DETERMINANTS OF EXPORTS OF U.S. AGRIBUSINESS FIRMS

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ABSTRACT

This paper analyzes the effect of firm size, capital intensity, profitability and agribusiness sector classification on a firm's probability and intensity (i.e. the ratio of export sales to total sales) of exporting with a Tobit model. Our results show that Firm Size, Capital Intensity and Profitability have quite small negative effects on the export probability and intensity of U.S. agribusiness firms. In contrast, to which agribusiness sector a firm belongs show strong and robust impact on its export behavior. The agribusiness sectors we identified imply the comparative advantages of U.S. agriculture.

INTRODUCTION

Since the early of 1990's, a number of articles have identified systematic differences between exporting and non-exporting firms. Among manufacturing firms exporters tend to be larger, more productive, more skill-intensive, more capital-intensive and pay higher wages than non-exporting firms (Bernard and Wagner, 1997, Bernard and Jensen, 1999). Previous trade theory which assumed a representative firm and focused on understanding "inter-industry" trade and "intra-industry trade" was challenged when it comes to these firm-level heterogeneities. A number of theoretical and empirical studies were then developed to understand the relationship between firm-level productivity differences and trade behavior.

There are two theoretical hypotheses formulated to explain why exporters can be more productive than non-exporting firms. One hypothesis is "Self-selection", which argues that only the most productive firms can overcome trade costs such as transportation costs, distribution costs, marketing costs, production costs and become exporters. The other hypothesis is "Learning by Exporting", which argues that firms engaged in international trade become more productive after they begin to export. Because they have access to a wider variety of intermediate and final goods, advanced technology, and intense competition, which can help to improve post-entry performance. Many empirical papers have investigated the two hypotheses using firm level longitudinal data of various countries and industries. The general conclusion is that more productive firms self-select into export markets, while exporting does not necessarily improve productivity (Bernard and Wagner, 1997, Bernard and Jensen, 1999, Hansson and Lundin, 2004, Delgado, Greenaway and Keller, 2004).

Based on the self-selection hypothesis, a branch of analysis examines prior success in terms of profitability on exporting rather than the effect of productivity on exporting. There are two reasons behind this development. The first is that profitability and productivity are highly correlated (Grazzi, 2012). The second is that profitability should be a more reasonable performance measure at firm level because profit maximization is the central goal for all firms (Foster et al. 2008). There are some but not many studies that

have analyzed the relationship between firm profitability and exports (Francesco Serti, 2007; Grazzi, 2012, Yama Temouri, Alexander Vogel and Joachim Wagner, 2012). Most of the studies focused on European countries and the conclusions vary by country. For example, Grazzi (2012) employed both regression analysis and non-parametric analysis to detect the relation between export and profitability among Italian firms over the period of 1989 to 2004. They did not find evidence that exporting activity is systematically associated with higher firm profitability. Temouri, Vogel, Wagner (2013) used OLS regression to examine the "self-selection" effect of business service firms in France, Germany and the United Kingdom from 2004 to 2007. Profitability of exporters was significantly smaller in Germany, significantly larger in France, and did not differ significantly in UK.

For our research, we would like to study if larger, more capital intensive and more profitable firms in the U.S. agribusiness sector have an advantage in exporting. To achieve this goal and based on the characteristics of these variables, we employ Tobit models to quantify the marginal effects and marginal probabilities of Firm Size, Capital Intensity, Return On Assets and agribusiness sector classifications on the Export Intensity and Exporting probabilities of U.S. agribusiness firms.

METHODOLOGY: THE TOBIT MODEL

The Tobit model was proposed by James Tobin (1958) to describe the relationship between a non-negative response variable and a vector of explanatory variables. The dependent variable usually has value of zero for a nontrivial fraction of the population but is roughly continuously distributed over positive values. Export Intensity is the dependent variable in our Tobit models. It represents the proportion of a firm's sales that are exported. Some firms in our data are non-exporting firms. They have zero export intensity in all years. Even exporting firms in our data have zero export intensity in some years. Because of the large number of zero values for export intensity and the continuous nature of non-zero export intensity, the Tobit model is appropriate and necessary if we want to analyze the relationship between Export Intensity and a set of explanatory variables.

