Evaluating the Economic Viability of Inland Seafood Markets in Georgia: A Two-Pronged Approach

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ABSTRACT

There is a lack of information regarding the barriers preventing Georgia seafood producers from taking advantage of a presumed market premium in inland markets. Using a two-pronged approach, we estimated the willingness to pay (WTP) for locally caught Georgia seafood (clams, crab, oysters, shrimp, and grouper) sold in either farmers markets or through community supported agriculture outlets in the Atlanta-Athens area. We then estimated the costs per pound associated with targeting inland markets using an enterprise budget framework. This cost data, combined with the WTP data, provides a more holistic picture of the potential profitability associated with transporting Georgia-caught seafood inland to in-state consumers. While our analysis suggests inland markets could be economically viable for shrimp, we also identified factors hindering the development of inland markets.

Key words: Community supported agriculture, community supported fisheries, commercial fisheries, direct marketing, enterprise budget, local food, willingness to pay.
JEL Codes: D12, D22, Q13, Q22.

INTRODUCTION

In the US, both Georgia seafood producers and consumers express frustration. Seafood producers are frustrated by what they perceive to be low dock prices (Anonymous Insider 2016.) Inland consumers, particularly those motivated by the local food movement, are frustrated by the lack of Georgia-caught seafood because much of the local catch exits the state for sale in national or international markets. Unpacking this perplexing outcome requires a better understanding of the factors preventing Georgia seafood producers from taking advantage of a presumed market premium for local seafood in inland markets given that very little seafood is sold and consumed inland.

This research analyzes the potential economic barriers to local inland seafood markets by using a two-pronged approach. First, to gain a better understanding of the preferences of consumers in

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Georgia seeking locally caught seafood, we gathered data from consumers who currently seek out locally produced foods via their participation in either Atlanta-Athens area farmers markets or two local Community Supported Agriculture (CSA) programs. Using a contingent valuation framework, we estimated the willingness to pay (WTP) for local, Georgia-caught seafood for consumers. The WTP analysis provides an estimate of the potential gain seafood producers could receive from targeting inland markets.

This information only provides part of the story. While the WTP estimates quantify the opportunity cost of not pursuing inland markets, they do not take into account the costs associated with processing, transporting, and selling product inland. Thus, the second prong of this research project involves assessing economic feasibility on the production side by developing an enterprise budget for an entrepreneur looking to transport fresh headed shrimp or live littleneck clams to Atlanta-area farmers markets or CSA drop-off sites. The enterprise budget framework allows us to estimate a cost per pound per species delivered into both inland market outlets. The cost data, combined with the WTP data, gives us a more holistic picture of the potential profitability associated with transporting Georgia-caught seafood to inland consumers.

Our results support the findings of other researchers who have investigated price premiums through WTP analyses for locally produced products (Dobbs et al. 2016; Burnett, Kuethe, and Price 2011; Best and Wolfe 2009; Loureiro and Hine 2002; Darby et al. 2008; Mennecke et al. 2007) and in particular, locally produced seafood products (Cowley and Coulon 2014; Fonner and Sylvia 2014; Brinson, Lee, and Rountree 2011; Ropicki, Larkin, and Adams 2010; Grimley and Roheim 2010). Furthermore, this research is innovative because it provides valuable information on both sides of the market by combining the consumer's side via the contingent valuation framework and the producer's side via an enterprise budget framework. The authors could find no other examples in the literature that have taken this methodological approach. This research contributes to literature by providing a more comprehensive assessment of the economic viability of cultivating new market opportunities. We also present qualitative research findings alongside this quantitative analysis in order to provide more insight into the factors presently hindering the development of inland markets.

BACKGROUND

In Georgia, seafood producers report they receive low dock prices (Anonymous Insider 2016). Inland consumers, particularly those motivated by the local food movement, have limited opportunities to purchase locally harvested seafood. In 2017, 7.6 million pounds of seafood[1] were landed in Georgia at a value of $16.8 million dollars (DNR 2018). Most of the seafood landed in local waters is transported out of Georgia, where it enters broader national and international markets. This leaves the large inland markets of Atlanta and Athens with relatively few local seafood varieties and an inconsistent supply.

Research indicates consumers are interested in locally produced foods and prefer to buy food from within their region (Burnett, Kuethe, and Price 2011; Mennecke et al. 2007; Jekanowski, Williams, and Schiek 2000; Gallons et al. 1997). A 2001 national survey indicated 81% of registered voters wanted their food to come from within the US, and 52% would prefer food produced in their own states (Stephenson and Lev 2004). Research has demonstrated consumers are willing to pay a premium for locally produced food. When given the choice of two products, one produced

1. For context, this quantity of landings places Georgia in the bottom third of states with commercial landings (NOAA 2019).

outside the local area at the cost of $1 and a local product that would cost more, half of those participating were willing to pay more for the same product that was produced locally (Stephenson and Lev 2004). A similar study revealed 75% of consumers were willing to pay a premium for locally grown foods (Govindasamy and Nayga 1996). This pattern extends to seafood. An analysis showed seafood distributed by Community Supported Fisheries (CSF)[2] received prices "usually well above wholesale pricing" and Northern shrimp distributed this way had prices "substantially higher than wholesale prices" (Brinson, Lee, and Roundree 2011).

One important question related to the local food movement is what is considered a "local" product in terms of the acceptable distance between point of production and point of sale. The 2008 US Farm Bill defined local as "less than 400 miles from its origin, or within the state in which it is produced." A study conducted in Iowa found that 67% of respondents believed local food was defined as having traveled 100 miles or less from the farm to the point of sale, and only one third considered food grown within their state or region to be considered "local" (Martinez et al. 2010; Pirog and Rasmussen 2008). For some, the definition of local depends on whether or not the owner of the farm is from the local community or whether the farm is owned by a corporation based out of state (Adams and Adams 2011). Thus, the definition of "local" varies considerably and incorporates factors beyond a strict delineation of the distance between the producer and the consumer.

