# Product and Marketing Innovation in Farm-Based Businesses: The Role of Entrepreneurial Orientation and Market Orientation

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## Abstract

Successful firms are able to meet changing consumer needs through adopting new products, services and unique marketing mixtures. Using structural equation modeling, we examined the role of entrepreneurial and market orientation on the effectiveness of new product sales and the utilization of marketing channels among farm-based businesses in Ontario, Canada. We also investigated the relationship between perceived environmental turbulence and the use of strategic resources. Findings show that Ontario agri-businesses who are entrepreneurial and market oriented are more likely to adopt new and/or significantly improved products and services while using multiple marketing channels. Furthermore, it was shown that environmental turbulence increases the degree of entrepreneurial and market orientation in these firms.

**Keywords:** entrepreneurial orientation, market orientation, new product sales, marketing channels, agribusinesses, farms

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## Introduction

There is a growing trend among innovative agricultural firms to differentiate their production and move away from the commodity markets (Hu, Batte, Woods and Ernst 2012). The growth of local and alternative markets signal an increased search for and use of marketing innovations (Beckie, Kennedy and Wittman 2012). However, as more firms become aware of the opportunities that are present in direct and alternative markets, the value due to the 'newness' of the innovation is attenuated and firms that continue to market their products through these channels will need to innovate in other ways. While the direction of innovative activity will depend on firm resources and the balancing of the risk with the opportunity, the type of innovation often falls into four broad categories: product, process, positioning, and organizational innovations (Baregheh, Rowley, Sambrook and Davies 2012). What resources must be developed within the firm to be successful in these environments? In these increasingly competitive market spaces, success may depend on the firm's ability to successfully scan the environment in search of new opportunities.

Within competitive markets, different firms may develop varied resources and employ diverse strategies in the search for profit (Alvarez and Busenitz 2001; Leiblein 2011). As a result, innovative and proactive firms may attempt to adopt new or significantly improved products and services through new product development processes. While large food processing firms may play a greater role in food product innovations, small and medium sized enterprises also devote time and other resources to the development of new products (Avermaete et al. 2003). Regardless of firm size, recent research has shown that market oriented food firms have greater levels of success in new food product development (Gellynck et al. 2012; Johnson, Dibrell, and Hansen 2009). The search for new opportunities and the subsequent development of new products suggests that an entrepreneurial orientation may also contribute to innovation success (Ireland, Hitt and Sirmon 2003; Webb et al. 2010) The successful introduction of new products into competitive markets may lead to greater profitability for innovative firms. By responding to market information on perceived customer needs, innovative and proactive firms are able to develop new products or marketing methods as a means of improving firm performance through new sales growth.

The purpose of this paper is to examine how market awareness along with firm proactiveness and innovativeness, measured using previously tested measurement scales, effect the amount of sales generated by new products and the number of outlets through which production is marketed. Using a structural equation model and data from a 2013 survey of farmers in Ontario, this paper examines the importance of a market orientation and entrepreneurial orientation for firms utilizing direct and alternative methods to market agricultural production. As markets evolve to meet the changing tastes and preferences of consumers, the type of resources necessary to profit in these highly competitive markets may change as well. One form this change may take is for competitive markets, to become more highly localized, therefore being able to anticipate trends in the market may be a valuable resource for firms hoping to develop customer loyalty and increased sales. The nature of competition in local markets may also differ, and may be more about quality and cooperation than price (Bloom and Hinrichs 2010; Wilhelmina et al. 2010). This change may provide agricultural firms with the opportunity to improve performance as research has shown that in other industries, firms that are aware of opportunities and are able to

respond to these opportunities have better performance outcomes (Rauch et al. 2009; Renko, Carsrud, and Brännback 2009).

However, research about how awareness and responsiveness factor into firm-level decisions within an agri-food context to inform industry and policy makers has thus far been limited. This paper examines how a market orientation and an entrepreneurial orientation effect new product development success, measured as a percent of sales from new products, and the number of marketing channels utilized by direct and alternative marketers in Ontario. Few studies have examined the effects of an entrepreneurial orientation and a market orientation on innovation success concurrently. Notable exemplars from outside agriculture are Baker and Sinkula (2009) and Hong, Song and Yoo (2013). McElwee and Bosworth (2010) note, the innovation process for agricultural firms is quite different from that of larger industrial firms. Consequently, this research provides valuable insight to the factors associated with innovation success for food product firms. Moreover, we account for environmental turbulence, as well as the degree of perceived competition and firm size, on the relationship between a market orientation and an entrepreneurial orientation on firm-level innovation.

In our results, we find that firms that scan the market for opportunities and who are proactive and innovative earn a greater percentage of sales from new products. Moreover, the results of our model show that market oriented, proactive and innovative firms are more likely to market their production through a wider array of marketing channels, and that this result is moderated by firm size. The perceived level of competition (as measured by the number of close competitors) is not found to moderate any of the hypothesized relationships. These findings are important as an increasing number of innovative and entrepreneurial farm businesses are operating outside of the traditional commodity framework. Within such markets, a market orientation is a powerful resource as it enables the firm to become aware of opportunities to provide superior value for consumers.

This paper will be presented as follows. First, we review the literature on product and marketing innovations as well as on firm orientation towards strategic decision-makings (entrepreneurial orientation and market orientation). Second, we develop a conceptual model to show the relationships between strategic orientations (entrepreneurial orientation or market orientation), perceived environmental turbulence, the number of close competitors, the number of marketing channels and the degree of improvement in NPS (new product sales). Hypotheses are presented for each relationship. Third, we explain the research methodology and the results of the path analysis, and finally we discuss our findings. We finish by suggesting some managerial implications and directions for future research.

## Literature Review and Model Development

The search for new opportunities is often the result of a need for the manager to improve performance relative to prior outcomes (Levinthal and March 1993). Within agricultural production, this search often leads to new processes by which the same output is produced more efficiently (Bultena and Hoiberg 1983; Diederen, Meijl, and Wolters 2003; Tepic et al. 2012) or to the development of new products or markets (Boehlje, Gray, and Detre 2005; Brandth and Haugen 2011; Vogel 2012). For farmers in Ontario, the growth in interest in local production

(even if it is unverified) (Dodds et al. 2013; Smithers, Lamarche, and Joseph 2008) provides an opportunity for farmers to take advantage of in direct and alternative marketing channels to improve performance. If more producers develop methods to meet the needs of this segment of consumers, firms may no longer be able to rely on the value of the newness of the purchase experience to create differentiated space between themselves and rival firms. If this occurs, farm businesses may need to further differentiate their production from other vendors who participate in direct and alternative markets (Adams and Salois 2010; Bond et al. 2008).

