Farmers' Perceptions of Regulatory Stringency in the Northeastern US

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Introduction

Agricultural producers have indicated from recent surveys that regulations are a major concern for business viability (Schulz, Artz, and Gunn, 2017). The different perceptions of these regulations may vary among producers depending on industry they are engaged in, size of their farm, their experience, and other structural factors and individual demographics. Specifically, producers may believe that the national, state, or local government over- or under-regulates on the margins of taxation, labor protections, environmental, food safety, and transportation. This paper analyzes survey data from a survey sent to Northeastern states agricultural producers.

Federal regulations are the same for all US farmers, the variability in regulation lies within the states and local governments. Therefore, variation in state regulations allow us to examine producers' perceptions of regulation in more detail. Regulations impose compliance costs on producers, requiring agricultural producers to invest more in management of their operations. These compliance costs may affect a producer that is newer in the industry more than an established producer or vice versa. This paper addresses the question of how an agricultural producer's perceptions of over- or under-regulation depends on their demographics and industry factors. Producers were asked to indicate whether they were under or over regulated in five key areas: taxation, labor protections, food safety, environmental, and transportation. Producers were asked to consider their local and state regulations when filling out the survey. The results can be used to analyze the differences between the states within the survey area and the differences in sectors.

Model

The survey question of interest for this research study is as follows: "For the state where you have your primary farming activities, how do you view that state's regulatory environment for agricultural activities?" Respondents chose a single answer from a 5-point Likert scale. The responses are as follows: 1-significantly under-regulated, 2-somewhat under-regulated, 3-appropriately regulated, 4-somewhat over-regulated, and 5-significantly over-regulated.

We examine the effects of ten factors on the perceived stringency of regulation: state of residence, agricultural sector (e.g. dairy, row crops), farmer experience, gender, education level, annual sales in dollars (a proxy for farm size), business organization type (e.g. partnership, s-corp), farm age, recent change in production size, and recent change in profitability. We examine these factors using an ordered logit model specified as follows:

$$S = \alpha + \beta_1 State + \beta_2 Sector + \beta_3 Experience + \beta_4 Gender + \beta_5 Gender + \beta_6 Education + \beta_7 Sales + \beta_8 OrgType + \beta_9 Age + \beta_{10} Size + \beta_{11} Profitability + \varepsilon$$

where S is the level of regulatory stringency selected by respondents.

Survey Methods

An online survey was implemented September through November 2014 to assess agricultural producer perceptions of regulations in their states (Campbell and Rabinowitz, 2015). The survey was open to all agricultural producers within the Northeastern states. Producers in the fruit, vegetable, nursery, greenhouse, and dairy sectors were of particular importance. These sectors have shown to have the highest economic output in the region compared to other sectors in the area (Lopez and Laughton, 2012; Lopez, Plesha, and Campbell, 2015). The survey was sent out as a link via several different outlets to attempt to reach a broad audience of producers in the survey

area. Additionally, major agricultural financial institutions published the link in their newsletters and state Farm Bureaus, university extension agents, and regional agricultural associations sent the link out via their member lists.

While the approach to solicit participation in the survey had the potential to be far reaching, it is difficult to track how many agricultural producers became aware of the survey and through which contact method. This makes defining the response rate nearly impossible. However, this method of distribution was considered necessary in order to collect enough valid data from agricultural producers throughout the region, especially since direct financial incentives were not offered for participation. All avenues used are considered credible methods for reaching agricultural producers and measures were taken to avoid duplicate responses.

Data

Survey respondents were asked first if they felt over or underregulated by the question of "For the state where you have your primary farming activities, how do you view that state's regulatory environment of agricultural activities?" If they indicated that they were overregulated the survey prompted them to indicate which sectors should be less regulated.

As the responses among the different categories there were especially low numbers of observations, we combined the ranges within a variable. The sales $350,000 to $999,999 and from 1 million and greater were combined. The education variable combined the 4 year college degree, graduate degrees, and professional degrees. The rest of the variables were not altered. Summary statistics can be found in Table 1.

Results

We examine producers' perceptions of regulations using business type data and demographics provided by agricultural producer survey data. A statistically significant association would indicate that the independent variables play a role in the determining the probability of the producer say that they are overregulated.

Logit models were run for 5 categories: Environmental, Labor, Food Safety, Transportation, and Business taxes. We determined the Food Safety, Transportation, and Business taxes lacked significance among the independent variables, which would implies we don't have adequate data to assess which factors affect the perceptions of overregulation. This leaves the labor and environmental regressions to focus on.

In the environmental regulation model, three variables were significant at the 10% level: the state of primary farming activities, gender, and the years of farm operator experience. Vermont is the only state that has significance at the 5% level, with an .0959 greater chance of saying they are overregulated. Females was significant at the 5% level with an odds ratio at 1.973. Years of farm experience from 21 to 30 years is 9.003 larger of answering yes to being overregulated with being significant at the 1% level. 41-50 years was significant at the 1% level with 5.309 greater chance of answering that they are overregulated. 51 and greater years had an odds ratio of 8.710 at the 1% level of significance.

For labor regulation category, there were more significant parameters compared to the environmental category. The state of primary farming activities, farm activity, farm experience, business organization, and years of education were all significant at the 5% level. New York was the only state that was significant compared to the other states. The odds ratio for New

York was 4.531 at a 1% level. Equine was the only farm activity that was significant at the 5% with an odds ratio of .148. For farm experience the range of 41 years to 50 years was significant at the 5% level with an odds ratio at 3.664. For education, some college had an odds ratio 6.698 and was significant at the 1% level. The two business organizational categories that had significance were limited liability corporation (LLC) and the other category that included co-operatives. For the LLC, they were 2.515 times more likely to be as perceived overregulated. For the other category which includes cooperative, non-profit, and hobby farms, said they were 4.612 times larger to be perceived as overregulated. Both were significant at the 5% level.

