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# **The Effect of Export Promotion Program Usage on Establishing Export Markets**

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## Introduction

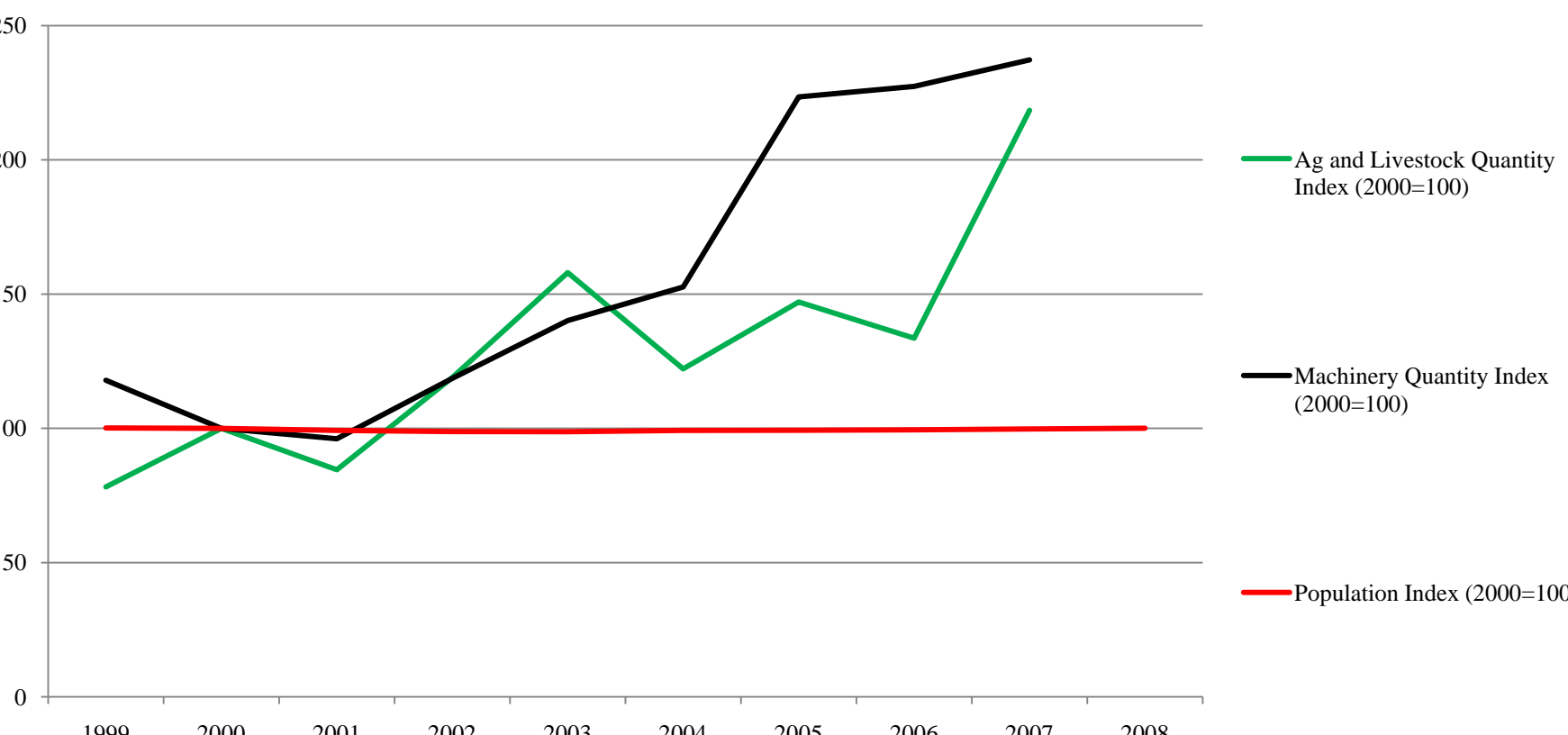
▪North Dakota’s GD has risen between 2% and 3% from 1997 to present day (Local Census 2006).

▪Since 1999, machinery exports have increased from \$282.228 million to \$1,183 million in 2008, a 319% increase (NDTO 2008).

▪The machinery sector was 78% of total durable exports from North Dakota in 2007.

▪North Dakota agricultural exports, such as crops and food products increased from \$140 million in 2004 to \$507 million in September 2008 (NDTO 2008).

Figure 1 Production Indices: Ag and Machinery in ND



▪The North Dakota Trade Organization (NDTO) was formed in 2004 for “Trade expansion through advocacy, education, and expertise (NDTO 2010).”

▪The NDTO offers several services, making it a “one-stop shop” for most of the export promotion services.

## Data

▪Used phone survey to contact 28 observations.

▪Contacted the President, chief financial officer, chief executive officer, or office manager.

▪*Dependent variable:* Export Revenue / Total Revenue

Table 1 Data Collected From Firm Surveys

Data Collected (2008 Financial Statement)	
Total and Export Revenue (\$)	Capital Expenses (\$)
Total and Export Expenses (\$)	Labor Expenses (\$)
Shipping Expenses (%)	NDTO use (1=yes, 0=no)
Promotion Expenses (%)	Awareness Rank (42)
Top Exporters => Used to find an aggregated foreign agricultural GDP and risk coefficient	

## Methodology

Taken from Helpman et al. (2004), consumers in a foreign market  $j$  have a CES utility function:

$$U(X_j, X_i) = \frac{X_j^\delta}{\delta} + \frac{X_i^\delta}{\delta} \quad \text{given, } \delta \neq 0$$

The consumer can either gain utility from consuming good  $X$  from market  $j$  or consuming the identical good from market  $i$ .

