'exacting' scrutiny, ... a less demanding test than the 'strict' scrutiny that might be thought to apply outside the commercial sphere. Under 'exacting' scrutiny, we noted, a compelled subsidy must 'serve a compelling state interest that cannot be achieved through means significantly less restrictive of associational freedoms.'" (*Janus*, p. 10)

In other words, the Court's earlier decision in *United Foods* is completely pertinent to their opinion in *Janus*. There needs to be a compelling state interest in the speech that cannot be achieved any other way, even for something that up until now has been considered by other courts as a broader regulatory interest. Hence, that compelling interest would seem today to be much higher than labor relations through collective bargaining. Is agricultural marketing a more compelling interest?

### Question 5. Why is nobody talking about *Johanns*?

From 2001 to 2005, as lawyers argued whether *Glickman* or *United Foods* was the correct test of a mandatory marketing program, eventually two appeals courts reached conflicting decisions. The case that was raised to the Supreme Court in 2005 from this conflict was, of course, the challenge to the beef checkoff in *Johanns*. Until *Johanns*, lower courts facing a challenge to a checkoff mostly cited *Glickman* (and *Abood*) and upheld the checkoff program.

The late Justice Antonin Scalia, cut the Gordian's knot. Scalia made both *Glickman* and *United Foods* of less importance to the argument over generic marketing assessments when, writing the majority opinion, he accepted and expounded upon an argument put forward by the government in *Johanns* that the beef checkoff did *not* violate the First Amendment because a checkoff-funded advertisement is not farmers speaking—it is the government speaking.

The checkoff assessment is merely a type of tax and the fact that Congress wants to collect it through the marketing boards does not change that. Ranchers can no more argue that the "Beef! It's what's for dinner" commercial violates their First Amendment rights than an oil company can argue

against the government using gasoline taxes to tell people to conserve energy. That ruling would seem to be the end of the argument concerning generic advertising, and I have made that argument myself.

In *Janus*, the dissent cites *Glickman*. The majority cites *United Foods*. But, nobody mentions *Johanns*. It is as if *Johanns* doesn't exist; there is not even a footnote to suggest, "*Johanns* is different." Reading the opinion in *Janus* and Justice Kagan's dissent, the arguments for constitutionality all go back to the original free-speech arguments—not the government speech argument. Why would the majority, who bring up *United Foods*, not say, "By the way, we do not include generic advertising, which is government speech and a settled opinion" and why would the minority, who bring up *Glickman*, not write, "Surely the majority does not mean to include cases of government speech?"

Courts like to tidy things up when they can. Leaving the *Johanns* ruling out altogether might have been an oversight (not likely), or perhaps they could not agree on whether it was pertinent and in what way, or perhaps, the entire Court was signaling they were not really satisfied with how easily free speech issues got tidied up in *Johanns*.

Justices Breyer, Kennedy, Thomas, and Ginsburg were all around for *Johanns*. Justice Kennedy (now departing) was a dissenter to it, while the other three concurred with Scalia. Today in *Janus*, the dissenters are Kagan, Sotomayer, Breyer, and Ginsburg (Breyer and Ginsburg were in the majority in *Johanns* while Kagan and Sotomayer arrived on the Court long after). Kennedy was already against *Johanns*, and there is a good chance so will be his replacement. If Thomas reconsiders and Kennedy's replacement has the same opinion as his predecessor, the Court could also overturn *Johanns*.

These five questions need good answers. The *Janus v. AFSCME* decision has definitely implicated two earlier agricultural commodity cases (*Glickman* and *United Foods*); it seems to me only a matter of time before there is a challenge to the remaining generic advertising case: *Johanns*. Since *Johanns* is the only case that is now keeping generic commodity promotions around, I would be surprised if marketing boards, like labor unions, do not find themselves in court over an issue they once believed settled.

#### Suggested Citation:

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#### Author's Bio

John M. Crespi is a professor in the Department of Economics at Iowa State University and Interim Director of the Center for Agricultural and Rural Development (CARD). He may be reached at [jcrespi@iastate.edu](mailto:jcrespi@iastate.edu).

