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What Exactly Are They Paying For? Explaining the Price Premium for Organic Fresh Produce

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This article investigates consumer preferences for organic fresh produce, and decomposes the organic price premium into some of the key attributes of organic products, using data from a survey of Sacramento-area households.

It is well known that organic markets have grown rapidly in the past decade, with sales of organic products growing at a rate of 10 to 20 percent annually. According to the Organic Trade Association, organic food sales reached $14 billion nationwide, and they are expected to reach nearly $16 billion by the end of this year. This represents 2.5 percent of all retail food sales, compared with a 1.9 percent share in 2003. Once a small niche market, organic products have crossed over to become a mainstream, common choice alternative for many consumers. Dimitri and Green report that among many different types of organic products, fresh produce remains the largest product category in terms of sales.

One interesting feature of organic products is the "price premium" they command in the market. Various consumer reports and academic studies have identified some of the key factors that make consumers buy organic products, which include health and nutritional concerns, superior taste, food-safety concerns, and environmental friendliness.

However, it is difficult to quantify what exactly consumers are paying for, because the factors that are reported to be important to consumers when purchasing organic products cannot be observed when making purchasing decisions. In fact, consumers may not observe the effect of many of these factors even after consumption. For example, it would take a long time after consumption to realize the effect of pesticide use on the body or to the environment.

It seems that consumers nevertheless create their own perceptions or expectations about products and their qualities, and make purchasing decisions accordingly. Thus, it is important to understand how consumers perceive the quality of the product. Organic products must have some perceived benefits to those who are willing to pay higher prices. Consumers who do not buy organic products either have different perceptions, or their perceived benefit from organics is not worth the price premium. In order to analyze the effect of such unobservable factors, one must obtain information on individuals' perceptions about these factors. Such information is not available from typical market data.

In order to better understand consumer preferences (and willingness to pay price premiums) for organic produce, we conducted a comprehensive mail survey of grocery shoppers in the Sacramento area during 2005. The survey collected information on shoppers' perceptions, attitudes, knowledge about

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OECD Support for Agriculture: Has it Historically Harmed Poor Countries?

by Alix Peterson Zwane and Margaret McMillan

Table 1. Definitions of Attribute Labels in the Choice Experiments

Label	What does it mean?	No label (blank)
Organic	A product is certified to be grown organically. By definition, it is also "No GMO" and "Environmentally Friendly." See these labels below.	A product is NOT organically grown.
Pesticide Free	A product was tested, and no pesticide residues were found on or in the product.	Either: (i) a product was not tested, or (ii) it was tested, and small amount of residues were found. Any residue levels are 10 to 100 times less than the level that can cause any adverse health effects.
No GMO	A product is certified to be NOT genetically modified.	A product may or may not be genetically modified.
Environmentally Friendly	A product is certified to be grown using the full range of environmentally friendly production techniques. The methods address three types of environmental concerns: (1) Low/no use of pesticides. This will reduce soil and water contamination. (2) Conservation of energy and use of renewable resources in production. (3) Taking more carbon into soil, which can reduce greenhouse gases and global warming.	Use none of these techniques.

organic standards, and some of their socioeconomic characteristics that help explain purchase patterns. The survey also included "choice experiments," which is a relatively new, powerful, and consumer-friendly technique to elicit peoples' preferences. These choice experiment data were then used to determine the consumer's willingness to pay price premiums for specific attributes of four types of fresh produce.

Survey and Data Collection

Our survey data were collected during January to June 2005. Mail questionnaires were sent to 2,400 households in Sacramento and neighboring cities in Northern California. Preparation for the survey, two focus groups, nine personal interviews, and two pretests of the survey were conducted during May to December 2004. Implementation of the survey itself was state-of-the-art, with an initial mailing, reminder postcard, and two follow-up mailings with questionnaires included. The response rate was 50 percent after accounting for undeliverable surveys.

Choice Experiments. Each respondent was presented a series of comparisons (choice experiments) between an organic version of a produce item and a conventionally produced version of the same item, with differences in up to four attributes, and was asked to choose which they preferred. Based on previous studies and focus group meetings, the key attributes identified were pesticide free, no GMO, environmentally friendly, and unit price. The first three attributes were characterized as product labels, where absence or presence of a label defines a characteristic of the product. Each consumer was asked from eight to 16 comparisons about a single type of produce, out of four produce items studied: Fuji apples, bananas, broccoli, and red leaf lettuce. These are the largest-selling produce items among produce with both organic and conventional offerings in Sacramento-area supermarkets.

Table 1 shows more detailed definitions of each label, which were provided to respondents as part of the survey. The *pesticide free* label may be perceived to convey a private health benefit to the consumer, while the *environmentally friendly* label is related to a public benefit of improved environmental quality. The *no GMO* label is not currently used for fresh produce, though it will become relevant since genetically-modified produce is in development.

