Predictors of Rent Returns to Innovation in Small Firms: An Exploratory Study

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Abstract

Small to medium enterprises (SME) are frequently associated with high levels of innovation. However, it is difficult for such firms to fully assess the merits of a particular innovation. This study examined the risk-return profile of future investment in innovation by SME with respect to anticipated 'rent' or financial returns. A survey of highly innovative SME was undertaken that examined management perceptions of the key strategic influences on rent returns. Regression analysis suggests that the firm's assessment of the rent returns from their innovation may be influenced by the value it is likely to deliver to the customer, the customer's expected use of the innovation to generate new sales and the ease of integrating the new innovation into existing technologies.

Keywords: *Small Business, Entrepreneurship, Innovation, Risk Assessment*

Innovation in Small Firms

Innovation is recognised as a key driver for economic and social development and a critical element in the future success of industry (Senge, Carstedt, & Porter, 2001). As a process within organisations, innovation is about new product or process leading to the enhancement of value for customers and shareholders (Drucker, 2002). Innovation requires change, both to the customer

and the supplier, as well as to the firm that drives the initiative. Such change can be incremental in nature or highly radical and disruptive (Tushman & Nadler, 1986).

Due to the potentially disruptive nature of innovation it is an activity containing inherent risk, with uncertainty in future technical, commercial and financial returns to the initial investment required (Gatignon & Robertson, 1993; Dziura, 2001). An important consideration in the decision to invest in future innovations is therefore the trade off between risk and return.

For small to medium enterprises (SME) (e.g. those with less than 200 employees), the ability to assess risk and evaluate potential returns is frequently difficult. Such firms are frequently viewed as having an important role to play in the generation of new innovations (Freel, 2000; Hansen, Sondergard & Meredith, 2002; Mogee, 2000). It has been estimated that around 67 percent of all inventions and 95 percent of radical inventions patented in the United States since 1945 were attributed to small entrepreneurial firms (NCOE, 2000). The role of small firms in Europe (European Commission, 2003) and Asia (APEC, 2003) has also been noted.

Despite the importance of SME to enhancing innovation, it remains difficult for the entrepreneurs associated with such businesses to fully assess the relative merits of their innovation in relation to risk-return trade offs. Successful diffusion of an innovation frequently involves consideration of a range of variables associated with market forces, including the relative power of competitors, suppliers and customers and regulatory agencies. For most small business operators, the evaluation of these many factors remains complex and difficult. Thus an evaluation tool designed to assist owner-managers of small firms assess the merits of their innovations is likely to be of significant value.

The Concept of RENT

While financial models (e.g. Net Present Value) can offer a guide to the potential attractiveness of innovations, these measures are limited in their capacity to fully assess the non-financial variables

likely to impact on the investment, such as the competitive reactions of the environment.[1] Moreover the innovator might be convinced of the value of its innovation but unable to analyse it or even prove its reality. There can be three main reasons to explain this.

First an innovator often places more emphasis on the anticipated absolute value of the innovation without considering the potential difficulties associated with its launch (Martin & Scott 2000). This evaluation frequently can be overly optimistic either because the anticipated interest is overestimated or because it does not take into account the erosion of the RENT due to the bargaining power of such environmental actors as suppliers and customers; and due to the effects of competition.

Second the innovator may have had an unstructured way of reasoning, thus they may act on an intuition rather than on a rational reasoning (Mockler, 2003). This is a high probability among small firms where the owner-manager is relatively isolated and lacks the support of an evaluation team with the skills to conduct appropriate feasibility analysis. Third, the innovation frequently involves a complex, non-linear process in which feedback over progress is difficult to anticipate. Santi, Reboud, Gasiglia, and Sabouret (2003) have suggested a risk assessment framework for SME to assess the strategic risk-return of future investment in innovation. This measures the anticipated 'RENT' or financial return anticipated from a particular investment in an innovation (Miles, Paul & Wilhite, 2003).