Tobit model expresses the observed response, y, in terms of an underlying latent variable y*, which has a normal, homoskedastic distribution with a linear conditional mean. The observed value y is equal to y* when y* is greater or equal to zero. The observed value y is equal to zero when y* is smaller than zero. Equation (1) gives the empirical specification of the latent variable underlying Tobit model in our study. As mentioned above, our observed response y_{it} is export intensity. x_{1it}, x_{2it} and x_{3it} represent Firm Size, Capital Intensity and ROA respectively. To be able to discuss Firm Size in terms of percentages, we take log of it when the models are estimated. The quadratic terms of the three variables are also included in the model. The remaining variables are industry dummies to take account of industry fixed effects. For example, D_{2000i} is an industry dummy for SIC 2000. We have estimated Tobit models both with and without industry fixed effects to see how the coefficients of the continuous variables change. u_i is for firm level random error. e_{it} is the overall error for the model. u_i and e_{it} are identically and independently distributed.

$$(1) \quad \begin{cases} y_{it}^{*} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{1it}^2 + \beta_3 x_{2it} + \beta_4 x_{2it}^2 + \beta_5 x_{3it} + \beta_6 x_{3it}^2 + D_{2000i} + \cdots + D_{5190i} + u_i + e_{it}, \\ y_{it} = 1[y_{it}^{*} > 0] \end{cases}$$

If x_{jit} is continuous, we can find the partial effect of x_{jit} on $P(y_{it}|y_{it} > 0, \boldsymbol{X})$ and $E(y_{it}|\boldsymbol{X})$ by using

calculus. Equation (2) and Equation (3) respectively show the marginal probability and marginal effect of the continuous variable x_{1it} in our study. Marginal probability tells us how one unit increase in x_{jit} increases the probability that the dependent variable have non-zero values, while marginal effect tells us how one unit in x_{jit} affects the expected value of y_{it}. $\emptyset\left(\frac{\boldsymbol{X\beta}}{\sigma_u}\right)$ and $\phi\left(\frac{\boldsymbol{X\beta}}{\sigma_u}\right)$ represent standard normal pdf and standard normal cdf, each evaluated at $\frac{\boldsymbol{X\beta}}{\sigma_u}$. Expect the term of β_1, the marginal effect and marginal probability also include the term of $2\beta_2 x_{1it}$. That is due to the fact that we include both linear and quadratic terms of the continuous variables in the Tobit model.

(2) $$\frac{\partial P(y_{it}|y_{it}>0,X)}{\partial x_{1it}} = \left(\frac{\beta_1+2\beta_2 x_{1it}}{\sigma_u}\right)\emptyset\left(\frac{\boldsymbol{X\beta}}{\sigma_u}\right)$$

(3) $$\frac{\partial E(y_{it}|\boldsymbol{X})}{\partial x_{1it}} = \frac{\partial P(y_{it}>0|\boldsymbol{X})}{\partial x_{1it}} * E(y_{it}|y_{it}>0,\boldsymbol{X}) + P(y_{it}>0|\boldsymbol{X}) * \frac{\partial E(y_{it}|y_{it}>0,\boldsymbol{X})}{\partial x_{1it}} = (\beta_1 + 2\beta_2 x_{1it})\phi\left(\frac{\boldsymbol{X\beta}}{\sigma_u}\right)$$

DATA DESCRIPTION

Our data was obtained from Standard & Poor's COMPUSTAT North America Database, which is a database of financial, statistical and market information covering publicly traded companies in the U.S. and Canada. It provides more than 340 annual and 120 quarterly Income Statement, Balance Sheet, Flow of Funds and supplemental data items on more than 10,000 active and 9,700 inactive companies.

Since our study focuses the U.S. agribusiness sector. Agribusiness firms were extracted from COMPUSTAT North America by two digit Standard Industry Classification (SIC) codes. The 27 SIC codes were identified as agribusiness related based on their definitions and Garcia-Fuentes, Ferreira, Kennedy, (2013). For detailed information on the 27 SIC categories, please see Table 1 and Table 2.

