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HOW DOES THE ENVIRONMENT SHAPE AN INDIVIDUAL'S MARKET ORIENTATION AND ENTREPRENEURIAL PROCLIVITY?

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Thesis

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Preface

After a long time working and writing this thesis, I have been reaching my final destination in master program of Management, Economics and Consumer studies. Over the period time of doing thesis, I have learned about Dutch agriculture which I had not been familiar with, how to run statistical analysis in hierarchical regression which I had never heard about, and how to write an academic paper in English.

This report could not be finished without many helps from my supervisor Dr. Frans Verhees – an assistant professor of MCB chair group. I would like to thank him for his enthusiastic supervising, and his great knowledge which guided me how to conduct data analysis and interpreted results in Dutch agricultural contexts. I really appreciate his comments and remarks on my paper. For me, this is the first time I have written a thesis in English so mistakes could not be avoided. With his careful correction to my paper, I have improved my English writing and grammar, especially in academic writing.

Besides, I would like to send my special thanks to my family and my dear friends. Thanks for their spiritual supports and encouragements which always give me much power to overcome difficulties during my study time in the Netherlands.

Last but not least, I would like to thank Vietnam Ministry of Education and Training for its scholarship. It has provided me not only financial support but also an opportunity to study here.

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Abstract

Nowadays, agricultural environment has been changing fast such as changing agricultural policy, intense competition, and fluctuating demand from consumers. As a result, farmers and horticultural growers need to adapt with this changing. Entrepreneurial proclivity (EP) and market orientation (MO) can lead farmers to better performance. However, the relationships between EP/MO and the environment are ambiguous. Therefore, this study aims to investigate how three underlying elements (Market dynamics, Competition, and Technological dynamics) of environmental dynamism shape Dutch farmers and horticultural growers' MO and EP. These relationships were hypothesized in conceptual model and tested with regression statistical methods afterwards.

According to data analysis, Customer dynamics, Competition, and Technological dynamics do not have any influence on Dutch farmers and horticultural growers' EP. Similarly, Customer dynamics have no influence on MO. EP and Competition, however, have positive effects on MO while Technological dynamics have a negative relationship with MO.

Consequently, some practical implementations are recommended. First, farmers and horticultural growers should be provided more business knowledge skills and marketing tools to respond with the changing of competition. Furthermore, to help small farms improve both MO and innovative technology, an effective agricultural social-economical-technical network needs to be implemented and developed among all stakeholders. Finally, their EP can be enhanced by entrepreneurial skill training courses.

For further research, the dominant suggestion is that more sub types of agriculture industries should be distinguished and analyzed in details. These subtypes will provide better understanding about the relationship between the environmental dynamics, farmers and horticultural growers' MO and EP

This thesis includes 6 chapters as follows. First, chapter 1 introduces the context and background of the research while Chapter 2 presents mostly relevant literature. Based on chapter 1 and chapter 2, chapter 3 hypothesizes a conceptual model with seven hypotheses. Furthermore, chapter 4 describes the research methodology including sampling, measures and analysis. Chapter 5 shows the research results, which are afterwards concluded in chapter 6. Finally, chapter 7 discusses the results including limitation, implications for literature and practice; and gives further research suggestions.

Key words: Market orientation (MO), Entrepreneurial proclivity (EP), environmental dynamics, farmers and horticultural growers, Market dynamics (MD), Competition (CD), Technological dynamics (TD)

1. Introduction

Many scholars have conducted researches about the consequences of **M**arket **O**rientation (**MO**) and **E**ntrepreneurial **P**roclivity (**EP**) for business organizations. Some researches prove the positive relationship either between MO (Jaworski & Kohli, 1993; Kirca et al., 2005; Narver & Slater, 1990; Rodriguez Cano et al., 2004) or EP (Matsuno et al., 2002; Rauch et al., 2009; Wiklund & Shepherd, 2003, 2005) and business performance. However, the role of environmental dynamism in these researches is ambiguous, which calls for further research (Grinstein, 2008; Rauch et al., 2009).

Product and business model life cycles are getting shorter in the business environment today (Hamel, 2000). Accordingly, profit from existing operations is uncertain, and businesses need to seek out new opportunities. This trend also applies to agriculture business. Since agricultural industries are shifting from protected and subsidized to more self-supported and open environment (Ondersteijn et al., 2006), agricultural business is facing continuing challenges such as changing agricultural policy, intense competition, and fluctuating demand from consumers (Clark, 2009). An example is the situation for dairy farmers whose income has been reduced significantly by reforming commodity specific support programs in the European Union's Common Agricultural Policy (CAP). Moreover, increasing concern from the general public and consumers about issues which rarely occurred in the past such as food safety crises, animal welfare issues, animal health issues, and health promoting products puts new pressure on farmers (Bergevoet, 2005; De Lauwere, 2005). Hence, the modern agriculture business needs to adapt to meet all these requirements.

Under this changing of organizational environment, the Policy Commission on the Future of Farming and Food (2002, p16, p20) also stated the urgent need to reform agricultural business (Commission, 2002). Consequently, farmers who often manage their farms by their own experience and (inherited) common sense have to adapt quickly to the changing business environment. Otherwise they will lose their profit and be defeated by competitors. Farmers are encouraged to focus more on entrepreneurial and management activities (Ondersteijn et al., 2006). They are required to deepen their businessman's mind and marketing skills. They should explore market opportunities quickly to survive in a liberalized world (Report of the Policy Commission on the Future of Farming and Food, 2002, p16, p20). Farms should be considered as firms to face these situations while farmers are encouraged to obtain a more entrepreneurial business model and perceive themselves as entrepreneurs (Phillipson et al., 2004).

Some researches state that EP and MO are already spread gradually over farmers and horticultural growers (Bergevoet et al., 2004; Knudson et al., 2004; Verhees et al., 2011b). Although it is shown that EP and MO positively influences agricultural business performance (Verhees et al., 2011b), it is not clear how the environment shapes the MO and EP of Dutch farmers. This research investigates how the business environment influences the MO and EP of Dutch farmers and horticultural growers. In particular, specific environmental dimensions are hypothesized to influence their MO and EP. Empirical data analyses are applied to explore these relationships.

When the relationship between environment and EP/MO is identified, it will gain insight about how environmental instabilities and uncertainties have shaped farmers and horticultural growers' EP and MO. Are they really influenced by the business environment and what should they do in a certain context? In the manner of evolution theory and natural selection, environments select organizations for survival on the basis of the fit between organization structure and environmental characteristics (Aldrich & Pfeffer, 1976). Therefore, an adjustment in farmers' behavior and mindset is necessary to help them adapt to environmental changes. The more firms adapt to the environmental changes, the more probability they survive.