As marketing environments for agricultural products evolve, firms who hope to outperform rivals—or even to meet their own aspiration levels—must continue to adapt in order to successfully navigate the competitive landscape. This second level of innovation (the first level being the choice to sell production via direct and alternative markets) may require a higher degree of information than the initial innovation. As this type of change seeks to set one's production apart from other producers operating in similar markets, this likely entails some form of innovation, which may include product or process innovations (Oke, Burke and Myers 2007). Research has shown that innovation success is a function of customer awareness (Ngo and O'Cass 2012) and proactiveness (Narver, Slater and Maclachlan 2004) and that radical innovation is positively related to expected future performance (Verhees, Meulenberg and Pennings 2010). More recently, Hong, Song, and Yoo (2013) find that market oriented and entrepreneurial firms in manufacturing and IT sectors have higher success rates in terms of new product development. In the following sections, we review the literature on the factors found to lead to greater success in product and marketing innovations and develop several hypotheses to test the relationships between these factors and innovation success within a sample of Ontario farm businesses utilizing direct and alternative marketing channels.

*Entrepreneurial Orientation*

Previous researchers have classified entrepreneurial firms as those who are proactive, innovative, and willing to take risks (Covin and Slevin 1989; Wiklund 1999). Similarly, Miller stated that entrepreneurial firms are those that "…engages in product market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch" (Miller 1983, 771). While there remains a debate as to whether an entrepreneurial orientation is a reflection of firm behavior or an attitude of the manager (Miller 2011), several research studies have shown that firms with an entrepreneurial orientation do have better performance outcomes (Grande, Madsen and Borch 2011; Naldi et al. 2007; Rauch et al. 2009).

When searching for new areas in which to compete, firms who have a more developed entrepreneurial orientation may more quickly and more accurately scan the environment for new opportunities (Lumpkin and Dess 2001). Recent work using data from Spain shows that proactivity and risk taking are positively related to the number of new ideas generated from inside the firm, but not to the adoption of existing innovations (Pérez-Luño, Wiklund and Cabrera 2011). Research has also shown an entrepreneurial orientation may be an effective structure for new product development in agribusinesses (Martinez and Poole 2004). Within competitive markets—such as local farmers markets—proactive and aggressive postures may lead to greater success in new product marketing (Engelen et al. 2014).

However, ownership structure may play a role in the nature and degree of risks that firms are willing to take.  Research has shown that family-owned firms with an entrepreneurial orientation that take on risks do so with negative performance outcomes as a result (Naldi et al. 2007).  In other contexts, however, entrepreneurial firms that are willing to take risk are more successful in new product development (Busenitz and Barney 1997). Research has also shown that entrepreneurially oriented firms tend to use marketing functions differently than less entrepreneurial firms (Morris, Schindehutte and LaForge 2002). In general, when facing dynamic environments, firms develop a broad range of new products and utilize marketing tools and procedures that are more customized to the relevant market (Morris et al. 2002).

The concept of an entrepreneurial orientation may be highly applicable to direct marketers of agricultural products.  While farms that sell their production through direct and alternative markets have differentiated their production from traditional production, they also must compete with other direct marketers.  One method of competition is through the development of new products (Guthrie et al. 2006).  Proactive firms may be more inclined to develop new products to differentiate themselves from other sellers in a particular market.  Similar to other industries, success in the development of new products among direct and alternative markets is not guaranteed.  Extant research shows that there is a positive correlation between entrepreneurial orientation and new product development success (Busenitz and Barney 1997; Drucker 1984; Pérez-Luño et al. 2011).

Previous research has indicated three fundamental characteristics of entrepreneurial oriented firms, including innovativeness, risk taking, proactiveness (Covin and Slevin 1989; Miller 2011; Rauch et al. 2009).  Although these dimensions may lead to different innovative outcomes and could be modeled as individual components (Miller 2011), a synergic combination of these factors can lead to new ideas (Lumpkin and Dess 1996). Therefore, in this research, we have defined entrepreneurial firms as ones who are innovative, proactive and willing to take on risk.  Based on the review of the literature, we propose:

> **H1.** *An increase in entrepreneurial orientation leads to higher levels of new product sales for Ontario farmers.*

> **H2.** *An increase in entrepreneurial orientation leads to an increase in the number of marketing channels used by Ontario farmers.*

*Market Orientation*

Two distinct streams emerge when reviewing the market orientation concept. A market orientation has been defined as both a behavioral function (Jaworski and Kohli 1993) and an organizational culture of the firm (Slater and Narver 1995).  Jaworski and Kohli (1993) define a market orientation as those actions within the firm that lead to the generation and dissemination of market intelligence related to customers' needs—either their present or future needs—by all departments of the organization and the firm's responsiveness to this information.  Those that view a market orientation as an organizational culture (i.e. Slater and Narver 1995) suggest that market oriented firms foster an environment within the firm that leads to suitable actions in order to create superior value for the customers and consequently, better performance of the firm. Within Narver and Slater's (1990) definition of a market orientation is the focus of customer

needs as well as competitor responses to the perceived needs of the market. Common within these somewhat divergent definitions is the focus on the customer and the needs that the firm could meet through their product offerings.

Innovation-based entrepreneurship, which is focused on novel marketing procedures and new product development, has been used to explain firm performance in localized markets (Bloom and Hinrichs 2010). For example, existing research shows a significant relationship between market oriented firms and the degree of their success in new product development (Carbonell and Rodriguez Escudero 2010; Cheng and Krumwiede 2012; Im and Workman Jr. 2004; Narver et al. 2004). For firms who are seeking to create new products, which may help differentiate their offerings from competing firms, a market orientation has been shown to have a positive effect on new product development as it enables and allows firm to become acutely aware of customer needs and the opportunities that are present in the market (Hurley and Hult 1998). Market oriented firms are more efficient in the new product development process because they are able to more accurately and quickly realize the present (and future) needs of customers. This knowledge may lead to greater effectiveness for proactive firms using explorative learning to discover opportunities for new products (Yannopoulos, Auh and Menguc 2012).

As in many industries, firms can either proactively seek out new areas for improvement, or they may react to first-movers who have previously identified the opportunity. The decision to proactively seek out new opportunities or to react to market changes (or even to do nothing at all) depends on the priorities of the firm and there will likely be firms that fall within all of these categories in many industries. For example, Johnson et al. (2011) find that food processing firms cluster around three divergent ideas: small but differentiated firms, lifestyle firms, and large, aggressive firms that focus on costs. Firms operating in direct and alternative markets would likely fall within the first two of Johnson et al.'s (2011) clusters. For these firms, proactively seeking out market needs and developing products to meet these needs may lead to greater success as this has been shown to lead to higher levels of new product success across a variety of industrial classifications (Narver et al. 2004). More recently, Hong, Song, and Yoo (2013) found that a market orientation has a significantly positive effect on the effectiveness of the development and marketing of new products within manufacturing and IT sectors in Korea.

