

**An Exploratory Study of How Small Firms Estimate the Potential Rent
Returns from Investment in Innovation**

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ABSTRACT

Conventional risk assessment models are financially based and often ignore the broader strategic and market risk that frequently faces the entrepreneur in a small innovative venture. This study outlines the findings of a survey of small, high innovator firms in Australia. Short-term, capital intensive innovations were the most common type found, with most firms seeking to secure long-term sustainable returns from future investments in the same technology after its initial establishment in the market. Firms that reported possession of a formal, systematic approach to new product development or innovation were significantly more likely to generate superior innovations from a commercial perspective than did their counterparts without such systems.

Keywords: *Small Firms, Entrepreneurs, Innovation, Risk Assessment.*

INTRODUCTION

Small to medium enterprises (SME) are frequently associated with high levels of innovation and making a strong economic contribution within the economy (NOCE, 2000; European Commission, 2003; APEC, 2003). However, it is often difficult for entrepreneurs managing such small firms to fully assess the merits of a particular innovation; particularly in relation to the risk-return trade offs that are required. 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. To address this need a study was undertaken by a joint French-Australian research team to evaluate the effectiveness of a screening tool, developed to assist entrepreneurs from small firms assess the risk-return profile of a future innovation investment. This paper outlines the findings of this study and the implications they have for small innovative firms and those seeking to assist them.

THE CONCEPT OF RENT

Within economic theory, innovation is 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. 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.

For small firms (e.g. those with less than 100 employees) the ability to assess risk and evaluate potential rent returns is frequently difficult. Such firms are frequently viewed as having an important role to play in the generation of new innovations (Freel, 2001; Hansen, Sondergard & Meredith, 2002; Mogege, 2000). Despite the importance of small firms 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.

While financial models such as discounted cash flow analysis (e.g. Net Present Value) or real options modelling can offer a guide to the potential attractiveness of innovations (Anderson, 2000), 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. Moreover the innovator might be convinced of the value of their 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 & Hartley 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. A risk assessment tool able to overcome these problems is therefore highly desirable for small firms.

DEVELOPING A RISK-RETURN MODEL

Initial work on the screening tool was undertaken in France during 2002 using a qualitative methodology involving 15 small business owners from the Dijon and Paris region who had an

innovation they were considering to invest in (Santi, Reboud, Gasiglia & Sabouret, 2003). The theoretical model developed for this screening tool assumes that the interest returned from an innovation is contingent on the amount of RENT that it can generate. This RENT is in-turn a function of three elements that vary independently of each other: i) VOLUME – or the volume of sales that the innovation can generate in a given time period; ii) RATE – or the margin of profit that the innovation can generate; and iii) LENGTH – or the duration or life cycle over which the innovation can be held in the market. This model is illustrated with the following formula:

$$\text{RENT} = \text{VOLUME} \times \text{RATE} \times \text{LENGTH}$$

An innovation can have a variety of profiles depending on the combination of volume, rate and length variables. For example, each of the components of the model can be either low or high creating a total of six RENT configurations. The first of these is that of the “**Shrimp**” which has low volume, rate and length, such an innovation is unlikely to be attractive. The second type is that of the “**Champion**”, which has high volume, rate and length and is the ideal configuration, although it may pose some problems for the small firm if sales volumes over stretch its production capacity. The third type of innovation is that of the “**Gadget**” where volume and length are low but rate is high. Such an innovation may be a poor investment, particularly if substantial resources are required. A fourth innovation configuration is that of the “**Joker**” that has high volume and length but low rate making it little better than the “Gadget” and a joke in terms of its capacity to return investment. The fifth configuration is that of the “**Lark Mirror**” or “**Flash in the Pan**” a configuration with good volume but poor length that may experience either high or low rate, making it challenging for the investor who might need to outlay substantial capital to secure the return over the short life cycle. Finally there is the “**Oasis**”, a configuration that offers good length

but low volume and high or low rate. The Oasis option may be of more benefit to the small firm due to the smaller, more tractable volume of sales that it offers (Santi, et. al, 2003).

It should be noted that not every innovation has the same value for a firm and not every configuration of rent is valuable. Further, rent can be eroded once the innovation has been launched in the market due to competitor and substitution effects. A distinction must therefore be made between the potential amount of rent (before any market introduction) and residual rent (after insertion in an economic environment). The relative lack of resources available to the average small firm might make the “Oasis” type of innovation attractive (e.g. one of small volume, to be able to supply, high or low rate of margin, and long length). All the other configurations present one or more specific dangers for small firm. For example, the “Shrimp” is unattractive for any firm while the “Gadget” offers only a short length leading to a “take the money and run” strategy. The other three configurations – “Lark Mirror/Flash in the Pan”, “Joker” and “Champion” – are all characterised by high volume and may not be easily followed by small firms with limited capacity to commit to such production.