Equations (4)-(7) show how variables in our study are generated. These variables are generated based on Garcia-Fuentes, Ferreira, Kennedy, (2013) and the availability of COMPUSTAT North America. Data items used to generate these variables: Total Assets, Total Sales, Export Sales, Selling, General and Administrative Expense, Net Amount of Plant and Equipment and After Tax Income are all extracted from Compustat North America.

For the response variable, Export intensity is the most widely used measure to assess export performance (Sousa, 2004). For the explanatory variables, firm size and capital intensity are important firm characteristics that have been used in many previous firm-level export performance studies. Return on assets can provide information of companies' effectiveness in generating profit. ROA tells how efficiently a company uses the firm's assets to generate operating profits.

(4) Export Intensity = Export Sales/Total Sales

(5) Firm Size= Total Assets

(6) Capital Intensity= Net Amount of Plant and Equipment/Total Assets

(7) ROA= After Tax Income/Total Assets

Instead of directly using the annual Firm Size, Capital Intensity, ROA and ROS as independent

variables, we employed simple moving averages of these variables. The simple moving averages are generated by first taking 1-year, 2-year and 3-year lags of Firm Size, Capital Intensity, ROA by firm. It is then calculated by taking the mean of the 1-year, 2-year, 3-year lag of the three variables. The theoretical finding of "self-selection" is that a firm needs to generate efficiency to become exporters prior to exporting (Melitz (2003)). Previous articles studied how firm size, capital intensity and profitability of a firm one year, two years and three years prior to exporting can impact export activity. We used simple moving averages of the independent variables in our Tobit models to allow for the influence of trends in size, capital intensity, and profitability on exports without requiring constant effects for one, two, or three years over the entire time period and across all firms.

One other data decision we made for the analysis was to replace missing values for export sales with a zero. The primary logic for doing so is that reporting export sales in these data is done voluntarily and most firms that don't export simply leave export sales blank rather than reporting zero values every year. This approach could result in our including firms that do export but don't report it in our dataset but there is no way to identify these firms and it was thought that this approach would create much less bias than excluding all firms that don't report exports from the analysis.

Table 1 and Table 2 display the mean and standard deviation for Export Intensity, Firm Size, Capital Intensity, ROA by Standard Industry Classification (SIC) code. The six agribusiness sectors that have no export activity are excluded from later analysis, because the dependent variable of the six sectors has no variations and econometric models cannot capture the relationship between independent variables and dependent variables of the six sectors. On the other hand, it gives us econometric problems such as severe multicollinearity when we estimate models including the six sectors.

Estimation Results

Table 3 and Table 4 respectively present marginal effects and marginal probability estimated by Tobit without industry fixed effects. Table 5 and Table 6 display marginal effects and marginal probability estimated by Tobit with industry fixed effects. For this part, we will discuss Table 3-Table 4 first and then Table 5-Table 6. Since the marginal effects and marginal probability of Firm Size, Capital Intensity and ROA are almost identical when estimated by Tobit with and without industry fixed effects, to be concise, we will discuss that for Table 3 and Table 4 only.

We can see from Table 3 and Table 4 that all the linear and quadratic terms of Firm Size, Capital Intensity and ROA have statistically significant marginal effects and marginal probability. The combined linear and quadratic effects of these variables are presented at the bottom of Table 3 and Table 4. In general, Firm Size and ROA have negative marginal effects and marginal probability. Capital Intensity has negative marginal probability while the marginal effect of Capital Intensity depends on Firm Size. The magnitude of the marginal effect and marginal probability of Capital Intensity and ROA are quite small, however, in terms of their impact on Export Intensity and exporting probability. When Firm Size is specified at 25^{th} percentile, 1% increase in Firm Size decreases Export Intensity by 0.6% and decreases exporting probability by 1.5%. 1% increase in Capital Intensity increases Export Intensity by 0.02% while decreases exporting probability by 0.04%. 1% increase in ROA decreases both Export Intensity and exporting probability by 0.1%. When Firm Size is specified at 50^{th} percentile, 1% increase in Firm Size decreases Export Intensity by 2.0% and decreases exporting probability by 3%. 1% increase in Capital Intensity decreases Export Intensity by 0.05% and decreases exporting probability by 0.04%. 1% increase in ROA decreases Export Intensity by 0.007% and decrease exporting probability by 0.1%. When Firm Size is specified at 75^{th} percentile, 1% increase in Firm Size decreases Export Intensity by 2% and decreases exporting probability by 3.7%. 1% in Capital Intensity increases Export Intensity by 0.05% while decreases exporting probability by 0.009%. 1% increase in ROA decreases Export Intensity by 0.03% and decreases exporting probability by 0.1%. One trend we do