Research has also shown that a market orientation be an important resource for agricultural firms. For example Gellynck et al. (2012) find that small and medium sized enterprises in traditional food markets with a more highly developed market orientation invest in product improvements and seek out new markets. Grunert et al. (2010) find that decision makers operating in more competitive environments are more market oriented, likely as a competitive response to meet the divergent needs of their customers. However, Johnson, Dibrell, and Hansen (2009) find that a market orientation only lead to improved performance through the relationship between interfunctional coordination and innovation.

While some firms may be more market oriented than others, the concept of a market orientation applies to all firms regardless of the industry in which they operate. Agricultural firms, especially those who operate in direct and alternative markets, need to be aware of current and future needs of customers as well as the means by which current and future competitors could meet these needs. As a result, it will be beneficial to consider the concept of a market orientation as a

continuum rather than just the presence or absence of it in a firm (Kohli and Jaworski 1990). Based on our review of the literature and the definition of a market orientation, we believe that there should be a direct relationship between market orientation and new product sales. Therefore, our third and fourth hypotheses state that:

> **H3.** *An increase in the market orientation of firms will be associated with higher levels of new product sales.*

> **H4.** *An increase in the market orientation of firms will be associated with the number of marketing channels used by Ontario farm businesses.*

*Environmental Turbulence*

Environmental turbulence refers to competitive uncertainties stemming from the environment, specifically as it relates to new customers, new competitors, and new technologies (Jaworski and Kohli 1993). Previous research has shown that within more stable environments, firms that are more reactionary (and therefore less proactive) may outperform those who continue to search for new opportunities (Covin and Slevin 1989). Within environments characterized by higher levels of turbulence, research has shown that bold actions by managers are needed to meet the changing needs of customers (Calantone, Garcia, and Dröge 2003). Achrol (1991) suggests that firms operating in dynamic and segmented markets may utilize a high degree of product innovation in order to quickly find products that meet the current needs of the market.

It has been suggested that greater levels of uncertainties in the environment require a more entrepreneurial posture in order to overcome environmental ambiguities (Achrol, 1991; Covin and Slevin, 1989). Previous research has shown there is a strong direct relationship between environmental turbulence and entrepreneurship (Davis, Morris, and Allen 1991; Engelen et al. 2014). Within turbulent environments, firms with a more proactive posture may see improved performance due to their ability to proactively scan for and respond to new opportunities (Engelen et al. 2014). It has been suggested that an entrepreneurial orientation is essential for businesses which operate in uncertain environments because there are several abnormal situations in these environments and an entrepreneurial posture enables the firm to be more effective in these situations (Miller 1983). Droge, Calantone, and Harmancioglu (2008, 275) suggest that "a proactive orientation may be more necessary for success in highly competitive, hostile markets than in markets where competition is weak." Conversely, in less competitive environments, a defensive posture may lead to greater performance.

A market orientation may also be more important in turbulent environments (Menguc and Auh 2006). Even within turbulent environments, market oriented firms are able to better manage existing environmental uncertainty through their ability to identify and respond to changing needs of the market (Jaworski and Kohli 1993). Perhaps as a result of this capability of market oriented firms (Day 1994), research has found a strong relationship between environmental turbulence and market orientation (Langerak 2003; Ottesen and Grønhaug 2004). These results suggest a strong relationship between environmental turbulence and entrepreneurial and market orientation. Thus, we propose the following hypotheses:

> **H5:** *An increase in perceived environmental turbulence leads to higher levels of entrepreneurial orientation among Ontario farmers.*
>
> **H6:** *An increase in perceived environmental turbulence leads to higher levels of market orientation among Ontario farmers.*

Based on the hypotheses mentioned above, we propose an investigation of the following model. In this model, environmental turbulence is seen as a key factor in determining the need for firms to develop a market orientation or an entrepreneurial posture (Covin and Slevin 1989). In addition, it has been assumed that firms which have two strategic resources—entrepreneurial orientation and market orientation—will perform better in new product sales and utilize a larger number of marketing channels. Figure displays the conceptual model of our study.
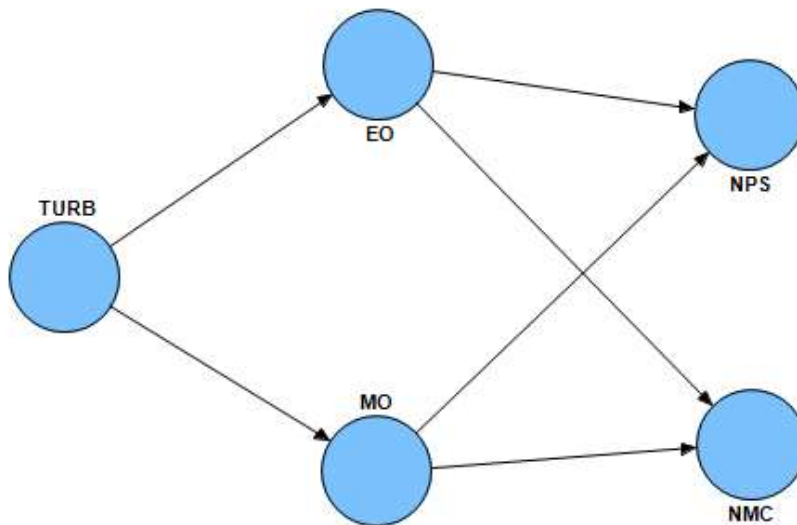


**Figure 1.** Conceptual Model

## Research Methodology

*Sample and Data Collection*

A survey of farmers in Ontario was conducted in 2013 in order to gather information on alternative marketing strategies and farm performance. The questionnaire was developed in consultation with members from Agriculture and Agri-Food Canada and was administered by IPSOS Agriculture and Animal Health in April and May of 2013. IPSOS was contracted to deliver 400 completed responses from their proprietary list of farmers in Ontario. In order to compensate producers for their time, respondents were paid $20 to complete the survey, with payment administered by IPSOS Agriculture and Animal Health.

Along with questions on farm and farmer characteristics (size, years in operation, education, etc.) the questionnaire asked respondents to provide information on the types of products produced and the amount of production marketed through various channels. Additionally, the respondents were asked to respond to several multi-item Likert and rating scales which measured their level of market orientation, entrepreneurial orientation, and environmental turbulence. These scales, while initially developed to examine similar issues in different industries, were modified to fit an agricultural audience.

Table 1 shows detailed descriptive information of respondents based on their annual gross sales. All respondents representing a farm operation with at least $10,000 annual gross sales qualified to participate. This excluded almost twenty-four percent of Ontario farms from participation but included farms whose operators have at least the intention to generate a significant share of household income from farming. The distribution of respondents across sales brackets is shown below, along with the shares from the farm census, only including operations with annual sales of $10,000 or higher. In addition, firms' ownership structure is provided in Table 1. We assumed five different types of ownership plus an additional category including any other possible types of ownership structure they might have. The table represents a total of 405 respondents, which includes both direct and indirect marketing Ontario farm businesses. We conducted our model based on 151 of respondents which were involved in direct marketing in order to sale their products.

