The Economic Impact of the Services Provided by and Electronic Trade Platform: The Case of MarketMaker

Samuel D. Zapata
School of Agricultural, Forest, and Environmental Sciences, 236 McAdams,
Clemson University, Clemson SC 29631, samueldzapata@gmail.com

Carlos E. Carpio
School of Agricultural, Forest, and Environmental Sciences, 233 McAdams,
Clemson University, Clemson SC 29631, ccarpio@clemson.edu

Olga Isengildina-Massa
Department of Economics, 701 S West Street, 331 Business Bldg.,
University of Texas at Arlington, Arlington, TX 76019-0479, isengild@uta.edu

R. Dave Lamie
School of Agricultural, Forest, and Environmental Sciences,
Clemson Institute for Economic & Community Development,
900 Clemson Road, Columbia, South Carolina 29229, dlamie@clemson.edu

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Producer Willingness to Pay for the Services Provided by an Electronic Trade Platform: The Case of MarketMaker

S.D. Zapata[1], C. E. Carpio[1], O. Isengildina-Massa[2], and R. D. Lamie[1],
[1]School of Agricultural, Forest, and Environmental Sciences, Clemson University, Clemson, SC 29634
[2]Department of Economics, University of Texas at Arlington, Arlington, TX 76019

Introduction

- E-commerce may have the potential to both increase sales revenues and decrease costs through greater efficiencies of operations.
- Most studies evaluating E-commerce websites have focused on assessing user-perceived quality rather than on the economic impacts these sites generate.
- Studies evaluating the effectiveness of specific agricultural E-commerce platforms are very limited and descriptive in nature.

Objectives

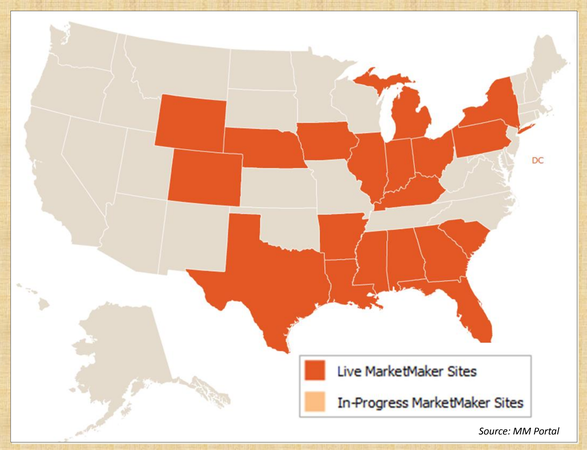
The main goals of this study are:

1) To estimate the economic value of the services provided by an E-Commerce website – MarketMaker (MM) – on agricultural businesses.
2) To determine how producers' characteristics and perceptions affect the economic valuation of the site.

MarketMaker

- MM is one of the most extensive collections of electronic searchable food industry related data engines in the country (Figure 1).
- MM website is used by producers as a free marketing tool that helps identifying new customers and provides potential clientele with detailed information about farmers' product portfolio, geographic location and contact information.
- To date, the site is operating in 18 states throughout the country with over 17,500 profiles – including 7,698 for producers – and receives about 1 million hits per month.

Figure 1. National MM Presence



Data and Methods

- Contingent valuation methods were employed to estimate the economic benefits of MM on registered producers.
  - Theoretically, producers' willingness to pay (WTP) for the services provided by MM represents the increase in profits attributed to the adoption of MM.
- Email and mail surveys were distributed to 1,446 producers registered on MM in 7 participant states: AR, FL, GA, IN, IA, MS, and SC. The overall response rate of the survey was 15.7 %.
- Respondents' characteristics were analyzed using both parametric and nonparametric techniques (Table 1).
- The producer WTP question was asked using a double-bounded elicitation format.
  - First, participants were asked if they are willing to pay an annual fee (B_1) for participating in MM and then a follow up question was asked with another bid, higher (B_2^H), or lower (B_2^L) depending on the response to the first question.
- Responses were analyzed using a censored regression approach. Six statistical distributions were considered in the modeling of the producer WTP: Normal, Weibull, Log-normal, Exponential, Log-logistic and Gamma distributions.