2. Literature review

Theories have been developing to explore the interactions between EP, MO and firm environment. This review focuses on seven themes which are related mostly to the research topic: entrepreneurship and entrepreneur definitions; firm owners' EP and MO concepts and their differences; firm environment; classification of entrepreneurial activities; and lastly the characteristics of farmers and horticulture growers' EP/MO. Although literature explained these themes in general and in various contexts, this paper primarily focuses on its application to farmers and horticultural growers.

2.1 Entrepreneurship and entrepreneur

What is entrepreneurship? Entrepreneurship is a field which involves study of the sources, discovery process, evaluation and exploitation of opportunities. It includes a set of individuals who discover, evaluate, and exploit opportunities to introduce new goods, services or processes. However, entrepreneurship does not require, but can include, the creation of new organizations (Shane & Venkataraman, 2000) because it can occur within an existing organization and opportunities can be sold to other individuals or organizations (Amit et al., 1993).

Who is an entrepreneur? In general, an entrepreneur is an individual who is responsible for creating new value (an innovation and/or a new organization). Along with this definition, entrepreneurship is the connection between individual and new value creation within an ongoing process and within an environment. Entrepreneurs are also defined as "individuals who manage a business with the intention of expanding that business with the leadership and managerial capabilities for achieving their goals" (Wolf & Schoorlemmer, 2007). This definition is considered as the most suitable and relevant to farm sector (McElwee, 2005).

2.2 Firm owner's Entrepreneurial Proclivity

In integration of management strategy and entrepreneurship literature, there are several different terms such as **E**ntrepreneurial **P**roclivity (**EP**), **E**ntrepreneurial **O**rientation (**EO**) and **E**ntrepreneurial **M**anagement (**EM**) which can be used interchangeably to describe equivalent concept (Matsuno et al., 2002). In this research, I use mainly the term Entrepreneurial Proclivity (EP). However, in some parts of this literature review, EO or EM is used as an interchangeable replacement of EP.

EP is defined as "the organization's predisposition to accept entrepreneurial processes, practices, and decision making, characterized by its preference for innovativeness, risk taking, and proactiveness" (Matsuno et al., 2002). In this definition, three salient dimensions which are innovativeness, risk taking and proactiveness are defined and used consistently in the literature. These dimensions are originally derived from Miller's suggestion (1983) which shows that an entrepreneurial firm engages in product market innovation, risky ventures, and proactive innovations to defeat competitors (Miller, 1983). Accordingly, innovativeness, risk taking, and proactiveness are adopted by many researchers to characterize entrepreneurship (Lumpkin & Dess, 1996).

The first dimension - innovativeness reflects a firm's tendency to be involved in and support new ideas, novelty, experimentation, and creative processes. This tendency may result in new products, services, or technological processes (Lumpkin & Dess, 1996; Rauch & Frese, 2009). The innovativeness represents a basic willingness to move away from existing technologies or practices to new ones. For example, 3M Company sends its 9000 technical employees in 34 countries into customers' workplaces to explore what problem customer usually meet with. And these employees are allowed to spend 15% working time for the goal of creating new innovations for 3M (Certo et al., 2009).

The second dimension - risk taking refers to the degree of managers' willingness to make large and risky resource commitment (Miller & Friesen, 1978). Along with this definition, risk taking involves taking adventurous actions by exposing to the unknown, borrowing heavily, and/or committing significant resources to investments in uncertain environments (Rauch et al., 2009). Risk has various meanings when putting it in different contexts. In the strategy context, there are three types of strategic risk: venturing into unknown; committing a relative large portion of assets; and borrowing heavily (Baird & Thomas, 1985). In financial context, risk is used as a risk-return trade-off and reflects the probability of a loss or negative outcome. Thus, firms with EP are often identified by risk taking behavior, e.g. investing in high risky project (Lumpkin & Dess, 1996). For example, Jeroen van der Veer, CEO of Royal Dutch Shell PLC, took the risky investment in Russia's Far East - a natural gas and crude oil reserving area. At that time, it was unknown that van der Veer's move would be successful. If Russian politics had been instable and pipeline construction had failed, Shell would have lost its 27.5% stake in the venture (Certo et al., 2009).

The third dimension - proactiveness refers to a forward looking perspective. Proactive firms initially anticipate and pursue new opportunities in the market (Lumpkin and Dess

1996, p.146). Proactiveness aims to seek new opportunities, which may or may not be related to the present line of operations. Proactive firms introduce new products and services ahead of competition, eliminate strategically operations which are in the mature or declining stages of life cycle (Venkatraman, 1989). Therefore, a proactive firm is often a market leader rather than a follower, and acting in foresight of market demand. An example is Proactive Communications (PC) - a small firm located in Killeen, Texas. From its beginning in 2001, PC has provided communications in hostile environments, such as Iraq and areas impacted by Hurricane Katrina. Being proactive in this case means being willing to put communication device on a military helmet or sleep outdoors. These activities are often avoided by other telecommunications firms. As a result, information that once took days to reach Iraq government offices is now delivered instantaneously. With annual growth of 18%, PC has been successful in other areas - Africa, South America, and Eastern Europe, where infrastructure deficiencies have prompted governments to leapfrog into satellite and wireless communication. By possessing the capability of being a first mover, PC has created a niche that may be sustainable in a technologically, environmentally, and dynamic world (Certo et al., 2009).

Together, three dimensions of EP (innovativeness, risk taking and proactiveness) contribute to renew the organizations and offer potentially superior value for customer (Matsuno et al., 2002). To some extent, all firms have EP because they have some levels of innovativeness, risk taking, and proactiveness, even if their levels are quite low (Schindehutte et al., 2008).

Farmer and horticultural growers' EP is defined as their routines, decision making and practices through innovativeness, risk taking, and proactiveness. EP stimulates farmer and horticulturists to renew their businesses by offering an alternative and potentially superior customer value proposition (Verhees et al., 2011b).

2.3 Classification of entrepreneurial activities

Entrepreneurship scholars have developed a few typologies to describe alternate perspectives of entrepreneurship. These classifications describe the differences in entrepreneurship as the combination of various individual, organizational, or environmental factors (Lumpkin & Dess, 1996). Dimensions of EP may vary independently under the influence of the external environment.

Firms in different environments emphasize different relationships between corporate entrepreneurship activities and financial performance (Zahra, 1993). Furthermore, the

differences among firms imply that EP dimensions may be combined in unique ways that vary from one firm to the next (Certo et al., 2009).

Baumol (1986) suggested that entrepreneurial activities fall into two primary categories: (1) initiating and (2) imitative EP. In one hand, initiating entrepreneurship refers to introduction of products, productive techniques, and other procedures that were not available before. In the other hand, imitative entrepreneurship deals with the diffusion of these innovations after their utilities have been demonstrated by the initiators (Baumol, 1986).

