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Performance expectations of small firms considering radical product innovation ☆

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ABSTRACT

Performance expectations influence business decisions such as investment decisions and demand for supplies, particularly in small firms with limited strategic planning. Despite widespread use of performance expectations by firms and governments when making sales forecasts and economic outlooks, surprisingly little research exists about how small firms form performance expectations. This paper contributes to reduce this knowledge gap by analyzing performance expectations of small firm managers operating in markets with radical product innovations. This paper proposes a model and hypotheses, which explain performance expectations of small firm managers based on firms' current success, radical product innovation, and variables that indicate firms' ability to respond to customer needs for radical product innovation. Data from 200 decision-makers in a real decision-making context support the model. The results show that performance expectations in small firms are only to a limited extent a naïve extrapolation of current success: radical product innovation and small firm's ability to respond to customer needs for radical product innovation influence performance expectations.

1. Introduction

Performance expectations, which are a manager's expectations about whether his or her firm will thrive or deteriorate in the future, have a big impact on decision making in firms (e.g. Stone, 1994), particularly in relation to investment decisions. Performance expectations, therefore, play an important role in economic indicators such as the Geschäftsklima-index or Ifo-index in Germany (Benner and Meier, 2004) and the Tankan-index in Japan. Firms operating in business-to-business markets may base decisions about investments on performance expectations of customers (Lindlbauer and Nerb, 1999). For example, performance expectations of farmers will influence sales of John Deere tractors and combines. The determinants of performance expectations, however, are important in order to understand better their impact on firm behavior, particularly purchase behavior. Despite widespread use of measures of performance expectations, surprisingly little research exists about the formation of performance expectations of firms (Glazer et al., 1989). This paper addresses this gap.

This research focuses only on small firms (SFs), which are firms run and controlled under direct supervision of the owner-manager. The remainder of this paper refers to SF owner-managers as managers. This paper considers only differences between SFs, particularly in the context of radical product innovation (RPI), as possible determinants of differences in performance expectations. RPI is an interesting context, because a proactive, risk-taking posture is more likely to result in new product success and, therefore, higher performance expectations (Calantone et al., 1994). Moreover, innovation initiates strategic planning and, therefore, the formation of performance expectations (Harris and Ogbonna, 2006). This study does not include dynamic environmental determinants of performance expectation, such as business cycles.

Current performance of firms explains performance expectations because many factors that influence current performance and performance expectations will not change over time. Current performance captures these influences on performance expectations. However, specific actions of firms, particularly radical product innovation (RPI), will influence performance expectations. This paper defines RPI as product innovation that requires acquisition of new technological know-how by a firm, is surrounded by technological uncertainty (i.e., about the performance of the new technology), and involves large investments relative to firm resources; and serves new customers or new customer needs and, therefore, requires acquisition of new market know-how by the firm. As such, increasing performance expectations may indicate demand for new supplies. A firms' ability to respond to customer needs for radical product innovation may already influence performance expectations.

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[1] After an impressive career as a marketing professor Matthew T.G. Meulenberg passed away in September 2006.

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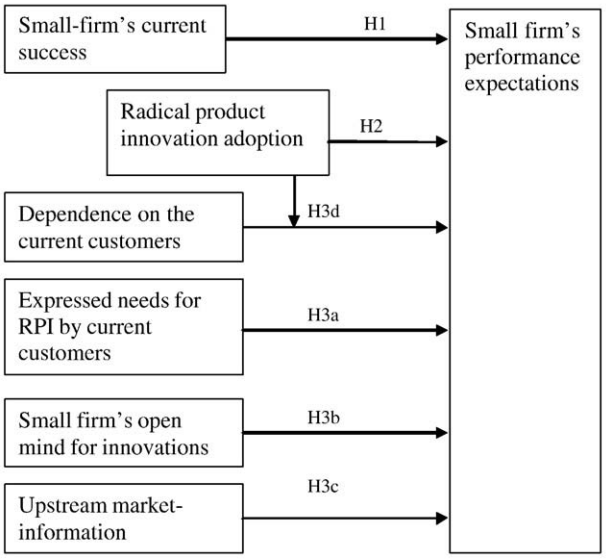

Fig. 1. Model that explains SF's performance expectations.