observe for Firm Size is that its negative marginal effect and probability increase as a Firm gets bigger

For Table 5 and Table 6, we will focus on discussing the industry fixed effects. Since SIC 0100 Agricultural Production Crops is the one with the minimum Export Intensity (0.17%) among the 21 agribusiness sectors, we used it as the base group when estimating Tobit models. So the estimated marginal effects and marginal probabilities are all relative to the base group. But since the Export Intensity of SIC 0100 Agricultural Production Crops is so small that roughly we can regard these marginal effects and probabilities as the net effects of these industries.

There are several agribusiness sectors that show significant impacts on Export Intensity and exporting probability. When Firm Size is specified at the 25th percentile, SIC 2000 Food and Kindred Products, SIC 2070 Facts and Oils, SIC 2111 Cigarettes, SIC 2611 Pulp Mills, SIC 2621 Paper Mills, SIC 2870 Agricultural Chemicals, SIC 3523 Farm Machinery and Equipment, SIC 5150 Farm-Product Raw Materials respectively have 17%, 74.9%, 24.2%, 76.4%, 4.7%, 9.0%, 19.0% and 39.2% greater Export Intensity than SIC 0100 Agricultural Production Crops. These industries respectively have 42.4%, 89.7%, 53.5%, 90.1%, 15.9%, 26.7%, 45.8%, and 70.1% greater marginal profitability than SIC 0100 Agricultural Production Crops. Except the SIC industries mentioned above, there are three more SIC industries that have marginal probabilities significant at 10%: SIC 2015 Poultry Slaughtering and Processing, SIC 2020 Dairy Products and SIC Canned Fruits and Vegetables respectively have 27.7%, 28.3% and 15.7% greater marginal probability.

When Firm Size is specified at 50th percentile, SIC 2000 Food and Kindred Products, SIC 2070 Facts and Oils, SIC 2111 Cigarettes, SIC 2611 Pulp Mills, SIC 2870 Agricultural Chemicals, SIC 3523 Farm Machinery and Equipment, SIC 5150 Farm-Product Raw Materials respectively have 12.7%, 65%, 18.7%, 66.4%, 6.4%, 14.3%, and 31.7% greater Export Intensity than SIC 0100 Agricultural Production Crops. These industries respectively have 35.1%, 87.2%, 45.9%, 87.8%, 20.8%, 38.3% and 63.5% greater marginal probability than SIC 0100 Agricultural Production Crops.

When Firm Size is specified at 75th percentile, SIC 2000 Food and Kindred Products, SIC 2070 Facts and Oils, SIC 2111 Cigarettes, SIC 2611 Pulp Mills, SIC 2870 Agricultural Chemicals, SIC 3523 Farm

Machinery and Equipment, SIC 5150 Farm-Product Raw Materials respectively have 7.2%, 49.2%, 11.2%, 50.5%, 3.3%, 8.3%, 20.9% greater Export Intensity than SIC 0100 Agricultural Production Crops. In terms of marginal probability, these industries respectively have 23.3%, 79.6%, 32.7%, 80.5%, 12.4%, 26%, and 50.2% greater marginal probability than SIC 0100 Agricultural Production Crops. Except these SIC industries, SIC 2621 Paper Mills respectively have 11.7% and 6.4% greater marginal probability when Firm Size is specified at 50^{th} percentile and 75^{th} percentile. Similar to the trend we observed for Firm Size, the marginal effects and marginal probabilities of agribusiness sectors decrease about or more than 10% as we evaluate them at larger firm sizes.