2.4 Firm owner's Market Orientation

The term "MO" refers the implementation of the marketing concept. Therefore, market oriented firms have consistent actions with the marketing concept (Kohli & Jaworski, 1990). There are three emerging MO perspectives: culture, behavior, and resource capabilities (Schindehutte et al., 2008).

From the cultural perspective, Narver & Slater (1990) focus on organization's values and norms. These authors define MO as the most effective and efficient organizational culture which creates the necessary behavior to offer superior value to buyers, and therefore leads to superior performance for the business. These authors concentrate on three behavioral components: customer orientation, competitor orientation, and inter functional coordination. First, customer orientation is firms' sufficient understanding of target customers and providing customers continuously with superior value (Narver & Slater, 1990). In other words, customer orientation is defined as "the set of beliefs that puts the customer interest first" (Deshpandé et al., 1993). Second, competitor orientation infers that a seller understands short-term strengths and weaknesses as well as long term capabilities and strategies of both current and potential competitors. Third, inter functional coordination requires corporation efforts of different department in organization. Marketing function does not only belong to a marketing department. To sum up, customer and competitor orientation are involved in acquiring information about the buyers and competitors while inter functional coordination is based on this information to create superior value for buyers (Narver & Slater, 1990).

From the behavioral perspective, Kohli and Jaworski (1990) emphasized organizational activities as the generation, dissemination and responsiveness to market intelligence (Kohli & Jaworski, 1990). It reflects organization's market intelligence to explore current and future customer needs. Hence, market oriented firms continuously collect

target-customer needs and competitor capabilities information then use this information to create enduring superior customer value (Schindehutte et al., 2008).

From the view of resource capabilities, MO is a level of firm's capability, which links a firm to its external environment (Kyriakopoulos & Moorman, 2004). It allows firm to compete by anticipating market requirements ahead of competitors, and by creating durable relationships with customers, channel members, and suppliers (Schindehutte et al., 2008).

Based on either perspective, MO leads organizations to inspired performance and competitive advantage by creating superior value for consumers. In other words, by assessing their needs continuously MO is a set of activities and cross functional processes aiming to create and satisfy consumers (Deshpandé & Farley, 1998). Consequently, market oriented firms always attempt to improve their offerings for its customers relative to competitors.

MO may be especially important for small firms because these firms can leverage their potential advantages (flexibly, and close to their customer) to provide individualized service (Pelham, 1999).

2.5 The difference between Entrepreneurial Proclivity and Market Orientation

Although MO and EP are closely connected, they are different constructs. Table 1 shows the differences between them.

Table 1. Difference between MO and EP

	MO	EP/EO
Literature origin	Marketing literature (Atuahene-Gima & Ko, 2001).	Management literature (Atuahene-Gima & Ko, 2001).
Market information	Put a lot of efforts on market intelligence (Kohli & Jaworski, 1990)	Engage in a wider level of information scanning activities to seek out new opportunities (Barringer & Bluedorn, 1999).
Responsiveness to environment	Response to market dynamics by concentrating on marketing concept, customer and competitor (Verhees et al., 2011b)	Response to a wider range of environmental forces, including new technology, legislation and societal concerns (Verhees et al., 2011b)
Innovation and new products	Enrich and adapt current innovations to meet current needs rather than the development of new products (Atuahene-Gima & Ko, 2001)	Foster initiation of product innovation with high levels of financial uncertainty and risk (Atuahene-Gima & Ko, 2001)

2.6 Firm environment

The environment is considered as one of the critical contingencies in organization theory and strategic management. In conceptualization of environment, there are three basic dimensions: dynamism (stability-instability, turbulence), complexity (homogeneity – heterogeneity, concentration - dispersion), and munificence (or hostility as obverse). Dynamism and complexity reflect degree of uncertainty an organization faces. Munificence indicates a firm's dependence on those environments for resources (Lumpkin & Dess, 2001). Development of these dimensions are based on two commonly approach to environment: (1) as a source of information and/or (2) as a stock of resources (Dess & Beard, 1984; Lumpkin & Dess, 2001).

Along with these dimensions, their subdivisions are developed. Dynamism subdivisions are market or technical turbulence; Munificence subdivisions include market growth, profitability, and competitive intensity; and Complexity subdivisions include product and customer differentiation (Pelham, 1999).

In this research, I focus on Dynamism dimension for two reasons. First, most research suggests that EO leads to better performance under dynamic conditions (Casillas et al., 2011; Lumpkin & Dess, 2001; Zahra, 1993). Second, markets for agricultural produce have been relatively stable, but are becoming more dynamic (Verhees et al., 2011a).

Dynamism pressures companies to renew themselves through innovation and also creates opportunities for a firm within its markets. A firm may locate a new niche in its existing market by modifying its products and processes. Moreover, it may locate an attractive niche outside its traditional markets by expanding the scope of its markets, by launching new product or process ventures. Therefore, dynamism prompts a company to exploit opportunities in current or new markets (Zahra, 1993).

Dynamic environments are linked with high unpredictability of customers' demand, and competitors' behavior. It is also characterized by rapid changes and high level of uncertainty in market trends and technological innovations (Atuahene-Gima & Ko, 2001; Dess & Beard, 1984; Miller, 1987a, b; Miller & Friesen, 1978; Zahra, 1993). Hence, in this research, I examine customer (market) dynamics, competition and technological dynamics as constructions of dynamic business environment.

2.7 Characteristics of farms and horticulture (SMEs)

Entrepreneurship concept has been mentioned mostly in small and medium sized businesses (SME) research (Bergevoet, 2005). In farm and horticulture business, the role of

owner/entrepreneur can be compared to SME's because most of farms are micro-firms with fewer than 10 employees or without employees (European-Commission, 2000). Hence, farmer's and horticultural growers' MO/EP share some similarities with SMEs'.

SMEs have some limitations and advantages dominated by competence of the entrepreneurs/firm owners to overcome those limitations.

Limitations are: (1) lack of economics of scale; (2) experience severe resource constraints; (3) limited geographic marketplace and market image; (4) little brand loyalty or market share; (5) little specialized management; (6) make decision under more imperfect information conditions; (7) limited time per major management task; (8) rarely have professional managers; (9) and have a mixture of business and personal goals (Verhees et al., 2011b).

In contrast, some advantages are (1) superior understanding of customer needs, market trends positioning; (2) prefer to create value adding differences for their market (3) exploit and create turbulent markets; (4) constantly adapt to opportunities to improve customer value; (5) pursue opportunities through innovation of products, processes, or strategy; (6) identify opportunities intuitively and subjectively; (7) and highly integrated decision making (Verhees et al., 2011b).