#### For additional information, the author recommends:

*Janus v. AFSCME* 585 U.S. \_\_\_\_ (2018) [https://www.supremecourt.gov/opinions/17pdf/16-1466\\_2b3j.pdf](https://www.supremecourt.gov/opinions/17pdf/16-1466_2b3j.pdf)

Crespi, J.M., T.L. Saitone, and R.J. Sexton. "The Supreme Court's Decision in the 'Raisin Case': What Does it Mean for Mandatory Marketing Programs?" *ARE Update* 18(6), July / August 2015.

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

Meilin Ma, Tina L. Saitone, Richard J. Volpe, Richard J. Sexton, and Michelle Saksena

**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.

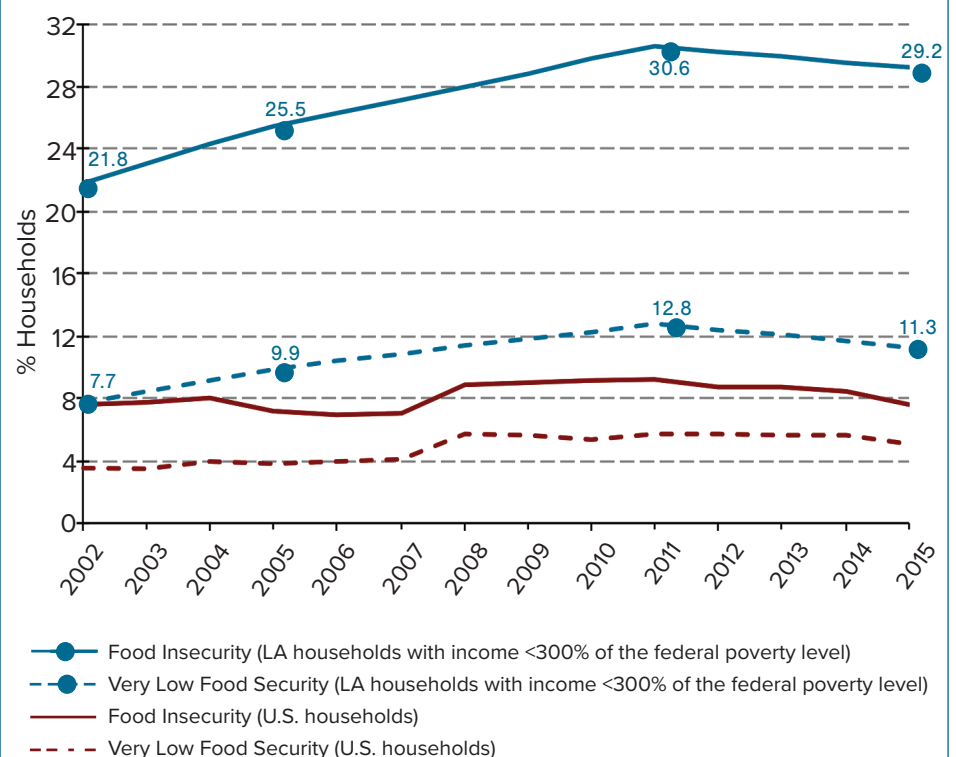
The Los Angeles metropolitan area is home to the largest number of people living below the poverty line and, not surprisingly, also the largest food insecure population among major U.S. cities. Nearly 16% of its 13 million residents were in poverty in 2015, a considerable portion of whom suffered from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