In each choice experiment, respondents were asked two questions: (1) if you had to buy the product today, which one would you choose? (Product A or Product B); and (2) would you actually buy it today? (YES or NO). This tells us not only which product the consumer prefers, but whether they are preferred over no purchase at all.

Decision-making by respondents in answering the choice experiments is modeled using a random utility framework, which presumes that the consumer chooses the alternative that gives the highest utility, and that utility depends not only the consumer's demographics and the attributes of the produce they are presented with, but also on unmeasured influences that are represented by a random error. Because there are multiple responses for each person, and to allow the preferences to vary across the population, the model used was a panel mixed logit. (Technical details can be found in Onozaka, Bunch, and Larson, 2006.)

Respondents were segmented into two groups based on their response to the question, "Do you buy fresh organic produce on a typical shopping trip?" "Non-regulars" are those who answered "no" to this question, while "regulars" are those who answered "yes." The segmentation approach was used to highlight the similarities and differences in the willingness to pay (WTP) for produce attributes.

Economic theory offers little guidance for how preferences for organic attributes might be distributed in the population. Comments obtained from the focus groups and personal interviews suggested strongly that different people may view each produce attribute positively or negatively, and as a result have a positive or negative WTP for it. For example, use of genetic modification is a controversial issue, with some in favor and some against, so that WTP for the *no GMO* label on produce could be positive or negative. Similarly, the *environmentally friendly* attribute refers to particular production techniques, and a person may or may not believe that these techniques are better for the environment, or are worth paying for. Likewise, the *pesticide free* label was viewed both favorably and unfavorably in focus group meetings and pre-testing. As a result, our model was designed to be flexible about whether each attribute increases or decreases a person's WTP for produce.

Table 2. Summary of Willingness to Pay for Produce Attributes

Market Segment	Produce Item	Attribute	Willingness to Pay for Each Attribute: Mean [a]	95% Confidence Interval		% Price Premium	% Negative
Non-regulars	Banana ($/lb)	Pesticide Free	**0.13**	0.09	0.17	15%	16%
		No GMO	0.04	-0.03	0.11	4%	42%
		Env. friendly	0.04	-0.13	0.16	5%	41%
	Fuji Apples ($/lb)	Pesticide Free	**0.14**	0.10	0.20	10%	16%
		No GMO	0.04	-0.04	0.12	3%	42%
		Env. friendly	0.06	-0.11	0.19	4%	40%
	Broccoli ($/bunch)	Pesticide Free	**0.26**	0.16	0.39	19%	16%
		No GMO	0.07	-0.05	0.23	5%	42%
		Env. friendly	0.09	-0.25	0.37	7%	41%
	Red Leaf Lettuce ($/head)	Pesticide Free	**0.21**	0.14	0.31	15%	16%
		No GMO	0.06	-0.04	0.18	4%	42%
		Env. friendly	0.09	-0.08	0.29	7%	39%
Regulars	Banana ($/lb)	Pesticide Free	**0.19**	0.14	0.26	23%	6%
		No GMO	**0.16**	0.02	0.29	19%	31%
		Env. friendly	**0.22**	0.11	0.34	26%	22%
	Fuji Apples ($/lb)	Pesticide Free	**0.25**	0.17	0.36	17%	6%
		No GMO	**0.20**	0.02	0.40	13%	32%
		Env. friendly	**0.29**	0.16	0.48	20%	22%
	Broccoli ($/bunch)	Pesticide Free	**0.47**	0.28	0.78	34%	6%
		No GMO	**0.37**	0.03	0.83	27%	32%
		Env. friendly	**0.54**	0.25	0.99	39%	22%
	Red Leaf Lettuce ($/head)	Pesticide Free	**0.35**	0.22	0.54	26%	6%
		No GMO	**0.26**	0.03	0.57	19%	33%
		Env. friendly	**0.40**	0.20	0.69	29%	22%

[a] *Means in **bold** are statistically significant (95% level).*

Findings and Conclusions

Table 2 presents the results on willingness to pay for the produce attributes, by type of produce and market segment (regular versus non-regular organic produce purchasers). It shows the average (mean) WTP, and the 95 percent confidence intervals for the mean. (This is the interval in which we expect the mean to be found 95 percent of the time.) The "percent premium" is calculated as the WTP for the produce attribute as a percentage of the average conventional price for that produce item, and "percent negative" is the percentage of the population with negative WTP. (These people view the attribute as undesirable.) As an example of how to interpret the table, the first line indicates that non-regular organic purchasers are willing to pay an average of $0.13 per pound more for a banana labeled "pesticide free" compared to one without that label, which is a 15 percent price premium, and 16 percent of the population view this attribute as undesirable.