In agricultural industry, farmer entrepreneur is divided into five groups: (1) economical entrepreneur who focus mostly upon monetary cost management; (2) social responsible entrepreneur who has social orientation; (3) traditional growers who try to highest yield against lowest cost; (4) new grower who wants to establish large company with renewals; (5) and doubting entrepreneur who has uncertain strategies (McElwee, 2005).

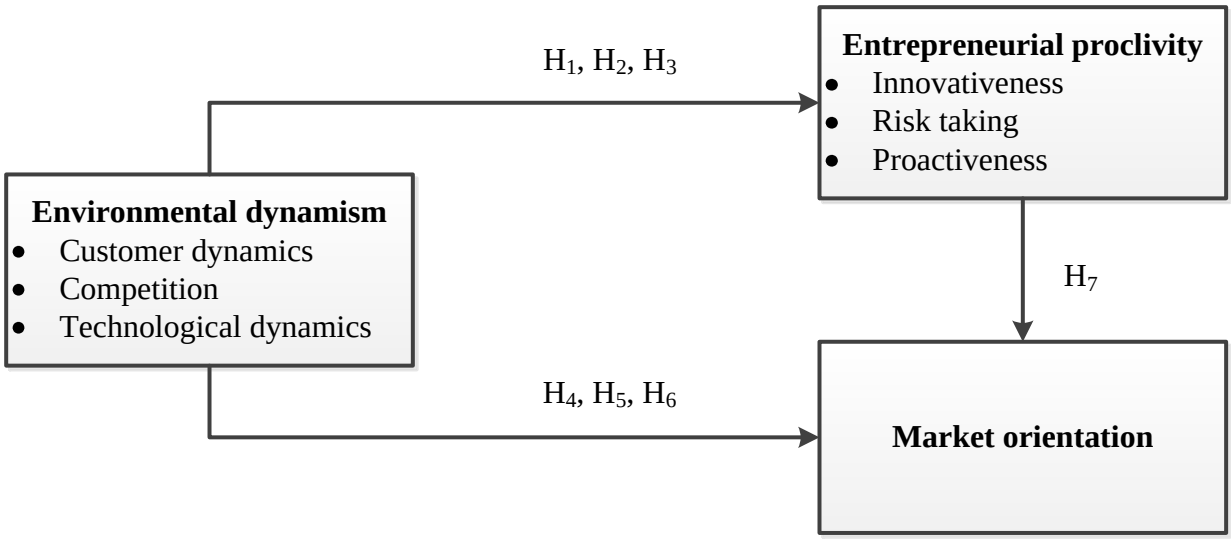
3. Conceptual model and hypotheses

This chapter aims to introduce the research model with hypotheses. They are built up and tested in the next chapter.

3.1 Research model

Our model applies to farmers and horticultural growers. It specifies causal (effect) relationships among three building blocks. They are: Environmental dynamism, EO and MO. In this model, I hypothesize that environmental dynamism affects farmers' EO and MO. In addition EP simultaneously influences farmers' MO. Finally, I demonstrate the hypothetical relationships in the model below.

Figure 1. The conceptual model and hypothesized relationships



3.2 Hypotheses

a) Environmental dynamism and Entrepreneurial proclivity (EP)

The principal characteristics of the environmental dynamism are creating new opportunities, requiring firms to innovate and renew themselves. Hence, EP should be positively associated with this environment because it focuses on approaching new business opportunities proactively (Rauch & Frese, 2009).

Adopting and learning EP may help businesses respond to uncertainties in the environment. It does not only help them to react quickly to new market opportunities but also requires them to renew themselves. Therefore, successful business in dynamic environment

should have high EP. Firms also learn that the higher their EP the higher the probability of surviving in dynamic environments. In other words, dynamic environments create more EP firms or push firms toward a more entrepreneurial orientation. As illustration, more proactive and aggressively competitive firms achieve better results in dynamic environments; family firms emphasizing innovativeness and risk taking perform better in dynamic environmental conditions (Lumpkin & Dess, 2001).

Farmers' business environment is dynamic as well. Agricultural market is changing rapidly, moving from supplier markets to customer markets, from national and international markets to global markets (Verhees et al., 2011a). Hence, farmers need to adapt to these changes. To demonstrate, some farmers diversify their business activities such as tourism activities or farm shops to exploit opportunities from dynamic business environments outside agriculture (Clark, 2009; Pyysiäinen et al., 2006).

Environmental dynamism also enhances farmers' innovation to offer premium value for customers (Casillas et al., 2011; Verhees et al., 2011a).

Therefore, I expect positive relationships between the dimensions of dynamic environment and EP of farmers and horticultural growers.

H_1: Customer dynamics have a positive influence on the entrepreneurial proclivity of farmers and horticultural growers.

H_2: Competition has a positive influence on the entrepreneurial proclivity of farmers and horticultural growers.

H_3: Technological dynamics have a positive influence on the entrepreneurial proclivity of farmers and horticultural growers.

b) Environmental dynamism and market orientation (MO)

In a stable environment with customers with stable preferences, firm's level of MO is lower because fewer adjustments in the marketing mix are necessary (Kohli & Jaworski, 1990). In contrast, the dynamic environment raises a lot changes in consumer needs and preferences. Therefore, firms should be customer oriented in uncertain and dynamic market (McElwee, 2005).

Increasing dynamics in environment could directly influence small firms. The small firm managers must increase emphasis on the externally oriented activities designed to understand, and satisfy customers as well as monitor competition (Pelham & Wilson, 1996). Moreover, higher competition will lead firm to be more market oriented because customers have many alternatives to satisfy their demands. In addition, by applying technological innovation to create new solutions to meet their customers' demands, firms obtain a

competitive advantage (Jaworski & Kohli, 1993) (McElwee, 2005). In a study, perceived environmental dynamism is positively associated with large firms' MO due to their expectations to reduce uncertainty (Davis et al., 1991).

In this research, the MO is operationalized on customer orientation and focuses on SMEs because of 2 reasons. First, to gain maximum benefit in dynamic environment, SMEs marketing have to include a customer orientation. (O'Dwyer et al., 2009). Second, MO in SMEs is a personal activity related directly to firm owners/managers. A customer orientation is their effective way to understand target customer, respond sufficiently to customer's needs afterwards by adding value to different marketing programs (Verhees et al., 2011b).

As presented in previous parts, farmers' business environment is dynamic. Dynamism of farmers' business environment could enhance their MO. Therefore, I offer the following hypotheses basing on three conceptual dimensions of dynamic environment.

H_4: Customer dynamics have a positive influence on the market orientation of farmers and horticultural growers.

H_5: Competition has a positive influence on the market orientation of farmers and horticultural growers.