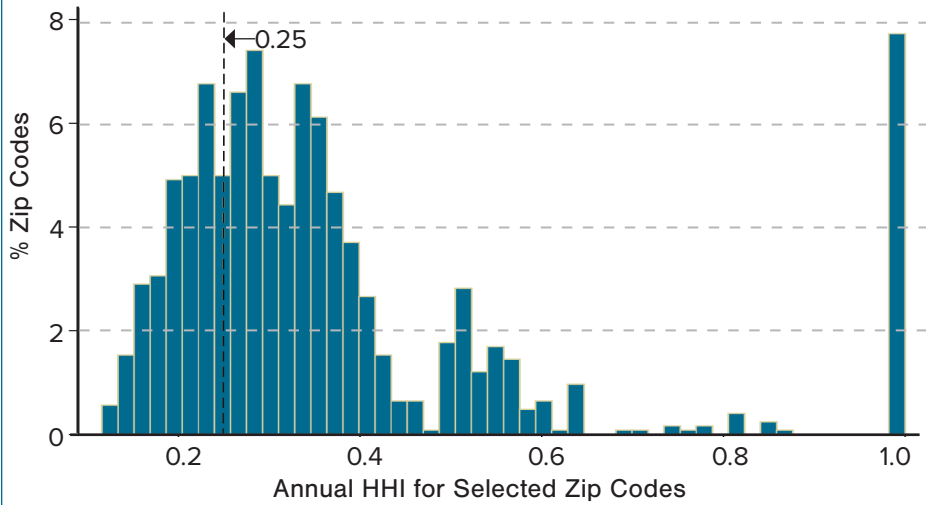
The United States is relatively unique among Western economies in terms of having specific policies designed to address food insecurity, with key examples being the SNAP (food stamp), Women, Infants, and Children (WIC), and School Lunch programs. However, not all low-income consumers access these programs, 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](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.

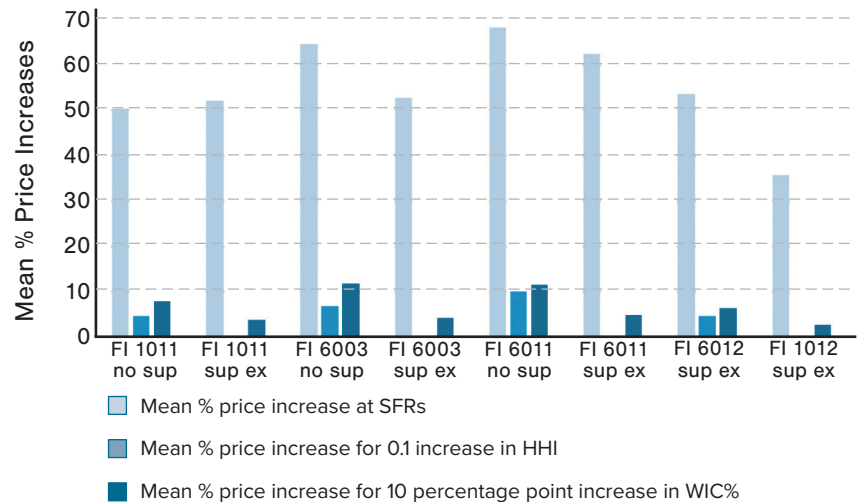
sales. In the study, we focused on the three most frequently redeemed FIs—FI 6003, FI 6011, and FI 6012—and an infant formula FI, FI 1011. Table 1 summarizes the foods contained in these FIs.

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

Meilin Ma is an assistant professor of agricultural economics at Purdue University and a 2018 Ph.D. graduate of the Department of Agricultural and Resource Economics (ARE) at UC Davis. Richard Sexton is a distinguished professor and Tina Saitone is a UCCE specialist, both in the ARE department at UC Davis. Richard Volpe is an assistant professor in the agribusiness department at California Polytechnic State University, San Luis Obispo. Michelle Saksena is an agricultural economist in the U.S. Department of Agriculture, Economic Research Service. Professor Sexton can be contacted by email at [rich@primal.ucdavis.edu](mailto:rich@primal.ucdavis.edu).