Regular organic purchasers have higher average

WTP for all the attributes than do non-regular purchasers, and the price premium they are willing to pay ranges from 13 percent to 39 percent, depending on the produce item and attribute. The price premiums for each attribute are highest for broccoli, and the *environmentally friendly* attribute is highest for all four produce types. All of these are statistically significant; that is, statistically the differences in WTP are greater than zero.

For non-regular organic purchasers, the average WTP is statistically greater than zero for only one of the attributes, *pesticide free*, and is not statistically different from zero for the other two. The price premium for *pesticide free* ranges from 10 percent (Fuji apples) to 19 percent (broccoli), depending on the produce item.

Comparing the two groups of purchasers, WTP for the *pesticide free* attribute is most similar between the two market segments, while preferences for the other two attributes, *no GMO* and *environmentally friendly*, are more diverse, with considerably higher fractions of the population viewing them as undesirable in both groups. Roughly 40 percent of non-regulars have negative WTP for these attributes, while 31 percent and 22 percent of regulars have negative WTP for the *no GMO* and the *environmentally friendly* attributes, respectively.

A few additional observations can be made. First, the fact that *pesticide free* is the most important attribute for non-regulars makes sense, as this attribute is likely to provide the most tangible personal benefit to an individual. However, regulars have the highest average WTP for the *environmentally friendly* attribute, suggesting that the voluntary contribution to society as a whole through their product choice (i.e., through improved environmental quality) is a significant motivation for regulars, and is larger in magnitude than the personal benefit of avoiding pesticide residues, on average. Second, the *no GMO* attribute has the lowest average WTP and largest proportion of the population with negative WTP, for both regulars and non-regulars. This is not surprising, as use of genetic modification is probably the most controversial and unfamiliar concept among the three attributes. However, about 60 percent of non-regulars and 70 percent of regulars are willing to pay some positive amount for the *no GMO* attribute, suggesting that a majority of consumers have some degree of concern towards the use of genetic modification and are willing to pay extra to avoid it.

This research provides some insights into what affects fresh consumers' organic versus conventional produce choices. There is considerable room for further research. How attitudes toward the environment and perceptions about produce attributes affect the price premiums is not yet fully understood and requires more attention for other products. Combining the choice experiment data with other sources of consumer information, such as supermarket scanner data, would also help enhance the statistical properties of the choice models and resulting price premium estimates.

**For additional information,
the authors recommend the following sources:**

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Farm Household Wealth: Where Does it Come From?

by

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This article examines the relationship between agricultural profits and farm household wealth across locations and farm sizes in U.S. agriculture. Farmland has out-performed non-farm investments over the past decade. Thus, households may want to keep their farmland to build wealth, even if it requires them to earn off-farm income.

Normally, the survival of a firm depends on its profitability, both in absolute and relative terms. To remain viable, a firm must offer returns that are both sufficient to cover the owner's financial obligations and competitive with returns from alternative investments. If a firm is profitable, the wealth of its owners can increase over time. An unprofitable firm, on the other hand, reduces owners' wealth. Yet, American agriculture is full of firms that routinely earn low or negative returns on equity from production operations. This surprising fact suggests that a better understanding of the relationship between farm profits and owner wealth is needed to explain the financial performance of the production agricultural sector. This article addresses that relationship.

To begin, assessing farm owner-operator wealth involves understanding that farmers are making production decisions based on total household wealth, not just on farm production profitability. In other words, the economic objective of "maximizing profits" needs to be replaced with "maximizing wealth" as the goal of each farm owner-operator. Previous research has shown that a household's ability to raise wealth is influenced by the size of the farm, the commodities being produced, the farm's proximity to urban development, and opportunities for off-farm employment for household members. This topic is important because differences in income and wealth among households across American agriculture lead to differences in farm exit rates which, in the worst cases, put some locations at risk of losing their agricultural industries as individuals leave agricultural production for more profitable investments.

The objectives of this study are to examine the relationship between agricultural profits and farm-household wealth across locations in U.S. agriculture, and to highlight some policy implications. Therefore, we study wealth patterns across regions and across farm sizes to gain insights into the future prospects for American agriculture.

The Relationship Between Income and Wealth

Total wealth (W) is usually expressed as equity or total net worth at time t. Over time, wealth changes such that $W_t = W_{t-1} + \Delta W_t$. Three types of economic gains contribute to wealth: profits from farm output, off-farm income, and capital gains on assets. Therefore, to understand the dynamics of wealth, we focus on wealth changes (ΔW) during a time period, which equals farm income plus off-farm income plus capital gains minus consumption for the period. The four components of wealth changes are themselves functions of other factors. Unfortunately, national data are not available for many of the factors in the accounting definitions of wealth changes and income. As a result, we estimate a recursive system of equations using national survey data for variables proxying for some key income factors and a household's wealth, as explained below.