APPLYING THE RENT MODEL

Prior to introducing the innovation to the market a first step for the entrepreneur of a small firm would be to first analyse the expected amount of potential rent. Estimating the potential sales volume requires a careful assessment of the market and the likely rate at which the new innovation may diffuse. Market size and the likely geographic reach of any potential market become important considerations, as well as the readiness of the market to accept the new innovation. Diffusion can be influenced by the existence of complimentary innovations as well as the degree to which the innovation is disruptive to existing technologies.

Estimating the likely rate of margin for the innovation is dependent on the cost of production and the price that the innovation can achieve within its selected markets. The innovator firm needs to adopt a generic market positioning strategy involving either substantially lower production costs (cost leadership), or superior value via differentiation to secure above average profits (Porter, 1980). However, the innovator will also need to consider the market forces of buyer and supplier power, market rivalry, new entry and substitution threats (Porter, 1980). Where there is a high level of market competition and relatively few entry barriers or substitution threats the chances of higher profit margins are likely to be poor. The relative power of customers and suppliers can also serve to erode the rate of profit margin by placing pressures on costs and profits.

Protection against such erosion effects can be important to securing both rate and length. For an innovation to be held within its market for a sustainable period at a good rate and volume is likely to depend on the technological basis of the innovation, the innovation intensity of the market and how easily the innovation can be imitated or substituted. To reduce erosion effects the innovator can seek to employ legal barriers such as trade marks, patents or copyright protection. These measures can prove costly for small firms and must be defended. Other options can include “causal ambiguity” in which the processes that led to the innovation are kept secret or at least not codified. Sometimes such processes can be so complex that they are difficult to readily imitate, or so specific to the originator that they cannot be replicated (Reed & De Fillippi, 1990). Maintaining a competitive advantage through the process of holding an innovation within its market may also be facilitated by the creation of “isolating mechanisms” that make it difficult for the competitor to appropriate the same knowledge or resources required to copy the innovation (Rumelt, 1984).

The ability to build such isolating mechanisms may depend on the ability of the firm to accumulate sufficient resources and skills that competitors may not be able to quickly replicate. This may require three conditions: i) “time compression diseconomies” – where the firm can secure a mark lead with its innovation and continue to hold this lead by continuous improvements; ii) “resources/skills mass efficiencies” – where the firm accumulates a stock of resources and skills greater than competitors; and iii) “interconnectedness of resources/ skills stock” – in which resources are used in a complex but competitive manner that cannot be replicated by competitors (Dierickx & Cool, 1989). However, for small firms this may prove difficult as it is unlikely that they will be able to assemble superior resources to their larger counterparts. To compensate for this small innovator firms are likely to need to forge strategic alliances with other firms capable to securing resources and skills stock and achieving competitive advantage via such collaboration (Ostgaard & Birley, 1994; BarNir & Smith, 2002). Also important to the assessment of the innovation’s potential for enhanced rent return is whether it is a stand alone or systematic in nature, and whether the innovator firm can develop the concept alone or if it requires the involvement of others.

METHODOLOGY & SAMPLING

A questionnaire was prepared that assessed the perceptions of entrepreneurs in relation to the rent-return model described above. The questionnaire was mailed to a database of 550 small high innovator firms held by the WA State Government Department of Industry and Resources (DOIR), who facilitated the data collection process. A covering letter explaining the purpose of the study was provided along with a pre-paid envelope. Fifty-seven usable responses were returned providing a 10 percent response rate, which is reasonable given that the questionnaire was fairly long and had been sent unsolicited.

The questionnaire was targeted at persons within the firms who could report on behalf of the entire organisation. The majority (90%) of respondents were entrepreneurs who held equity in the firm while also having executive functions. All respondent firms had fewer than 100 employees with the 75 percent having fewer than 20 employees and 83 percent having less than AUD \$5 million in annual turnover (the average was AUD \$1 million). A wide range of industries were represented in the sample although 24 percent were in the information technology, computing or electrical engineering area, 20 percent in manufacturing and construction. Unlike most small Australian firms 76 percent had formal written business plans and 80 percent were engaged in export activity. The majority (96.5%) of respondent firms said that they planned to introduce a new innovation within the next three years. Innovation was measured using the five classifications originally identified by North and Smallbone (2000): i) product/service innovation; ii) market development innovation; iii) marketing innovation; iv) process technology innovation; and v) administrative innovation. Eighty-four percent of the sample had product/service innovations with many having an innovation that reportedly encompassed multiple categories.