Another important question regarding the local food movement revolves around motivations for sourcing locally produced food. DeLind (2011) argues the local food movement is simultaneously "a social movement, a diet, and an economic strategy." Proponents argue local production and distribution are mechanisms to bring consumers and producers together, thereby strengthening face-to-face relationships (DeLind 2003). Connected to this conception of local food is an argument that manifestations like the CSA model can provide social, economic, and environmental benefits to local communities (Haney et al. 2015). There is also a perception of higher quality and greater nutritional benefits associated with local foods that underlies this desire for locally sourced foods (Hartman Group 2008). Consumers note the exceptional taste associated with local foods, allowing producers to concentrate on food grown for taste and nutrition, rather than transportability (ALFI 2008). Wolf, Spittler, and Ahern (2005) found that consumers perceived food sold at farmers markets to be "fresher looking, fresher tasting, a higher-quality product, a better value for the money, more reasonably priced, more likely to be grown in their country, more likely to be locally grown, more likely to be good for the environment, and more likely to be traceable to the processor and grower when compared to supermarket produce." However, consumers might not shop at farmers markets because they are not convenient or because sourcing food from local food systems imposes other transactions costs that deter buyers (Gregoire and Strohbehn 2002; Wolf, Spittler, and Ahern 2005; Hardesty 2008). On the producer side, local food production has been shown to benefit a region's smaller agricultural producers (Hughes and Boys 2015).

Turning this discussion toward local seafood production, the local food movement has the potential to benefit fishing communities. As one Alaskan involved in local fish politics in Sitka explained: "People are increasingly interested in who grew their food or who caught their fish . . . they want a personal connection to the farmer (or fisherman) who produced their meal" (Swagel

2. A CSF is a form of direct marketing of seafood modeled after CSA programs where the consumer pays an upfront amount in return for weekly deliveries over the course of a season (Brinson, Lee, and Rountree 2011; Walking Fish 2018). Both CSAs and CSFs share the goal of reducing the social and physical distances between consumers and producers (Campbell et al. 2014).

2011). This type of close relationship between food producers and consumers is referred to as "direct marketing." This approach is well established in agriculture, with the United States Department of Agriculture (USDA) reporting that direct marketing amounted to $3.0 billion in sales, up threefold since 2007 (Low et al. 2015; NASS 2015; Martinez et al. 2010). Direct marketing has the potential to increase revenue for fishermen by allowing them to sell at a price premium above what they might receive ex-vessel. Researchers at the National Oceanic and Atmospheric Administration (NOAA) suggest direct marketing could increase fishermen's income by "providing: (1) a constant, premium price for all fish and (2) an outlet for fish with low market prices" (Brinson, Lee, and Rountree 2011).

The value of direct marketing strategies for fishermen goes beyond the direct exchange of products at premium prices. Through their personal interactions and connection with local fishermen, consumers develop an appreciation of the industry, as well as an understanding of the issues facing the industry, including regulatory or political challenges. In this way, consumers may be more supportive both at the market and in the ballot box when it comes to issues impacting local fisheries. Fishermen benefit from interactions with consumers by observing the public valuing their contributions (Brinson, Lee, and Roundtree 2011). People buy local seafood for a variety of reasons, with cost not being the primary consideration (Tookes, Barlett, and Yandle 2018). In a study conducted in Carteret County, NC, the vast majority of consumers surveyed indicated a WTP a premium price to eat local seafood at restaurants, with 84% indicating it was important to them that seafood was locally harvested (Andreatta, Nash, and Martin 2011).

According to the Atlanta Local Food Initiative (ALFI), demand for locally grown food produced via sustainable methods has skyrocketed, and the limited supply cannot keep up with the demand (ALFI 2008). Since 2006, the number of farmers markets in the US has increased 190%, providing customers a more direct connection to local and regional food systems (Low et al. 2015; USDA 2019). CSAs first emerged in the US in the 1980s. Since then, the number of CSAs in the US has increased to over 12,617 (USDA 2014)[3]. Further, organizations and institutions have attempted to source from local food systems by using regional food hubs and farm-to-school programs. Food hubs are enterprises that aggregate locally sourced food for wholesale, retail, and institutional outlets, and since 2006 the number of regional food hubs in the US has increased by 288%, while the number of farm-to-school programs has increased 430% (Barham 2010; Low et al. 2015). Thus, there is a relatively untapped opportunity for Georgia seafood producers to market their product to inland markets (Tookes, Barlett, and Yandle 2018). The challenge is to understand which factors prevent Georgia seafood producers from participating in inland seafood markets. In order to gain some perspective on this issue, we first turned our focus to the consumer to estimate WTP for locally caught seafood.

METHODS

In order to estimate WTP for locally caught seafood we surveyed two subgroups, farmers market patrons and CSA members. We chose these subgroups because participation in a farmers market or CSA signals a consumer's interest in locally produced products. Given the dearth of local, Georgia-caught seafood being sold in the Atlanta-Athens region, we theorized these subgroups

3. The USDA's Census of Agriculture collected data on CSA participation in 2007 and 2012. However they dropped this question from the most recent (2017) Census.

Table 1. Socio-demographic Sample Characteristics

Characteristic	For the Farmers Market Survey	For the State of Georgia
Median age	45	35.9
Percent female	59.4	51.9
Median household income	$75,001–$100,000	$47,829
Persons per household	1.89	2.74
Percent with a high school degree or higher	98.6	85.5
Participates in Wholesome Wave (WW)*	3.78	

* Established in 2009, they currently partner with 37 different producer-only farmers markets in Atlanta and across the state of Georgia. They double each SNAP dollar spent to encourage shopping at local farmers markets.

would be more likely than the general population to purchase and pay a price premium for locally-caught seafood. The demographic information for our survey respondents is provided in table 1.[4] The surveyed population at the farmers market was older, more affluent, more female, and more educated than the state as a whole (table 1).

During fall 2014, we conducted 367 face-to-face intercept surveys at 10 farmers markets[5] in the Atlanta-Athens area. Because this research was part of a larger effort to assess the feasibility of using the local food movement to tap into inland markets, the survey instrument contained questions about local food, seasonality, sustainability, and the respondent's interest in seafood species, including product forms, in addition to five single-bounded dichotomous choice questions to assess WTP for locally harvested Georgia species (shrimp, crab, clams, grouper, and oysters).[6] Tookes, Barlett, and Yandle (2018) present an analysis of respondents' understanding of local food, their willingness to consider seafood within the local food movement, and their awareness of seasonality and sustainability issues. The five single-bounded dichotomous choice questions were presented in the following format: If (species Z) cost $XX.XX at the local supermarket, would you be willing to pay $YY.YY for local, Georgia (species Z)?