This paper proposes a model to explore determinants of performance expectations of SFs operating in markets with radical product innovations (Fig. 1). The model addresses three questions. First, are performance expectations a naïve extrapolation of SFs' current success? This question seems particularly relevant for SFs, because SFs have limited strategic planning. Second, what is the influence of RPI adoption on performance expectations? SFs make strategic plans to decide about the adoption of an RPI, which may have a long-term effect on performance expectations. Third, does a SF's ability to respond to customer needs for radical product innovation influence performance expectations? The possibility to adopt a RPI may already influence SF's performance expectations.

The structure of this paper is as follows. This paper specifies a model that explains the formation of performance expectations in SFs operating in markets with radical product innovations and derives hypotheses. Empirical research tests the model using data from a real life context with real decision-makers, to be precise data from poultry farmers. Finally, the paper presents and discusses the results.

2. Model and hypotheses

The model describes that current success, introduction of RPI or not, and ability to respond to customer needs for radical product innovation (i.e., an expressed need for RPI by current customers, information from suppliers, SFs' open mind for innovations, and dependence on current customer) drive managers' performance expectations.

Limited and simple strategic planning may make SFs myopic for environmental changes that affect their future performance, such as changes in demand and competition. As a result SFs simply extrapolate current market conditions to the future. Extrapolating current market conditions results in the hog cycle (Hanau, 1928), where farmers make production decisions based on current prices as an indicator of future prices. Furthermore, SFs may assume, sometimes wrongly, that they have control over their performance and that current success results from a competitive advantage, which does not disappear overnight. Foregoing arguments support the hypothesis that successful SFs also have positive performance expectations. Current success of SFs influences performance expectations, because SF managers consider current success an indication of future opportunities, windfall profits excluded. Managers expect that the structural market situation and the capabilities of an SF will change gradually only.

H1. Current success positively influences a small firm's performance expectations.

RPI requires strategic planning. For example, Stewart et al. (1999) find that SF owners focusing on growth and change tend to engage more in planning than SF owners who focus more on stability. Managers focusing on growth and change put more effort into planning and consequently into developing performance expectations than managers focusing on their current product assortment only (Harris and Ogbonna, 2006). Furthermore, RPIs normally have a long-term impact on performance and RPI decision making, therefore, leads to long-term performance expectations. Moreover, product innovation, particularly RPI is important for a firm's prosperity (Geroski et al., 1993; Calantone et al., 1994). SFs expect RPI to improve their future performance. SFs that adopt an RPI, therefore, will be positive about the future. Even if the RPI is not successful yet, managers might hold on to positive expectations about performance, to avoid cognitive dissonance (Festinger, 1957). This paper hypothesizes, therefore, a positive direct relationship between RPI adoption and an SF's performance expectations.

H2. The adoption of radical product innovation positively influences a small firm's performance expectations.

Responsiveness to market information, an element of market orientation, positively influences performance (Jaworski and Kohli, 1993; Cano et al., 2004; Deshpandé and Farley, 2004; Kirca et al., 2005). Also, SF's ability to respond to market information will influence performance and, therefore, performance expectations. Assuming that an RPI is an opportunity, SF's ability to respond to market information about needs for the RPI will influence performance expectations. The ability of SFs to respond to market information about needs for the RPI requires an expressed need for RPI by current customers, an open mind for innovations, information from suppliers, and independence from current customers.

Market information from current customers is important for RPI in SFs. Market information in SFs is different from that in large firms, because SFs lack the financial means to gather their own independent market information; commissioning marketing research, which is fine-tuned to SF's specific interests, is hardly an option for SFs. General market information is widely available for every SF, but is not considered to be a cause for different performance expectations. Current customers, however, are an important source of market information for SFs given the importance of networks (Carson et al., 1995; Bessant, 1999). Moreover, needs of current customers are best, perhaps exclusively, known by the respective SF and may, therefore, cause differences in performance expectation between SFs that operate in the same industry, but have different customers.