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# The Economic Impacts of Agricultural Groundwater Markets

Ellen M. Bruno

**Groundwater markets offer a cost-effective means of meeting management goals under the 2014 Sustainable Groundwater Management Act. Using data from the Coachella Valley groundwater basin, we quantify the economic impacts of trade in one of California's most important agricultural regions. Facilitating groundwater trade under a mandatory basin-wide "cap" on pumping will reduce disruptions to the local economy and keep land in production, relative to a scenario where trade is prohibited.**

The 2014 Sustainable Groundwater Management Act (SGMA) is revolutionizing the way that Californians use and manage groundwater. Previously unmanaged and unregulated by the state, many California groundwater basins have suffered significant declines in storage levels because groundwater is pumped faster than the replenishment rate. SGMA imposes timelines for newly formed, local regulatory agencies to reach long-term sustainable groundwater levels. In order to end unsustainable practices, many agencies are currently working to find ways to reduce overall groundwater withdrawals from their basins. Groundwater markets have entered the discussion as a potential management tool, and in some cases, are already being implemented.

Groundwater markets are an appealing management tool. They represent the cheapest way for society as a whole to achieve a sustainability goal by incentivizing reduction in pumping by those that can cut back at the least cost. Furthermore, relative to some other management tools, markets can eliminate some uncertainty in reaching a sustainability goal; an explicit "cap"

is set on the amount of water available for pumping prior to trade. However, the potential spatial redistribution of extraction resulting from trading can have impacts on the hydrologic system. Extraction from Point A vs. Point B can affect hydrologic connectivity and spatial variability in the depth to the groundwater, ultimately affecting extraction costs and groundwater-dependent ecosystems.

When considering these external impacts, it is important to consider what would happen under alternative management approaches, i.e., groundwater restrictions but no trade, as opposed to the status quo. Under SGMA, the status quo (no groundwater management at all) is no longer an option; agencies must make their basins sustainable whether they implement markets or not. Given the necessity of a "cap," the relevant comparison becomes "cap-and-trade" vs. "cap-but-no-trade." In this article, we explore the responses of agriculture to both scenarios, estimate the economic impacts of allowing trade, and discuss ways of preparing for the spatial redistribution of pumping that may occur due to trade.

## Responses to Groundwater Restrictions

To prevent continued groundwater basin overdraft, a farmer's allocation of groundwater pumping rights will likely be reduced from past practices. Let us first consider a farmer's response to groundwater reductions when trade of pumping rights is prohibited. We can think of a restriction on groundwater use as an increase in the price or cost of using water as an input to production. Farmers can respond to changes in the price of water by adjusting water use along several dimensions. These dimensions might include

acreage, crop choice, and other inputs and technologies that affect water use. These responses are important to consider when comparing different policies, and will change if water is available to buy or sell.

Since a constraint on groundwater use effectively increases the cost of applying water as an input, groundwater restrictions will incentivize farmers to switch to crops that are less water-intensive. An increase in the price of water effectively decreases the value of a water-intensive crop, and thus we expect substitution towards crops that require less applied water per acre.

If we consider water and land to be complementary inputs to production, then an increase in the price of water will decrease irrigated acreage, meaning groundwater restrictions may induce land being taken out of production. Similarly, if we think water and labor are complementary inputs to production, then we can expect an increase in the price of water to decrease the use of labor as well. As a result, we expect groundwater regulations to affect land use and labor decisions, regardless of whether trading is allowed.

## The Role of Markets

In a groundwater market, or a cap-and-trade scenario, those who hold rights to pump groundwater would be allowed to sell or lease their rights, and others would be able to buy the right to pump additional groundwater. Those willing to pay the most for an additional acre-foot of groundwater would buy from those who are willing to be compensated in exchange for that groundwater. Selling or supplying groundwater in this context simply means being paid not to pump up to one's full allocation of groundwater pumping rights. Unless permits were auctioned off, farmers would not have to pay for