Summary and Implications

Our study examined the "self-selection" hypothesis among U.S. agribusiness firms. Particularly, we investigated the relationship between Firm Size, Capital Intensity, Firm Profitability and agribusiness sector classification on Export Intensity using Tobit Models.

Our results show that Firm Size, Capital Intensity and Profitability have statistically significant but quite small negative effects on the export probability and intensity of U.S. agribusiness firms. The finding of a small negative effect of firm size on export behavior contradicts findings for manufacturing firms in previous literature. Although the firm size effects found in this study are too small to be of practical significance, the negative relationship may be due to the limitations of the data used in the analysis. The COMPUSTAT data includes only publically traded firms and does not include data on the level of foreign direct investment (FDI) of these firms. If larger firms are more likely to use FDI to reach foreign markets instead of exports, that could contribute to our findings of a small negative relationship between firm size and exports. Additional joint analysis of both export and FDI behavior would be very useful if such data can be developed.

The small negative effect of profitability on the export behavior of U.S. agribusiness firms is consistent with the findings of some previous studies. Temouri, Vogel and Wagner (2013) had similar findings for German business service firms. Amendolagine, Capolupo, and Petragallo (2007) and Grazzi (2012) found no evidence of higher profitability for Italian exporters. Why both our study and previous studies did not find positive effects of profitability on exports is a question that worth further investigating, since a productivity premium is generally expected in theoretical models and found in some empirical studies, and productivity and profitability are highly correlated.

The agribusiness sector in which a firm operates is by far the most important factor explaining the export behavior of agribusiness firms in our analysis. The sectorial effect is strong and robust. SIC 2000 Food and Kindred Products, SIC 2070 Fats and Oils, SIC 2111 Cigarettes, SIC 2611 Pulp Mills, SIC 2870

Agricultural Chemicals, SIC 3523 Farm Machinery and Equipment and SIC 5150 Farm-Product Raw Materials are seven agribusiness sectors that have significantly greater probability and intensity to export. This fact reveals information of comparative advantage of U.S. agriculture. Corn, soybean, tobacco, and livestock are major agricultural products of the U.S. and U.S. has a relative high yield in these products relative to other countries. Three out of the six sectors: SIC 2070 Fats and Oils, SIC 2111 Cigarettes, SIC 5150 Farm-Product Raw Materials, either directly export these agricultural products or process these agricultural products. The comparative advantage of SIC 2611 Pulp Mills comes from U.S.'s rich forestry resources and the prime export behavior of SIC 2000 Food and Kindred Products, SIC 2870 Agricultural Chemicals and SIC 3523 Farm Machinery and Equipment is based on U.S.' outstanding agricultural manufacturing ability. Agribusiness sectors with no exporting firms include grocery stores and agricultural services. The market for these sectors is very localized so the export behavior of these sectors is explained by the natural market for the products and services they sell rather than by factors such as firm size and capital intensity.

The sectorial findings suggest that one of the most productive areas for further investigation of exports of agribusiness firms would be an analysis of firms within sectors with considerable firm-level diversity in export behavior. This type of study would provide insights in firm characteristics which affect export behavior in sectors where the potential for exports is evident but export behavior is different. As with other suggestions for future research, this too is dependent on the availability of adequate data.