**Table 1.** Profile of responding agri-businesses in Ontario, Canada

| Characteristics of respondents | Percentage of full sample (%) – 405 firms | Percentage of direct marketers (%) – 151 firms |
|---|---|---|
| **Annual Gross Sales** | | |
| $10,000 to $24,999 | 15.3 | 24.5 |
| $25,000 to $49,999 | 13.1 | 15.9 |
| $50,000 to $99,999 | 10.9 | 13.2 |
| $100,000 to $249,999 | 18.3 | 17.9 |
| $250,000 to $499,999 | 16.3 | 13.2 |
| $500,000 to $999,999 | 12.8 | 4.6 |
| $1 million and over | 13.3 | 10.6 |
| **Ownership Structure** | | |
| Sole Proprietorship | 38.8 | 39.1 |
| Family-owned corporation or Ltd. company | 33.1 | 27.2 |
| Partnership with a written agreement | 7.9 | 9.3 |
| Partnership without a written agreement | 18.0 | 22.5 |
| Corporation with non-family investors | 1.0 | 1.3 |
| Other (e.g., joint venture, trust) | 1.2 | 0.7 |

*Measurements*

All multi-item measures were based on 7-point Likert scales, from 1 (strongly disagree) to 7 (strongly agree). All of the scales that we have used in our study were adapted from the extant literature. The adaptation contained subtle changes which make that more applicable to farm businesses in Ontario, Canada. The reliability of the scales is investigated by calculating composite reliability and Cronbach's alpha measures. Moreover, convergent and discriminant validity is investigated using the Fornell and Larcker (1981) methodology on AVE (average variance extracted) of latent variables.

*Entrepreneurial Orientation (EO)*

Based on the actual conditions farm businesses are facing in Ontario, we utilized an eight-item semantic differentiation scale which was developed by Covin and Slevin (1989) to measure entrepreneurial orientation (EO) of the firm. This scale examines managerial proactiveness, innovativeness, and competitive aggressiveness. The EO scale has a relatively high coefficient alpha and the items all have high item-to-total correlations (all above 0.45). The questions are presented in Appendix. This scale has been used in prior studies in order to capture the degree of entrepreneurial orientation in a firm and/or organization (Hansen et al. 2011; Wiklund and Shepherd 2005).

*Market Orientation (MO)*

The market orientation of the farm businesses was measured using a scale which had been developed by Narver and Slater (1990). The scale measures the importance of customers and competitors in the search for opportunities. On average, respondents tended to agree with the measurement items. The scale has a high coefficient alpha and the item-to-total correlations (all above 0.40), which indicates that the majority of the variance is attributed to the scale itself, not random error. The questions are presented in detail in the Appendix. This scale has also been used in previous studies as a measurement tool of the level of market orientation of firms (Hong et al. 2013; Johnson et al. 2009).

*Perceived Environmental Turbulence (TURB)*

The perceived level of environmental turbulence is measured using a scale first developed by Jaworski and Kohli (1993). This scale addresses perceived changes in customers, competitors, and technology. Overall, the scale exhibits good composite reliability of 0.79, whereas the recommended cut-off is 0.70. The questions are presented in the Appendix. This scale, and its revisions, have been used frequently in other studies to predict environmental turbulence and its dimensions (Calantone et al. 2003; Slater and Narver 1994).

*New Product Sales (NPS)*

Effectiveness in new product development depends on a new products' share in total gross sales of the firm. Hence, we assumed that effectiveness of new product developments will be reflected eventually in total sales of the firm. As a result, we asked respondents about the percentage of their total gross sales which has originated from new and/or significantly improved products and services that had been introduced in 2010 or later. Given the range, we categorized the responses into five categories (NPS<=5%; 6%<=NPS<=15%; 16<=NPS<=30%; 31%<=NPS<=50%; NPS>=50%). Descriptive statistics for NPS is represented in the Results and Discussion section. NPS was a numerical variable, hence, it was standardized by using the Z-Score technique. We use the standardized new product sales, ZNPS, as an indicator of the NPS variable. By this way, we could measure the level of effective new product sales in our sample agri-businesses.

*Number of Marketing Channels (NMC)*

Respondents were asked about the number of marketing channels they have used to sell their final products—either direct or indirect. In order to simplify the model, we have assumed that farm businesses that use various marketing channels are more likely to create a unique and novel marketing mix. Since NMC was a numerical variable, it was standardized using the Z-Score technique. The standardized number of marketing channels, ZNMC, is used as an indicator of NMC construct.

*Scale Reliability and Validity*

## Construct Reliability

Internal consistency refers to the correlation between a construct and its indicators. As a basic rule, a reliable construct should be highly correlated with its indicators. Cronbach's alpha is the main indicator which determines internal consistency. Basically, Cronbach's alpha values or a composite reliability value of 0.70 or higher are considered adequate (Cronbach 1951; Nunnally 1978). We used both composite reliability and Cronbach's alpha to investigate the scales' reliability.

Table 2 below shows Cronbach's alpha values and composite reliability of all factors were above 0.70. As a result, we assume that our constructs are internally consistent.

**Table 2.** Constructs' reliability indicators (Cronbach's alpha and composite reliability)

| Latent Variables | Composite Reliability | Cronbach's Alpha |
|---|---|---|
| Entrepreneurial Orientation | 0.87 | 0.84 |
| Market Orientation | 0.95 | 0.94 |
| Number of Close Competitors | 1.00 | 1.00 |
| Number of Marketing Channels | 1.00 | 1.00 |
| New Product Sales | 1.00 | 1.00 |
| Perceived Environmental Turbulence | 0.78 | 0.68 |

*Construct Validity*

Construct validity refers to the degree that indicators measure the related construct (Churchill, Jr. 1979; Mackenzie, Podsakoff, and Podsakoff 2011). Generally, we should consider two different types of validity: convergent validity and discriminate validity (Bryant 2000; Clark and Watson 1995). Both types of scale validity were examined using Smart-PLS[1] (Ringle, Wende, and Will 2005).

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[1] We used Partial Least Squares technique to conduct a structural equation modelling (PLS-SEM). Comparing to covariance-based SEM, PLS-SEM allows us to work with small samples and it also works well with non-normal data (Joseph F. Hair, Sarstedt, Pieper, & Ringle 2012).

  

*Convergent Validity*

Convergent validity refers to the degree of correlation between a latent variable and its indicators (observed variables). Hulland (1999) suggested that if the average variance extracted (AVE) for a construct is greater than 40 percent, it means that the convergent validity of a construct is at a satisfactory level. In other words, selected indicators for a construct should cover at least 40 percent of its variance to measure the construct properly. Therefore, the cut-off value of AVE in our research was 0.4.