Using the RENT configuration model the responses from each case were analysed to classify the volume, rate and length associated with the innovations each firm were considering launching in the next three years. VOLUME was estimated by worldwide sales estimated by the end of the third year measured as either less than AUD \$10 million per annum (low) or greater than AUD \$10 million per annum (high). RATE was estimated using a 5-point scale ranging from small through to very high profits over the time period. LENGTH was estimated in terms of how easily the innovation might be copied or substituted producing a measure of either short or long lifecycles.

FINDINGS & DISCUSSION

Using the VOLUME, RATE and LENGTH variables estimated from the data a series of typologies were created involving either high or low scores. It can be seen from Figure 1 that the most common type was that of the “Lark Mirror/Flash in Pan”, followed in turn by the “Champion” and “Shrimp”, with the “Joker” being the least common type. It should be remembered that these types were derived from the responses of the respondents and were therefore self-reported classifications. The relatively high proportion of “Lark Mirror/Flash in Pan” innovations is worth noting given that this type is frequently capital intensive over a short lifecycle. The low number of “Gadget” and “Joker” innovations in the sample is also unsurprising given their lack of attractiveness to future investment. However, the low number of “Oasis” innovations is also noteworthy as these are theoretically a more suitable investment for small firms.

Table 1: Innovation Configurations found in the Sample

	Volume/Rate/Length	Frequency	Percent
Shrimp	Low/Low/Low	10	17.5
Champion	High/High/High	12	21.1
Gadget	Low/High/Low	7	12.3
Joker	High/Low/High	4	7.0
Lark Mirror/Flash in Pan	High/Low-High/Low	18	31.6
Oasis	Low/Low-High/High	6	10.5
Total		57	100.0

Chi-square tests were employed to measure any differences at the 0.05 level of confidence between these RENT configurations and firm demographics. This analysis found some

differences and many similarities. No significant differences were found in relation to the type of management structure of the firms, however a significant difference was found in relation to size of the firms and the classification of their innovation into the six types. “Gadget” and “Joker” type innovations were found to be more common among the medium size firms (e.g. 20-100 employees). For example, 90 percent of “Shrimp”, 83 percent of “Champion”, 78 percent of “Lark Mirror” and 100 percent of “Oasis” innovations were found associated with firms with less than 20 employees. By contrast 57 percent of “Gadget” and 75 percent of “Joker” innovations were found amongst the firms with over 20 employees. Given that the “Gadget” and “Joker” innovations are considered to be the least attractive due to their poor potential returns to investment, this is an unusual finding.

A similar pattern was found in terms of the firm’s annual turnover (which is usually correlated with the firm’s employment base). For example, 100 percent of all “Shrimp” and “Oasis” innovations and 83 percent of all “Champion” and “Lark Mirror” innovations were found among firms with less than AUD\$5 million in annual turnover. By comparison 43 percent of “Gadget” and 50 percent of all “Joker” innovations were found among firms with over AUD\$5 million in annual turnover. No significant differences were found between these different innovation types and such things as the possession of a formal written business plan, engagement in exporting, or investment in training for managers or employees. This was also the case for these innovations and whether the firm participated in a joint venture relationship with customers, suppliers or other parties. One area in which there was a significant difference found between the innovation types was the possession of a formal process of innovation and new product development. For example, 92 percent of “Champion” innovations and 100 percent of the “Oasis” innovations were found within firms that had such a formal process of innovation management. The majority of “Shrimp” and “Lark

Mirror/Flash in Pan” innovations were to be found in firms without formal innovation management systems. For the “Gadget” and “Joker” innovations there were as many firms with such formal innovation management systems as there were those without.

CONCLUSIONS

Given the relatively small sample these findings can only be viewed as indicative but they highlight the importance of small firms having a systematic innovation management or new product development system. Also noticeable was the relatively high number of “Lark Mirror/Flash in the Pan” configurations, which are often short-term, capital intensive innovations. For small firms this may not provide long-term returns to investment and may place significant burdens on their already limited resources. It was notable that the majority (64%) of respondents planned to develop their innovation alone suggesting that their resources could be severely stretched if the innovation proved to have a short life-cycle and prove less profitable than anticipated.

These findings suggest that small innovator firms can benefit from adopting systematic new product development or innovation management systems. This can be achieved through education programs designed to assist the entrepreneur to understand the commercialisation process and more effectively screen innovations prior to their launch. The study has limitations in that the sample size is small and limited to a single location. Future research is required to replicate the results of the study using a larger sample drawn from multiple locations. Future analysis of such data would seek to generate screening tools that can enable entrepreneurs to quickly assess the merits of their innovations and also apply these tools to a program of innovation management education designed to guide their future management performance.

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