In this study, farm income is derived from pre-tax revenues from farmers' and ranchers' sales of production output, plus government payments received by household members, minus production and ownership costs. Production costs are the variable expenses incurred when producing an output. The data used are for purchased inputs only, as reported by households. Ownership costs are the fixed and other expenses incurred. Data for depreciation are used here as a proxy for ownership costs. Government transfers are included as an explanatory variable to enable an assessment of the true sustainability of farm production as an income source. To many farm households, government payments may be significant. It is expected that most government payments to agricultural producers come from business activities concerning the household's ownership and/or operation of a farm or ranch.

Off-farm income has represented over 90 percent of average farm-household income in recent years. Our model states that off-farm income consists of the sum of off-farm salary or wages earned and non-farm investment or "unearned" income.

Table 1. Regression Results for Change in Wealth and Farmland Value Equations by Region, 1996-2004

Variable	North-east	Lake States	Corn Belt	Appala-chia	South-east	Delta	Southern Plains	Northern Plains	Mountain	Pacific
Change in Wealth Equation										
Farm income	0.2485	0.0404	0.0787	0.0859	0.1347	-0.0137	-0.0442	-0.0187	-3.2371	0.2862[1]
Non-farm income	0.7110	0.0737	0.1343[1]	0.1025	0.1088	0.0818	-0.0402	0.3879[3]	5.1212	0.7461[2]
Change in Farm Capital	0.9077[3]	0.9785[3]	0.7354[3]	1.0084[3]	0.9736[3]	0.9169[3]	1.0402[3]	0.9994[3]	0.3039	0.2014[2]
Change in Non-Farm Capital	0.0785	0.2065[3]	0.0460	0.2488[3]	0.1495[3]	0.2569[2]	0.5285[3]	0.0114	0.1521	0.2654[3]
Consumption	-0.0450	0.2625	0.1484[1]	-0.1495[3]	0.3070	0.2219	-0.0892	-0.0583	2.2035	-0.2659
Farmland Value Equation										
Revenue Per Acre	0.1654	-0.0199	0.2248[2]	0.0050	0.0015	0.1548[1]	-0.0566	0.2980	3.0217	0.1359
Government Payments/Acre	-7.5977	4.2571	34.0459	-1.4195	0.5947	-2.6671[3]	-12.2190	2.2098	-3.2247	0.5927
Cost of Capital	-0.0017	-0.0001	-0.0001	0.0001	-0.0001	-0.0000	0.0001	-0.0004	-0.0004[2]	0.0002
Productivity	0.0380	0.0339	-0.0536	0.0308	0.2114[3]	-0.1489[1]	0.0665	-0.2292	-2.8185	-0.1107
Population Density	0.0091[3]	0.0050[3]	0.0059[3]	0.0076[2]	0.0105[3]	0.0052[3]	0.0041[1]	0.0081[3]	0.0325[3]	0.0290[3]

The value in each box is the variable's regression coefficient and its t-statistic is statistically significant at the 99 percent, 95 percent, or 90 percent confidence levels, respectively, when denoted [3], [2], or [1].

Off-farm employment is the primary source of non-farm income for a majority of farm and ranch households. Non-farm investment includes income sources such as interest income on savings, Social Security and other retirement benefits, and interest and dividends on non-farm assets such as stocks and bonds.

Capital gains are simply the change in value of a farmer's capital from one period to the next. The capital variable in our model is the sum of the market values for all assets held by the household, as reported by the farmer. Farmland has historically represented about 75 percent of assets held by farm households.

Farmland values vary much more than do other agricultural assets because they are a function of numerous variables. Thus, we estimate a simple equation for the price of farmland: the (average) value per acre of farmland and buildings is a function of the (average) cash flow per acre from agricultural production of the farm, plus government payments received per acre, minus the effects of the average cost of capital, plus a farm-level estimate of productivity per acre, plus the effects of population density (people per square mile) in the county.

Farm household consumption data used are the annual expenditures reported by the household. Consumption decisions affect change in wealth levels directly because all income (from farm and non-farm sources) not consumed become savings, which are held in some form as capital, thus contributing to capital gains.

Procedure

We evaluate the inter-linkages between farm-household wealth and income in ten production regions covering the continental 48 states. Our data are annual farm-level observations from the U.S. Department of Agriculture's Agricultural Resource Management Survey from 1996 through 2004, giving us a total of 95,517 observations.