Table 1. Variable Means by SIC Industry

SIC Industry	# of Firms	# of Obs	Export Intensity Mean	Firm Size Mean	Capital Intensity Mean	ROA Mean	ROS Mean
SIC 0100 Agricultural Production Crops	21	257	0.17%	1486.903	44.78%	3.50%	7.50%
SIC 2000 Food And Kindred Products	10	199	6.06%	13650.31	25.03%	4.17%	-6.38%
SIC 2015 Poultry Slaughtering and Processing	5	85	4.20%	628.186	52.55%	3.38%	-5.99%
SIC 2020 Dairy Products	9	70	0.91%	2106.857	35.67%	6.67%	5.53%
SIC 2030 Preserved Fruits and Vegetables	11	191	1.90%	1008.577	34.72%	5.18%	2.14%
SIC 2033 Canned fruits and vegetables	3	73	2.44%	548.997	30.07%	5.37%	3.65%
SIC 2040 Grain Mill Products	10	165	0.84%	4200.106	46.89%	6.29%	5.07%
SIC 2060 Sugar and Confectionery Production	10	195	1.28%	821.3558	39.56%	6.30%	5.10%
SIC 2070 Fats and Oils	3	68	42.29%	5341.796	41.69%	4.60%	2.92%
SIC 2082 Malt beverages	9	140	1.00%	4758.919	52.45%	5.12%	5.86%
SIC 2086 Bottled and canned soft drinks	22	293	2.13%	2696.896	33.55%	-16.58%	-34.17%
SIC 2090 Misc. Food and Kindred Products	12	177	0.21%	351.187	30.34%	-30.58%	-272.40%
SIC 2111 Cigarettes	7	124	3.53%	26538.14	18.34%	7.43%	9.45%
SIC 2211 Broad woven fabric mills, cotton	4	85	5.99%	195.905	32.49%	1.10%	0.58%
SIC 2611 Pulp mills	2	48	46.19%	2094.867	70.55%	5.18%	11.64%
SIC 2621 Paper mills	19	276	3.29%	4799.223	55.87%	4.65%	4.54%
SIC 2870 Agricultural Chemicals	17	177	7.67%	2245.973	38.16%	-32.00%	-143.98%
SIC 3523 Farm machinery and equipment	8	201	7.50%	4426.41	17.21%	4.32%	3.30%
SIC 3550 Special Industry Machinery	5	52	6.12%	290.246	16.14%	2.97%	2.97%
SIC 5150 Farm-Product Raw Materials	3	73	17.97%	1483.792	23.98%	4.53%	1.98%
SIC 5190 Farm supplies	5	83	8.90%	383.484	13.61%	1.93%	0.23%
SIC 0700 Agricultural Services	3	81	0.00%	764.147	30.37%	8.68%	3.42%
SIC 2052 Cookies and crackers	1	23	0.00%	226.432	52.16%	13.23%	7.89%
SIC 2080 Beverages	3	71	0.00%	16115.32	32.80%	12.09%	11.01%
SIC 5180 Beer, Wine, and Distilled Beverage	2	19	0.00%	640.369	5.63%	4.09%	2.80%
SIC 5180 Beer, Wine, and Distilled Beverage	2	19	0.00%	0.00%	640.369	5.63%	4.09%
SIC 5411 Grocery stores	26	461	0.00%	0.00%	3718.298	47.63%	5.05%
SIC 5812 Eating places	68	1015	0.00%	0.00%	1089.001	62.03%	2.57%
Whole Sample	298	4702	13.08%	3.31%	3554.673	42.74%	0.70%