The bid values were randomized across individuals; however, the order of the WTP questions presented for each species did not vary across individuals. As discussed later, this may have influenced the WTP estimates. The bid values were set in the following manner. Price data for the five species were collected from six local supermarkets[7] in close proximity[8] to the farmers markets included in the survey. The data collected included the product price, unit of sale (pounds, bag, per dozen, per clam/oyster, count of shrimp), product form (whole, headed, filleted, fresh, frozen, live, shucked, cooked), and state or country of origin. Collecting data at this level of specificity allowed us to calculate average supermarket price data for specific species and product forms. Based on those prevailing average retail prices, we established our bid values, which were set approximately 5 to 32% higher than retail prices, depending on the species. This methodology

4. Due to a coding issue in Survey Monkey, the demographic information for the CSA respondents was not collected and cannot be reported alongside the farmers market information.

5. Snellville, Roswell, Clarkston, Truly Living Well, Grant Park, Emory, Freedom, Peachtree Road, Athens, Morningside.

6. The product forms were specified as: blue crab, wild-caught, picked and cooked leg and claw meat; shrimp, wild-caught, 16–20 count, headed, not deveined, not peeled, not cooked; grouper, wild-caught, headed filet, fresh; live clams, littleneck (7–10 clams per pound); live oysters (Eastern oyster, *Crassostrea virginica*).

7. DeKalb Market, Whole Foods, Kroger, Trader Joes, Publix, The Fresh Market.

8. We looked at seafood prices at all stores that carried seafood within a one-mile radius of the farmers market. In a few cases, we slightly widened this radius if there were no competing stores, in order to have a price comparison starting point.

follows the work of Grimley and Roheim (2010); Lacaze, Rodríguez, and Lupín (2010); Carpio and Isengildina-Massa (2009); and Rodriguez, Lacaze, and Lupin (2008). While we pre-tested our survey, following the implementation of the full survey, it became clear the bid values probably should have been set higher, particularly for oysters and clams. We discuss this observation in more detail when we present the results of the parametric and non-parametric WTP estimates.

For the CSA survey, two of the largest CSAs in the Atlanta-Athens region, Riverview Farms and Moore Farms and Friends, distributed our electronic version of the survey (administered via Survey Monkey) to their members. Online respondents were presented with a somewhat longer survey instrument, which, again, asked questions pertaining to the local food movement, inquiring about products consumed and preferred product forms, and seasonality and sustainability issues. The online version of the survey included the same five dichotomous choice questions as the farmers market counterparts. In total, 494 responses were collected electronically in the spring of 2015.

In order to estimate WTP for the farmers markets and CSAs in the Atlanta-Athens region, the responses for all farmers market locations were pooled to create one sample for all locations. Similarly, the responses from the two CSAs were combined to create one sample. Given that some respondents chose not to answer all of the WTP questions in a given survey, the sample size for responses for each species varies, and is reported in Appendices A and C. Respondents were given the choice of answering "Yes," "No," "I don't know," or "I don't eat it" when presented with a contingent valuation question for each species. If the respondent answered "I don't know," the response was conservatively coded as a "No" response, following the approach of Caudill and Groothuis (2005) and others (Groothuis, Groothuis, and Whitehead 2008; Ropicki, Larkin and Adams 2010; Du Preez, Lee, and Cloete 2013). If the respondent answered "I don't eat it," the response was dropped from the estimation procedures described below.[9]

ESTIMATING WTP PER POUND ON THE CONSUMER SIDE

Non-Parametric Approach. The first approach used to calculate WTP for this study is the distribution-free Turnbull estimator described by Turnbull (1976) and Habb and McConnell (2002), among others. Of the many recommendations by the NOAA Blue Ribbon Panel on Contingent Valuation (1993), the selection of the Turnbull lower bound estimate on WTP is appropriate given the following:

> Generally, when aspects of the survey design and the analysis of the responses are ambiguous, the option that tends to underestimate WTP is preferred. A conservative design increases the reliability of the estimate by eliminating extreme responses that can enlarge estimated values wildly and implausibly (NOAA 1993).

Turnbull lower bound estimates impose minimal assumptions and can be used to calculate a lower bound approximation to mean WTP (Day 2005). Another advantage of using the Turnbull lower bound estimate is the distribution of the estimator is normal (Haab and McConnell 2002).

9. Since our survey involves fish and shellfish species, consumers might not consume the product for religious reasons or allergy concerns. If this is the case, no price will induce them to purchase the species; therefore, it is appropriate to drop those consumers from the analysis.

Confidence intervals and hypothesis tests can be conducted once the mean lower bound WTP and variance of the estimate are calculated. The probability that a respondent's WTP falls within a given bid value interval, t_{j-1}, to t_j can be written as:

$$P_j = P\left(t_{j-1} < WTP \leq t_j\right) for\, j = 0, 1, \ldots M + 1. \tag{1}$$

The number of respondent who responded "No" to a given bid value t_j is represented by N_j, while Y_j captures the number of respondents who responded "Yes" to bid value, t_j, and T_j represents the total number of respondents who were offered bid value t_j. The cumulative distribution function (c.d.f.) is written as:

$$F_j = P\left(WTP \leq t_j\right) for\, j = 0, 1, \ldots M + 1,\ where\, F_{M+1} = 1. \tag{2}$$

The probability density function (p.d.f.) is represented as:

$$f_j = F_j - F_{j-1.} \tag{3}$$

The p.d.f. must be nonnegative and sum to 1; thus, intervals might need to be pooled in order to construct a monotonically increasing c.d.f. The lower bound estimate of WTP is captured by the following expression:

$$WTP = \sum_{j=-M}^{M+1} t_{j-1} \times f_{j.} \tag{4}$$

The variance is calculated as:

$$V\left(f_j\right) = V\left(F_j\right) + V\left(F_{j-1}\right) = \frac{F_j\left(1 + F_j\right)}{N_j + Y_j} + \frac{F_{j-1}\left(1 + F_{j-1}\right)}{N_{j-1} + Y_{j-1}}. \tag{5}$$

As the bid price increases, the proportion of "No" answers should increase, suggesting a downward sloping demand for the good. However, due to random sampling, it is possible to observe non-monotonic distribution functions (proportions of "No" responses) for some of the offered prices (Haab and McConnell 2002). While most of the responses were monotonically increasing in the proportion of "No" responses, this was not true in all cases. This issue was more frequently observed with the farmers market survey responses (four of the five species had pooled responses compared to none for the CSA survey responses). When strict monotonicity did not hold, a monotonicity restriction was imposed on the distribution free estimator. This is captured in online-only appendices A and B, which present the Turnbull lower bound estimates for mean WTP and the variance for those estimates. When the monotonicity restriction is imposed, the term 'pooled' appears in the table. A more detailed procedure on how to calculate the lower bound WTP estimates is presented by Haab and McConnell (2002).