In our analysis across farm sizes, we use three size categories. These three categories follow the USDA's topology for farm types. Farm Size 1 corresponds to "limited resource," "retirement," and "residential" farms. Farm Size 2 corresponds to "farm/lower sales" and "farm/higher sales." Farm Size 3 is "large family farms" and "very large farms."

We deflated the nominal values of the monetary variables by the GDP implicit price deflator such that values presented in the tables are in year 2000 dollars. Also, we used two alternative measures of productivity: one for crop farms and one for livestock farms.

Empirical Results

As expected, we find a diverse pattern of relationships linking farm income, land value, and farm-household wealth over time. We also find patterns when accounting for differences in locations and farm sizes.

Change in Wealth. Wealth consists of both farm and non-farm capital. As shown in the top section of Table 1, both components were significant in six of the 10 regions: the Lake States, Appalachia, Southeast, Delta, Southern Plains, and Pacific. Clearly, changes in farm capital are important in wealth-building. That variable was significant in every area except the Mountain region. Also, income from either farm or non-farm sources generally was not significant. The only region to have significant farm income was the highly profitable Pacific: California, Oregon, and Washington. However, households in that region got a much larger contribution to wealth, on average, from off-farm income, as indicated by the relative size of the two regression coefficients. In general, the wealth results mean that income, in absolute amounts, was small compared to capital gains. Thus, wealth comes from capital gains, not income, in all parts of the country's agricultural industry.

Table 2. Regression Results for Equations by Farm Size, Across Ten Regions, 1996-2004

Explanatory Variable	Farm Size 1	Farm Size 2	Farm Size 3
Change in Wealth Equation			
Farm Income	-2.9673	0.1048	-0.0183
Non-farm income	0.8052[2]	0.3119	0.9166[2]
Change in Farm Capital	0.2595	0.8308[3]	0.9292[3]
Change in Non-farm Capital	0.0908	0.0103	0.1365[3]
Consumption	0.4472	0.2259	0.2541[1]
Farmland Value Equation			
Revenue per acre	-0.6476	0.6089[3]	0.0152
Government Payments per acre	-3.2415	0.8957	0.1846
Cost of Capital	-0.0000	-0.0001	-0.0000
Productivity	0.0535	-0.0061	0.0114
Population Density	0.0086[3]	0.0118[3]	0.0208[3]

[3], [2], and [1] denote statistical significance at the 99%, 95%, and 90% confidence levels, respectively. These regressions use state dummy variables for fixed effects.

Farm Size 1 corresponds to limited resource, retirement, and residential farms.
Farm Size 2 corresponds to farm/lower sales and farm/higher sales.
Farm Size 3 are large family farms and very large farms.

Both farm and non-farm capital were significant in most regions but had differential impacts on wealth. For example, a $1,000 increase in farm capital in the Lake States would raise wealth by about $979, compared to $201 in the Pacific. Also, a $1,000 increase in non-farm capital would raise wealth by about $207 in the Lake States and $265 in the Pacific. In all regions except the Pacific, the lower regression coefficients for changes in non-farm capital, compared to coefficients for farm capital, imply that there are few economic opportunities for shifting resources out of agriculture and into non-agricultural uses. In general, these results show that holding farmland (which represents about three-quarters of farm capital) has been a much more profitable investment over the past decade than have non-farm investment alternatives, on average.

Farmland Value. Economic theory suggests that the price of farmland reflects either its value as an input in agricultural production, or the non-farm demand for land. The key result here is that the proxy variable for the non-farm demand for farmland (county population density by year) was significant in all of the 10 regions (bottom section of Table 1). This is consistent with the growing realization that non-farm demand for farmland is increasingly affecting farmland values, even in areas such as the Corn Belt and Northern Plains whose economies were dominated by production agriculture in the last century. The population density variable swamped the effects of the four other explanatory variables in our equation. This appears to be inconsistent with the traditional theory that farmland value is determined primarily by its ability to generate agricultural revenues. However, this result is consistent with the "urban influence" on farmland prices found in recent studies. Thus, the proximity of a farmland parcel relative to non-agricultural development is a key factor in pricing. This implies that no commodity can generate enough revenue to adequately compete with expanding urban development, meaning that land-use ordinances may be needed to preserve farmland in urbanizing areas.

Farm Size Results. Results in Table 2 show how American farms of different sizes from all 10 regions have performed over the last decade. As expected, the size of a farm has significant effects on its financial performance.

In the *change in wealth equation* results, it is clear that Size 1 households are better off focusing their activities off the farm. Non-farm income was the only significant source of wealth for small-sized farms. Medium-sized farms derive wealth only from gains on their farm capital, which is most likely their land. Large farms benefit from capital gains on all assets, plus from their off-farm income.

