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Examining Agribusiness Shippers' Responses to Regulatory Change

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Background

Ocean Shipping Reform Act (OSRA) in 1998

- **Replaced Shipping Act of 1984**
 - Enforced common carriage on shippers
 - Shippers could only negotiate rates directly with carriers or use tariff rates
 - FMC published both
 - Carrier forced to grant rates to similar shippers
- **Power shifted to the rate setting cartels**
 - Transpacific Westbound Rate Agreement (TWRA)
 - Asia North American Eastbound Rate Agreement (AN-ERA)
- **Set freight rates**
- **Regulated supplies of the industry**
- **Controlled majority of the market**
- **Decreased options available to shippers**

Background continued

Ocean Shipping Reform Act (OSRA)

Goal

- To promote market driven environment.

Results thus far

- Private contracting between carriers & shippers.
- Number of independent service contracts increased 200%.
- 3rd party agents negotiate for small shippers.
- 80% of cargo now under private contracts.
- Weakened rate – setting powers of cartels.
- Size of shippers, regularity of shipments, product characteristics could affect choice of direct contracts versus 3rd party agents.

Research Question

- What affects operational strategies of shippers?
- Examine previous work, focusing on Stewart and Inaba paper.

Related Studies

- **Goetz (2002)**
 - Looked at airline deregulation and concentration.
- **Bowen (2002)**
 - Examined deregulation and accessibility of airlines in poor countries.
- **McMullen & Stanley (1988)**
 - Studied production structure of motor carriers after deregulation.
- **Wang (2006)**
 - Studied influence of OSRA on market structure in trans-Atlantic trade routes.
- **Inaba & Mendey (2001)**
 - Examined how size of shipper affects support for OSRA.
- **Blatner, Inaba & Stewart (2003)**
 - Examined changes in private agreements vs collusive agreements under OSRA.
- **Stewart & Inaba (2003)**
 - Modeled the contractual decision structured between shippers and carriers.
 - Two step process: Direct negotiations vs 3rd party agent and once 3rd party, what type of 3rd party agent to use.
 - Found large shippers used private contracts & choice of 3rd party dependent on product type.

Methodology

- Use same data set (81 agribusiness firms) of Stewart and Inaba (S&A)
- Enlarged categorical variable VOLUME variable into three dummy variables, representing the small, medium and large sizes in a nested logit model
- Analysis was run in two models
 - Bivariate probit model
 - Heckman two step selection model
- Data and variables included:
 - Type of commodity
 - Annual volume
 - Regularity of shipment
 - Use of 3rd party agent
 - Type of 3rd party agent (freight forwarders or shippers associating)
 - Shippers that are small & have irregular shipments

Estimation Results for the Bivariate Probit Model and Heckman Two Step Model

Variable	Bivariate Probit	Sample selection	Heckman 1
Stage1: TPA or OWN			Probit
Intercept	0.4339 (0.3666)	0.5315*** (0.1881)	0.5277*** (0.1868)
Volume	-0.0003 (0.0003)	-0.0004*** (0.0001)	-0.0004*** (0.0001)
Stage2: SA or FF			Probit
Intercept	-0.8932*** (0.3096)	-0.7972*** (0.3154)	-1.6551 (1.1278)
P1 (lumber or wood products)	0.4048 (0.5057)	0.6966 (0.4875)	0.8840 (0.6500)
P2 (meat or poultry)	0.4039 (0.5002)	0.5634 (0.5085)	0.8435 (0.7532)
P3 (fresh produce)	0.6781* (0.3755)	0.7022* (0.3708)	0.9999* (0.5256)
SPOT (small/irreg shipments)	-0.4313 (0.4398)	-0.6164 (0.4023)	-0.7940 (0.5347)
Selectivity Correction			
Rho	0.9999*** (0.0007)	0.9999 (0.0000)	
IMR			2.2060 (1.8587)

Standard errors are in parenthesis. *** $p \leq 0.01$ ** $p \leq 0.05$ * $p \leq 0.1$



Methodology continued

Re-estimation of Stewart and Inaba (S&A)

- Both found size was driver in first stage.
- No evidence that small shippers use 3rd party agents more often.
- S&A found all products to be significant in joining shipping associates.
- Our re-estimation found only fresh produce was significant.
- This study had standard errors of correlation coefficient of 0.0007; S&A had 1.36×10^{18}

Estimation Results

Variable	Bivariate Probit	Sample Selection	Heckman-Probit	Heckman-Logit
Stage 1: TPA or OWN				
Intercept	0.0464 (0.5848)	0.0217 (0.5702)	-0.1465 (0.5971)	-0.2608 (1.0330)
SML	0.6617 (0.4788)	0.6902 (0.4647)	0.8680* (0.4946)	1.4395* (0.8604)
Large	-0.5339** (0.2771)	-0.8584** (0.3643)	-0.7883** (0.3721)	-1.2883** (0.6229)
Reg	-0.0033 (0.5599)	0.0889 (0.5467)	0.1869 (0.5531)	0.3254 (0.9685)
Stage 2: SA or FF				
Intercept	-0.9081*** (0.3070)	-0.8425*** (0.3124)	-0.7947 (0.6295)	-1.2766 (1.0681)
P1 (lumber or wood products)	0.4208 (0.3616)	0.8172 (0.5303)	0.9588 (0.6440)	1.5283 (1.0835)
P2 (meat or poultry)	0.4175 (0.3616)	0.4784 (0.4830)	0.9247 (0.7444)	1.5078 (1.2580)
P3 (fresh produce)	0.5946* (0.3554)	0.6362* (0.3557)	1.0628** (0.5266)	1.7404** (0.8855)
SPOT(small/irreg shipments)	-0.3154 (0.4062)	-0.5201 (0.4401)	-0.8775 (0.5620)	-1.3970 (0.9577)
Selectivity Correction				
Rho	0.9999 (0.0000)	0.9999 (0.0000)		
IMR			0.7069 (0.8479)	1.1141 (1.4604)

Standard errors are in parenthesis. *** $p \leq 0.01$ ** $p \leq 0.05$ * $p \leq 0.1$



New Estimation Results

- **Different models yield similar results.**
- **Small shippers are positive & significant at 0.01 level.**
- **Large shippers are positive & significant at 0.05 level so not inclined to use 3rd party agents.**
- **Fresh produce shippers have a higher likelihood of joining a shipping association rather than a freight forwarder.**
- **Shippers that are irregular & small are less likely to join a shipping association than other shippers.**

Conclusions

- **OSRA has been successful in promoting a market driven environment.**
- **Private contracts ↑, conferences ↓ and discussion agreements ↑.**
- **Shippers size, in both studies, plays important role in willingness to negotiate contracts on their own.**
- **Other products have no trend.**
- **Small shippers with irregular shipments avoid shipping associations and favor freight forwarders.**
- **New models improved confidence but results were similar to S&A.**

Questions?

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Thank You