Particularly an expression of need for RPI by current customers is important for differences in performance expectations, because managers of SFs perceive RPI to be important for the performance of their firm and, because expressed customer needs for RPI facilitate successful RPI (Cooper, 1993; 1999).

H3a. An expressed need for radical product innovation by current customers positively influences a small firm's performance expectations.

SF's open mind for innovations implies a willingness of managers to learn about and adopt innovations. This characteristic is important for SFs, because innovative capabilities of SFs are more behavioral and less material than those of large firms (Rothwell and Dodgson, 1994). Moreover, an open mind for innovations is a higher-order construct that captures other entrepreneurial characteristics, such as risk taking and proactiveness (Mudd, 1990). Entrepreneurial characteristics are

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necessary to respond to customer needs also after the introduction of the RPI (Bhuian, 2005). An open mind for innovations, therefore, increases the perceived ability of SFs to respond to market information and thus results in positive performance expectations.

H3b. Small firm's open mind for innovations positively influences a small firm's performance expectations.

Suppliers are an important resource for innovation, particularly for SFs (Carson et al., 1995; Chandy and Tellis, 2000; Rama, 1996; Traill and Grunert, 1997; Walter, 2003). Upstream market information reveals possibilities to respond to customer needs for radical product innovation and may solve problems after the introduction of the RPI, which will make SFs more positive about the future.

H3c. Upstream market information positively influences a small firm's performance expectations.

SF's dependence on current customers might decrease possibilities to respond to customer needs for radical product innovation, which will decrease performance expectations. For example, SFs are unable to abandon current customers and serve other more profitable customers when they depend on current customers. This paper hypothesizes that dependence on current customers reduces SFs' performance expectations when SFs have not yet adopted RPI and are serving current customers with traditional products.

H3d. Dependence on current customers negatively influences a small firm's performance expectations when SFs have yet to adopt RPI.

3. Method

3.1. Decision context and sample

To understand market behavior of SFs properly data from managers in their real decision-making context is important (e.g., Smith, 1982). The test of the proposed model, therefore, uses firms in the Dutch poultry industry, more specifically the layer industry. Managers of SFs in the Dutch layer industry are suitable for this research, because they have to decide about all aspects of their enterprise, bear all risks and gains of the enterprise, and, therefore, have performance expectations about their firm. Moreover, in 2000, the year of the survey, the Dutch layer industry was considering new ways to keep hens, because the traditional cages will be prohibited by European law after the year 2012. In the year 2000, firms considered five alternative ways to keep layers: birdcage stables with or without chicken run, free range stables with or without chicken run, and biological production of eggs. These alternative ways to keep layers are RPIs, because firms acquire new technological know-how, for example about how to handle diseases and maintain egg quality. This knowledge is not widely available from research or experience and, consequently, performance varies widely between firms. Moreover, firms add animal friendly as a radically new product attribute for eggs, which requires new market know-how, because only some market segments are willing to pay for this attribute. Furthermore, investments involved in these production technologies are large for firms in the Dutch poultry industry, because the system requires a completely new interior for the stables. Finally, the performance of these production technologies was not clear in 2000. The alternative for these RPIs is an enriched cage, which has some extra features and is acceptable according to EU regulation, after 2012.

A random sample of 220 poultry farmers was drawn from a list including all firms with more than 1000 layers in the Netherlands. First, interviewers contacted respondents by phone to ask for their participation. Over 90% of respondents agreed to participate. Interviewers conducted 204 computer guided, face to face interviews to obtain the data. The analyses use exactly 200 interviews; 4 respondents are poultry farmers, but do not own layers and are, therefore, excluded from the analyses. From these 200 respondents, 75 use one of the 5 alternative ways to keep layers.

3.2. Scale development

Appendix A shows all items of the measurement scales as well as their reliability. Analyses use sum scores of the multi item scales.