One potential reason some of the estimates for mean WTP required the pooling of responses could be the hypothetical nature of the referendum question posed to the respondents. This could lead to an overstatement of "Yes" votes given that respondents might be indicating their interest in having the option to buy said seafood at the farmers market or CSA, but not that they would actually pay that amount in the future. This is known as a hypothetical bias in the literature (Loomis 2011).

Another potential source of bias is interview bias, as the farmers market survey was conducted in-person while the CSA survey was conducted online (Krosnick 1999; Kleckner et al. 2002). While face-to-face interviews are the preferred mechanism to conduct CV surveys (NOAA Blue Ribbon Panel 1993), research has shown that interviewer bias has the potential to influence estimates of WTP (Leggett et al. 2003; Loureio and Lotade 2005). We suspect this could lead to an overestimate of WTP for local seafood.

An additional factor that could have biased the estimated values is the range of prices posed for different species. Some species had a range of bid values that were lower (oysters and clams) than the range of values presented for other species (shrimp, grouper, and crab) (see online-only appendices A and B for more information). Since survey participants were asked to answer WTP questions for all five species in succession, some species might have appeared to be relatively 'cheap' given the prices the respondents previously saw. Thus, a greater percentage of "Yes" responses were obtained for those species.

There may also be strategic bias on the part of respondents. Strategic bias emerges when respondents misrepresent their preferences in order to influence the decision-making process (Bennett and Blamey 2001). The impact of this strategic behavior can bias the estimation of WTP in either direction. There could be people who overstate their WTP in an effort to induce the CSAs to offer seafood products, because this behavior would bias WTP estimates upward for the market as a whole, providing a positive signal to prospective suppliers. Alternatively, people might understate their WTP if they believed that their responses would be used to set prices in the market. In this way, by masking their true, higher WTP, those consumers could capture more consumer surplus when purchasing 'underpriced' seafood products.

NON-PARAMETRIC RESULTS

The estimated mean WTP values for all five species from both the farmers market and CSA surveys are presented in table 2. Excluding the WTP estimates for clams, all of the remaining estimates of mean WTP were not statistically different between the farmers market and CSA respondents. This result is not surprising, given a similar type of consumer frequents both types of local food-oriented outlets. The Turnbull lower bound estimates help give us a conservative starting point to compare the parametric estimates of mean WTP, which are described in the next section.

Table 2. Non-Parametric (Turnbull Lower Bound) Estimates of Mean WTP

	Crab ($/lb)	Shrimp ($/lb)	Grouper ($/lb)	Oysters ($/lb)	Clams[a] ($/lb)
Combined farmers market	$17.92	$20.53[b]	$23.83	$3.93	$5.23
Combined CSA	$19.65	$19.32	$26.21	$3.69	$5.86[c]
Percent above current supermarket price,[1] Combined farmers market	–6%	8%	–12%	4%	5%
Percent above current supermarket price,[1] Combined CSA	3%	2%	–3%	–3%	17%

[a] Statistically significant difference between the Turnbull lower bound WTP estimates for both market outlets at the 5% level of significance.

[b] Statistically significant difference between Turnbull lower bound WTP estimate and the current supermarket price at the 5% level of significance.

[c] Statistically significant difference between Turnbull lower bound WTP estimate and the current supermarket price at the 1% level of significance.

[1] Average current supermarket prices: Crab $18.99; Shrimp $18.99; Grouper $26.99; Oysters $3.79; Clams $4.99.

Parametric Approach. Following Cameron and James (1987), the following estimates of mean WTP were calculated using the probit estimation procedure in STATA. WTP is assumed to be a linear function represented by:

$$\mathrm{WTP}_i(z_i, u_i) = z_i'\beta + u_i, \tag{6}$$

where z_i, is a vector of explanatory variables, β is a vector of parameters, and u_i is an error term with an assumed distribution of $u_i \sim N(0, \sigma_2)$. It is further assumed that the u_i are independently and identically distributed with mean zero and standard deviation, σ. Since survey respondents were presented with a dichotomous choice (yes or no) to a bid value (t_i) that varied randomly across individuals, their response to the contingent valuation question suggests the respondent's true valuation is either greater than or less than the bid value. If acceptance of the bid value (a "Yes" response) is denoted as $y_i = 1$ and rejection of the bid value is denoted as $y_i = 0$, then we can express the probability of observing a "Yes" response using equation (1) as:

$$Pr(y_i = 1|z_i) = \Pr(u_i > t_i - z_i'\beta). \tag{7}$$

Assuming that $u_i \sim N(0, \sigma_2)$, we can further write that:

$$Pr(y_i = 1|z_i) = \Phi\left(z_i'\frac{\beta}{\sigma} - t_i\frac{1}{\sigma}\right). \tag{8}$$

Here Φ denotes the standard normal cumulative density. Cameron and James (1987) suggested two methods to estimate this model by using equation (8) and maximum likelihood estimation to solve for β and σ, or by using an ordinary probit regression model with t_i included on the right-hand side among the "explanatory" variables. The probit model provides us with consistent estimates of $\hat{a} = \frac{\hat{\beta}}{\hat{\sigma}}$ and $\hat{\delta} = \frac{-1}{\hat{\sigma}}$.

Using the assumption of normality, the expected value for WTP is given by:

$$\mathrm{E}(\mathrm{WTP}_i|\tilde{z}, \beta) = \tilde{z}'\left[-\frac{\hat{\alpha}}{\hat{\delta}}\right]. \tag{9}$$

No explanatory variables are included in our estimation of WTP; thus, z is equal to one and the formula for WTP as presented in equation (9) reduces to $-\frac{\hat{\alpha}}{\hat{\delta}}$.

Parametric estimates of WTP were obtained for three of the five species from the farmers market survey (shrimp, grouper, and crab). Confidence intervals were estimated using the Krinsky and Robb procedure (Krinsky and Robb 1986; Habb and McConnell 2002). The issue with the remaining two species (oysters and clams) is related to the low percentage of "No" responses as the bid value increased. Effectively, the sample responses were not variant enough to the posed bid values to discern statistically significant parametric estimates and confidence intervals. Parametric estimates of WTP were obtained for all five species in the CSA survey. Confidence intervals were estimated using the Krinsky and Robb procedure (Haab and McConnell 2002).