H_6: Technological dynamics have a positive influence on the market orientation of farmers and horticultural growers.

c) Entrepreneurial proclivity (EP) and market orientation (MO)

MO is strongly correlated with EO (Grinstein, 2008). Three underlying elements of EP together lead to a firm's market orientation, show the greater level of firm's EP the greater level of firm's MO is (Matsuno et al., 2002). Particularly, it is believed that business innovation enhances and promotes firm's customer orientation (Deshpandé et al., 1993).

Farmers and horticultural growers with higher EP will offer alternative and potentially superior value for customers, which lead up to higher level of MO. Therefore, I hypothesize there is positive relationship between them.

H_7: The entrepreneurial proclivity of farmers and horticultural growers has a positive influence on their market orientation

4. Methodology

This chapter presents the research sample and data collection. The reliability of the measurement scales is tested by Factor analysis and Cronbach Alpha. Later (in chapter 5), regression analysis and hierarchical linear modeling are applied to test the hypotheses.

4.1 Sample and data collection

A sample of 1359 firms was drawn from the Dutch Farm Accountancy Data Network (FADN). This sample presents the population of Dutch farmers and horticultural growers in different sectors (e.g. greenhouse horticulture, arable farming, dairy farming and intensive livestock farming)

The respondents received the questionnaires with an introductory letter to motivate them and a return envelope with postage and return address via regular mail. Another option for them is an online questionnaire. All questionnaires were sent in April 2010. After one month, 391 questionnaires were returned. A reminder was sent in June 2010. After 3 months, 621 questionnaires were returned and 575 questionnaires did not have any missing values. These questionnaires are used for the data analyses.

Furthermore, 18 agricultural experts were interviewed to evaluate the market dynamics, competition and technological dynamics of each agricultural industry. They are agricultural economists, bankers, government officials, farmers' representatives, and management consultants. Each expert rated all 6 agricultural industries hence each scale was completed 108 times.

4.2 Variables and measurements

All the concepts in my model were measured by questionnaires. Most scales in the questionnaire were originally developed in English. Then, the questionnaire was translated by a native Dutch person. To test whether the questionnaire was understandable for farmers and horticultural growers in different sectors, two rounds of personal interviews were conducted. Questions were adjusted based on comments from respondents and preliminary quantitative analyses to test dimensionality and reliability of the measures. Appendix A shows the measurement statements. Respondents rated all statements on a 7-point Likert scale which showed their levels of agreement or disagreement.

Measurement properties are assessed by Principal Component Analysis (PCA) and reliability analysis (Cronbach's Alpha). All scales were checked for normal distribution by Q-Q plot beforehand.

Table 2 describes the measurement scale properties. The PCA of each measure should support a one-component solution. The first component's eigenvalue must be larger than 1.0 while others are smaller than 1. A scree plot can indicate for one component solution by showing a sharp decline in Eigenvalue from the first to the second component and a gradual decrease in Eigenvalues from the second component onwards. Moreover, the first component solution should account for a minimum of 50% of the variance in the items (Hair, 2010). All items should have a loading on the first component (before rotation) higher than 0.6. Finally, to assess for reliability of the scale, Cronbach's Alpha scores should be higher than 0.6.

Table 2. Measurement scale properties

Scale	# of items	Eigen value second component	Variance account for	Lowest items loading	Cronbach Alpha
Entrepreneurial proclivity	3	0.38	82%	0.86	0.86
• *Innovativeness*	6	0.60	67%	0.76	0.90
• *Risk taking*	9	1.25	57%	0.66	0.91
• *Proactiveness*	9	0.73	69%	0.78	0.94
Market orientation	9	0.91	62%	0.61	0.92
Environmental dynamics					
• *Market dynamics*	3	0.77	60%	0.64	0.66
• *Competition*[1]	*3*	*0.95*	*54%*	*0.37*	*0.53*
Competition[2]	2	0.45	78%	0.88	0.71
• *Technological dynamics*	4	0.77	56%	0.64	0.73

[1]: before removing one item

[2]: after removing one item

All measures met the criteria stated above except risk taking and one item in the competition scale. One item in the competition scale loaded very low (0.37) so it was

rejected. Risk taking had a second component's Eigen value that was slightly larger than 1. However, it met all other criteria so all items were maintained for further analysis.

4.3 Regression analysis and hierarchical linear modeling (HLM)

Regression analysis is a way of predicting an outcome variable from one (simple regression) or several predictor variables (multiple regressions). Normally, regression is useful to test causal-effect relationships.

Hierarchical linear modeling (HLM) is a more advanced form of simple regression and multiple regressions because it allows testing outcome variable at multiple hierarchical levels (Field, 2009; Raudenbush & Bryk, 2002). In this method, either the intercepts or slopes, or both, vary across different contexts. It is appropriate to use with nested data.

In my data, farmers are nested in agricultural industries. For HLM method, 2-step (level) regression is implemented.

This hierarchical linear modeling is represented in table 3 below.

Table 3. Hierarchical linear model regression

EP, MO and environmental dynamism across industry	EP and environmental dynamism across industry
Level 1 (Farm level)	
$MO_{ij} = b_{0j}industry_j + b_{1j}EP_{ij} + \varepsilon_{ij}$	$EP_{ij} = b_{2j}industry_{j+} \varepsilon_{ij}$
Level 2 (Industry level)	
[1] $b_{0j} = \gamma_{00} + \gamma_{01}MD_j + \gamma_{02}CD_j + \gamma_{03}TD_j + u_{0j}$ [2] $b_{1j} = \gamma_{10} + \gamma_{11}MD_j + \gamma_{12}CD_j + \gamma_{13}TD_j + v_{0j}$	[3] $b_{2j} = \gamma_{20} + \gamma_{21}MD_j + \gamma_{22}CD_j + \gamma_{23}TD_j + w_{0j}$
Combined model is	
$MO_{ij} = (\gamma_{00} + \gamma_{01}MD_j + \gamma_{02}CD_j + \gamma_{03}TD_j + u_{0j})*industry_j + (\gamma_{10} + \gamma_{11}MD_j + \gamma_{12}CD_j + \gamma_{13}TD_j + v_{0j})*EP_{ij} + \varepsilon_{ij}$	$EP_{ij} = (\gamma_{20} + \gamma_{21}MD_j + \gamma_{22}CD_j + \gamma_{23}TD_j + w_{0j})*industry_j + \varepsilon_{ij}$

(With i = farmer, j = agricultural industry)

The first step (Level 1) corresponds to the farm level in which the relationship between farmers and horticultural growers' MO and EP is tested. The second step (Level 2) corresponds to the agricultural industry level in which EP and industry's coefficients are explained by levels of three environmental dynamism's components. In level 2, the effect of industries and EP on farmer and horticultural growers' MO might vary because each industry

has different environmental dynamism. Industry and EP variable are level-2 variables. The relationship between environmental dynamism and EP is analyzed simultaneously and similarly. However, for this relationship, only industry's coefficients vary.