Note: the unit of Firm Size is millions of dollars

Table 2. Variable Standard Deviations by SIC Industry

SIC Industry	Export Intensity Std.	Firm Size Std.	Capital Intensity Std.	ROA Std.	ROS Std.
SIC 0100 Agricultural Production Crops	0.012	2613.649	0.211	0.065	0.154
SIC 2000 Food And Kindred Products	0.259	19032.980	0.090	0.053	0.506
SIC 2015 Poultry Slaughtering and Proc.	0.118	753.191	0.125	0.100	0.363
SIC 2020 Dairy Products	0.026	2563.650	0.146	0.058	0.045
SIC 2030 Preserved Fruits and Vegetables	0.090	1896.434	0.152	0.077	0.132
SIC 2033 Canned fruits and vegetables	0.068	770.046	0.099	0.042	0.025
SIC 2040 Grain Mill Products	0.055	4892.899	0.148	0.074	0.061
SIC 2060 Sugar and Confectionery Prod.	0.046	1324.960	0.121	0.052	0.050
SIC 2070 Fats and Oils	0.460	7568.868	0.082	0.060	0.047
SIC 2082 Malt beverages	0.042	10090.350	0.229	0.048	0.063
SIC 2086 Bottled and canned soft drinks	0.127	5598.836	0.153	0.830	1.586
SIC 2090 Misc. Food and Kindred Products	0.011	618.827	0.165	1.302	23.777
SIC 2111 Cigarettes	0.057	26385.410	0.104	0.084	0.085
SIC 2211 Broadwoven fabric mills, cotton	0.154	171.564	0.085	0.085	0.048
SIC 2611 Pulp mills	0.478	1519.775	0.110	0.030	0.103
SIC 2621 Paper mills	0.110	6419.966	0.135	0.054	0.055
SIC 2870 Agricultural Chemicals	0.156	3560.904	0.220	1.130	5.393
SIC 3523 Farm machinery and equipment	0.150	7472.980	0.042	0.057	0.041
SIC 3550 Special Industry Machinery	0.122	290.920	0.112	0.043	0.047
SIC 5150 Farm-Product Raw Materials	0.179	1607.323	0.056	0.026	0.011
SIC 5190 Farm supplies	0.174	547.838	0.065	0.086	0.075
SIC 0700 Agricultural Services	0.000	0.000	1373.815	0.215	0.068
SIC 2052 Cookies and crackers	0.000	0.000	66.687	0.032	0.036
SIC 2080 Beverages	0.000	0.000	10774.650	0.087	0.044
SIC 5180 Beer, Wine, and Distilled Bev.	0.000	0.000	897.248	0.033	0.016
SIC 5411 Grocery stores	0.000	0.000	5827.419	0.115	0.039
SIC 5812 Eating places	0.000	0.000	3506.269	0.188	0.107
Whole Sample	0.140	0.140	8930.236	0.213	0.403

Table 3. Marginal Effects Estimated by Tobit Without Industry Fixed Effects

	Firm Size Specified at 25th Percentile	Firm Size Specified at 50th Percentile	Firm Size Specified at 75th Percentile
Firm Size	0.021**	0.0173**	0.012**
(Firm Size)^2	-0.003***	-0.003***	-0.002***
Capital Intensity	-0.002***	-0.002***	-0.001***
(Capital Intensity)^2	0.00003***	0.00002***	0.00002***
ROA	-0.0006*	-0.00005**	-0.0003**
(ROA)^2	0.0000008***	0.000006***	0.0000004***
Combined linear and quadratic effect			
Firm Size	-0.006	-0.020	-0.020
Capital Intensity	0.0002	-0.0005	0.0005
ROA	-0.001	-0.00007	-0.0003

Note: *, **, *** denote significant at 10%, 5%, and 1% levels, respectively

Table 4. Marginal Probability Estimated by Tobit Without Industry Fixed Effects

	Firm Size Specified at 25th Percentile	Firm Size Specified at 50th Percentile	Firm Size Specified at 75th Percentile
Firm Size	0.053***	0.035**	0.027**
(Firm Size)^2	-0.007***	-0.005***	-0.004***
Capital Intensity	-0.004***	-0.004***	-0.003***
(Capital Intensity)^2	0.00005***	0.00005***	0.00004***
ROA	-0.0002***	-0.001***	-0.0008***
(ROA)^2	0.000000007***	0.000001***	0.000001***
Combined linear and quadratic effect			
Firm Size	-0.015	-0.03	-0.037
Capital Intensity	-0.0004	-0.0004	-0.00009
ROA	-0.001	-0.001	-0.001