We apply a version of Andersson’s (2007) theoretical model of entry costs for entering a foreign market. Andersson’s (2007) theoretical model shows firm  $i$  located in market  $r$  maximizes profits by exporting to market  $s$  according to the following equation:

$$\pi_{i,s} = p_{i,s} z_{i,s} - \frac{\beta}{\gamma} t_{rs} z_{i,s} - F_{rs}$$

where  $p_{i,s}$  denotes firm  $i$ ’s price in market  $j$ ,  $z_{i,s}$  denotes the quantity demanded in market  $s$ , and  $\frac{\beta}{\gamma} t_{rs} z_{i,s}$  denotes firm  $i$ ’s marginal cost.  $F_{rs}$  is the entry costs associated with firm  $i$  entering and exporting to market  $s$ . Because we assume that the firm has already entered in their domestic market, the assumption can be made that  $F_{rs} > 0$  and  $F_{rr} = 0$ .

The producer’s objective, assuming a CES utility function, is to maximize expected utility through profit maximization shown as:

$$\text{Maximize}_\lambda EU(\pi(a)) = EU(1-\lambda)\pi_D(a) + (\lambda)\pi_X(a)$$

Expected utility is the sum of profits from domestic sales and profits from foreign sales. There must be an assumption that domestic market parameters are known with certainty.

A Tobit model accounts for the truncated dependent variable having only positive values. Created by Tobin (1958) to show relationships between non-negative dependent variables and independent variables it also can be used for smaller sample sizes with a non-negative dependent variable. The Tobit equation will then take the form:

$$\begin{aligned} \text{Ratio}_{xj} = & \beta_0 + \beta_1 \ln K_i + \beta_2 \ln L_i + \beta_3 \text{ship}_{ij} \\ & + \beta_4 \text{prom}_{ij} + \beta_5 \text{aware}_{ij} + \beta_6 \text{ndto} + \beta_7 \text{firm}_i \\ & + \beta_8 \text{risk} + \beta_9 \ln \text{aggdp}_j + \beta_{10} \text{Risk}^2 + \varepsilon \end{aligned}$$

Table 2 Expected Impacts on the Dependent Variable

Variable	Expected Sign	Variable	Expected Sign
Prom <sub>ij</sub>	+	Firm <sub>i</sub>	-
Ship <sub>ij</sub>	-	Risk	-
ln K <sub>i</sub>	+	ln Ag <sub>j</sub>	+
ln L <sub>i</sub>	-	NDTO*Small	+
Aware <sub>ij</sub>	+	NDTO*Medium	+
NDTO	+	Risk <sup>2</sup>	+

## Results

•Tobit regression uses a Chi-squared statistic to show significance

•The Chi-squared is a sum of the effect from all the observation for each variable.

•The greater the chi-squared statistic, the more significant the variable is on the dependent variable.

Table 3 Multivariate Regression Results

Parameter	Estimate	Standard Error	Chi-Squared
c	0.9349	0.3797	6.06**
Ship	0.0000	0.0000	0.11
Prom	0.0000	0.0000	0.75
ln K	0.0337	0.0104	10.44**
ln L	-0.1001	0.0236	18.06***
Aware	0.0098	0.0028	11.89***
NDTO	-0.3394	0.1563	4.71**
Small	-0.2722	0.1519	3.21*
Medium	-0.4773	0.1538	3.25*
Risk	-0.1343	0.0308	18.98***
ln Ag	0.1518	0.0347	19.10***
Small*NDTO	0.4171	0.1809	5.32**
Medium*NDTO	0.4048	0.1785	5.14**
Risk2	0.0012	0.0003	20.04***

Note 1: \*, \*\*, \*\*\* shows significance at the 10, 5, and 1 percent, respectively.  
Note 2: Figures rounded to the fourth decimal place.

Table 4 Empirical Effects

Effect on Share of Export Revenue			
Variable	Small	Medium	Large
c	\$1,144,121.07	\$9,159,716.32	\$192,773,354.66
Ship	\$0.00	\$0.00	\$0.00
Prom	\$0.00	\$0.00	\$0.00
ln K	\$69.81	\$1,387.77	\$15,947.18
ln L	(\$207.35)	(\$4,122.12)	(\$47,368.14)
Aware	\$2,2029.99	\$40,356.40	\$463,744.06
ln Ag	\$314.44	\$6,251.12	\$71,833.01
GDP			
Risk	(\$27,819.17)	(\$553,347.40)	(\$6,355,186.39 )
Risk2	\$324.17	\$4,941.60	\$56,784.99
NDTO	\$16,094.93	\$269,317.20	(\$16,060,686.99 )

### Hypotheses

•Unable to reject the null for all sizes of firms in Hypothesis 1: Export promotion is not significant in determining the share of export promotion in North Dakota agribusiness.

•Able to reject the null in Hypothesis 2 for only small and medium size firms: The use of the NDTO has a positive significant effect on the share of export revenue in North Dakota agribusiness.

## Conclusions

•The NDTO significantly affects small and medium firms in a positive manner.

•For every \$1.00 spent on the NDTO, firms increase export revenue about \$6.44 and \$107.73 for small and medium firms, respectively.

•Large firms using the NDTO have smaller shares of revenue coming from exports.

•Wilkinson and Brouthers (2000) also found state-sponsored export promotion services to be significant.

•When a manager of small or medium firm decides to enter or expand in the foreign market they should use the North Dakota Trade Office because it positively effects the firms share of export revenue.

### Shortcomings

•Effect from export promotion services and the NDTO is not fully quantified.

•Sample size is relatively small.

•May be a better way to collect the firm data besides a telephone survey.

### Future Research

•Effects from each program the NDTO offers

•The impact of the NDTO and export promotion state-wide

•Including other sectors present in the state of North Dakota.

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