The *farmland value equation* results have significant implications for land-pricing theory. The revenue per acre generated by farming has no effect on small- and large-sized farms, contrary to traditional theory. Medium-sized farms do get a significant effect from production revenues per acre. All three farm sizes have significant population density effects, but the regression coefficient increases with farm size. This implies that a farm's proximity to urban areas is key to its farmland values, as noted by recent studies, and that large parcels may have higher development value per acre.

"Large farms not only generate more dollars due to their larger scale of operations, but a higher portion of each dollar of income from each source is captured as wealth."

Implications of the Results

These results generally agree with recent studies of farm financial performance. We suggest three implications of our results.

First, the finding that changes in both farm and non-farm capital are significant in explaining changes in wealth in most regions suggests that non-farm capital is a substitute for farm capital. This indicates that farm households have diversified their portfolios.

Second, changes in farm and non-farm capital have differential impacts on farm wealth across farm locations. In general, the fact that changes in non-farm capital have smaller impacts than do changes in farm capital across all regions except the Pacific implies that there are few profitable opportunities to shift resources out of agriculture in most of the country. However, this may also reflect the asset fixity problem faced by most farm households. Or it may indicate simply that urban pressures pushing farmland values up are creating the best investment alternative available to agricultural producers. In other words, farmland has out-performed non-farm investments over the past decade.

Third, farm size affects household wealth in unexpected ways. In Table 2, three of the four income sources were significant in increasing the wealth of large farms, and the scale of their effects were greater for large farms than for small or medium-size farms. Capital gains from farm assets were significant for medium and large farms, but the coefficient was higher for large farms. Capital gains from non-farm assets were significant for only large farms. Finally, off-farm income was significant for small and large farms, but the coefficient was highest for large operations. Therefore, large farms not only generate more dollars due to their larger scale of operations, but a higher portion of each dollar of income from each source is captured as wealth.

These results support the long-expressed notion that large-scale farms are more competitive in today's global commodity markets and, therefore, have a higher probability of surviving. The results are also consistent with the "big fish eat little fish" story of consolidation long visible in American agriculture. Therefore, the pattern of financial performance observed in our household data indicates that existing trends of decline in small- and medium-sized farms are likely to continue for some time. The unknown is the pace of consolidation because it will depend on how long the "little fish" choose to hang on to their farmland. Our analysis implies that choice will be made based on farm-household wealth factors having little to do with agriculture.

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Assessing Geographic Branding Strategies: Lessons for Country-of-Origin Labeling

Colin Carter, Barry Krissoff, and Alix Peterson Zwane

We draw on the economics of product differentiation in a trade context and use three case studies to assess country-of-origin labeling (COOL) as a branding strategy for farm produce. Lessons are drawn from Vidalia onions, Washington State apples, and Florida orange juice, which suggest that the use of geographic identifiers to achieve differentiation could be profitable in the short run, but any hope that such differentiation will prove useful at the country level for farm produce seems likely to be misplaced.

In the 2002 Farm Bill, the United States Congress introduced country-of-origin labeling (COOL) requirements on certain meats (beef, lamb, and pork), fish and shellfish, fresh and frozen fruits and vegetables, and peanuts. Supporters of mandatory COOL argue that the legislation will give domestic producers an advantage, since surveys show that U.S. consumers prefer "made in USA products." We present three case studies of ongoing geography-based branding efforts in the U.S. produce sector to highlight the criteria necessary for successful branding based on geographic origin. These criteria include product differentiability, promotional efforts, supply controls and entry restrictions.

Our findings largely support the conclusions of the U.S. Food Safety and Inspection Service that there is no evidence that, "a price premium engendered by COOL will occur, and if it does, [that it] will be large or persist over the long term." First of all, differentiation is simply not an option for many goods based on the nature of the products in question. Second, successful differentiation requires a level of control over product supply and market entry that is unlikely to be achieved for a good produced over a large geographic region. Finally, advertising and promotion contribute to the success of any differentiated goods campaign, and many agricultural industries may not be able to generate the necessary funds for promotion given recent U.S. court decisions.

