An opportunity overlooked: A choice experiment to estimate consumers' willingness to pay for locally grown fruits in Cusco, Peru

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Motivation

1. Local food consumption has become a growing movement, particularly in the US and Europe, in response to concerns over the environment, food quality, and supporting local farmers.
2. Limited quantitative evidence on consumers' preferences for local foods in the global South.
3. Understanding consumers WTP for local food is important in strengthening linkages between rural communities and nearby urban consumers to provide additional income for smallholders in developing countries.
4. Cusco provides an ideal case study as it is similar to other rapidly growing urban areas in developing countries. It has received an increasing influx of migrants, has a growing middle class, and has a local food production dominated by poor and remote farmers.

Main Objective

To estimate de consumers' WTP for local foods in Cusco, Peru

Choice Experiment

Our study used a choice experiment (CE) to determine consumers WTP for three locally grown tree fruits, apples, avocados, and pears, in comparison to the same fruits not grown in Cusco. These fruits were selected based on four focus groups where consumers were asked about what a local product meant to them, what distinguished it from non-local products, and which fruits they frequently purchase. They noted that fresher and tasted better but had a worse physical appearance than the nonlocal fruits.

Field experiment

1. Our study is unique in conducting a field survey in local markets of Cusco, often interviewing consumers just before or after they had made a purchase, instead of using phone and internet surveys or households interviews.
2. We interviewed 300 consumers in the local market, same environment where they make their food purchases.
3. The first fruit asked was randomly assigned
4. A series of four questions (if she preferred the local fruit, if she would be WTP for the local fruit, the maximum price she would be WTP, and her confidence in her response) was asked for each fruit in order to obtain each consumers WTP for the local fruit.

Choice scenario: WTP for local foods

If the FRUIT has the attributes: physical appearance, taste, and freshness. Do you will buy these FRUITS if the prices are?

Local Fruit	Price 1 per kilogram
Non-local Fruit	Price 2 per kilogram
None	

If the consumer choose local FRUITS:

Which is the maximum price that are you willingness to pay for the same amount of local FRUITS?

10% more	Price 1*(1.1) per kilogram
20% more	Price 1*(1.2) per kilogram
30% more	Price 1*(1.3) per kilogram
40% more	Price 1*(1.4) per kilogram
50% more	Price 1*(1.5) per kilogram

Random Utility Model

Each individual solves the following constrained maximization problem: $MaxU(C(A), s, e) = V[A, y - p * c, y, s, e]$ subject to a budget constraint $p * c = y$. The good attributes (A) are a random vector, y is the income, s is the vector of individual characteristics. The choice of which good to select may be represented by a set of binary indices:

$$\delta = 1, C(A) > 0, V[A, y - p * c, y, s, e] > maxV[A, y - p * c, y, s, e] \quad (1)$$

$$\delta = 0, C(A) = 0 \quad (2)$$

δ is is a dichotomous variable equal to one if the local food is chosen and zero if is not.

Econometric model

We use a Multinomial Logit Model, the choice experiment consists of M choice sets (three local fruits and six sequentially bids). Each choice set (F) consist of several alternatives in terms of sequentially increasing bids. We express the choice probability as following:

$$Pr[\delta = 1|F] = PrV[A, y - p * c, y, s] + e_i > maxV[A, y - p * c, y, s] + e_j \quad (3)$$

For simplicity V[.] is assumed to have a linear functional form:

$$Pr[\delta = 1|F] = \beta_0 + \beta_1 * gender + \beta_2 * age + \beta_3 * education + \beta_4 * income + \beta_5 * children \quad (4)$$

Where, $gender$ is a dummy variable that takes a value of 1 for a female respondent, age the age in years, $education$ the number of years of education completed, $income$ per capita household income, $children$ the number of household members 14 years old or younger.

Results

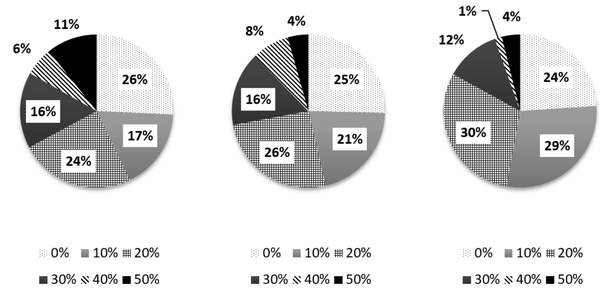

Figure 1. Percentage of participants that were WTP 0, 10%, 20%, 30%, 40%, and 50% for locally grown apples (left), avocados (middle), and pears (right)

1. No large differences in the responses among the three fruits
2. For each of the cases, nearly 75% of consumers were WTP at least 10% more for these locally grown fruits, while 25% were not WTP more
3. The one large difference in the results is that more consumers are WTP much for locally raised apples than they would for the other two fruit, 11% percent of participants said they would be WTP 50% more for locally raised apples.

Average Marginal Effects from equation (4):

Characteristics	Apples +30%	Avocados +10%	Avocados +20%	Avocados +40%	Avocados +50%	Pears +10%	Pears +20%	Pears +50%
Gender	0.005	-0.133***	-0.065	0.049	-0.049	0.007	0.055	-0.046
	(0.074)	(0.071)	(0.078)	(0.056)	(0.034)	(0.083)	(0.089)	(0.036)
Age	-0.039**	0.017	0.018	-0.011	-0.021*	0.038*	0.029	-0.023*
	(0.019)	(0.020)	(0.021)	(0.014)	(0.012)	(0.022)	(0.022)	(0.013)
Education	0.006	-0.004	-0.008	0.007	0.008	-0.008	0.017**	0.001
	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.008)	(0.004)
Income	-0.023	-0.110	0.084	0.085**	-0.051	0.209**	-0.096	-0.066
	(0.076)	(0.095)	(0.086)	(0.042)	(0.046)	(0.084)	(0.098)	(0.060)
Children	0.045***	0.014	0.038***	0.036***	-0.008	0.001	0.011	0.012
	(0.021)	(0.024)	(0.014)	(0.014)	(0.015)	(0.028)	(0.028)	(0.011)

*** p<0.01, ** p<0.05, * p<0.1

Consumers who are younger and more educated and those with small children were WTP more for locally produced apples, avocados, and pears than they would for these fruits produced outside of Cusco.

Conclusions

- The results from the CE provide evidence that consumers in urban areas in developing countries are not only seeking out local food but also likely to pay a premium for these locally grown products.
- The results of the CE demonstrate the potential demand from not only wealthy consumers but also middle-income consumers for locally grown produce, as income did not prove to be a strongly significant determinant in a consumers WTP more for the locally raised fruits
- Focus on consumers in local food systems need to expand from targeting elites to include middle consumers
- More research is needed to understand consumers buying patterns and habits to build the necessary linkages between smallholders and consumers to create new markets and enhance rural incomes

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