ASSESSING THE ROLE OF MANAGERIAL PRACTICES ON FIRM PERFORMANCE: AN INVESTIGATION OF THE AGROCHEMICAL DEALER SECTOR IN BRAZIL

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Abstract

The agrichemical-input industry in Brazil has become the largest one in the world, surpassing the North-American market. In this context, agrichemical suppliers and dealers apply managerial practices to compete on market share and profitability. The paper addressed a discussion about the contributions of managerial practices such as consumer relationship management, financial planning and practices based on human resource management to dealers' competitiveness. Data about managerial practices from 115 agrichemical dealers in Brazil were collected and an appropriate method of multiple regression estimation was conducted. It connects which process contributed to variation on company's agrichemicals gross revenue. This study provided straightforward recommendations to agrichemical dealers for better performance.

Key words: *Management, Agribusiness, Agrichemical*

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1. Introduction

Agrichemical revenues in Brazil reached about US$ 9.7 billion in 2012, an 14.4% increase over the US$ 8.4 billion in 2011 . Brazil, as the largest market for agrichemicals, has attracted investments from many chemical companies and opened a window of opportunities in the distribution market. Indeed, dealers are responsible for over than 60% of all agrichemical sales in Brazil.

Although the importance of agrichemical dealers are well known, little is known about their managerial processes and related performance. Which process contributes to higher performance? Should a dealer invest on customer-oriented management? What are the contributions from human resource management? To what extent the financial management explains better performance? We fill this lack of knowledge by analyzing data on 115 Brazilian dealers. Moreover, we found statistical support to our conclusions by applying appropriate methods of estimation.

This paper is informative to dealers, to chemical companies, to investors and, in fact, to most businesses. Dealers need support when deciding priorities to invest on managerial processes. These priorities may also help chemical companies that have invested on the education of their dealers by providing training courses and advisory services. Dealers showing poor performance may attract investors to make profit by establishing a professional business model and also by consolidating some strategic regional markets. Other businesses may benefit from insights from our discussion and conclusions about managerial processes and related performance.

We grounded on theory and previous references to help the development of this research. Many theorists and practitioners have being advocating on the benefits of establishing better management processes. There are several studies on different sectors of the economy showing

that practices such as Human Resources Management (HRM), Customer Relationship Management (CRM) and financial planning lead to better performance of the organizations. Huselid (1995) found statistical significance when correlated human resources practices to firm's performance. In terms of financial planning, Lazaridis & Tryfonidis (2006) investigated 131 companies in Athens to found statistical support on the correlation of working capital managing practices and company's profitability.

According to Barney (1995), many firms have great performance even in a high treated, low opportunity and unattractive environment. The good performance cannot be explained only by the firm's environment analysis; rather, explanation must consider the internal attributes of the firm such its managerial practices. In this sense, Mizumoto et. al. (2010) argued that the adoption of managerial practices do increase the survival chance along with entrepreneur's human capital and social capital, all results supported by the investigation of 1,961 small startup companies in Brazil.

This paper investigated the managerial practices of 115 agrichemical dealers in Brazil. Specifically, the paper addressed a discussion about the contributions of managerial practices to dealers' competitiveness and draw empirical contributions from the best practices investigated in the Brazilian market. Considering the managerial practices, the study investigated managerial processes based on customer-relationship management; financial planning and practices based on human-resource management. Moreover, we shed light on the contributions of management processes to company performance.

We organized this paper as follows: the next section will be presented the overall market and structure of agrichemical dealers in Brazil; one specific section of references on previous studies about firms' performance and managerial practices; all sections are followed by results discussion and final remarks.

2. Brazilian agrichemical sector overview

The green revolution, started by Norman Borlaug in 1943, brought a series of new inputs to the agriculture production enabling the world to produce more food than never imagined. Pesticides, synthetic fertilizers, hybrid seeds varieties, and other inputs became more and more

common in the field and the market channel of agricultural inputs emerged as a necessity to make products to reach producers.