Note: *, **, *** denote significant at 10%, 5%, and 1% levels, respectively

Table 5. Marginal Effects Estimated by Tobit With Industry Fixed Effects

	Firm Size Specified at 25th Percentile	Firm Size Specified at 50th Percentile	Firm Size Specified at 75th Percentile
Firm Size	0.024**	0.019**	0.013***
(Firm Size)^2	-0.004***	-0.003***	-0.002***
Capital Intensity	-0.002**	-0.002**	-0.001**
(Capital Intensity)^2	0.00003***	0.00002**	0.00002**
ROA	-0.0006**	-0.0005**	-0.0003**
(ROA)^2	0.0000008***	0.0000006**	0.0000004**
SIC 2000 Food And Kindred Products	0.170**	0.127**	0.072*
SIC 2015 Poultry Slaughtering and Proc.	0.095	0.067	0.035
SIC 2020 Dairy Products	0.097	0.069	0.036
SIC 2030 Preserved Fruits and Vegetables	0.047	0.031	0.015
SIC 2033 Canned fruits and vegetables	0.036	0.024	0.011
SIC 2040 Grain Mill Products	0.022	0.014	0.006
SIC 2060 Sugar and Confectionery Prod.	0.029	0.019	0.009
SIC 2070 Fats and Oils	0.749***	0.650***	0.492**
SIC 2082 Malt beverages	0.023	0.015	0.006
SIC 2086 Bottled and canned soft drinks	0.020	0.013	0.006
SIC 2090 Misc. Food and Kindred Prod.	0.002	0.001	0.001
SIC 2111 Cigarettes	0.242**	0.187**	0.112*
SIC 2211 Broad woven fabric mills, cotton	0.032	0.021	0.009
SIC 2611 Pulp mills	0.764***	0.664**	0.505**
SIC 2621 Paper mills	0.047*	0.032	0.015
SIC 2870 Agricultural Chemicals	0.090**	0.064**	0.033*
SIC 3523 Farm machinery and equipment	0.190**	0.143**	0.083*
SIC 3550 Special Industry Machinery	0.069	0.047	0.023
SIC 5150 Farm-Product Raw Materials	0.392**	0.317**	0.209**
SIC 5190 Farm supplies	0.044	0.030	0.014
Combined linear and quadratic effect			
Firm Size	-0.012	-0.018	-0.019
Capital Intensity	0.0002	-0.0005	0.0005
ROA	-0.001	-0.00007	-0.0003

Note: *, **, *** denote significant at 10%, 5%, and 1% levels, respectively

Table 6. Marginal Probability Estimated by Tobit With Industry Fixed Effects

	Firm Size Specified at 25th Percentile	Firm Size Specified at 50th Percentile	Firm Size Specified at 75th Percentile
Firm Size	-0.045***	0.039***	0.029**
(Firm Size)^2	-0.007***	0.006***	-0.004***
Capital Intensity	-0.005***	-0.004***	-0.003***
(Capital Intensity)^2	0.00005***	0.00005***	0.00004***
ROA	-0.001**	-0.001**	-0.0008**
(ROA)^2	0.000001***	0.000001***	0.0000009***
SIC 2000 Food And Kindred Products	0.424***	0.351***	0.233**
SIC 2015 Poultry Slaughtering and Proc.	0.277*	0.217	0.130
SIC 2020 Dairy Products	0.283*	0.222	0.134
SIC 2030 Preserved Fruits and Vegetables	0.157*	0.116	0.063
SIC 2033 Canned fruits and vegetables	0.126	0.091	0.048
SIC 2040 Grain Mill Products	0.082	0.058	0.029
SIC 2060 Sugar and Confectionery Prod.	0.106	0.076	0.039
SIC 2070 Fats and Oils	0.897***	0.872***	0.796***
SIC 2082 Malt beverages	0.085	0.060	0.030
SIC 2086 Bottled and canned soft drinks	0.076	0.053	0.026
SIC 2090 Misc. Food and Kindred Prod.	0.011	0.007	0.003
SIC 2111 Cigarettes	0.535***	0.459***	0.327**
SIC 2211 Broad woven fabric mills, cotton	0.114	0.082	0.043
SIC 2611 Pulp mills	0.901***	0.878***	0.805***
SIC 2621 Paper mills	0.159**	0.117*	0.064*
SIC 2870 Agricultural Chemicals	0.267***	0.208**	0.124**
SIC 3523 Farm machinery and equipment	0.458***	0.383***	0.260***
SIC 3550 Special Industry Machinery	0.216	0.164	0.094
SIC 5150 Farm-Product Raw Materials	0.701***	0.635***	0.502***
SIC 5190 Farm supplies	0.150	0.111	0.060
Combined linear and quadratic effect			
Firm Size	-0.0107	-0.036	-0.035
Capital Intensity	-0.001	-0.0004	-0.00009
ROA	-0.001	-0.001	-0.001

Note: *, **, *** denote significant at 10%, 5%, and 1% levels, respectively

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