Variables were run through a likelihood ratio test to examine if the significant variables provided some explanation in the model. Additionally, we ran a linear probability model to confirm that a logit model was the correct model for the data.

References:

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Tables

Table 1 Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
stateprod	410	4.434	2.159	1	9
busorg	410	2.785	1.792	1	6
farmage	410	3.744	1.995	1	6
farmexp	407	3.425	1.582	1	6
farmact	409	5.046	2.533	1	11
Pproduct	407	4.295	1.006	1	6
Pprofit	404	4.205	1.147	1	6
gender	394	0.670	0.471	0	1
sales_new	410	2.488	1.590	1	5
educ_new	410	2.807	0.914	1	4

Table 2 Odds Ratios for Environment

VARIABLES	(1) Odds Ratio
evmtover	
2.stateprod	0.449
	(0.431)
3.stateprod	1.090
	(0.530)
4.stateprod	0.823
	(0.445)
5.stateprod	3.579*
	(2.565)
6.stateprod	2.082*
	(0.883)
7.stateprod	0.900
	(0.729)
8.stateprod	0.0959**

	(0.113)
9.stateprod	0.918
	(0.815)
2.farmact	1.318
	(0.952)
3.farmact	0.784
	(0.493)
4.farmact	0.464
	(0.224)
5.farmact	0.700
	(0.515)
6.farmact	0.475
	(0.427)
7.farmact	0.649
	(0.358)
8.farmact	0.650
	(0.428)
9.farmact	0.676
	(0.602)
10o.farmact	-
11.farmact	2.018
	(1.605)
2.farmexp	1.792
	(1.178)
3.farmexp	9.003***
	(5.495)
4.farmexp	2.615
	(1.570)
5.farmexp	5.309***
	(3.368)
6.farmexp	8.710***
	(5.719)
gender	1.973**
	(0.675)
2.educ_new	1.080
	(0.546)
3.educ_new	1.475
	(0.718)
4.educ_new	1.271
	(0.642)
2.sales_new	0.764
	(0.390)
3.sales_new	1.180
	(0.497)
4.sales_new	0.894

	(0.482)
5.sales_new	1.193
	(0.636)
2.busorg	1.059
	(0.826)
3.busorg	0.562
	(0.371)
4.busorg	0.636
	(0.257)
5.busorg	1.648
	(0.802)
6.busorg	0.897
	(0.601)
2.farmage	0.611
	(0.340)
3.farmage	0.474
	(0.278)
4.farmage	0.546
	(0.342)
5.farmage	0.732
	(0.506)
6.farmage	0.867
	(0.437)
2.Pprofit	0.733
	(1.104)
3.Pprofit	0.411
	(0.598)
4.Pprofit	0.599
	(0.858)
5.Pprofit	0.333
	(0.476)
6.Pprofit	0.758
	(1.120)
2.Pproduct	1.327
	(1.097)
3.Pproduct	0.453
	(0.329)
4.Pproduct	0.794
	(0.455)
5.Pproduct	0.454
	(0.262)
6.Pproduct	-
Constant	0.338
	(0.581)

Observations	372

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3 Odds Ratios for Labor

VARIABLES	(1) Odds ratio
lbrover	
2.stateprod	0.282
	(0.357)
3.stateprod	2.315
	(1.197)
4.stateprod	1.266
	(0.747)
5.stateprod	0.967
	(0.778)
6.stateprod	4.531***
	(2.051)
7.stateprod	0.264
	(0.277)
8.stateprod	0.667
	(0.629)
9.stateprod	0.141
	(0.181)
2.farmact	0.599
	(0.461)
3.farmact	0.996
	(0.693)
4.farmact	0.862
	(0.435)
5.farmact	0.234*
	(0.204)
6.farmact	0.148**
	(0.136)
7.farmact	0.325*
	(0.195)
8.farmact	0.244*
	(0.189)
9.farmact	2.663
	(2.684)
10.farmact	0.170
	(0.261)

11.farmact	0.324
	(0.308)
2.farmexp	1.595
	(1.016)
3.farmexp	2.771*
	(1.656)
4.farmexp	2.473
	(1.469)
5.farmexp	3.664**
	(2.359)
6.farmexp	3.199*
	(2.200)
gender	1.449
	(0.531)
2.educ_new	6.698***
	(4.210)
3.educ_new	2.793*
	(1.677)
4.educ_new	3.250*
	(2.069)
2.sales_new	1.539
	(0.843)
3.sales_new	1.852
	(0.853)
4.sales_new	1.136
	(0.643)
5.sales_new	1.485
	(0.841)
2.busorg	1.682
	(1.498)
3.busorg	3.085
	(2.351)
4.busorg	2.515**
	(1.069)
5.busorg	2.636*
	(1.376)
6.busorg	4.612**
	(3.249)
2.farmage	0.573
	(0.339)
3.farmage	0.411
	(0.264)
4.farmage	0.657
	(0.416)
5.farmage	0.406
	(0.318)

6.farmage	1.474
	(0.742)
2.Pprofit	2.804
	(2.167)
3.Pprofit	3.271*
	(2.111)
4.Pprofit	1.414
	(0.848)
5.Pprofit	0.685
	(0.380)
6.Pprofit	-
2.Pproduct	0.249
	(0.435)
3.Pproduct	0.371
	(0.616)
4.Pproduct	0.196
	(0.312)
5.Pproduct	0.126
	(0.202)
6.Pproduct	0.0996
	(0.170)
Constant	0.115
	(0.210)
Observations	374

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1