SF's performance expectations consists of one negatively formulated item: I am negative about the future of my poultry farm. Respondents rate this item on a seven-point semantic differential scale. The semantic differential scale is anchored by completely disagree versus completely agree. Subtracting the original score from eight to recode the measure makes interpretation of results easier. Consequently, a high score means positive performance expectations. The item for SF's performance expectations is part of a scale with six items, which is tested in another study among 124 Dutch farmers (See Appendix A). The Principal Component Analysis (PCA) of this scale shows that a one-component solution is appropriate, because the first component explains 71% of the variance, and the second component has an Eigen value smaller than 1 (Hair et al., 1992). All items load higher than 0.80 on the first component, before rotation. Reliability of the measure (Cronbach's alpha) is 0.92 ($n=124$). The item used for this study correlates highly ($r=0.86$, $p<0.01$) with this measure for SF's performance expectations.

Current success consists of five items. Three group interviews with members of the research population suggested these items. All measurement properties are appropriate in the PCA and reliability analysis shows a Cronbach's alpha of 0.79.

RPI adoption consists of the answer to the question whether respondents already use one of the animal friendly ways to keep layers, which are RPIs. Note that this variable is dichotomous, being 0 if the answer is no, that is the SF only produces eggs in a traditional system and being 1 if the answer is yes, that is the SF uses an animal friendly production system.

The need for RPI that current customers express consists of the turnover of animal friendly eggs of each customer relative to his total turnover. Respondents provide the name and address of their customer. Respondents mention 54 different customers. The number of eggs that were supplied by the poultry farmers in the sample to the respective customer and that had the animal friendly product attribute is the estimate for customers' turnover in animal friendly eggs. The total number of eggs supplied by the poultry farmers in the sample to the respective customer is the estimate for customers' total turnover. Subsequently, the estimate for customers' turnover in radically new products was divided by the estimate for customers' total turnover. The 54 resulting percentages are a proxy for the customer's expressed need for RPI.

Upstream market information uses as a starting point items of Jaworski and Kohli's (1993) measure for market orientation, particularly the market-intelligence component. Two items in the measure originate from the responsiveness component, but load high on the same component as items originating from the market-intelligence component. Discussions with managers of SFs indicate that suppliers of feed are the most important suppliers in this industry. Items therefore measure the extent to which a manager generates information about feed suppliers and the feed market. Five items measure upstream market information.

SF's open mind for innovations consists of five items originating from Pallister and Foxall (1998). With the items, managers indicate whether they consider themselves as creative and inventive and whether they are willing to try innovations before other people do.

Dependence on the current customer is a firm's need to maintain a relationship with its current customer to achieve its goals (Kumar et al., 1995). Replaceability of current customers indicates SF's dependence on current customers (Heide and John, 1988; Kumar

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Table 1
Results of OLS regression of manager's performance expectations on the hypothesized explanatory variables.

	SF's performance expectations
Small firm's current success (H1)	0.14*
RPI adoption (H2)	0.29**
An expressed need for RPI by current customers (H3a)	0.15*
Small firm's open mind for innovations (H3b)	0.18**
Upstream market information (H3c)	0.21**
Dependence on the current customer (H3d)	−0.17*
Dependence on the current customer × RPI adoption	0.23**
N	200
F	12.85**
R^2 (adjusted R^2)	0.32 (0.29)

*$p<0.05$, **$p<0.01$.

et al., 1995). Discussions with potential respondents suggest three items from Kumar et al. (1995) as useful to measure dependence on the current customer, after some adjustments to the research context.

4. Results

Table 1 shows the standardized coefficients (βs) obtained from ordinary least squares (OLS) regression of the SF's performance expectations on the hypothesized explanatory variables.

Small firm's current success has a positive influence on small firm's performance expectations ($\beta=0.14$, $p=0.02$), which confirms that SFs expect to some extent that business conditions will stay as they are.

The positive impact of RPI adoption on an SF's performance expectations ($\beta=0.29$, $p<0.01$) confirms Hypothesis 2. Managers hold on to positive performance expectations about the RPI that they had when they were planning to adopt the RPI.

The results show that an expressed need for RPI by current customers has a positive influence on a SF's performance expectations, which confirms Hypothesis 3a ($\beta=0.15$, $p=0.04$). RPI is an opportunity and expressed customer needs facilitate successful RPI.

The positive coefficient for Small firm's open mind for innovations ($\beta=0.18$, $p<0.01$) confirms Hypothesis 3b, which shows that more innovative managers are more optimistic about the future. This entrepreneurial characteristic allows small firms to respond to the expressed needs for RPI.