PARAMETRIC RESULTS

As presented in table 3, there is a positive premium for all five species above the current market price prevailing at local supermarkets for both the farmers market and CSA responses. As mentioned above, the respondents from the farmers market were slightly more likely to respond

Table 3. Parametric Estimates of Mean WTP (95% Confidence Interval in parentheses)

	Crab[a] ($/lb)	Shrimp[b] ($/lb)	Grouper[b] ($/lb)	Clams ($/lb)	Oysters ($/lb)
Combined farmers market	$26.75 ($24.50, $42.04)	$26.57 ($25.03, $31.10)	$32.48 ($31.58, $33.80)	—	—
Combined CSA	$23.95 ($23.32, $24.93)	$24.33 ($23.70, $25.35)	$32.92 ($32.25, $33.83)	$8.31 ($7.14, $17.03)	$5.70 ($5.24, $7.42)
Percent above current supermarket price,[1] Combined farmers market	41%	40%	20%	—	—
Percent above current supermarket price,[1] Combined CSA	26%	28%	22%	67%	50%

[a] Statistically significant difference between the parametric WTP estimates for both market outlets at the 5% level of significance.
[b] Statistically significant difference between the parametric WTP estimates for both market outlets at the 10% level of significance.
[1] Average current supermarket prices: Crab $18.99; Shrimp $18.99; Grouper $26.99; Clams $4.99; Oysters $3.79.

"Yes" to a bid value. This influenced the confidence intervals and parametric estimates presented in table 3. In terms of the parametric estimates of WTP between the two samples, the WTP estimates for crab are significantly different at the 5% level of significance, while the WTP estimates for shrimp and grouper are only significantly different at the 10% level of significance.

In contrast to the inability to obtain parametric estimates of WTP using the farmers market survey responses, statistically significant estimates of WTP were obtained for oysters and clams from the CSA survey responses (table 3). Caution should still be taken when interpreting these estimates given they are 50% or 67% higher than the current prevailing market prices at the supermarket for oysters and clams, respectively. Given the hypothetical nature of the survey, responses might be biased in favor of a "Yes" answer, providing an upward bias for the estimated WTP values. Regarding oysters and clams in particular, these species might have appeared to be 'cheap' given the bid values respondents saw for other species (shrimp, grouper, and crab); thus, a greater percentage of "Yes" responses were obtained for oysters and clams.

In summary, the parametric estimates of mean WTP indicate a statistically significant WTP above prevailing supermarket prices for all five species. The Turnbull lower bound estimates provide a conservative estimate of mean WTP that helps put the parametric estimates in context. Even with the conservative Turnbull lower bound estimates of WTP, there is a statistically significant price premium above the current supermarket prices for shrimp sold at the farmers market and for clams sold through a CSA (table 2). Combining this information with the parametric estimates presented in table 3 provides more evidence for the existence of a positive WTP for all five species that exceeds the current market prices paid at area supermarkets. We present Turnbull lower bound estimates to provide conservative estimates of WTP and address concerns of upward bias in the WTP estimates due to the potential sources of bias presented earlier.

ESTIMATING COSTS PER POUND ON THE PRODUCTION SIDE

While the first half of this research estimated the WTP for locally produced seafood and determined that farmers market and CSA patrons in Georgia, even under conservative estimates, are willing to pay a premium for locally caught seafood, this information alone does not provide prospective seafood operators with enough information to make a determination regarding the potential economic viability of inland markets. In order to explore economic viability more fully, both expected revenues and expected costs must be taken into account. The costs of procurement, processing, transportation, and distribution of seafood to inland markets might exceed the expected price per pound consumers are willing to pay. Thus, seafood operators might not pursue inland markets because they are not profitable. In order to explore this possibility more thoroughly, an enterprise budget framework is formulated to identify and quantify the variable and fixed costs of delivering a processed product to the inland markets. An enterprise budget is a highly customizable, adaptable framework for assessing the economic feasibility of various product forms and market outlets by estimating the costs, revenues, and overall profitability of an enterprise (Engle 2010). The framework is based upon a host of baseline assumptions regarding the variable and fixed costs associated with a hypothetical seafood producer transporting product to inland markets. The model assumptions are based on our collection of the best available cost information along with qualitative interviews with current industry participants (Tookes and Yandle 2016). The details of the enterprise budget and key assumptions are described below.

By design, the enterprise budget provides a highly customizable framework for evaluating a host of markets and species sold under a variety of operating assumptions. In order to simplify

the analysis for the discussion here, two market outlets will be explored. It is assumed that an operator would either sell product at a farmers market or through a CSA partnership. The key difference between the two market outlets is the assumed shrink, or economic loss due to unsold product, which is assumed to be 10% for farmers market operators and zero for CSA operators.

In terms of the seafood product sold, it is assumed that seafood producers either sell fresh, headed, shell-on shrimp at a farmers market or through a CSA, or they sell live littleneck clams at a farmers market or through a CSA. The reasons for separating the sale of fresh headed shrimp versus live littleneck clams is twofold. First, there are differences in terms of processing and bagging requirements between the two, which affects the fixed and variable costs of production. Second, there are notable differences between the Georgia Department of Agriculture's regulations regarding the sale of fresh versus live seafood. As a result, this impacts both the fixed and variable costs of the product sold. The sale of certain species may be associated with higher economic costs and lower profit margins, making this an economic deterrent to inland marketing.

METHODOLOGY AND KEY ASSUMPTIONS

The enterprise budget was created using Microsoft Excel (see online-only appendix C for more information). The enterprise budget assumes a 28-week selling season.[10] Common to both market outlets is the use of a pickup truck with an eight-foot cargo bed,[11] a digital scale, and marine-grade coolers[12] to transport the product. The model automatically calculates the number of feasible trips per week given the assumed capacity[13] level for a hypothetical operator. Depreciation,[14] interest costs,[15] insurance costs,[16] licensing costs,[17] and farmers market fees[18] are all included as fixed costs within the model.

Due to Georgia Department of Agriculture regulations for selling live seafood from mobile vehicles, live clams must be sold from vehicles with mechanical refrigeration, a two-compartment hand sink with hot and cold running water, and storage tanks for gray water (GDA 2015). Due to these restrictions, one way for a prospective operator to be in compliance is to obtain a concession trailer[19] offering the required amenities.[20] An operator looking to sell all other types of

10. The reason for this assumption is twofold. First, white shrimp landings in Georgia generally occur during the months of April to June and September to December, making the 28 weeks assumption reasonable. Second, few farmers markets and CSAs operate year-round, while many operate from May to December.