Table 3 below shows the AVE value of the constructs in our research. The calculated AVE for three variables, including the number of close competitors, number of marketing channels, and new product sales, is 1. The reason is the aforementioned variables are not latent constructs, but rather numerical items which have been created to measure the corresponding variables.

*Discriminant Validity*

Fornell and Larcker (1981) depicted that discriminant validity refers to how well a construct correlates highly with its indicators rather than other constructs. In other words, there should be minimal overlap between constructs which would indicate that each construct measures a singular concept. Fornell and Larcker (1981) indicate that discriminant validity will be acceptable when the square root of average variance extracted for a construct is higher than its correlations with all other constructs. Table 4 below compares square root of AVE for each construct with the correlation between constructs in our research. It shows that the latent variables under consideration here have acceptable levels of discriminant validity. Note that diagonal elements show the square root of AVE for latent variables.

**Table 3.** Average variance extracted of constructs

| Latent Variables | AVE |
|---|---|
| Entrepreneurial Orientation | 0.51 |
| Market Orientation | 0.58 |
| Perceived Environmental Turbulence | 0.42 |
| Number of Close Competitors | 1.00 |
| Number of Marketing Channels | 1.00 |
| New Product Sales | 1.00 |

**Table 4.** Discriminant Validity of Constructs

|  | EO | MO | TURB | NCC | NMC | NPS |
|---|---|---|---|---|---|---|
| EO | **0.72** | | | | | |
| MO | 0.31 | **0.76** | | | | |
| TURB | 0.53 | 0.29 | **0.66** | | | |
| NCC | 0.13 | 0.15 | 0.11 | **1.00** | | |
| NMC | 0.30 | 0.35 | 0.19 | 0.04 | **1.00** | |
| NPS | 0.26 | 0.26 | 0.28 | 0.11 | 0.24 | **1.00** |

**Note.** Diagonal displays square root of AVE, off diagonals are correlations.

## Estimation Method

Structural Equation Modelling (SEM) is used to estimate the suggested conceptual framework that is represented in Figure . SEMs are causal modelling approaches in theory examination which allow for testing causal effects among both latent and measured variables. There are two types of SEMs: covariance-based structural equation models (CB-SEM), and partial least squares structural equation models (PLS-SEM). While both are used to test causal relationships and test theory, they are different based on their statistical viewpoint, the way they approach to the final solution, and the assumptions they make (Hair, Ringle, and Sarstedt 2011). CB-SEM attempts to reproduce the variance-covariance matrix among measured variables in a way that the difference between actual and modelled variance-covariance matrices is minimized. On the other hand, PLS-SEM tries to minimize the residual of endogenous variables' variances (Hair et al. 2011) provided the fact that in SEMs (in both types) researchers attempt to explain endogenous variables' variances and estimate exogenous variables' variances. Generally, when compared to CB-SEM, PLS-SEM is less restrictive with regard to the assumptions of normality of distributions, minimum sample size, and maximum model complexity (Hair et al. 2011).

Using non-experimental data, it is likely that underlying assumptions of CB-SEM are violated. In this study, testing the normality for some of our measured variables e.g. number of close competitors and number of marketing channels showed that they are not distributed normally. Moreover, our sample size is small comparing to the number of estimating parameters[2] and it does not meet the minimum criteria to conduct CB-SEM. Therefore, we conducted PLS-SEM which is an alternative method and leads to more accurate results when these assumptions are violated. Unlike covariance-based structural equation models, there is no model-based goodness of fit measure for PLS structural equation models (Hair et al. 2011; Henseler and Sarstedt 2013).

## Results

*Descriptive Statistics*

Table 5 shows the distribution of direct marketing respondents based on the share of their total gross sales that originated from their new or significantly improved products. Based on these results, it seems that most of our sample businesses generate a majority of their sales from the marketing of existing products. However, a significant proportion—almost twenty percent—generates more than 16% of their sales from new products.

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[2] As a rule of thumb, minimum number of respondents required for CB-SEM is the number of estimating parameters multiplying by 10.

**Table 5.** Descriptive statistics for NPS during 2012 among direct marketers

|  | **Frequency** | **Percent** | **Valid Percent** | **Cumulative Percent** |
|---|---|---|---|---|
| Missing Data | 49 | 32.5 | 32.5 | 32.5 |
| 5% or less | 28 | 18.5 | 18.5 | 51.0 |
| 6% to 15% | 42 | 27.8 | 27.8 | 78.8 |
| 16% to 30% | 23 | 15.2 | 15.2 | 94.0 |
| 31% to 50% | 4 | 2.6 | 2.6 | 96.7 |
| 51% or more | 5 | 3.3 | 3.3 | 100.0 |
| Total | 151 | 100.0 | 100.0 | |

Secondly, we have categorized marketing channels in which our respondents sell their products into two categories: direct marketing and indirect (alternative) marketing. In total, 151 respondents were involved in direct consumer marketing (on-farm market, roadside stand, farmers' market, CSA, online store, informal farm gate selling, delivery service, etc.).

*Hypotheses Tests*

A path analysis of the conceptual model presented in Figure  was conducted using Smart PLS (Ringle et al. 2005).  Table 6 presents the test results for each hypotheses at the 95% confidence level ($\alpha = 0.05$). At this level, we have accepted only those hypothesizes for which t-values are greater than 1.96. Hence, six of seven proposed propositions are statistically significant. Figure 2 shows the final tested model along with the coefficients for each proposed relationships.

**Table 6.** Results of hypotheses tests

| **Hypothesis** | **Path** | **Coefficient** | **T-Value** | **Standard Error** | **Result** |
|---|---|---|---|---|---|
| **H**1 | EO → NPS | 0.203 | 2.249 | 0.090 | Supported |
| **H**2 | EO → NMC | 0.215 | 2.174 | 0.099 | Supported |
| **H**3 | MO → NPS | 0.194 | 2.025 | 0.096 | Supported |
| **H**4 | MO → NMC | 0.286 | 3.488 | 0.082 | Supported |
| **H**5 | TURB → EO | 0.528 | 7.870 | 0.067 | Supported |
| **H**6 | TRUB → MO | 0.291 | 2.770 | 0.105 | Supported |