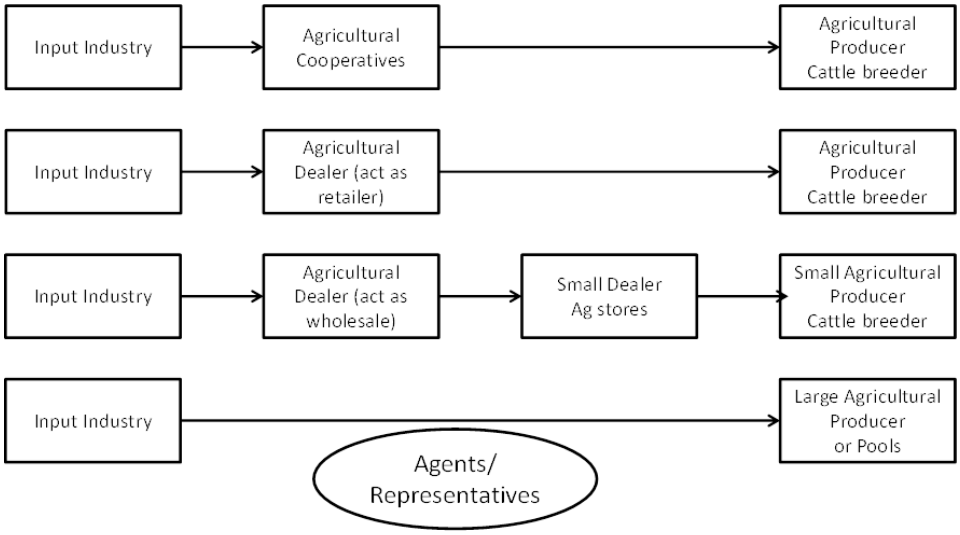
The importance of the green revolution to the world food supply is notable, especially the role that agrichemical plays granting high levels of production. According to Oerke (2006), the potential losses due to agricultural pests, between the years of 2001 and 2003 was about 26-29% for soybean, wheat and cotton, and 31, 37 and 40% for maize, rice ad potatos, respectively. The study evaluated 19 regions along the globe. Fortunately, the potential losses were mitigated by controlling weeds, pests and pathogens chemically. In Brazil, agrichemicals are even more needed than in temperate regions because of the fact that the tropical region is a more propitious ambient to the growth of weeds and dissemination of plagues.

As stated above, this new variety of products that emerged after green revolution reaches farmers through a market channel.

Stern et. al. (1996) defined a market channel as an inter-organizational network of institutions involved in the process of making products and services available for consumption and use (Thomé e Castro, 2008). According to Cônsoli, Prado & Marino (2011) the agriculture input dealer sector play an important role because it helps on keeping proximity and good relationship with farmers that are placed in very different regions in a continent-wide country such as Brazil; and because dealers adjust their portfolio of products, services and even credit according to each region.

In the year of 2011, according to SINDAG (National Union of Industry of Products for Agriculture Defense) agrichemical input industry market in Brazil was about US$ 8.4 billion (considering herbicides, pesticides, fungicide, acaricide and others crop protectants). In 2012 it reached about US$ 9.7 billion, a 14.4% market growth over the preview year.

How agricultural inputs are delivered from the input industry to farmers vary in four manners according to Cônsoli, Prado & Marino (2011). Figure 1 represents how inputs reaches producers. The first way is distribution through cooperatives which have bargain power allowing them to buy products by lower prices. Besides, they offer technical assistance and other services to cooperated producers.



Source: (Cônsoli, Prado and Marino, 2011)

Figure 1 - Agrichemical market channel in Brazil - Types of agents

The second way the input reaches the farmers is through agricultural dealer agent, which may strongly vary in terms of size, product variety, brand, offer of service, among others. In addition, this formation is quite different according to specific regions in Brazil.

The third possibility is the redistributor which are small dealers and agricultural stores that buy products from a big dealer and resell it in a very powdered market composed mainly by small farmers of vegetable and leaves which demand lower quantity of products in comparison to the acreage of crops like soybean, maize, cotton, rice, etc.

The last alternative is the direct distribution: the industry sells its products directly to huge farmers or to pools of farmers. In this case some agents may help in the process and they earn a perform revenue.

Despite the existence of four modalities of distributions, the most important is through agricultural dealers, which represents about 60% of sales of crop protectants according to Mazotini et. al. (2011). In the last years this sector is getting more concentrated. In 2002 there were approximately 8,000 dealers in Brazil, six years ahead this number shrank 15% resulting in less than 7,000 dealers in the year of 2008. Experienced agents in the sector believes that

Brazilian agrichemical sector will run the same way U.S agrichemical dealer ran, in other words, the sector will become concentrated, dealers will become larger and service oriented rather than product oriented. This new scenario will force organizations on the sector to improve their managerial practices as a way to gain competitiveness.