In order to help the innovator not only to correctly assess the initial anticipated value of its innovation but also the erosion effects it will face when launched on the market, the process of analysis follows several steps (Santi et al 2003; Reboud & Mazzarol, 2004): i) analysis of anticipated rent (the 'potential rent'), related to the kind of innovation and the number and size of the potential using markets; ii) analysis of the characteristic of the environment of the potential using market, and the related erosion effects; iii) analysis of the competitive strengths the

[1] For more details see the review made by Beaudoin and St Pierre, 1999.

innovation will have to face, leaving only a 'residual rent'; and iv) analysis of the competitive situation of the SME and its ability to launch the innovation, able to catch an 'appropriable rent'.

Innovation is in economic theory a potential source of competitive advantage (Nemeth, 1997). The rent associated to this competitive advantage is the condition for its success and further development. An innovator is thus going to develop a new resource or competence or going to create a new combination of existing resources and competencies (Schumpeter, 1934). A firm with a competitive advantage should be able to generate a rate of profit higher than the mean rate of profit in its industry and even more to keep this rate higher during a given period. In many cases of innovation the durability of the advantage can be protected thanks to the patent system.[2] The innovator is then the only legal user of the innovation for a twenty-year period securing a legal monopoly and creating a sustainable competitive advantage. This emulates the concept of Ricardian rent.[3]

A Model of Risk Assessment

Determination of the potential RENT return from a future innovation is a function of three variables (Santi, et.al 2003 and Reboud & Mazzarol, 2004): i) **Volume** – as measured by volume of sales over one year; ii) **Rate of Margin** – as measured by profits generated from the innovation; and iii) **Length** – or duration or life cycle of the innovation. This amount will be the combination of three components, which will vary independently one from the other. This can be shown as follows:

RENT = VOLUME X RATE X LENGTH.

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[2] For a complete analysis see "Revue d'Économie Industrielle" number 99, 2nd trimester 2002.

[3] For more details on the concept of rent, see Schumpeter [1912], Lewin and Phelan "*Rent and Resources: an Austrian perspective*", University of Dallas, 2002, Dagnino, Giovanni Battista; "*Understanding the Economics of Ricardian Chamberlinian and Schumpeterian Rents: Implications for Strategic Management*"; Rivista Internazionale di Scienze Economiche e Commerciali, Jan.-March 1996, v. 43, iss. 1, pp. 213-35.

Figure 1 illustrates the relationship between these variables in relation to the diffusion life-cycle of an innovation. Table 1 also shows each of these three elements and their potential indicators.

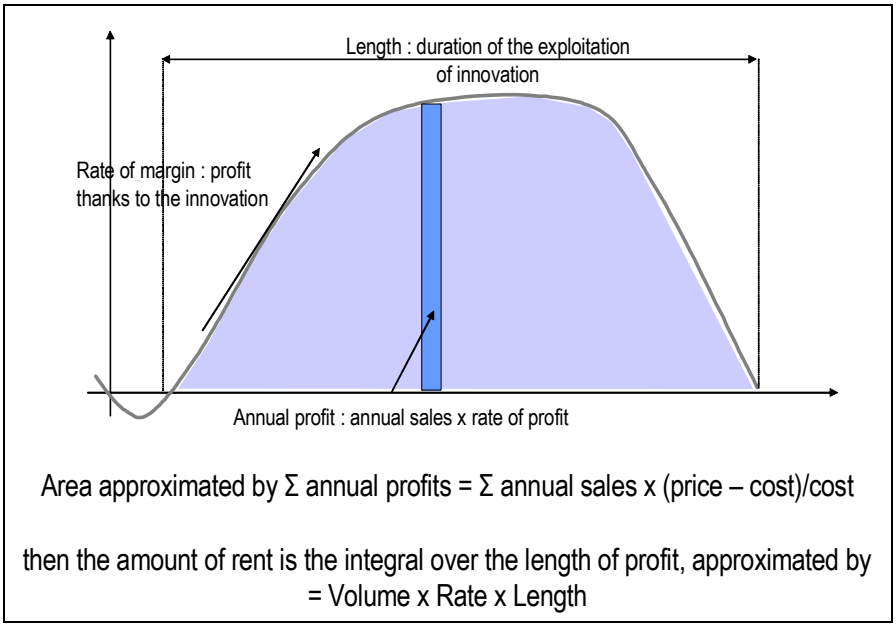

Figure 1: Components of the Rent (Santi et al. 2003 and Reboud & Mazzarol, 2004)