**R-squared Values:** EO = 0.279; MO = 0.084; NMC = 0.166; NPS = 0.103
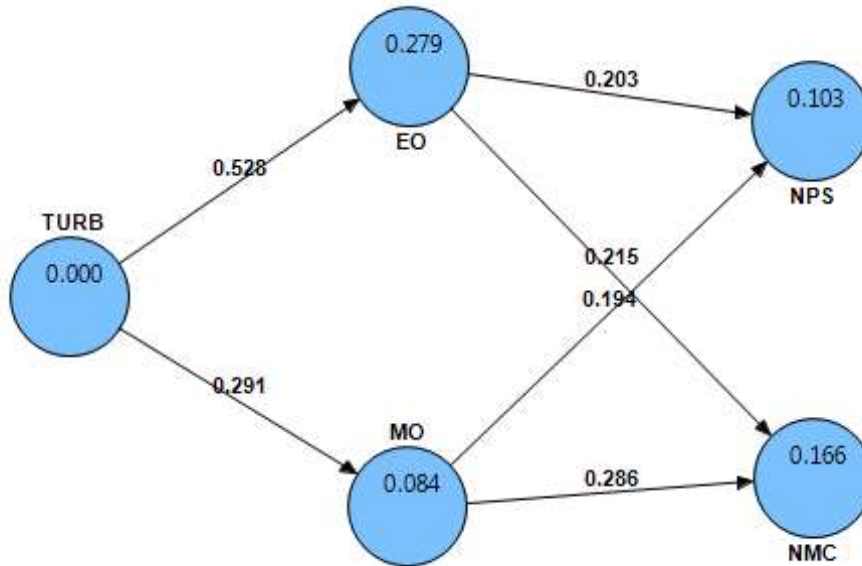
**Figure 2.** Final Tested Model

*Entrepreneurial Orientation, New Product Sales, and Number of Marketing Channels*

The first two hypothesizes predicted a positive relationship between entrepreneurial orientation and new product sales and also between entrepreneurial orientation and the number of marketing channels. The results of the path analysis (Table 6) support our first hypothesis (H1) at the 95% confidence level. Hence, the entrepreneurial orientation of a firm has a positive effect on its growth in new product sales (0.20, t-value > 1.96). This result can be interpreted as a one-unit increase in the EO latent factor would lead to a 0.20 standard deviation increase in the NPS variable. H2 is supported as well. (0.21, t-value > 1.96). Here, a one-unit increase in the EO factor score would correspond to a 0.21 standard deviation increase in the number of marketing channels used by the farm business.[3]

*Market Orientation, New Product Sales, and Number of Marketing Channels*

Hypotheses 3 and 4 predicted a positive relationship between market orientation and new product sales and also between market orientation and the number of marketing channels. Based on Table 6, there is a significant positive relationship between a firm's market orientation and growth in new product sales (0.19, t-value > 1.96). It means more market orientated firms have greater levels of new product sales as measured through the percentage of sales generated through new products. Here, the estimate of 0.19 would mean a one-unit increase in the MO factor score would mean a 0.19 standard deviation increase in new product sales by the farm business. [4] Therefore, H3 is supported. Furthermore, as we expected, there is a positive

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[3] As the NPS variable is a Z-score, a parameter estimate of 1 would be interpreted as such: a one-unit change in the latent variable would be associated with an increase in NPS equal to one standard deviation from the mean. An estimate of 2 would correspond to a two standard deviation increase from the mean.
[4] Other estimates on paths to NPS and NMC can be interpreted similarly.

significant relationship between market orientation and utilizing number of marketing channels (0.29, T-Value > 1.96). Again, here a one-unit change in the MO factor would lead to a 0.29 standard deviation change in the NMC score.

*Perceived Environmental Turbulence, Entrepreneurial Orientation, and Market Orientation*

Based on Table 6, perceived environmental turbulence was found to be positively related to the entrepreneurial orientation of the firm. Hence, H5 is supported (0.53, t-value > 1.96). Here, a one-unit increase in perceived turbulence would be associated with a 0.53 increase in the entrepreneurial orientation factor score. In addition, H6 is supported which means perceived environmental turbulence has a positive effect on firm's market orientation (0.30, t-value > 1.96). In this case, each one-unit increase in perceived turbulence would lead to an increase of 0.30 of the market orientation factor score.

**Additional Analysis**

We are also interested in examining how two moderating variables, the number of close competitors and the size of the firm, moderate the hypothesized relationships. The need for, and ability to develop, new products may be influenced by the nature of the competition and the resources available within the firm to carry out the proposed product and marketing changes. For firms in more benign environments, the need to develop new products may be limited as competition is less fierce.

*Number of Close Competitors (NCC)*

Agricultural markets may be highly localized. Based on several factors, including geography, some markets may be more highly contested than others. For firms within more highly contested markets, the need to develop new products and market their production through more outlets may be greater. Greater levels of competition might be considered as the reason of environmental turbulence (Tosi and Slocum 1984). While the perceived level of environmental turbulence may influence the need for a firm to be market oriented to develop an entrepreneurial posture, the number of close competitors within a specific market may moderate the level of sales from new products and the need to seek out additional channels.

Therefore, we examined how the number of perceived close competitors moderates the relationships between market orientation, entrepreneurial orientation, and product and marketing innovations. A multi-group analysis has been done to address the difference between agribusinesses which have less (or equal) than five close competitors and those which have more than five close competitors in output market. Tables 7 and 8 display the results of this analysis and show the difference between these two groups.

**Table 7.** Number of perceived close competitors in output markets

|  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| **NCC <= 5** | 90 | 59.6 | 59.6 | 59.6 |
| **NCC > 5** | 61 | 40.4 | 40.4 | 100.0 |
| **Total** | 151 | 100.0 | 100.0 |  |

**Table 8.** Multi-group analysis between farms with different number of close competitors

| | NCC <= 5 | | | NCC > 5 | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|
| **Path** | **Coefficient** | **T-Value** | **Result** | **Coefficient** | **T-Value** | **Result** | **t-statistic** | **P-Value** | **Statistically different** |
| EO → NPS | 0.126 | 1.186 | Not supported | 0.302 | 3.095 | Supported | 1.111 | 0.268 | YES |
| EO → NMC | 0.182 | 1.738 | Not supported | 0.261 | 2.753 | Supported | 0.555 | 0.580 | YES |
| MO → NPS | 0.237 | 2.338 | Supported | 0.090 | 0.932 | Not supported | 1.101 | 0.272 | YES |
| MO → NMC | 0.318 | 4.349 | Supported | 0.260 | 3.065 | Supported | 0.528 | 0.599 | NO |
| TURB → EO | 0.558 | 7.223 | Supported | 0.553 | 9.476 | Supported | 0.184 | 0.854 | NO |
| TRUB → MO | 0.351 | 3.133 | Supported | 0.200 | 1.981 | Supported | 0.747 | 0.456 | NO |

**R-squared Values:**
EO = 0.311; MO = 0.123;
NMC = 0.171; NPS = 0.091

**R-squared Values:**
EO = 0.306; MO = 0.040;
NMC = 0.175; NPS = 0.115

Based on the multiple group analysis, we find that firms who operate in markets where they perceive to have fewer competitors, the paths from EO to new product sales and the number of marketing channels used are no longer significant. This differs from the full model where these paths were found to be significantly different from zero. We also find that for firms in more competitive markets, the path from market orientation to new product sales is no longer significant. Further research is warranted, but this may indicate that these firms may feel that it is better to focus on producing a few 'tried and true' products very efficiently and effectively rather than to devote resources to new product development given the high failure rate that is seen other food markets (Khan et al. 2013).