In this study, regression analysis and hierarchical linear modeling are applied simultaneously to check each other's results.

5. Results

Table 4 illustrates average scores for each environmental dynamism component (market dynamics, competition and technological dynamics) of each agricultural industry (arable farming, dairy farming, intensive livestock, greenhouse horticulture, and fruit orchards) based on the assessment of 18 agricultural experts. Average scores of farmers and horticultural growers' EP and MO across industries are presented as well.

Table 4. Environmental dynamics, EP and MO's average scores across agriculture industries

	Arable farming	Dairy farming	Intensive livestock	Greenhouse horticulture (flowers and plants)	Greenhouse horticulture (vegetables)	Fruits orchards
Market dynamics	2.55	2.35	2.53	4.08	3.57	3.29
Competition	3.33	2.86	3.83	3.89	4.06	3.53
Technological dynamics	3.13	3	3.21	4.1	4.06	3.21
EP	4.20	3.89	4.00	4.13	4.08	4.20
MO	4.29	3.61	4.43	4.34	4.26	4.33

Running ANOVA analysis, it is showed that average scores between industries are significantly different for market dynamics ($F = 17.9$, $p < 0.05$), competition ($F = 4.18$, $p < 0.05$), technological dynamics ($F = 4.2$, $p < 0.05$) and market orientation ($F = 6.6$, $p < 0.05$). In contrast, EP ($F = 1.6$, $p > 0.1$) has no significant difference among industries. It is clearly seen that EP's average scores are similar (they vary in small range from 3.89 – 4.2). Accordingly, regression [3] (in level 2 of the hierarchical regression) is not tested further; and H_1, H_2, H_3 are rejected as well.

For environment dynamism, market dynamics are higher in horticultural industries (greenhouse and fruits horticulture) than farming industries (arable, dairy farming, and

intensive livestock). Competition in horticulture is more intensive than arable and dairy farming. Technological dynamics are highest in greenhouse horticulture while lowest in dairy farming. Dairy farming also gets lowest scores (3.61) for MO while others varies from 4.29 to 4.43. In general, horticultural growers get highest scores while dairy farmers get lowest scores for all of environment components, MO and EP.

For testing hypothesis H_4, H_5, H_6 and H_7, two models are examined. First model included EP as independent variable while second model added MD, CD, and TD as more three independent variables. Table 5 provides the results of ordinary least squares (OLS) regression of MO on market dynamics (MD), competition (CD), technological dynamics (TD), and entrepreneurial proclivity (EP).

Initial model is able to predict MO but the second model (with extra MD, CD, TD) is even better because F_{change} (F_{change} = 11.05) is significant (p = 0.00). Competition has a positive influence on farmers and horticultural growers' MO (b = 0.944, p = 0.000) in line with hypothesis 5. Similarly, entrepreneurial proclivity is positively and directly related to the level of market orientation (b = 0.554, p = 0.000). Hence, hypothesis 7 is confirmed.

Table 5. Relationship between Environmental dynamism/EP and MO

	MO Model 1	MO Model 2	
EP	0.572**	0.554**	
MD	-	0.381 n.s	
CD	-	0.944**	F_{change} = 11.05
TD	-	- 0.987*	p = 0.00*
R^2	0.223	0.266	
F	164.615**	51.606**	
N	575		

* = p< 0.05; ** = p< 0.1; n.s. = not significant p > 0.1

However, market dynamics (MD) show no effect on MO, which rejects hypothesis 4. Hypothesis 6 is also rejected. Although technological dynamics (TD) have a relationship to market orientation, it has a negative influence on MO of farmers and horticultural growers (b = - 0.987, p = 0.095), which contradicts hypothesis 6. Moreover, examining VIF values in multicollinearity diagnostics shows that there is no multicollinearity among CD (VIF = 3.17), EP (VIF = 1.01), and TD (VIF = 3.16). Based on standardized coefficients, Competition

($b_{standardized}$ = 0.314, p = 0.000) has less influence on MO compared to EP ($b_{standardized}$ = 0.554, p = 0.000).

Before accepting these results, hierarchical linear model is done simultaneously through 2-level regression.

In level 1, through block regression two models are examined with MO as dependent variable. First model included independent EP variable while second model added 6 agricultural industries as more independent variables. Agricultural industries are dummies so dairy farming was chosen as baseline category.

The results from table 6 show ordinary least squares (OLS) regression of MO on EP and agricultural industries. Both model 1 and model 2 are significant, model 2 with added variables is better because F_{change} (F_{change} = 6.89, p = 0.00) is significant and EP (b = 0.551, p = 0.00) has significantly positive relationship with MO, which confirms hypothesis H_7.

4/5 industries (except fruit orchards) have significant t-tests. It means that these industries are more market oriented than dairy industry. Therefore in level 2, industry's coefficients might vary and should be tested (Regression [1]).

Table 6. Level 1 – Effect of EP and different agricultural industries on MO

	MO $^{Model\ 1}$	MO $^{Model\ 2}$	
EP	0.572**	0.551**	
Arable farming	-	0.504**	
Intensive livestock	-	0.760**	
Greenhouse horticulture (flowers and plants)	-	0.599**	F_{change} = 6.89
Greenhouse horticulture (vegetables)	-	0.543**	p = 0.00
Fruit orchards	-	0.553, p=0.18$^{n.s}$	
R^2	0.223	0.268	
F	164.615**	34.585**	
N		575	

** = p < 0.05; * = p < 0.1; n.s. = not significant p > 0.1

However, it was unclear whether there was interaction between EP and the agricultural industries so 5 interaction (EP- industry) variables were created and put in other regression models. Similar to previous block regression, 2 models are tested with MO as dependent variable. Model 1 has EP and industry dummies as independent variables while

model 2 added 5 interaction variables. Again, dairy farming was decided as baseline category.

Table 7 shows results of ordinary least squares (OLS) regression of MO on entrepreneurial proclivity (EP), agricultural industries and EP - industry interactions. Both models have ability to predict outcome variable (MO) but the first model is better because F_{change} (F_{change} = 1.29, p=0.27 > 0.1) is not significant. Therefore, the influence of EP on MO does not vary across different agricultural industries and regression [2] is not tested in level 2.