Table 1: measure of potential rent

Components of RENT	*Indicators*
VOLUME: (potential annual sales)	– Size of industry or market sector – Geographic diffusion potential – Size of end-user markets – Limits due to prior patents
RATE: (potential profit margin)	– Type of innovation process involved – Type of innovation involved – Level of prior protection for intellectual property
LENGTH: (potential life-cycle)	– Technological basis of innovation – Innovation intensity of the user centre – Legal and technical protection of intellectual property

(Santi, et.al. 2003)

As the combination of these three variable components, a rent can be characterised by its extreme profile: large/small volume; high/low rate of margin and short/long life cycle. With two possibilities for each variable a total of six combinations can be identified. These are illustrated in Figure 2, where the options are shown with their various trade-offs of volume, rate and length within the rent equation.

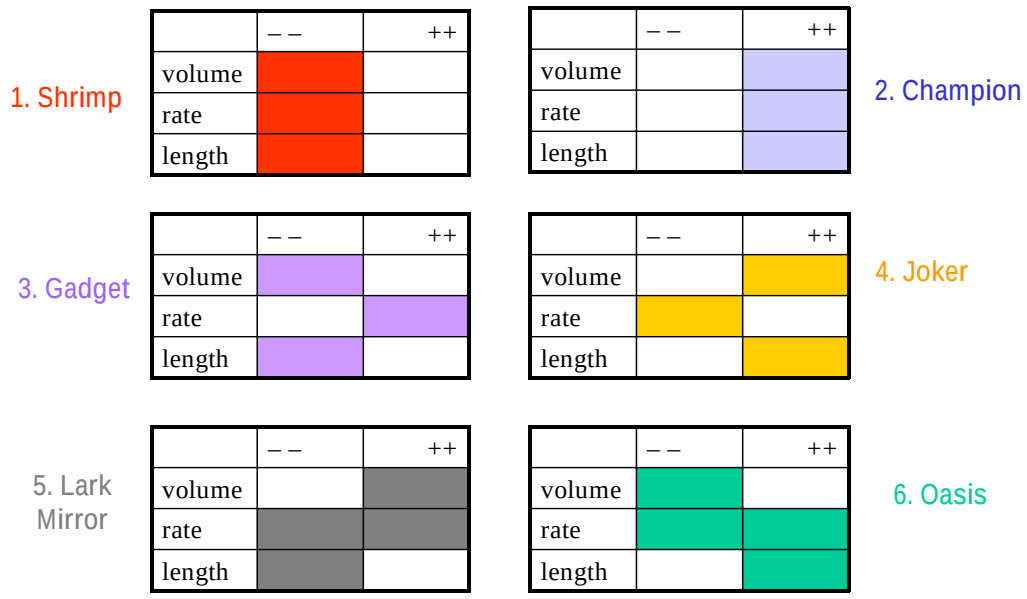

Figure 2: Typology of configurations of rent of an innovation (Santi et al. 2003)

Each configuration involves different levels of volume, rate and length thereby determining the anticipated rent to be derived from the innovation. As shown in Figure 2 these configurations are labelled: 'Shrimp', 'Champion', 'Gadget', 'Joker', 'Lark Mirror' (Flash in the Pan), or 'Oasis'. These may be further described in the following terms:

1. **Shrimp** – a configuration offering low rent potential due to its modest levels of volume, rate and length, as such it is unlikely to be of much interest;

2. **Champion** – a configuration with high potential rent;

3. **Gadget** – a configuration offering low volume and length but high rate, leading to little interest overall. Such a configuration would not justify significant investment;

4. **Joker** – configuration with high volume and length but low rate making it little better than the 'Gadget' despite its apparently attractiveness;

5. **Lark Mirror or "Flash in the Pan"** – a configuration with good volume but poor length and may experience both high or low rate, making it challenging for the investor that may need to outlay substantial capital to secure the return over the short life cycle; and

6. **Oasis** – a configuration that offers good length but low volume and high or low rate.