*Firm Size*

It has been suggested that the nature and degree of innovative activity may vary across firm size (Rogers, 2004). Gronum et al. (2012) find evidence to suggest that innovative activity is positively associated with firm size. However, Uhlaner et al. (2013) show that firm size negatively moderates the development of product and process innovations in a sample of Dutch SMEs. It could be that larger firms may be better equipped in terms of financial and human resources to carry out new product development initiatives, but they may also lack the strategic flexibility to successfully undertake these initiatives.

Therefore, we examined how firm size moderates the relationships between market orientation, entrepreneurial orientation, and product and marketing innovations. A multi-group analysis was conducted to address the difference between agribusinesses which have less than $500,000 in sales and those that have greater than $500,000 in sales. Based on total gross sales in 2012 (Table 1), we categorized our sample of Ontario direct marketers (a total of 151) into two categories i.e. small and large firms. Due to this categorization, farms with total gross sales less than $500,000 in 2012 have been assumed as small farms and those with total gross sales more than $500,000 have been assumed as large farms. Table 9 displays some descriptive results.

Using a multi-group analysis, we investigated differences between small and large firms in terms of our proposed model in Figure 1. Table 10 records the results of the comparison between small and large farms.

**Table 9.** Farms' size categorization based on their total gross sales in 2012

|  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Total gross sales < $500,000 (Small firms) | 128 | 84.7 | 84.7 | 84.7 |
| Total gross sales >= $500,000 (Large firms) | 23 | 15.3 | 15.3 | 100.0 |
| Total | 151 | 100.0 | 100.0 |  |

**Table 10.** Multi-group analysis between small and large firms

| Hypothesis | Path | Small Firms | | | | Large Firms | | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coefficient | T-Value | Result | | Coefficient | T-Value | Result | | t-statistic | P-Value | Statistically different |
| H1 | EO → NPS | 0.226 | 2.305 | Supported | | 0.113 | 1.063 | Not supported | | 0.506 | 0.614 | YES |
| H2 | EO → NMC | 0.210 | 2.110 | Supported | | 0.200 | 1.941 | Not supported | | 0.027 | 0.979 | YES |
| H3 | MO → NPS | 0.245 | 2.547 | Supported | | -0.106 | 1.046 | Not supported | | 1.551 | 0.123 | YES |
| H4 | MO → NMC | 0.288 | 3.460 | Supported | | 0.303 | 4.116 | Supported | | 0.054 | 0.957 | NO |
| H5 | TURB → EO | 0.507 | 7.461 | Supported | | 0.564 | 10.089 | Supported | | 0.215 | 0.830 | NO |
| H6 | TRUB → MO | 0.304 | 2.575 | Supported | | 0.648 | 8.334 | Supported | | 1.227 | 0.222 | NO |

R-squared Values:
EO = 0.257; MO = 0.092;
NMC = 0.163; NPS = 0.144

R-squared Values:
EO = 0.317; MO = 0.420;
NMC = 0.187; NPS = 0.013

The results of the multiple group analysis show that firm size moderates the relationship between several of the proposed hypotheses. As firm size increases (as measured by sales) our results show that the importance of the relationship between an entrepreneurial orientation and new product sales decreases. For small firms the path coefficient is 0.226, while it is not significantly different from zero for large firms. A similar result is occurs when examining the relationship between an entrepreneurial orientation and the number of marketing channels utilized by respondents. A market orientation is shown to be a more important factor for determining new product sales for smaller firms compared to larger firms. Again, the coefficient for the path

model is not statistically different from zero for larger firms, but it is positive and significant for smaller firms.

These results may signal the need for strategic flexibility in terms of the search for new products and markets for smaller firms who are looking to find a defendable position in the market. Moreover, from the perspective of larger firms, it may be that their current levels of performance are enough to discourage additional investments in new products and new markets. It may also be that larger firms have already found the product space where they have some advantage over the competition (perhaps a local first mover advantage) and they now focus their resources on closing productivity gaps rather than searching for and exploiting opportunity gaps (Goldsmith and Gow 2005).

## Discussion

Our research examined the effect of two strategic resources, entrepreneurial orientation and market orientation, on the effectiveness of new product development (i.e. sales) and the use of multiple marketing procedures (i.e. marketing channels). Furthermore, we assumed that entrepreneurial orientation and market orientation will be influenced by perceived environmental turbulence. The results provide strong support for hypotheses in the conceptual model presented in Figure . Based on the path analysis, greater perceived turbulence in the business environment encourages firms to have a more entrepreneurial and market orientation.

Based on our results, an entrepreneurial orientation is shown to be positively associated with the share of NPS in total sales. This result is consistent with the research of Busenitz and Barney (1997), who found a significant relationship between entrepreneurial orientation and firm's success in new product development. Furthermore, Baker and Sinkula (2009) indicated that entrepreneurially oriented firms are more likely to use customized marketing techniques for their customers. This relationship has also been seen in our study of agribusinesses that use direct markets to sell their products.

It has been shown in our study that market orientation has effects on both NPS and on the number of marketing channels used. Current research has verified a positive relationship between market orientation and new product development (Carbonell and Rodriguez Escudero 2010; Martinez and Briz, 2000; Narver et al. 2004; Yannopoulos et al. 2012). Our analysis of Ontario farm businesses points to a similar result (assuming success in development would manifest itself through sales increases). In addition, we assumed that market and entrepreneurially oriented firms have two perspectives. First, they are involved in adopting novel and unique methods to reach their objectives. Secondly, they are highly involved with meeting market needs and preferences. Hence, we made the proposition that these firms are more likely to adopt a marketing mixture that is unique. As we expected, this hypothesis is supported. As a result, market orientation leads to using more marketing channels.

Our finding supports the notion that firms who perceive more turbulence in their market seem to develop more entrepreneurial postures (Covin and Slevin 1989; Miller 1983). Similarly, our findings show a positive and significant relationship between environmental turbulence and market orientation, which has also been found in previous work (Droge et al. 2008; Ottesen and

Grønhaug 2004). As markets continue to evolve, both within Ontario and across the globe, farm businesses looking to take advantage of this opportunity may benefit from the development of the market sensing resources and proactive behaviors within a market orientation and an entrepreneurial orientation.