Background and Policy Context

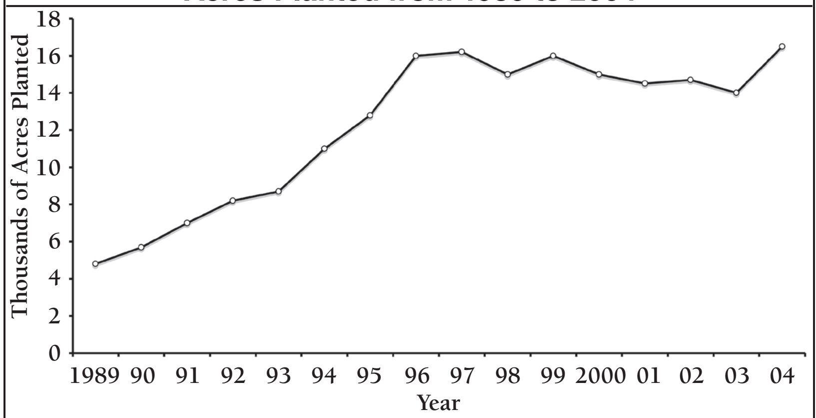
Mandatory COOL requires that retailers inform consumers of the country of origin for the covered commodities. The major direct costs of a program like COOL include the costs of segregation along the marketing channel and tracking product origins, the physical cost of labels, and enforcement costs. The U.S. Department of Agriculture's Agricultural Marketing Service estimates that domestic producers, foodhandlers, and retailers would spend $582 million on COOL recordkeeping in the first year alone. The Food Marketing Institute estimates that compliance by fruit and vegetable suppliers will cost $1.3 billion annually.

The fact that producers have not found it profitable to voluntarily provide COOL to customers for fresh produce, meats, and fish is strong evidence that willingness to pay for this information does not outweigh the cost of providing it. In other words, if the benefits outweighed the costs, profit-maximizing firms would have already exploited this opportunity.

Even if the cost of providing country-of-origin information is low or negligible, and the legislation indeed results in higher prices for U.S. products, unexploited willingness to pay for U.S.-grown products may be insufficient to generate increased profits for domestic producers. This is likely to be the case if produce markets are monopolistically competitive and the marketing of differentiated products involves economies of scale. There is strong evidence of intra-industry trade in agriculture, which is consistent with the premise that produce markets are monopolistically competitive.

The effect of mandatory COOL on domestic producers' market share and price depends on whether the consumer thinks the additional information differentiates the domestic product further from its substitute goods. If this is the case, domestic producers may realize an increase in market power as a result of COOL. However, the increase in market power can only be exploited if the domestic industry can restrict entry or otherwise control supply. Price premiums for fruits and vegetables depend critically on a product's differentiability and producers' ability to control its supply. Under monopolistic competition, origin labeling may raise profits in the short run if labels distinguish attributes that consumers care about. But permanent gains in profit require supply controls. The lessons from the case studies of origin-based labeling below broadly support these conclusions.

Figure 1. Georgia Spring Onions: Acres Planted from 1989 to 2004



Source: National Agricultural Statistics Service

Case Study 1: Vidalia Onions

The existence of a price premium for Vidalia onions has been documented, which suggests that Vidalia onion growers have been extremely successful in defending their brand even as acreage planted has risen. Table 1 shows grower prices of spring onions in Georgia (mainly Vidalia) compared to spring onions grown in California, Arizona, and Texas. Georgia onion prices are on average over 100 percent higher than California prices, 200 percent higher than Arizona prices, and over 50 percent higher than Texas prices

The passage in 1986 of the Vidalia Onion Act in the Georgia state legislature delimited very specifically a qualified production area for onions that could be marketed as Vidalia onions. The Vidalia Onion Act required growers to register with a central authority, allowed the Georgia Commissioner of Agriculture to set standards, mandated inspections, and set criminal penalties for the violation of identification and sales restrictions.

The Vidalia Onion Committee has the authority to restrict supplies through both direct and indirect means. The Committee has the authority to coordinate planting decisions, including acreage reductions. Indirect evidence of successful coordination comes from NASS data on prices and harvested area for Georgia spring onions. Even in the face of rising acreage (Figure 1) the price of Vidalias remain relatively high (Table 1).

Vidalia onion growers have a differentiated product which they have been able to distance from its substitutes by creating and promoting the "Vidalia onions" label. They have been able to maintain this distance through supply controls. However, our next case study illustrates that not all products which are geographically specialized can maintain a successful brand.

Case Study 2: Washington Apples

Although many states in the U.S. grow apples, the state of Washington has produced more than one-half of the country's apples for many years. Like Vidalia onion growers, Washington apple producers have historically used promotional activities to inform consumers of the distinguishing characteristics of their product. The Washington Apple Commission (WAC) has invested hundreds of millions of dollars over the past decades into research and marketing, in an attempt to preserve the state's reputation for quality.

Unlike Vidalia onion growers, Washington apple growers have not been able to maintain coordination over funding for those activities. Notably, organic apple growers and specialty cultivar growers have successfully sued to allow them to opt out of generic advertising efforts, severely restricting the activities of the WAC. These growers contend that the Washington apple label is too broad for their own branding purposes. Instead, they hope to capture price premiums above and beyond that afforded by the regional brand.