11. The assumed pickup truck is a 2016 Ford F150 with an eight-foot cargo bed with a starting MSRP of $26,540.

12. It is assumed that an operator is purchasing a Coleman 150 quart marine grade cooler(s). http://www.coleman.com/150-quart-white-marine-cooler/3000001525.html.

13. Given an eight-foot cargo bed, it is assumed that at most, seven Coleman coolers could be transported at one time.

14. Depreciation for both the scale and cooler(s) is estimated assuming five years of useful life and a zero salvage value.

15. Interest charges are treated as a fixed cost within the model to capture the opportunity cost of capital purchases incurred through a loan or through the use of an operator's personal funds. The interest on the fixed capital is estimated by taking the initial investment plus the estimated salvage value of the capital items, divided by two (Carkner 2000). This number is then multiplied by an interest rate, which was assumed to be 4% given current prevailing interest rates in 2016.

16. Product liability insurance for the operator selling into a farmers market is assumed to be $200 per year.

17. The Georgia Department of Agriculture requires annual mobile food sales establishment licenses, which are $100 per year (GDA n.d.).

18. It is assumed that the cost per week is $25 per farmers market, which is a common rate in the Atlanta-Athens area.

19. It is assumed an operator would obtain a brand-new concession trailer at a cost of $14,300 based on online advertisements.

20. Regulations stipulate all sales must be made from within the enclosed vehicle, and both the storage and sales areas must be enclosed. Screens able to prevent insects from entering the vehicle during sales are sufficient, and air screens can be used in place of physical screens.

fresh (but not live) seafood must keep the product at 40°F or less with either enough ice on the seafood without refrigeration or a combination of both ice and refrigeration.

In terms of calculating the weekly amount of pounds sold, the enterprise budget starts with a given round weight of product. In the case of an operator selling littleneck clams, they are assumed to be an unprocessed, live product. In the case of an operator selling fresh, headed, shell-on shrimp, there is a conversion[21] between the round weight and processed weight of the product. In either case (processed or live product), labor is required to process and bag the product for sale. The Georgia Department of Agriculture requires all product sold at a farmers market to be bagged and labeled prior to arrival (GDA 2015). CSA drop-off sites often operate with items being pre-bundled prior to pick up. Thus, regardless of the inland marketing outlet, some degree of processing and handling is required, and the associated labor costs for the headed fresh shrimp[22] and live clams[23] are calculated within the model.[24] Ice is also an important variable input in this production process.[25]

The other important variable costs associated with targeting inland markets are the transportation costs involved. Miles driven from the coast to the market destination,[26] as well as the number of miles driven within the Atlanta-area (traveling to and from farmers market(s) or CSA site(s)), are calculated within the model.[27] The model also accounts for the opportunity cost of labor[28] engaged in the transportation and sale of the product. Another related transportation expense is the cost of spending a night in the Atlanta area.[29] Given the approximate 600-mile round trip, it isn't time effective to drive from the coast to the Atlanta area, sell product, and drive back in the same day.

Based on data from the Community Farmers Markets, Inc. in Atlanta, smaller-sized farmers markets average 500 visitors per day, mid-sized farmers markets average 1,000 visitors per day, while the largest farmers markets can average 2,000 visitors per day (Sam Gader, personal communication, June 25, 2019). We combined this foot traffic data with survey data we gathered regarding the frequency of consumption for each species (table 4) in order to estimate the weekly volume for each species.[30] For CSAs, we found a similar overlap in the potential number of weekly

21. It is assumed there is a 40% yield loss when converting from round to headed shrimp.

22. It is assumed a laborer can process 100 pounds of shrimp an hour (Henry et al. 2005).

23. Littleneck clams are sorted 20 per bag (2 lbs. per bag). The bags are mesh seafood bags with labels affixed to the bag for proper identification. It is assumed a laborer can process 100 bags of product per hour. This estimate was derived from personal communications with a variety of clam dealers and processors in the US who sort their product manually.

24. Assuming an hourly wage rate of $7.25, which corresponds to the federal minimum wage rate.

25. Ice costs are calculated within the model assuming a 60/40 split between the pounds of shrimp and pounds of ice (Riepe 1997). For live clams, it is assumed that four pounds of ice are placed at the bottom of a marine cooler and the live product is placed above that ice layer with a burlap sack between the ice and product.

26. It is assumed that an operator travels 300 miles one way. In general, the distance from Atlanta-Athens to the Georgia fishing communities in Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden ranges from 200–300 miles.

27. The cost per mile driven is calculated using the standard mileage rate for business use as calculated by the General Services Administration.

28. Assuming an hourly wage of $11.88 and 10 hours spent in the car per round trip plus an eight-hour day selling the product. This hourly wage is the national median wage for occupational code 53-3031 Drivers/Sales Workers (BLS 2017).

29. In order to approximate lodging costs and meals away from the home, the GSA per diem rates for lodging and meals and incidental expenses (M&IE) are used for the Atlanta area, which includes the counties of Fulton, Dekalb, and Cobb (GSA 2016a). The lodging rate is $138 per night and the M&IE is $69 per day, and when prorated by 75% is $52 per day. As mandated for all federal employees traveling on official business, the first and last calendar day of travel are reimbursed at 75% of the M&IE for that area (GSA 2016b). This proration is used in the enterprise budget calculations.

30. We combined the consumption frequency data, the average household size from table 1, and an assumption regarding the consumption of each species per person (1 lb. serving of clams per person and 0.5 lb. serving of shrimp per person) to arrive at the three product volumes evaluated for each species.

Table 4. How Often do You Purchase Each Type of Seafood?

	Shrimp	Clams
Weekly	17%	0%
Monthly	40%	6%
Every few months	29%	14%
Once or twice a year	7%	29%
Never	6%	51%

consumers. Using the Moore Farms and Friends CSA as an example, there are approximately 500 active members who purchase food during the season in any given week, which aligns with the average number of visitors at the smallest farmers markets. Their membership base is closer to double that amount based on the underlying number of paid memberships[31] (Laurie Moore, personal communication, June 12, 2019). The product volumes we chose for each of the three scales of operation at farmers markets and CSAs were informed by this market information and our survey results.