The results show that upstream market information positively influences an SF's performance expectations ($\beta=0.21$, $p<0.01$), which confirms Hypothesis 3c. Upstream market information seems to speed-up identification of opportunities that emerge in upstream markets, which makes SFs positive about the future.

The negative coefficient for dependence on the current customer ($\beta=-0.17$, $p=0.03$) confirms Hypothesis 3d stating that dependence on the current customer negatively influences an SF's performance expectations when SFs have not adopted the RPI. SFs that are dependent on their current customer are unable to serve other customers with the more profitable RPI.

The support for Hypotheses 3a, 3b, 3c, and 3d supports the notion that SFs' ability to respond to customer needs for radical product innovation has a positive influence on performance expectations.

The coefficient for the interaction term between dependence on the current customer and RPI adoption is positive ($\beta=0.23$, $p<0.01$); dependence on the current customer has a positive influence on SF's performance expectations for firms that have already adopted the RPI ($\beta=0.21$, $p=0.04$). Dependence on the current customer guarantees an outlet for the new product in case of RPI adoption.

5. Conclusions

The results show that performance expectations in SFs are only to a limited extent a naïve extrapolation of SF's current success. Positive long-term performance expectations formed during the preparations to adopt the RPI influence performance expectations after adopting the RPI irrespective of the SF's current success. Also, SF's ability to respond to customer needs for radical product innovation, influence SF's performance expectations.

Current success has a positive influence on performance expectations; SF managers expect that the structural market situation and the capabilities of the SF will change gradually only.

RPI adoption has a direct influence on performance expectations; long-term positive objectives formed during planning for a RPI appear to have a long-lasting influence on performance expectations.

SF's ability to respond to customer needs for radical product innovation, as indicated by an expressed need for RPI by current customers, SF's open mind for innovations, upstream market information and independence of current customers, has a positive influence on performance expectations.

Information about market opportunities, particularly from current customers, appears to have a positive influence on performance expectations of SFs. This result suggests that SFs prefer to serve current customers that express a need for RPI rather than to generate new customers by RPI.

Small firm's open mind for innovations has a positive influence on SF's performance expectations. This finding suggests that personal characteristics of managers, particularly entrepreneurial characteristics, influence performance expectations of SFs.

Upstream market information facilitates RPI by offering solutions for problems related to the RPI. Moreover, upstream market information speeds up the identification of future opportunities that will be offered to SFs.

Dependence on current customers has a negative influence on performance expectations of SFs without RPI, and a positive influence on those SFs that have adopted RPI. SFs might feel themselves restricted in responding with RPI to market opportunities if they depend on a customer who is not, or to a limited extent, interested in RPI. The influence of dependence on current customers on performance expectations, however, seems contingent on the market situation; when SFs have adopted an RPI, dependence on the current customer increases performance expectations.

6. Discussion and implications

6.1. Discussion

Analogies exist between results of this study and those found in the financial literature. Most notably, performance expectations of small firms are influenced by current success just as earning expectations of publicly traded firms are influenced by past earnings (Abarbanell and Bernard, 1992; Bar-Yosef et al., 1987; Frazzini, 2006). Likewise, performance expectations of small firms are influenced by investment decisions (i.e., RPI) just as earning expectations of publicly traded firms are influenced by investment decisions (Lee and Nohel, 1997). A parallel also exists with the management literature. The result that expressed needs for RPI of customers influence performance expectations of small firms reflects the value of lead users for new product performance as described in management literature (Franke et al., 2006; Lilien et al., 2002; Urban and von Hippel, 1988; Von Hippel, 1988;). The influence of an owner's open mind for innovations, an important element of entrepreneurial orientation, on performance expectations of small firms corresponds to the influence of entrepreneurial orientation on performance in the management and marketing literature (Slater and Narver, 2000; Matsuno et al., 2002).

6.2. Implications

Performance expectations of SFs are an indicator for their future performance, which has an impact on an economy. Knowledge about

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factors that influence performance expectations of SFs, therefore, may help to better understand and predict economic cycles.