Table 7. Interaction between EP and agricultural industries

	MO $^{Model\ 1}$	MO $^{Model\ 2}$
EP	0.551**	0.450**
Arable farming	0.504**	0.153, p=0.77$^{n.s}$
Intensive livestock	0.760**	0.189, p=0.71$^{n.s}$
Greenhouse horticulture (flowers and plants)	0.599**	- 0.237, p=0.72$^{n.s}$
Greenhouse horticulture (vegetables)	0.543**	- 0.882, p=0.18$^{n.s}$
Fruit orchards	0.553, p=0.18$^{n.s}$	- 0.663, p=0.72$^{n.s}$
EP x Arable farming		0.091, p=0.45$^{n.s}$
EP x Intensive livestock		0.146, p=0.24$^{n.s}$
EP x Greenhouse horticulture (flowers and plants)		0.208, p=0.17$^{n.s}$
EP x Greenhouse horticulture (vegetables)		0.354*
EP x Fruit orchards		0.297, p=0.5$^{n.s}$
R^2	0.268	0.276
F	34.585**	19.499**
N	575	

** = p< 0.05; * = p< 0.1; n.s. = not significant

Next, regression [1] of level 2 is conducted. In this level, industry's coefficients are predicted by three environmental dynamism's components.

Table 8. Level 2 - Effect of different environmental dynamism on MO across industries

Agricultural industries' coefficients	
MD	0.129 n.s
CD	0.815 *
TD	- 0.535 n.s
R^2	0.911
F	6.799 n.s
N	6

** = p< 0.05; * = p< 0.1; n.s. = not significant

Table 8 provides ordinary least squares (OLS) regression of Agricultural industries' coefficients on market dynamics (MD), competition (CD) and technological dynamics (TD). Only competition (CD) has significantly positive relationship (b = 0.815, p = 0.05) with MO. This result shares similarity to the previous multiple regressions, which confirms hypothesis H_5.

6. Conclusion

This chapter summarizes the results. It also gives conclusion to the research problem and research hypotheses.

In this study, 7 hypotheses are tested. For hypothesis 1 to 6 (H_1- H_6), it is assumed that 3 dimensions of environmental dynamism have positive influence on Dutch farmers' MO and EP while the last hypothesis assumed that Dutch farmers' EP has a positive influence on the MO.

According to data analysis, Customer dynamics, Competition, and Technological dynamics do not have any influence on farmers and horticultural growers' EP. Similarly, Customer dynamics have no influence on the MO. Therefore, hypotheses H_1-H_4 are rejected.

Hypothesis H_5, which hypothesized that Competition has a positive influence on the farmers and horticultural growers' MO, is confirmed. Thus a change in competition in environmental dynamism leads to a change in MO in the same direction. Likewise, hypothesis H_7 is confirmed that changing in the Dutch farmers and horticultural growers' EP is associated with changing in MO in the same direction.

Although Hypothesis H_6 is rejected, it reveals another side of the relationship between Technological dynamics and MO. Technological dynamics have negative influence on MO. Consequently, a change in technological dynamics leads to an inverse change in market orientation.

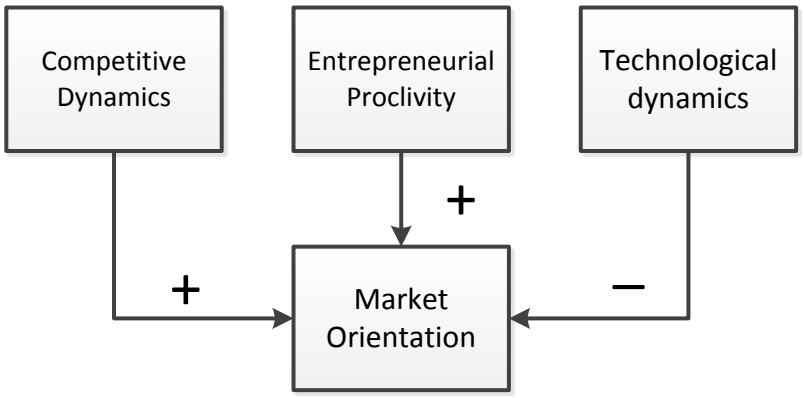
In short, this empirical study examined the relationships among three underlying components of environmental dynamism (market dynamics, competition and technological dynamics), on Dutch farmers and horticultural growers' EP, and MO. Seven hypotheses are tested but only 2 hypotheses are confirmed. EP and competition have positive effects on MO. One hypothesis, however, got reverse result. Technological dynamics have a negative relationship with MO.

Answering to research problem stated in chapter 1 (Introduction), Dutch farmers' EP is not shaped by environmental dynamism. In contrast, their MO is shaped by two of three environmental dynamism's elements, which are competition and technological dynamics, in different directions. While more intensive competition in the market brings more market orientation of Dutch farmers and horticultural growers, increase of technological dynamics in environment dynamism decreases level of their market orientation. Simultaneously, EP also enhances the level of their market orientation. The more entrepreneurial Dutch farmers get,

the more market oriented they are. With EP, firms become more proactive, risk taking and innovative in creating superior values that meet customers' needs. Hence, this leads firms to be more market orientation.

Figure 2 below summarizes the study results.

Figure 2. Hypotheses testing result



7. Discussion

This chapter presents limitation, managerial and practical implications of the findings in previous chapter. Suggestion for further research is also included.

7.1 Limitation

This study only classified Dutch farms into some main types as arable farming, dairy farming, intensive livestock, greenhouse horticulture, and fruit orchards. However, more specific classification should be needed within the main types. Because each agricultural subtype operates in different environments, it might lead to different farmers and horticultural growers' MO and EP. The subtypes will provide better understanding for the relationship between the environmental dynamics, farmers and horticultural growers' MO and EP. They also provide more data for analyze specific differences among industries. Moreover, they enhance power of statistical analysis because with only 6 industries, level 2 of hierarchical regression method has limited degree of freedom.

7.2 Implication for the literature

The result of this study is in line with the finding of Matsuno (Matsuno et al., 2002) which investigated 364 U.S. manufacturing companies. Although the sample sizes and research contexts are different, both researches share similar results that EP has positive influence on MO. In particular, this research contributes to entrepreneurial and market oriented knowledge for Dutch agricultural study.

For competition, the finding shows that there is a direct relationship between environment and MO. Due to an increasing number of international competitors in the free market, satisfying customers better than competitors is firms' compulsory strategic option. Under high intensive competition, firms face more challenge to keep their customers or steal them from competitors (Jaworski & Kohli, 1993).

Across 6 agricultural industries, dairy farming has lowest score of MO and environmental dynamism. A possible explanation is that dairy farming always gets most subsidies from CAP many years[1]. Switching to free market products is really a new phenomenon for dairy farmers due to long time working under market protection, while horticultural and intensive livestock farmers get used to running a non-subsidized farm business (Wolf & Schoorlemmer, 2007). Moreover, dairy farmers are not familiar with market orientation and marketing activities because they are outsourcing marketing activities

[1] http://www.farmsubsidy.org/NL/scheme/?page=1

to a few large dairy cooperatives (e.g. Friesland Campina). Therefore, dairy farmers compared to others do not have much powerful motivation to be more market oriented which focuses on customer and market demands. On the contrary, farmers who do not work in protected industries, have to react to competition by themselves, try to reach their customers, exploring customers' needs and satisfy them.