As demonstrated by table 4, shrimp is more frequently consumed than clams. Nearly 60% of respondents stated they eat shrimp weekly or monthly, while only 6% reported eating clams weekly or monthly. Fifty-one percent of respondents stated they "Never" eat clams, and no one reported eating them weekly (table 4). The data aligns with per capita seafood consumption data published by the National Fisheries Institute (NFI 2018). Since 2000, shrimp has been the most commonly consumed seafood species in the US, doubling from 2.2 lbs. per capita in 1990 to 4.4 lbs. per capita in 2017 (Shamshak et al. 2019). In contrast, per capita clam consumption has fallen 50% since 1990, down to 0.3 lbs. per capita in 2017 (NFI 2018).

RESULTS

The culmination of this analysis is a set of breakeven prices per pound for both product forms (fresh processed shrimp and live clams) and both direct marketing outlets (farmers markets and CSAs). Breakeven prices imply zero profit because they exactly cover the total cost of delivering a product to the market destination. As such, breakeven prices are starting points for a potential operator to begin to understand how much above the ex-vessel price they would have to sell their product in order to realize a profit. It is important to note that the breakeven prices are calculated prior to taxes, which vary depending on specific characteristics of the operator.

The following two tables present the prices an operator would need to receive in order to exactly breakeven and cover the total costs of processing and transporting a processed shrimp product over a 28-week operating horizon. Three different scales of operation were chosen to demonstrate how the breakeven prices vary depending on the quantity of product sold. Breakeven prices decrease as the quantity of product sold increases because the variable and fixed costs are spread over more pounds of product. Table 5 captures the breakeven prices for an operator selling at a farmers market, where there is an assumed loss of 10%. Table 6 presents the breakeven prices for an operator selling through a CSA where the assumed shrink is zero.

It is important to reiterate that the breakeven prices presented in tables 5 and 6 do not include the cost of acquiring the shrimp. An operator looking to pursue direct inland marketing

31. This is because the annual membership dues are low ($36.00), and maintaining an active membership preserves the option to purchase product in a current or future season.

Table 5. Breakeven Prices for Farmers Market Delivery of Processed Shrimp

Total Sold Product Per Week based on 10% Shrink of Processed Product (purchased round weight in parentheses)	135 lbs (250 lbs)	270 lbs (500 lbs)	540 lbs (1,000 lbs)
Breakeven price per pound (to cover total cost)	$6.92	$3.70	$2.08
Potential profit per pound[1] before subtracting ex-vessel prices per pound	$13.61	$16.83	$18.45

[1] Farmers market Turnbull lower bound WTP ($20.53) – Breakeven price per pound (to cover total cost).

of processed shrimp could be an active participant in the fishery or a spouse/relative of an active participant. The operator could also be someone looking to purchase fresh whole shrimp at the docks and sell the processed product inland. An active participant in the shrimp fishery would want to evaluate the estimated breakeven prices relative to the ex-vessel prices he or she currently receives. In the case of an industry outsider looking to target inland markets, the dockside price is an explicit cost of production. In either case, this is an important opportunity cost or explicit cost that should be taken into account when evaluating the overall potential profitability of inland markets. It became evident early on in our research that there was a high degree of variability and confidentiality surrounding the ex-vessel prices received by different shrimp vessels and that estimating those prices was beyond the scope of this research project. It also became clear the underlying market dynamics and nature of the traditional seafood distribution chain posed their own barriers to the adoption of inland markets. These factors will be explored in greater detail in the Discussion section. Therefore, this analysis exclusively focuses on the costs per pound associated with processing, transporting, and selling the product to inland markets, and the breakeven prices represent the costs that must be recovered over and above any ex-vessel prices that are paid or that are foregone by an operator.

Another way of examining the economic viability of selling processed shrimp at inland markets is comparing the difference between prices consumers are willing to pay per pound versus the estimated costs per pound of processing, transportation, and sale. Using the Turnbull lower bound WTP estimates presented earlier for farmers market and CSA patrons (table 2), this information is calculated and presented in the last row of tables 5 and 6. In order for the operator to realize a profit per pound, the ex-vessel prices must be less than those values. If the ex-vessel price for whole unprocessed shrimp was $1.99 per pound, then an operator selling 135 pounds of shrimp weekly at a farmers market would realize a profit of $11.62 per pound. When multiplied by the weekly (135) or seasonal (3,780) pounds sold, the total profit would be $1,568.70 per week or $43,923.60 per season. As can be seen from the last row of tables 5 and 6, the potential profit per pound increases as the pounds sold per week increases. Farmers market sales assume a shrink of 10%, which implies the potential profit per pound earned by an operator selling to a CSA might

Table 6. Breakeven Prices for CSA Delivery of Processed Shrimp

Total Sold Product Per Week (purchased round weight in parentheses)	150 lbs (250 lbs)	300 lbs (500 lbs)	600 lbs (1,000 lbs)
Breakeven price per pound (to cover total cost)	$6.22	$3.32	$1.87
Potential profit per pound[1] before subtracting ex-vessel prices per pound	$13.10	$16.00	$17.45

[1] CSA Turnbull lower bound WTP ($19.32) – Breakeven price per pound (to cover total cost).

Table 7. Breakeven Prices for Farmers Market Delivery of Live Clams

Total Sold Product Per Week based on 10% Shrink of Product (purchased quantity in parentheses)	450 clams (500 clams)	900 clams (1,000 clams)	1,800 clams (2,000 clams)
Breakeven price per pound (to cover total cost)	$21.84	$10.95	$5.52
Potential profit per pound[1] before subtracting ex-vessel prices per pound	($16.61)	($5.72)	($0.29)

[1] Farmers market Turnbull lower bound WTP ($5.23) – Breakeven price per pound (to cover total cost).

Table 8. Breakeven Prices for CSA Delivery of Live Clams

Total Purchased and Sold Product Per Week	500 clams	1,000 clams	2,000 clams
Breakeven price per pound (to cover total cost)	$19.65	$9.85	$4.96
Potential profit per pound[1] before subtracting ex-vessel prices per pound	($13.79)	($3.99)	$0.90

[1] CSA Turnbull lower bound WTP ($5.86) – Breakeven price per pound (to cover total cost).

be higher. However, the WTP estimate for farmers market patrons was higher ($20.53) than the estimate for CSA patrons ($19.32),[32] thus profitability per pound depends on both the market outlet and the volume of product sold. Regardless, there is a positive potential profit per pound across both market outlets for all three scales of operation.