Table 1. Characteristics and Perceptions of Respondents (n=227)

Variable Name (Units)	Category	Category Proportion			Mean	
		Email	Mail	Total	Nonparametric lower and upper bounds	Parametric (Standard Deviation)
Registration type	1= Self-registered	82.95	64.29	74.89		0.75 (0.43)
	0 = Otherwise	17.05	35.71	25.11		
Marketing contacts[a]	0	66.38	69.39	67.76	(1.30, 4.00)	2.65 (5.55)
	1 to 9	25.86	24.49	25.23		
	10 to 20	5.17	4.08	4.67		
	21 to 30	2.59	0.00	1.40		
	31 to 40	0.00	2.04	0.93		
Total annual sales ($1,000)	Less than $10	42.64	40.82	41.85	(72.73, 144.71)	100.09 (217.02)
	$10 to $50	26.36	32.65	29.07		
	$50 to $100	13.95	8.16	11.45		
	$100 to $250	5.43	11.22	7.93		
	$250 to $500	5.43	2.04	3.96		
	$500 to $1,000	0.00	5.10	2.20		
	Over $1,000	6.20	0.00	3.52		
Type of user	1= Active	41.09	22.45	33.04		0.33 (0.47)
	0 = Passive	58.91	77.55	66.96		
Time registered on MM (Months)	Less than 1	1.55	0.00	0.88	(16.70, 28.08)	22.02 (11.56)
	1 to 6	10.08	1.02	6.17		
	7 to 12	10.85	4.08	7.93		
	13 to 24	55.81	52.04	54.19		
	25 to 36	13.95	20.41	16.74		
	37 to 48	5.43	16.33	10.13		
	Over 48	2.33	6.12	3.96		
Time spent on MM activities (Min/month)	Less than 30	79.84	86.73	82.82	(11.02, 46.75)	21.99 (18.39)
	30 to 60	14.73	8.16	11.89		
	61 to 120	2.33	4.08	3.08		
	121 to 300	2.33	0.00	1.32		
	301 to 600	0.00	1.02	0.44		
	Over 600	0.78	0.00	0.44		

[a] Marketing contacts refer to the total contacts received since the producer became registered on the MM website.

- Estimation of the different models was carried out using maximum likelihood estimation procedures, and selection of the model that "best described" the data was based on the Akaike information criterion corrected for finite sample sizes (AICC).
- The standard errors of both coefficient estimates and marginal effects were estimated using bootstrapping techniques.

Results and Discussion

- Based on the AICC results, the Log-logistic (LL) distribution was the preferred distribution for the WTP analysis.
- The mean WTP and marginal effects for the LL distribution are:
  - $E(WTP|\boldsymbol{X_i}) = exp(\grave{\mathbf{X}}_\mathbf{i}\boldsymbol{\beta})\Gamma(1+\sigma)\Gamma(1-\sigma)$
  - $\frac{\partial E(WTP|\mathbf{X_i})}{\partial x_j} = \beta_j E(WTP|\boldsymbol{X_i})$

  where $\mathbf{X_i}$ is a vector of covariates, $\boldsymbol{\beta}$ a vector of parameters and σ is the shape parameter.
- On average, producers are willing to pay $47.02 (s.e. $16.64) annually for the services they receive from MM.
- The WTP value is also a measure of the increase in annual profits attributed to the use of MM and could also be used as a guide if a participation fee is imposed in the future.
- The estimated aggregate annual economic value that registered producers place on the services provided by MM is $361,960. This aggregate estimate only represents a portion of the total benefits generated by MM since other users of the site are not considered in the analysis (e.g., consumers and farmers markets).
- Empirical results indicate that region, registration type, the number of marketing contacts received due to MM, gender of the participant, and firm's total annual sales have a significant effect on producers WTP for the serviced provided by MM (Table 2).

Table 2. Coefficient and Marginal Effect Estimates Log-logistic model (n=227)

Variable	Coefficient		Standard error	Marginal effect		Standard error
Constant	2.6964	***[a]	0.3620			
Registration type (Self-registered=1, Otherwise=0)	-0.5872	**	0.2811	-26.5184	**	15.5569
Time registered on MM (Months)	0.0146	**	0.0084	0.5528	**	0.3183
Time spent on MM activities (Min/months)	0.0028	**	0.0014	0.1048	**	0.0609
Type of user (Active=1, Passive=0)	0.6300	***	0.2531	24.9529	**	11.5420
Marketing contacts	0.0336	**	0.0202	1.2685	*	0.8511
Total annual sales ($1,000)	0.0006	**	0.0003	0.0232	**	0.0129
Survey type (Mail=1, Email=0)	-0.7655	***	0.2671	-26.3297	***	8.5284
σ[b]	0.6020	***	0.0651			
Log-likelihood function -139.5						

[a] Significance levels of 0.01, 0.05 and 0.10 are indicated by ***, ** and * respectively.
[b] σ corresponds to the shape parameter of the log-logistic model.

For more information contact
Carlos E. Carpio: ccarpio@clemson.edu

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