Predicting anticipated rent from innovation commercialisation in SMEs

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Abstract

Purpose – The purpose of this paper is to examine the relationship between the expectations that small business entrepreneurs hold in relation to the future returns from the commercialisation of innovations, and key organisational elements including inputs, knowledge, culture, strategy, portfolio, project management and commercialisation. More specifically, this research aims to deepen the knowledge of how small- and medium-sized enterprises (SMEs) manage their innovation and identify critical factors determining the potential innovation outcomes.

Design/methodology/approach – This study draws on a large sample of innovative SMEs from multiple Organisation for Economic Co-Operation and Development countries. Data were collected using a questionnaire administered face-to-face with owners-managers or executives of SMEs who made critical decisions for the innovation management of the firm. First, a factor analysis is conducted to identify the most appropriate measures for each variable. Second, the authors test for multicollinearity among independent variables. The final step integrates results from the general linear model analysis that measures the relationship between organisational factors and the anticipated returns.

Findings – Findings suggest that positive expectations over future investment in innovation – as measured by the anticipated rent – are influenced by organisational factors, including innovation strategy, portfolio management, project management, and organisational culture and commercialisation process. Conversely, the resource endowment is not perceived as a barrier to innovation and to the development of a competitive advantage. In addition, industrial knowledge management has an indirect effect on the anticipated returns.

Originality/value – Despite extensive research in innovation management, the role of organisational factors on anticipated returns in SMEs has not been investigated to date. The study provides researchers with new insights into the resource-based view and the theory of entrepreneurial rent from the perspective of innovation management. The findings offer guidance to managers as to potential success factors in enhancing the rent, but also reflect entrepreneurial optimism in the management of innovation.

Keywords Innovation, Small- to medium-sized enterprises

Paper type Research paper

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1. Introduction

Innovation is an important driver of economic and social development and a critical element in the future success of industries (OECD, 2010). As a process within organisations, innovation is about new products or processes leading to the enhancement of value for customers and shareholders (Adams *et al.*, 2006; Bessant, 2003). However, innovation requires change, both to the customers and the suppliers, as well as to the firm. Such change can be incremental in nature or highly radical and disruptive (Tushman and O'Reilly, 1997). 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 (Dziura, 2001).

Because of the high-failure rate of innovation commercialisation in small firms, it is essential for entrepreneurs to estimate the potential returns before they commit to a particular investment (Wong and Tong, 2012). However, small- and medium-sized enterprises (SMEs) have traditionally had difficulties in commercialising innovation because of their limited resources and ability to cope with the investment risk (Mazzarol and Reboud, 2011). The challenge for many small firms that seek to commercialise an innovation is their ability to use conventional financial models (e.g. net present value) to assess the attractiveness of their innovation (Beaudoin and St Pierre, 1999). As a result, innovative small firms are likely to place greater emphasis on the anticipated absolute value of their innovation without considering the potential difficulties associated with its launch (Martin and Scott, 2000). An important consideration in the decision to invest in future innovations is therefore the trade-off between risk and return. Moreover, knowing in advance the difficulties the small firm may encounter when trying to commercialise an innovation can help to improve aspects of this innovation before it is too late (Naidoo, 2010) These factors strengthen the need for more research into the strategic management of innovation (Tidd, 2001), which remains a field of study that has become compartmentalised and fragmented despite its multidisciplinary nature (Shafique, 2013).

The objective of this research was to study the strategic management of innovation within SMEs seeking to commercialise new products and services, and thereby secure economic rents from their investments. The study takes an organisational perspective, investigating the factors that have significant effects on the anticipated returns, to understand how these SMEs manage innovation and what drives their optimism over such investment returns. More specifically, the study explores the impact of organisational factors on the potential volume of innovation sales, the expected rate of margin and the duration of exploiting an innovation.