Moreover, this research shows that SFs' ability to respond to radical product innovation influence their performance expectations. For example, signaling demand and technical opportunities for RPI, and, more general, improving SF's capabilities to respond to opportunities, may influence performance expectations. This finding offers opportunities for suppliers to small firms, governments, or other stakeholders who prosper when SFs are more positive about their future.

Suppliers to SFs need to know what drives increasing performance expectations of SFs, because they are not always an indicator of increasing demand for supplies, but may indicate qualitative changes in the demand for supplies. Preparations to adopt RPIs, and even the ability to respond to customer needs for radical product innovation increase performance expectations and indicate qualitative changes in the demand for supplies rather than quantitative changes.

SFs can improve their performance expectations by monitoring customer needs and new technological possibilities, and by improving their capabilities to respond to such opportunities. This result suggests that SFs become more positive about their future performance if they improve their market orientation (e.g. Slater and Narver, 2000; Kirca et al., 2005). The parallel between results of this study and financial and management literature suggests that insights, theories and methods developed in financial and management literature may be used to further gain insight in SFs' behaviors, and vice versa.

6.3. Future research

This study makes a first attempt to understand the formation of performance expectations. This research focuses particularly on SFs considering RPI. Refining the analysis of the relationship between innovation and performance expectations in SFs seems worthwhile, for example by analyzing the impact of other types of innovations, such as modifications of existing products or process innovations.

Other opportunities for further research are the application to SFs of concepts developed in the finance literature, because earnings expectations of publicly traded firms resemble performance expectations of SFs. Compared to SFs, however, medium-sized and large firms have more management and marketing expertise and the formation of performance expectations is probably a group process. Hence, researchers should adapt and test concepts from the finance literature for use in SFs.

The impact of SFs' resources and capabilities on performance expectations may be analyzed in more detail. For example, resources such as social and business contacts may influence performance expectations. Also, the influence of financial strength of the firm should be considered; a strong financial basis makes a SF more resistant to market risks, which might influence performance expectations.

Another avenue for research is the analysis of the relationship between SF's performance expectations and its future decision making. Knowledge about the influence of dynamic determinants such as changes in market demand would increase understanding of the formation of performance expectations too. Such research projects require longitudinal data.

Appendix A. Scale items

Small firm's performance expectation

1. I am negative about the future of my farm (r)*.
2. I am negative about the future profitability of my farm (r).
3. I am negative about my income from the farm (r).
4. I expect that my farm will be successful.
5. I expect that the profitability of my farm will rise.
6. I expect that my income from the farm will rise.

* Only this item was used in this study.

(7 point semantic differential scale anchored by totally disagree versus totally agree).

Current success (Alpha = 0.79)

1. Compared to colleagues, I achieve a good margin per egg.
2. Compared to colleagues, I achieve good financial results with layers.
3. Compared to colleagues, I have a profitable layer business.
4. I acquire a good income from my layer business.
5. I achieve excellent financial results with my layer business.

(7 point semantic differential scale anchored by totally disagree versus totally agree).

Small firm's open mind for innovations (Alpha = 0.71)

1. I am reluctant to introduce new ways of doing things until I've seen that they work for other poultry firms (r).
2. I have to see other people use something new before I will consider it (r).
3. I often find myself skeptical of new ideas (r).
4. I consider myself to be creative and original in my thinking and behavior.
5. I am an inventive kind of person.

(7 point semantic differential scale anchored by totally disagree versus totally agree).

Upstream market information (Alpha = 0.75)

1. I often meet feed suppliers to find out what products and services they are going to provide in the future.
2. I do a lot of research into the supply of feed.
3. I regularly assess the quality of fodder and services of feed suppliers.
4. I regularly check whether the product offer of my feed supplier still matches my wants.
5. I regularly draw up plans to anticipate developments at feed suppliers.

(7 point semantic differential scale anchored by totally disagree versus totally agree).

Dependence on the current customer (Alpha = 0.64)

1. There are other customers than my major buyer to whom I could sell my eggs (r).
2. It is costly for me to switch to another buyer.
3. It would be difficult for me to replace my most important buyer without losing some income.

(7 point semantic differential scale anchored by totally disagree versus totally agree).

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