The result of relationship between technological dynamics and market orientation is somewhat surprising because it contradicts the hypothesis. Turning to Dutch farm characteristics, Dutch farm is normally small and family-owned with a few working people on farm. Number of farmers working has been decreasing over years (Wolf & Schoorlemmer, 2007). Hence, they have to manage everything on the farm such as growing, harvesting, feeding cattle, and selling farm products; and have limited time and labor to focus simultaneously on technological innovation and market orientation. Consequently, they have to choose one of two business strategic options to invest time and labor. In addition, it is noted that only 12.9% of farmers are younger than 40 years old, 66.7% are in range of 40-64 years old and 20.4% are older than 64 years old. Older farmers, on the one hand, have more experience than others; on the other hand, they are more conservative to new things and tightly bound to traditions (Wolf & Schoorlemmer, 2007). For these possible reasons, higher changes of technology in agricultural business environment decrease level of farmers and horticultural growers' MO.

7.3 Implication for practice

In the Netherlands, the triangular relationship among the government, farm and agricultural university (Food Valley[2] in Wageningen is an illustration) has been in existence for over years. This relationship was established through the Dutch OVO system (Research, Extension and Education). The OVO system has built the Dutch agricultural knowledge infrastructure for decades and used to be a key element for the success of Dutch agriculture. However, this system tends to be weakened due to the new concerns, options and priorities such as ecological and environmental concerns. Accordingly, a trajectory privatization of research and extension institutions have been developing (Leeuwis et al., 2006). Currently, some large corporations that specialize in agriculture either have their own research center e.g. Nestle, Unilever, Heinz or Heineken, or have engaged with some independent R&D centers (outsource R&D). Conversely, farmers and horticultural growers cannot afford their own

[2] http://www.foodvalley.nl/English/default.aspx

researches. In order to help small farms improve both MO and innovative technology, an effective agricultural social-economical-technical network needs to be implemented and developed among all stakeholders such as decision makers, farmer, scientists, public organizations, etc. Last but not least, the government should have suitable policy to bridge distance between farms and research laboratory.

The innovation results from laboratory must be practical and applicable so that farmers can produce innovative products for their agribusiness. Additionally, researchers in R&D centers and farmers should have a powerful cooperation in exploring and fulfilling requirements of the market. For instance, transgenic potato breeding was introduced a few years ago in the Netherlands. For farmers, this research brings lower pesticide cost but higher starting material costs[3]. Moreover, its growth depends on public acceptance mostly derived from environmental and consumer organizations. Environmental organization considers its long term environmental impact while consumer organization worries about its safety for human consumption.

EP, which has positive impact on MO, can be enhanced by entrepreneurial skill training courses. In addition to professional and management skills equipping farmers how to manage farms, some important entrepreneurial skills should be provided through education. These entrepreneurial skills are opportunities recognizing, strategic developing, cooperating and networking skills. They are not only necessary for farmers to identify both existing and new opportunities in the market, but also find ways to develop and improve a profitability business (Wolf & Schoorlemmer, 2007).

Farmers' market orientation is also influence positively by changing of competition in dynamic environment. Recognizing the changes in time is very important with farmers. Therefore, an appropriate vocational education programs or consultative service help enterprise to set right goals in right times. Accordingly, farmers and horticultural growers should be provided more business knowledge skills and marketing tools to respond with the changing of competition. Moreover, training programs in entrepreneurship may support farmers in seizing the opportunities created by environment changes to compete with others. E-learning is a very good way of distance learning to support farmer in their study. Internet also provides up-to-date competitor information for them (Ban, 2002).

[3] http://www.accessexcellence.org/RC/AB/BA/Potatos_in_Netherlands.php

For dairy farms in future, dairy farmers should improve MO if they do not want to depend on the cooperatives anymore, or follow differentiation strategy (e.g. organic farmers or farmers who sell their products directly to the consumers). One way of improving MO is improving entrepreneurial competency which can be developed through the use of study groups as training program (Bergevoet & Woerkum, 2006).

7.4 Suggestions for further research

For industry classification, more dominant and specific agricultural subtypes should be distinguished and analyzed in details. A detail classification digs up further information on farmers' behavior and its relationship with the environment. For example, intensive livestock can be divided into pig, veal, chicken, egg; arable farming divided into different crop rotations; and dairy farming divided into organic and regular milk.

In the methodology, this study is cross sectional which is not suitable enough to test the causal-effect relationships in the conceptual model. Thus an experimental or time series research design could test the causality of these relationships better.

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Appendix A

Measurement statement used in the questionnaire for each element

Innovativeness

1. If I see opportunities, I am willing to start activities that are new to me
2. I look for opportunities to work on something new
3. If I see opportunities, I am good at starting activities that are new to me
4. I see opportunities to work on something new
5. If I see opportunities, I start activities that are new to me
6. I am always working on something new

Risk taking

1. If I see opportunities, I am willing to take great risks (with chances for very high profits)
2. I want to have the courage to seize opportunities
3. If I see opportunities, I am good at taking great risks (with chances for very high profits)
4. I belief I have to take great financial risks to seize opportunities
5. I can have the courage to seize opportunities
6. I know how to take great financial risks to seize opportunities
7. If I see opportunities, I am starting to take great risks (with chances for very high profits)
8. I have the courage to seize opportunities
9. I take great financial risks to seize opportunities

Proactiveness

1. I am willing to start activities that other firms do not do, yet
2. If I see opportunities, I like to respond before other firms do
3. If there are opportunities, I belief I have to be one of the first firms to use them
4. I am good at starting activities that other firms do not do, yet
5. If I see opportunities, I can respond before other firms do
6. If there are opportunities, I know how I can be one of the first firms to use them
7. I start activities that other firms do not do, yet
8. If I see opportunities, I respond before other firms do
9. If there are opportunities, I am one of the first firms to use them

Market Orientation

1. I regularly ask my customers whether they are satisfied
2. I regularly check whether my products correspond with what my customers want
3. I try to find out what my customers want in the future
4. I understand my customers' problems

5. I know what other customers than my current customers (i.e. potential customers) want
6. I know where and to whom my customers sell their products
7. I have information about the consumers of my products
8. I know how societal trends influence my firm
9. I regularly check whether it's better to sell my products to another customer than my current customer

Market dynamics

1. Customer wishes constantly change.
2. Customers constantly search for new products.
3. At one time customers are very price sensitive and next time they are not.
4. Firms in this industry constantly supply the same customers.

Competition

1. Competition is killing
2. Everything a company can deliver can almost immediately be delivered also by another company.
3. Competition is mainly focused on price.

Technological dynamics

1. Technology is changing fast
2. Technological advances offer great opportunities
3. Technological advances offer great opportunities for new products
4. Technological advances are not spectacular