While the "Champion" configuration appears the most desirable, Santi et.al (2003) have suggested that the "Oasis" configuration is more suitable for an SME because the small overall volume of sales may be more readily exploited by the small firm. Such an innovation opportunity is essentially that found in a niche market. However, the capacity of the SME to secure a desirable rent return from its innovation is likely to depend on its resources, the nature of the innovation and the characteristics of the market environment into which it is seeking to diffuse the innovation. Key forces likely to influence the market environment include the power of customers and their capacity and willingness to adopt the new innovation, the power of competitors, and the capacity for new market entrants and substitution threats to erode the competitive advantage of the innovation (Porter, 1980).

Sampling and Methodology

To evaluate the efficacy of the RENT configuration model outlined in Figure 2, a survey instrument was prepared based upon the original framework used by Santi, et.al. (2003). This used the questions and followed the steps of the original model, asking the respondent to evaluate items using Likert-type scales rating his/her responses. The survey was piloted with owner-managers of SME known for their high level of innovation investment in new products.

The questionnaire was subsequently distributed to SME identified as highly innovative. These firms were registered with the Western Australian State Government Department of Industry and Resources (DOIR), who facilitated the data collection process. A total of 550 firms were surveyed, drawing from the database of innovator companies held by the Western Australian Government. Mailed questionnaires with accompanying covering recruitment letters were sent to all these firms and a total of 57 usable responses were returned (10% response rate).

The questionnaire was targeted at persons within the firms who could report on behalf of the entire organisation. Within the final sample 42 percent were owner-managers, 23 percent were executive managers and principal shareholders, 25 percent were executive manager shareholders and 10 percent were executive managers without shareholdings. Thus the majority of corespondents were both executive managers and owners. All firms within the sample had less than 100 employees, with the majority (75%) being small enterprises. The final distribution of firms by size was: i) 35 percent - micro-enterprises (e.g. less than 5 employees); ii) 40.5 percent – small enterprises (e.g. 5-20 employees); and iii) 14.5 percent – medium-sized enterprises (e.g. 21-200 employees). Annual turnover ranged from less than AUD$0.5 million to over AUD$20 million, however 83 percent had less than AUD$5 million, with the average around AUD$1 million. The majority (76%) of respondent firms indicated that they had prepared a formal business plan within the previous three years. Eighty-percent of these firms indicated that they had engaged in some form of export activity, and 58 percent claimed to have some formal process for innovation or new product development.

All respondents were asked if they had plans to introduce a new innovation within the next three years. The majority (96.5%) indicated that they had plans for some new innovation of which 54 percent felt their innovation would create a new market, while 55 percent felt their innovation was compatible with existing products and processes. Sixty-four percent of the firms had generated their innovation alone.

Exploratory Regression Analysis

To evaluate the relationship between the six configurations of RENT and various predictors within the SME a regression analysis was employed. However, first a dependent variable had to be created to measure RENT. In order to estimate this model the dependent variable had to be constructed from three measures of VOLUME, RATE, and LENGTH. The first of these was estimated using an item relating to the potential annual sales estimated to be secure on a world-wide basis as measured in dollars. The second component was measured using an item that estimated the potential rate of profit the SME felt the innovation was likely to yield. Finally, length was measured using an item that estimated the ease with which an innovation could be copied. This allowed the development of a dependent variable that provided an estimate of low to high levels of potential RENT while also creating a proxy measure for the six RENT configurations as outlined in Figure 2.

A total of 28 independent variables were used in the model that measured the respondent's assessment of the customer's likely perception of the innovation and how readily the customer might adopt the innovation. This included customer perceptions of risk, compatibility of the innovation with existing technologies, price, and value, ease of understanding, and pre and post testing ability. These independent variables also examined power of customers and suppliers.

The analysis used a stepwise methodology that produced a model after three steps as shown in Table 2. It can be seen that this model had an adjusted R-square of 0.432 suggesting that the model explains around 43 percent of the variation in the data. This model suggests that the predictors of RENT were: i) the level of value likely to be offered to those who adopt the innovation; ii) the relative importance of potential sales turnover to lead customers; and iii) the compatibility of the innovation to the existing technologies operated by customers.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
3	.685	.469	.432	.57296

Predictors: (Constant), Q22 value offer to customer, Q51 importance of sales turnover to customers, Q27 customer compatibility of technology.