Agricultural dealers have enough incentives to develop an efficient management to compete with other dealers and other modalities of distribution. We observe that dealers with better management practices gain market share by increasing sales volume. Considering a financial perspective, more sales means that the dealer will be able to dilute fixed cost and, even more important, that the dealer will access higher rebates from the suppliers. Being larger also open a window of opportunities for the dealer to consolidate its brand, to increase the bargain power to suppliers and to hire high quality professionals.

3. The role of management on firm performance

3.1.Human resources management

The contribution of human resources management (HRM) to organization's performance wasn't always a known topic. According to Wright et. al. (2005), human resource practitioners have a long history trying to demonstrate to the rest of the organization the value of their work. To prove the importance of human resource in organizations performance numerous studies were conducted in this field in the last two decades (Huselid, 1995; Becker & Huselid, 1998; Wright et al., 2005; Guest et al., 2003).

Human resources management, human resources practices or high performance work system are bundles of practices adopted by firms in a crescent rate with the intention to promote better results (economically, in terms of productivity, employee retention, etc.) within an organization as it will be described below. It is worth to say that there isn't on single combination of practices that will work for any organization, it is important to align objectives and internal characteristics with the strategy in human resources. In addition, according to King (1995) human resources practices produce better results when they make part of a consistent whole rather than in isolation.

Barney (1995), describing resources and capabilities which can put an organization in competitive advantage states that human resource is an important issue that when combined with other sources can drive the organization through a competitive advantage path. Besides, Huselid (1995), drawing on Belgri (1991), Butler, Ferris & Napier (1991), Cappelli & Singh (1992), Jackson & Schuler (1995), Porter (1985), Schuler (1992) and Wright & McMahan (1992) works, stated that "human resource management practices can help to create a source of sustained competitive advantage, especially when they are aligned with a firm's competitive strategy".

Quality, technology, economy of scale, etc. which were common sources of competitive advantage have become easier to imitate. At this context human resource management become an important issue especially because according to Becher & Huselid (1998) "the development of a high performance workforce remain a significant unrealized opportunity for many organizations".

The association between HRM and organizations performance was observed in several works. Huselid (1995) clearly established the contributions of HRM to performance, specifically; the incremental of one unity of HRM practice (measured as one standard deviation) decreased on 7.05% the employee turnover, explained sales increase of US$ 27.044 per employee, and positive effects also on the company performance such as revenue growth of US$ 3,814 and market value growth of US$ 18,641.

Guest et. al. (2003) added to Huselid (1995) work by analyzing different industries through several years. They found a positive correlation of HRM practices and performance, corroborating Huselid (1995). In addition, Guest et. al. (2003) made clear that this positive effect remains only when considered the HRM practices over the years, but this result is lost when considered a short period of time.

However, Wright et. al. (2004) criticized these previous arguing methodological problems to prove causality of HRM and business performance. His work proposed to solve these methodological concerns but ended up non conclusive, for instance, it was not clear if the causality is also reverse: the company invests more on HRM process because of its (previous) higher performance. Still, the research found a positive correlation of HRM practices and current performance.

In terms of productivity, Ichniowski, Sahw & Prennushi (1997), observed among 38 homogenous steel production that "lines using innovative work practices such as incentive pay, teams, flexible job assignments, employment security, and training achieve substantially higher levels of productivity than do lines with the more traditional approach, which includes narrow job definitions, strict work rules, and hourly pay with close supervision".

3.2.Financial management

Financial management may be considered the most important aspect in company's management since a misleading financial conduction can drive an organization to bankruptcy. An important aspect in financial management is working capital management. Working capital can be defined as the amount of capital available to meet the day-to-day operations of an organization.

Deloof (2001) stated that sales might be increased by managing working capital offering generous trade credit and thus greatening the time lag in cash conversion cycle (CCC). On the flip side it will lead to higher amount of capital locked up in working capital. Indeed, by shortening the productions and sales cycle, the company enhances its profitability according to Lazaridis & Tryfonidis (2006) when they investigated 131 listed companies on Athens Stock Exchange. Moreover, by shortening the CCC, the company may dispose more cash to anticipate supplies at discounted prices.