*Limitations and Future Research*

This study has limitations which could be addressed in future research. First, we have considered the number of marketing channels as a set of various marketing channels in which Ontario farmers usually sell their products. The scale that we used for this construct was the number of marketing channels used by the respondent firms. Future researchers may use separate specific scales to measure the utilization of new marketing channels and procedures to account for both scale and importance to the farm business (and partner firm). Second, within the group analysis, we have considered a specific component of perceived environmental turbulence, the number of close competitors. However, generally there are three sources of environmental turbulence which are market turbulence, competition intensity, and technological turbulence (Droge et al. 2008). Future research may consider all three in order to get more extended results. It may also be beneficial to consider the moderation role of close competitors in this model.

## Conclusions

The purpose of this research was to investigate the importance of entrepreneurial orientation and market orientation as it relates to new product development effectiveness and the number of marketing channels used within the agri-food industry in Ontario, Canada. Using a PLS structural equation model and data from a 2013 survey of Ontario farm businesses, our findings support previous research which found that entrepreneurial and market-oriented firms are more likely to use new or significantly improved products and new marketing mixes (Cheng and Krumwiede 2012; Hong et al. 2013; Hurley and Hult 1998; Slater and Narver 1994). These findings will be important as an increasing number of innovative and entrepreneurial agricultural firms are operating outside of the traditional commodity framework. Within such markets, a market orientation is a valuable resource as it may enable the firm to become aware of opportunities to provide superior value for consumers. Additionally, we have considered the role of entrepreneurial and market orientation simultaneously, a useful contribution to the market orientation and entrepreneurial orientation literatures.

Overall, our research shows that an entrepreneurially oriented firm is more likely to be successful in new product sales. For farm businesses operating close to large population centers or other important markets, farm managers may see a benefit from the market scanning capabilities within a market orientation and the proactive and innovative posture within an entrepreneurial orientation. From the research results, firms should know that if they work in highly competitive environments, it may helpful to be proactive with respect to developing new products that meet perceived needs of the market. If competition within this segment of the industry increases (at the local level), the value of the market sensing capability and the proactive approach to competition may be more crucial.

## Acknowledgments

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# Appendix

*Entrepreneurial Orientation (EO) Measurement*

The entrepreneurial orientation (EO) of the firm is measured using an eight-item scale developed by Covin and Slevin (1998). This scale examines managerial proactiveness, innovativeness, and competitive aggressiveness.

Please indicate which of the following paired statements you agree more with. For example, if you fully agree with the one on the right, select '7'. If you are indifferent between the two, select '4'. If you agree more with the one on the left but not fully, you could select '2' or '3'. Again you will also notice in some of the statements the term "competitor". By "competitor" we mean other farmers/farm operations – local or global. Examples of competitive actions include market expansion, employee poaching, increased land rent etc.

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**In general, we favor . . .**

| | | |
|---|---|---|
| A strong emphasis on the use of tried and true products or services for our farm operation. | 1 2 3 4 5 6 7 | A strong emphasis on using new products and services, technological leadership, and innovations. |

**How many new lines of products (e.g. crops, livestock types, food products) or services has your farm marketed during the past three years?**

| | | |
|---|---|---|
| No new lines of products or services. | 1 2 3 4 5 6 7 | Very many new lines of products or services. |
| Changes in product or service lines have been mostly of a minor nature. | 1 2 3 4 5 6 7 | Changes in product or service lines have usually been quite dramatic. |

**In dealing with its competitors my/our farm operation . . .**

| | | |
|---|---|---|
| Typically responds to actions which competitors initiate. | 1 2 3 4 5 6 7 | Typically initiates actions to which competitors respond. |
| Typically seeks to avoid clashes with competitors, preferring a live-and-let-live attitude. | 1 2 3 4 5 6 7 | Typically adopts a very competitive attitude, not avoiding clashes with competitors . |

**In general, we. . .**

| | | |
|---|---|---|
| Tend to focus on low-risk investment projects (with normal and certain rates of return). | 1 2 3 4 5 6 7 | Tend to go for high-risk investment projects (with chances for very high returns). |

**In general, we believe that . . .**

| | | |
|---|---|---|
| Owing to the nature of the business environment, it is best to explore our options gradually via cautious, incremental behaviour. | 1 2 3 4 5 6 7 | Owing to the nature of the business environment, bold, wide-ranging acts are necessary to achieve the farm's objectives. |

**When confronted with decision-making situations involving uncertainty, we . . .**

| | | |
|---|---|---|
| Typically adopt a cautious wait and see attitude in order to minimize the probability of making costly decision. | 1 2 3 4 5 6 7 | Typically adopt a bold, aggressive attitude in order to maximize the probability of exploiting potential opportunities. |

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*Market Orientation (MO) Measurement*

We measure the market orientation of the firm using a scale developed by Slater and Narver (1990). The scale measures the importance of customers and competitors in the search for opportunities.

Again using a 7 point scale with "1" being "strongly disagree" and "7" being "strongly agree", please indicate how much do you agree or disagree with each of the following statements? If the statement does not apply to your farm operation, please select "not applicable". You will notice in some of the statements the term "customer." By "customer" we mean those people or companies that purchase your production, even if they are not the final user of your production. You will also notice in some of the statements the term "competitor". By "competitor" we mean other farmers/farm operations – local or global. Examples of competitive actions include market expansion, employee poaching, increased land rent, etc.

    a. The business objectives on our farm operation are driven by customer satisfaction.
    b. We continually monitor our level of commitment to serving customers' needs.
    c. Our strategy for competitive advantage is based on our understanding of customer needs.
    d. Our strategies are driven by our beliefs about how we can create greater value for our customers.
    e. We measure customer satisfaction regularly.
    f. We pay close attention to our customers, even after the sale is made.
    g. We share information with our employees concerning competitors' strategies.
    h. We are quick to respond to competitive actions that threaten us.
    i. We target customers and customer groups where we have, or can develop, a competitive advantage.
    j. We regularly discuss competitors' strengths and strategies.
    k. We regularly visit current customers to see how our products and/or services are meeting their needs
    l. We discuss reasons for successful and unsuccessful customer experiences on a regular basis.
    m. We coordinate all of our business functions (from buying to producing, selling and accounting) in order to better serve the needs of our target markets.
    n. We understand how everyone in our company can contribute to creating customer value.

*Perceived Environmental Turbulence (TURB) Measurement*

The perceived level of environmental turbulence was measured using a scale first developed by Jaworski and Kohli (1993).

Again using a 7 point scale with "1" being "strongly disagree" and "7" being "strongly agree", please indicate how much do you agree or disagree with each of the following statements? If the statement does not apply to your farm operation, please select "not applicable". Again you will also notice in some of the statements the term "competitor". By "competitor" we mean other farmers/farm operations—local or global. Examples of competitive actions include market expansion, employee poaching, increased land rent etc.

a. In our kind of business, customers' preferences for products change quite a bit over time.
b. Our customers are very price-sensitive.
c. New customers' needs tend to be different from those of our existing customers.
d. Competition in the markets we operate in is cut-throat.
e. Technological changes (for example, new varieties, new production processes) provide big opportunities in our industry.