**Table 1.** Top 10 Coachella Valley Crops, Revenue, and Average Applied Water

Crop	Acreage	Revenue	Revenue Per Acre	Applied Water (AF/Acre/Year)	Revenue Per Acre-Foot
Dates	7,964	\$40,110,000	\$5,036	8.0	\$630
Grapes	7,379	\$143,222,000	\$19,409	3.0	\$6,470
Bell Peppers	5,288	\$77,700,000	\$14,693	2.0	\$7,347
Lemons	5,200	\$110,605,000	\$21,270	2.9	\$7,334
Carrots	4,777	\$28,700,000	\$6,007	2.5	\$2,403
Broccoli	2,475	\$14,561,000	\$5,883	1.7	\$3,461
Sweet Corn	1,883	\$11,174,000	\$5,934	5.0	\$1,187
Lettuce	1,600	\$12,480,000	\$7,800	1.2	\$6,500
Watermelon	1,525	\$14,860,000	\$9,744	3.0	\$3,248
Mandarins	1,475	\$19,721,000	\$13,370	2.5	\$5,348
<b>Total</b>	<b>39,566</b>	<b>\$473,133,000</b>			

their initial allocation of groundwater permits. Once permits were allocated, an individual could choose to opt out of trading (that is, hold on to their pumping rights), and in that sense, can be made no worse off in the presence of a trading regime than under a scenario where trade is not allowed.

Allowing trade of groundwater pumping rights is a way to reduce the increased water costs associated with a required reduction in groundwater use, meaning land and labor adjustments would happen to a lesser extent. Water markets provide another avenue through which to adapt, so less land would be fallowed, and less acreage would be switched to different crops relative to a cap-but-no-trade scenario.

Well-functioning groundwater markets would, in theory, minimize the disruption to the local farm economy that would come from a mandated reduction in groundwater use. Markets represent an economically efficient or cost-effective way to reach a conservation goal; the outcome after trade represents the most efficient way for society to reach a given basin-wide curtailment of groundwater pumping.

### Economic Benefits from Trade

Quantifying the relative benefits from market-based instruments is important for understanding which groundwater management tools are best. To estimate

the magnitude of the benefits from trade, I combined a theoretical and statistical model of agricultural groundwater use to evaluate the impacts of groundwater markets. The model is applied to the Coachella Valley, a groundwater-dependent agricultural region in Southern California located just north of the Salton Sea and south-east of the San Bernardino Mountains.

A novel feature of this model is that all parameters were either constructed or estimated with observational data from the Coachella Valley. Importantly, the price responsiveness of groundwater users was estimated with rich, micro-level data on groundwater extraction and groundwater prices. The Coachella Valley Water District is one of very few water districts that charge volumetric prices for agricultural groundwater pumping, enabling the estimation of the price responsiveness.

Agriculture in the Coachella Valley depends heavily on groundwater and Colorado River water for irrigation, and has roughly 65,000 acres in crop production with a total production value of over half a billion dollars a year. The area produces 95% of the nation’s dates, as well as table grapes, citrus fruits, bell peppers, and other vegetables.

Because the Coachella Valley groundwater basin has suffered at times from groundwater overdraft, three of the

Valley’s four groundwater sub-basins are subject to a timeline and set of goals mandated by SGMA for reaching groundwater sustainability. Multiple water agencies in the Coachella Valley have been approved by the California Department of Water Resources to jointly manage the Coachella Valley groundwater basin over the coming years. They are required to work together to reach sustainability targets for the entire basin, e.g., by trading groundwater pumping rights. In this analysis, we consider the impacts of a 20% reduction in basin-wide groundwater reduction, which is the reduction required to eliminate the roughly 70,000 acre-feet (AF) of average overdraft reported by the Coachella Valley Water District.

Table 1 lists the 10 leading crops grown in the Coachella Valley, along with information on revenues and average applied water. Revenue and acreage data come from the Coachella Valley 2016 Acreage and Agricultural Crop Report and applied water by crop comes from University of California Cooperative Extension Cost and Return Studies. Revenue per acre-foot of water is calculated by dividing per-acre revenues by the average acre-feet of water applied (note 1 AF=325,853 gallons).

The economic model characterizes the short-run gains from groundwater trade in equilibrium as a function of four features of the market setting: the heterogeneity in demand for groundwater across users, the price responsiveness of groundwater pumpers, the total allowable pumping in the basin, and the initial allocation of groundwater rights among users. Assuming a required reduction in basin-wide use of 20% and an initial allocation of permits based on land holding, model results for the Coachella Valley show that the economic surplus with trade is 47% larger than under a cap-but-no-trade scenario, if trade is perfectly competitive.