Charatou, Elfani and Lois (2010) corroborated these results when analyzed 43 companies from Cipria from 1998 to 2007. In fact, companies that established financial process to control days in inventory, and to actively manage the receivables and payables accounts presented above-the market performance.

Although we have found previous studies that explored the benefits of establishing sophisticated financial mechanisms to manage risks (such as portfolio decisions, future markets, derivatives, among others) and to optimize resources (holding structures with business units, consolidated work flows, among others), we focused on quite simple processes due to our empirical context.

3.3.Customer Relationship Management (CRM)

We found many definitions about relationship marketing and Customer Relationship Management (CRM) investigating previous literature. Stone and Woodcock (1998) argued that relationship marketing is a use of techniques and process of selling, communicating, marketing and driving attention on costumer in order to improve the relationship. Adding to this definition, Bretzke (2000) argue on the benefits of implementing a CRM process: better understanding on the customer needs; organization of historical data on each customer to drive actions that may improve customer retention and loyalty; reduction on cost of sales to allow better sales margin.

Parvatiyar and Sheth (2001) defined CRM as: "Customer Relationship Management as a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer. It involves the integration of marketing, sales, customer service, and the supply-chain functions of the organization to achieve greater efficiencies and effectiveness in delivering customer value".

In addition, Valente (2002) and Peppers and Roger (2003) make clear that the implementation process is challenging. The company´s employee will be willing to implement a CRM process if the benefits of it are well understood. For this reason, the company should evaluate and compare current skills and capabilities and the gaps between those required to implement the CRM. Since these gaps are well defined and treated, the company must provide specifics training to improve their time.

According to Swift (2001), customer relationship management provides a better understand of customer behavior to improve the business performance by means of increasing profitability and gaining customer´s loyalty. Consistent with this argument, Reinartz (2004) published that (1) the more firms are focused in implementing CRM, the better they seem to perform, and (2) developing an incentive and organizing the firm's structure is more likely to improve business performance with CRM practices.

However, few studies have being developed proving the benefits of CRM practices on business performance and whether the program is meeting the company`s expectation. Considering a qualitative approach, Peppers and Rogers (2003) have advocated on the benefits of considering customer´s profile, needs and value in order to take appropriate action according to

each group of interests. Even more, this approach allow that the company think on share of customer to complement the approach of market share. Still, Kumar (2008) mentioned that academics have developed few studies about the impacts of CRM implementation on firms profitability. The lack of appropriate data makes it difficult to measure the relationship between CRM and firm profitability (Boulding et. al. 2005).

Even thought, Krasnikov and colleagues (2009) accessed data on the banking industry to conclude that the CRM implementation provided an 27.5% increase in profit. Thus, it is expected that the implementation of CRM has a positive effect on company performance.

4. Methods

To achieve the proposed objectives, it was used data of 156 agrichemical dealers in 18 states of Brazil. In fact, the data accounts for a wide variety of crops: soybeans, corn, wheat, sugar cane, orange, tomato, and potatoes, among others. The authors had access to the output of an audit process made by a consultancy company. The process consisted on applying a structured questionnaire by personal interviews from January to June 2011. Each interview consumed about 6 hours on average. All data was previously analyzed and, after a missing analysis, it was considered 115 valid questionnaires.

The appropriate method of analysis was multiple regression estimation. The dependent variable was gross revenue of the dealer, accounted in Brazilian currency (Reais). For sake of comparison, it was considered only the revenue from agrichemicals, discounting the seed and fertilizer revenue from the overall revenue. It is worth to note that segment-portfolio (agrichemical, seed and fertilizer) is a dealer decision according to its strategic positioning. The correlation of dependent and each independent variable along with summary statistics are presented at annex 1.

It was considered three independent variables measured by an ordinal ranking. The first one was a proxy for customer-relationship management: it was questioned if the dealer establishes goals based on “share of customer” (SOC) and to what extend the dealer provides specific training to the sales force based on customer-relationship concepts. The second variable indicated the application of financial management process such as the planning of working capital and the

decision based on financial reports (profitability, liquidity, financial leverage). The third proxy for human resource management indicated if the dealer compensates the sales force according to sales performance as a mechanism of incentive and to what extend the company provided training to their employees.

Three other variables were applied as control. Considering that the dealer size may influence the dependent variable, this effect was controlled by a size proxy, which was the number of employees. To account for context-differences in the Brazilian market, it was applied a dummy for dealers that are geographically located at "Cerrado". Considering that the previous' year margin may influence the gross revenue of the current year, it was addressed a specific control for this effect.