Dependent Variable: RENT

Coefficients

Model	B	Std Error	Beta	t	Sig.
(Constant)	1.091	.555		1.964	.056
Q22 value offer to customer	.341	.079	.487	4.345	.000
Q51 importance of sales turnover to customers	.184	.058	.358	3.201	.003
Q27 customer compatibility of technology	-.160	.054	-.329	-2.946	.005

Dependent Variable: RENT

Discussion of the Findings

The regression model outlined above suggests that the respondent's assessment of the RENT returns from their innovation may be influenced more by their anticipation of the value it is likely to deliver to the customer, the customer's expected use of the innovation to generate new sales and the ease of integrating the new innovation into the customer's existing technologies. Such findings are consistent with those of Rogers (1962) who highlighted the importance of the relative advantage of the innovation to the customer or adopter, and the compatibility of the innovation to existing processes.

The most important influence on the decision making of small firms is likely to be the customer. Small firms are likely to focus on their leading customers as a priority due to their ability to provide immediate sales revenues for the innovation. Sundbo (2001) has also shown the importance of close interactions between the firm and its lead customers as a means of enhancing innovation.

While still tentative, these findings indicate that the small innovator firm is likely to gauge the merits of their proposed innovation largely in terms of how it will be received by its leading customers. This is not surprising and supports other findings of the way in which small, high technology firms interact within their industry (Mazzarol, 2003).

Research into the innovativeness of small firms has placed emphasis on the role of the entrepreneur, the market and the firm itself (de Jong & Brouwer, 1999). Such firms will need to have internal cultures in which there is a close relationship between the entrepreneurial leadership and the employees, in which quality and the willingness to strive for continuous improvement manifest (Mazzarol, 2002).

The role of the customer as a driver of innovation within small firms might be explained in terms of the prospecting behaviour of the entrepreneur (Kickul & Gundry, 2002). The findings from this present study support this and point to the need for the small innovator firm to have entrepreneurial management that is closely in touch with leading customers and able to adapt its innovations to suit their needs and deliver value in terms of new sales growth, but without having to make significant changes to their existing technology base.

The most important of the predictors to the determination of RENT appears to be the potential value the innovation offers to the customer, as reflected in the beta for this item. Interesting the beta for the item relating to the compatibility of the innovation with the customer's existing technologies was negative. This may reflect the lower rental from an innovation that is more incremental than radical within the industry.

Conclusions

This regression model is exploratory in nature and does not seek to provide definitive findings. Further research is required with a larger sample and some adjustment to the questionnaire before any strong conclusions can be shown. Tentatively this analysis highlights the importance of the leading customer for small innovator firms in relation to RENT returns particularly the ability of the innovation to offer value to customers and customers who place high value on sales turnover. However, enhanced RENT may accrue where the innovation is more radical than incremental in nature.

As the findings from this study indicate, the key predictors for returns to investment in innovation as perceived by the management teams of SME are the acceptance of the new product by customers. SME seeking to invest in innovation are likely to be guided more by the market pull of customer acceptance of their new product than consideration of the intrinsic merits of the technology itself. The need for relatively quick market diffusion of the innovation can be explained in terms of the need within the SME to secure sales revenue to ensure sufficient cash flow to fund the growth of the business. Unlike their larger counterparts the SME is usually deficient in working capital and lacks the ability to withstand long periods before investments reach break-even. For this reason the SME is likely to focus on the needs of the customer and the customer's ability to readily adopt the innovation. It is noteworthy that the majority of firms in this sample were engaged in the development of their innovation alone, with few seeking to develop technologies in concert with university researchers or other publicly funded research centres. This is consistent with other findings from similar studies (Mazzarol, 2003) and may suggest that innovation in many small firms is more likely to be incremental than radical in nature. Future research will focus on further development of the model and its evaluation across a wider range of SME with the prospect of multi-country studies designed to measure the possible impact of national innovation systems.

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