We can alternatively consider the impacts of markets in terms of the reduction in the cost of compliance with SGMA. Model results show that the cost of compliance from a 20% reduction in basin-wide groundwater extraction can be reduced by 59% with voluntary groundwater trade.

The value of the gains from trade for the Coachella Valley were calculated with estimates of average annual groundwater extraction of about 230,000 AF and a pumping price of \$126 per AF. Assuming the water district imposed pumping restrictions of a reasonable magnitude and distributed permits for pumping based on current acreage, the possible gains to Coachella Valley groundwater users from water trading relative to cap-but-no-trade are estimated at \$40.6 million annually. Allowing groundwater trade could significantly improve welfare.

Given the model assumptions and parameter estimates calculated for the Coachella Valley, the gains from trade are large, meaning markets have potential to cause significant cost-savings when it comes to implementing SGMA. Furthermore, a simulation analysis shows that the gains from trade remain large over a reasonable range of parameter values. Therefore, results are likely to generalize to other basins where trading might occur. Allowing and enabling trade on groundwater basins facing pumping reductions due to SGMA will mean fewer disruptions to the local economy and less land being taken out of production, relative to the alternative where trade is prohibited.

### Protections for Third Parties

Groundwater markets will have impacts on parties that are not directly involved in trading. These external parties may include rural communities that rely on groundwater for drinking supply, groundwater-dependent ecosystems, surface water supplies, and farm labor. Relative to a cap-but-no-trade scenario, markets result in

economic benefits for the farm labor economy and rural communities through their substantial cost-savings. However, due to some of the unique features of groundwater as a commodity, the spatial redistribution of extraction due to trade may have physical consequences that will affect surface water, small-system drinking supplies, habitat, and ecosystems.

Trading rules and restrictions can be imposed to protect these third parties. Nylen et al. (2017) suggest a number of rules to address concentration, hydrologic connectivity, and other spatial impacts. Instead of allowing groundwater to be traded on an AF-for-AF basis, it has been suggested that trades be adjusted according to where the trades are occurring and the impacts associated with the locations. For example, groundwater trades near streams could be subject to a different trading ratio than sales far from surface water supplies. To further avoid “hot spots” or cones of depression in the groundwater table near rural residential areas, limitations or boundaries can be set. Trading restrictions can be set to limit transactions from certain areas entirely.

### Conclusion

Many groundwater management agencies are considering, or already implementing, market-based instruments for managing groundwater under SGMA. This research contributes to our understanding of the potential for groundwater markets by estimating the efficiency gains from groundwater trade for the water district serving the Coachella Valley. In this simulated scenario, Coachella Valley irrigators had to reduce aggregate groundwater use by 20%. With this cut-back, allowing trade improves economic outcomes by almost 50% relative to the same restriction without trade.

The substantial cost-savings that come from allowing groundwater trade in the face of basin-wide groundwater

restrictions can have large positive impacts on agricultural producers, consumers, disadvantaged communities, and local farm labor. Of course, these results are conditional on assumptions about the nature of trading and they must be considered in light of the impacts from the spatial redistribution of pumping, but they speak to the potential benefits of allowing trade given a water restriction of this magnitude.

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#### Author’s Bio

Ellen Bruno is a Cooperative Extension Specialist in the ARE department at UC Berkeley. She can be contacted by email at [ebruno@berkeley.edu](mailto:ebruno@berkeley.edu).

#### For additional information, the author recommends:

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Department of Agricultural and Resource Economics

UC Davis

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### Co-Editors

Richard Sexton

Sofia Berto Villas-Boas

David Zilberman

### Managing Editor and Desktop Publisher

Julie McNamara

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Julie McNamara, Communications Director

Giannini Foundation of Agricultural Economics

Department of Agricultural and Resource Economics

University of California

One Shields Avenue, Davis, CA 95616

E-mail: [julie@primal.ucdavis.edu](mailto:julie@primal.ucdavis.edu)

Phone: 530-752-5346

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