Table 1. Description and measures of all variables

Dependent Variable:	
Gross income	Measures the gross income from sells of crop protectant in Brazilian Real (BLR). Variable may have any positive value according to sales value.
Explanatory Variables:	
Customer relationship managerial (CRM)	Measures the existence of a set of CRM practices defined in our analysis and in what extend are those practices held. Grades may vary from 0 to 6 meaning "no CRM practices" to "fully application of practices", respectively.
Human resources practices (HRP)	Measures the existence of a set of human resources practices defined in our analysis and in what extend are those practices held. Grades may vary from 0 to 6 meaning "no human resources practices" to "fully application of practices", respectively.
Financial resource management (FRM)	Measures the existence of a set of financial management practices defined in our analysis and in what extend are those practices held. Grades may vary from 0 to 6 meaning "no financial management practices" to "fully application of practices", respectively.

Control variables:	
Region	Measured by a binary variable that represents whether the company is located in Cerrado's region (1) or not (0).
Net income lag	Correspond to the net income variation between the year of 2009 and 2010 (in percentage). Value may be a negative or positive value or even be equal zero is case of no changes in net income.
Acreage growth	Continuous variable representing total acreage growth in the state company is located. Variable may have negative or positive value or be equal zero. Negative and positive value represents reduction or growth, respectively, in total acreage area in the state in percentage. Zero represents no change in acreage area.
Employee number	Represents the number of employees working on the company. Variable may have any positive value directly related to the number of employees.

5. Results

We reported 5 models to support our research discussion based on 115 Brazilian agrichemical dealers (Annex 2). Before discussing the results on each independent variable of interest, it is worth to note an increase on the R-square from the first to the fifth estimation.

The first model accounted only for control variables. Three variables were statistically significant. The positive coefficient for size proxy (Employee number < 0.001) indicated a positive effect on gross revenue. At the same direction, it was found a positive effect of margin on previous year (Net income differential < 0.05) on gross revenue on the current year. "Region" variable was positive (< 0.05). This effect may be explained by the fact that farmers (the dealers' customer) at this region are much larger than farmers at the South-East or the South of Brazil (not in the "Cerrado" region).

The second estimation reported the result of CRM independent variable and the control variables. The proxy was statistically significant (<0.05). The positive coefficient indicated that

the establishment of goals based on "share of customer" (SOC) and the use of specific training on customer-relationship concepts contributed to more gross revenue. In fact, this positive effect was expected as the marketing theorists and practitioners advocate (Stone and Woodcok, 1998; Bretzke, 2000; Parvatiyar and Sheth, 2001; Valente, 2002; Peppers and Roger, 2003; Swift, 2004; Reinartz, 2004; Boulding, 2005; Kumar, 2008; Krasnikov et. al., 2009).

Model 3 presents the result of FRM independent variable and the control variables. Although it was expected a positive relationship of financial resource management to gross revenue, this variable was not statistically significant while the other control variables remained statistically significant.

The fourth model indicated that HRP independent variable was statistically significant (<0.05). The proxy for human resource practices indicated if the dealer compensates the sales force according to sales performance as a mechanism of incentive and to what extend the company provided training to their employees. All these processes explained gains in gross revenue, indicated by the positive coefficient of the human-resource management proxy. We corroborated previous works from Huselid (1995), Guest et. al.(2003) and Wright et. al. (2004).

Model 5 presents the complete model. To our surprise, FRM became statistically significant (<0.10), but negatively related to gross revenue. This result, although weakly significant, was not expected according to previous studies from Deloof (2001); Lazaridis & Tryfonidis (2006); Charatou, Elfani and Lois (2010). A dealer that plans its working capital and decides based on profitability, liquidity, and financial leverage-reports presented less gross revenue than a dealer that does not apply financial processes. One possible explanation is that financially prepared dealers are more profitability-oriented than revenue-oriented.

6. Conclusion

This paper shed light on the contributions of management processes to company performance. Moreover, it connects which process contributed to variation on company's gross revenue. In addition, this study provided empirical evidence from 115 Brazilian agrichemical dealers investigated in 2011. Considering the discussed results, companies may orient the establishment

of management processes and its related investments on human capital to support these processes.