Washington apple growers are not in a position to follow the Vidalia strategy of limiting supply or restricting entry and therefore are unable to maintain price premiums. Compared to annual crops like onions, tree crops are slower in responding to market signals. Attempts by the state or WAC to reduce supply would be problematic. Unlike the Vidalia growers, Washington apple growers do not coordinate on acreage restrictions or supply constraints via quality standards. As the controversy over advertising expenditures illustrates, these growers are too diverse to have either the means or inclination to control supply to raise prices over marginal cost.

Case Study 3: Florida Orange Juice

The Florida orange juice industry brings $9 billion annually to the state of Florida. Recently, there has been a major shift in consumer demand away from frozen concentrate orange juice (FCOJ) toward not-from-concentrate juice (NFC). NFC juice is made almost exclusively with domestically grown oranges, while FCOJ is produced with a blend of concentrates from domestic and foreign sources.

Within the FCOJ category, differentiation opportunities are extremely limited. Processors mix crops to engineer a quality product, seeking to achieve a desired flavor, color, acidity, and viscosity. As a result, processors encourage consumers to regard foreign and domestic products as equivalent. This seriously limits the ability of domestic FCOJ to distance itself from foreign FCOJ.

In the NFC sub-category, the gains from increased demand due to promotion should accrue almost exclusively to Florida growers. Indeed, Florida growers have until recently been able to maintain a coordinated advertising effort. Unlike the Washington apple promotional efforts, which led to disagreements among producers of different apple cultivars, promotional activities by the Florida Department of Citrus have touted the health benefits of orange juice in general, without any conflict among growers.

Despite this successful coordination, in 2004 the Court dealt the industry a blow when it ruled that the "box tax" on domestic producers (that funded promotion) was unconstitutional. An appeal is in process, but Florida orange juice promotion may be severely curtailed in the future just as in the Washington apples' case.

Conclusion

Consumers may be willing to pay a premium price for domestic produce if they perceive it to be of higher quality, but this opportunity will not necessarily translate into higher grower profits unless a number of conditions are met. First, any distinguishing characteristics of the product must be maintained and made clear to consumers, usually via promotion. The more broadly based a regional branding effort is, the less likely that producers will pay to support promotional efforts. Thus, promotion of Washington apples has been unsuccessful because organic and specialty growers in the state have successfully blocked mandatory funding of promotion. On the other hand, Vidalia onion growers, as a narrow class of specialty growers, have successfully collected promotion funds. For COOL to be successful in generating a price premium, there must be complementary promotion. However, legal rulings that have been made in the past few years make it more difficult to raise funds for effective promotion for a regional industry.

Second, in a tightly defined geographic region, producers are more likely to be able to collectively restrict entry and control the supply of a branded product. Vidalia growers have the most powerful tools at their disposal for controlling supply among the products that we discuss. For COOL to restrict supply of a given product, the legislation must limit the supply of foreign-grown products by acting as a non-tariff barrier to trade.

Table 1. Prices of Spring Onions

Year	Georgia	California	Arizona	Texas	U.S.A.
1990	32.40	11.10	10.50	17.00	16.00
1991	31.50	18.00	8.61	19.10	19.10
1992	25.40	11.80	9.82	19.80	16.70
1993	29.70	18.00	16.40	26.20	22.40
1994	20.70	8.00	7.70	10.70	11.30
1995	28.10	14.00	7.90	19.20	18.60
1996	30.50	9.80	8.60	9.70	13.20
1997	25.60	14.30	12.60	16.90	18.40
1998	30.90	14.10	15.30	21.70	20.00
1999	27.10	11.90	11.40	17.40	17.30
2000	26.00	10.60	5.80	17.20	16.60
2001	27.50	13.50	8.00	18.50	18.30
2002	32.20	14.20	8.35	21.40	20.00
2003	34.30	22.90	9.89	38.10	29.70
2004	23.50	15.10	8.80	22.60	19.70
2005	29.70	12.00	10.20	29.70	22.60

Season average price in dollars per hundredweight.
Source: National Agricultural Statistical Service, USDA

In summary, our case studies suggest that the use of geographic identifiers to achieve differentiation can be viable, but any hope that such differentiation will prove useful at the country level for farm produce seems likely to be misplaced.

For additional information, see the following sources:

Carter, C. and A. Zwane. 2003. "Not so cool? Economic implications of mandatory country-of-origin labeling," *ARE Update* May/June 2003. www.agecon.ucdavis.edu/uploads/update_articles/v6n5_2.pdf.

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Krissoff, B., F. Kuchler, K. Nelson, J. Perry, and A.i Somwaru, 2004. "Country-of-Origin Labeling: Theory and Observation." www.ers.usda.gov/publications/WRS04/jan04/wrs0402/.

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