Examining the sale of live clams at farmers markets or CSAs, we see a very different story given the estimated volumes that could be supported based on our survey and market research. When we subtract the breakeven prices per pound from the estimated WTP values for each market outlet, the only volume associated with a positive profit per pound is 2,000 clams sold at a CSA, and this is before subtracting the acquisition cost of the clams, which would likely be greater than $0.90 per pound[33] (tables 7 and 8). Assuming an ex-vessel price of $1.50 per pound for littleneck clams, an operator would need to sell approximately 2,700 clams a week at a farmers market in order to breakeven. Further, operator would need to sell 7,200 clams per week in order to realize a profit per season ($46,083.06) that is comparable to the profit per season obtained by an operator selling 135 pounds of headed shrimp per week ($43,923.60). Given our estimated market volumes for clams, those higher volumes don't seem feasible. This may explain why we didn't observe operators selling clams at a farmers market or through a CSA during the course of our research. We were aware of three different producers selling shrimp at farmers markets, which is economically feasible at all three of the product volumes we estimated.

DISCUSSION

Estimating the prices consumers are willing to pay for locally caught seafood products is a necessary, but not sufficient, condition for evaluating the economic viability of new market outlets. As was demonstrated with the use of an enterprise budget framework, the costs associated with processing, transporting, and selling product at inland markets are not trivial. Our analysis shows

32. The Turnbull lower bound WTP estimates for shrimp were not statistically different between farmers market and CSA respondents (table 2). The parametric estimates of WTP for shrimp were statistically different between market outlets at the 10% level of confidence (table 3).

33. The Turnbull lower bound WTP estimates for crab were statistically different between farmers market and CSA respondents (table 2).

that for product sold at a farmers market, which also has a 10% assumed shrink, only processed fresh shrimp is economically feasible, especially once we consider hypothetical ex-vessel prices.[34]

This brings us back to the goal of this research project, to analyze potential barriers to local inland seafood markets in Georgia. Based on our analysis, it appears that inland markets are economically viable for shrimp. This raises further questions regarding why more local shrimp is not moving into local inland markets. Our research was able to shed additional light on this question.

In addition to our quantitative work, we also conducted a number of qualitative interviews with industry participants[35] to gauge their perceptions of factors hindering the development of inland local seafood markets. It became clear early in our interviews that the lack of development was not due to a lack of awareness of local inland markets. Many considered exploring inland markets; however, they questioned the willingness of consumers to pay higher prices to cover the costs of delivery. Further, many stated that time spent transporting or selling seafood is time not spent catching seafood. As one interviewee put it, "You can't catch 'em and sell 'em" (Tookes and Yandle 2016).

One of the biggest obstacles hindering the development of inland marketing channels is associated with the structure of the traditional seafood distribution chain in Georgia. In general, vessels sell to dock owners, who sell to distributors, who sell to supermarkets, restaurants, or other end buyers. Vessels have relationships with a particular private dock or fish house that are often important and longstanding, which they are wary to disrupt. At present, there are no public docks at which a vessel can tie up and off-load product for sale. Further, very few vessels have the cold storage, live holds, ice, and scales necessary to offload and maintain the product prior to sale. Finally, dock owners offer themselves as reliable buyers of product season in and season out, regardless of the quality or size landed. The services dock owners provide are important to the overall economic livelihoods of the vessels, and many vessels are loath to jeopardize those relationships in order to explore and exploit inland markets. As one industry participant put it, "If you tie up a boat on a dock, you're obligated to sell him everything you get. [There is an obligation to] Sell your shrimp" (Tookes and Yandle 2016). When asked if some dock owners would be willing to let product go elsewhere or allow vessels to divert a small percentage of their total landings, the response was "They won't turn a blind eye" (Tookes and Yandle 2016). It was one interviewee's opinion that in order to operate outside of the standard distribution chain, a higher price would have to go back to the dock owners somehow. Again, given the vessels' reliance on dock owners for coolers, freezers, and storage capacity, cutting out this portion of the current seafood distribution chain doesn't seem feasible. Most industry participants interviewed agreed that some intermediary, rather than someone who actively works on a vessel, was needed to transport the product inland for sale.

One might ask why dock owners are unwilling to investigate inland markets. Based on our interviews, hesitancy seems to boil down to dock owners shunning risk in favor of a system they know well and feel works well enough. In many cases, a dock owner has a relationship with a buyer who will send a semi-trailer truck down Interstate 95 to receive all of the product. This relationship model is in contrast to the number of new relationships that would have to be established in

34. The hypothetical ex-vessel prices for shrimp and clams are based on informal conversations with anonymous industry participants.

35. Fourteen qualitative interviews were conducted with individuals involved in varied and overlapping fisheries, with a total group of five who targeted finfish, six shrimpers, three individuals who ran docks or engaged in processing or distributing seafood, three clam farmers, and one crabber. In addition, in three of those interviews, the license-holder's wife joined the session.

order to pursue inland local markets. Sales to inland markets are unknown, while existing relationships often guarantee purchase of available product. As research has shown, unpredictable market conditions often necessitate a middleman to facilitate the sale of highly perishable product and assume some financial risk carried by the fisher (Norr 1975; Bestor 2004; Garrity-Blake and Nash 2007; Crona et. al 2010).

While our analysis provides a static assessment of WTP estimates and breakeven prices, those parameters can change over time. Future changes in market prices could emerge due to supply and demand dynamics, such as an increase in supply as more seafood producers divert product into inland markets, a change in consumers' WTP for seafood due to changes in income, tastes or preferences, or changes in transportation or labor costs. The factors contributing to the lack of local seafood moving inland in Georgia are more nuanced than a singular examination of WTP or breakeven prices would suggest.

CONCLUSION

The results of our research help shed light on an important question regarding the lack of locally caught Georgia seafood in inland markets. The first part of our research established the existence of market premiums for locally caught seafood estimated from existing farmers market and CSA patrons, which supports the findings of previous studies. This information alone is not sufficient to determine the economic viability of inland markets. The second part of our research estimated the costs per pound associated with processing, transporting, and selling product at inland markets using an enterprise budget framework. Combining the WTP and breakeven price data, we were able to estimate the profit per pound that operators could expect to receive from selling either fresh headed shrimp or live clams at a farmers market or CSA. While this information gives some insight into the economic viability of inland markets, our qualitative interviews with current industry participants revealed other economic and social factors that presently hinder the exploration and exploitation of inland markets.

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