Supplier companies should consider these results to adjust their relationship programs with agrichemical dealers. For instance, it was supported that the establishment of customer-relationship management and human-resource management processes enhanced the dealer's performance based on gross revenue. Indeed, results from financial management proxy suggested the use of additional performance measures besides the gross revenue metric. This is because the establishment of financial management processes harmed the gross revenue. One possible explanation, which this study was constrained to support, is that a financial-oriented decision may promote profit rather than gross revenue.

Even though this study overcame the challenge of collecting data from this sector, future studies should shed light on alternative performance measures to agrichemical dealers. Indeed, profitability measures are hard to access by several reasons; the overall one is the resistance to open this kind of information. However, it is worth to note that many agrichemical dealers face, by themselves, the challenge to identify and to make accountable reasonable performance measures due to changes on tax policy and on accountancy rules.

I this work due to statistical restrictions we were not able to apply causal analysis in our study. The causal analysis is important to check whether the implementation of managerial practices described above will cause a positive effect on agrichemicals sales. We strongly recommend further studies to investigate this topic.

This study provided straightforward recommendations to agrichemical dealers for better performance. Moreover, the establishment of a professional management may attract other opportunities for dealers. Recent movements of investors in Brazil open a window of opportunity to agrichemical dealers. For instance, it was already announced two acquisitions of Brazilian dealers by foreign investors. Indeed, this market operates also by internal consolidation on which one dealer acquires or merger with others. The attractiveness of a dealer certainly accounts for the geographical market, the strategic positioning and the level of professional management.

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Annex 1. Summary statistics and correlation

	Variable	Mean	Std. Dev.	Min.	Max.	1	2	3	4	5	6	7	8
1	Gross income	14,700,000	13,800,000	1,500,000	7,100,000	1.0000							
2	Customer relationship management (CRM)	3.628931	2.045537	0	6	0.2261* 0.0109	1.0000						
3	Financial resources management (FRM)	5.100629	1.186394	0	6	0.1262 0.1590	0.5501* 0.0000	1.0000					
4	Human resources practices (HRP)	3.918239	1.169055	0	6	0.3254* 0.0002	0.3419* 0.0000	0.5353* 0.0000	1.0000				
5	Employee number	59.58442	129.2231	4	1100	0.4942* 0.0000	0.1643* 0.0417	0.1785* 0.0268	0.2300* 0.0041	1.0000			
6	Region	0.2201258	0.4156404	0	1	0.1677 0.0606	-0.0522 0.5134	-0.1736* 0.0287	0.0503 0.5289	-0.1272 0.1159	1.0000		
7	Net income lag	15.34247	114.7611	-197	1150	0.1967* 0.0343	-0.0351 0.6738	0.0677 0.4166	0.1667* 0.0443	-0.0316 0.7087	0.1387 0.0950	1.0000	
8	Acreage Growth	0.1075949	4.395402	-18	10	0.0922 0.3046	-0.1164 0.1452	-0.1370 0.0861	0.0202 0.8014	-0.0568 0.4844	0.5643* 0.0000	0.1069 0.2008	1.0000

*P<0.05

Annex 2. Multiple regression estimations

Variables	Model 1 β (std. dev)	Model 2 β (std. dev)	Model 3 β (std. dev)	Model 4 β (std. dev)	Model 5 β (std. dev)
Customer relationship management (CRM)		1147939* (536750.8)			1417603* (617549)
Financial resource management (FRM)			155064 (949207.7)		-2319780† (1183802)
Human resources practices (HRP)				1958971* (949734.5)	2386816* (1087417)
Employee number	51293.74*** (7570.025)	48511.55*** (7562.691)	51085.28*** (7710.075)	47641.02*** (7667.761)	46526.15*** (7557.361)
Region	7388332* (2987172)	6733574* (2955694)	7399883* (3001309)	6598444* (2968741)	5444558† (2948796)
Net income lag	20860.39* (8612.023)	21335.43* (8478.384)	20713.97* (8696.685)	17206.35* 8670.291	19185.33* (8545.908)
Acreage Growth	-59626.45 (274247)	16313.84 (272223.2)	-55528.82 (276608)	9823.187 (272367)	57469.62 268300
Observations	115	115	115	115	115
R^2	0.3384	0.3651	0.3386	0.3633	0.3992

*** p<0.001, **p<0.01, *p<0.05, †<0.1