This research is based on a large-scale study of innovative SMEs drawn from a cross-section of developed economies within the Organisation for Economic Co-Operation and Development (OECD) group of countries (Mazzarol and Reboud, 2011). The principal units of analysis are the perception of the anticipated return to future investment in the innovation by the firms' leadership teams. Also examined is the influence of factors identified by Adams *et al.* (2006) as a framework for measuring the management of innovation. We adopt a strategic perspective, and work from the assumption that the primary goal of innovation within a business is the establishment of a sustainable and distinctive competitive advantage. This in turn, is a precondition for the appropriation of economic rents extracted from the intellectual property associated with the innovation (Milgrom and Roberts, 1992; McGrath *et al.*, 1996; Miles *et al.*, 2003).

The paper is structured as follows, first it overviews the theoretical and empirical foundations of strategic decision making within innovation management and

commercialisation. A conceptual model is then proposed with hypotheses, before outlining the methodology and key constructs. Finally, the results and findings are analysed and discussed before reaching conclusions.

2. Theoretical background

2.1 The concept of innovation rent

The concept of "economic rent" emerged in the nineteenth century in relation to resources that are limited in supply and can therefore command premium prices. A scarcity of any resource, either tangible or intangible, allows above average rents to be charged by those who own such resources (Schoemaker, 1990). Economic rent is an important point of focus within the resource-based view (RBV) of strategic management because it helps to explain why some firms are able to secure long-run rent streams through their ability to control unique and valuable resources that cannot be easily replicated or substituted (Barney, 1991; Mosakowski, 1998).

At least two distinct types of economic rent have been identified with specific relevance to the strategic management of the firm. The first of these is "Ricardian rent", which focuses on bundles of tangible and intangible resources over which the firm has ownership or control. The second is "Schumpeterian rent", which focuses on the firm's ability to develop unique capabilities (Makadok, 2001). Ricardian rent is consistent with the RBV of strategy where the firm's ability to control unique and valuable resources permits it to secure above average rents (Penrose, 1959; Wernerfelt, 1984; Barney, 2001). However, Schumpeterian rent is more consistent with the dynamic capabilities concept of strategy that sees the firm's ability to deploy and exploit resources as critical to its competitiveness (Amit and Schoemaker, 1993; Teece *et al.*, 1997). For firms engaged in innovation commercialisation within fast-changing task environments Schumpeterian rent creation is likely to be more important, while firms in more stable task environments will potentially find Ricardian rent of greater importance (Lim *et al.*, 2013).

Systematic or formal approaches to the management of innovation commercialisation usually involve the protection of intellectual property via procedures such as patents, copyright, design registration and trademarks (Bertolotti, 1995). Yet the ability of a firm to create isolating mechanisms that can form strategic foundations for rent enhancement can also take the form of information and resource asymmetries, culture, processes and competencies (Dierickx and Cool, 1989; Schoemaker, 1990). These resources and capabilities form "strategic assets" that provide the firm with the ability to engage within its chosen industry and deal with customers, suppliers, competitors, substitution threats and the forces of regulatory and environmental change (Amit and Schoemaker, 1993).

Small entrepreneurial firms engaged in the commercialisation of innovation are likely to suffer from resource constraints and may deal with risk and uncertainty through different forms of organisational response (Alvarez and Barney, 2005). When faced with making decisions over future investments, such as with innovation, it is suggested that entrepreneurial leadership will focus on a predetermined level of affordable loss or acceptable risk rather than a predetermined return on investment (Sarasvathy, 2001). The absence of clearly established market price signals also forces the firm's management to develop strategies for future commercialisation without these navigation markers (Lippman and Rumelt, 2003). Further, the ability of small entrepreneurial firms to exploit potential economic rents from market opportunities has been associated with their capacity to convert tacit knowledge into explicit knowledge and generate isolating mechanisms that allow them to secure sufficient control to enable effective arbitrage (Alvarez and Barney, 2004).

By drawing on an RBV strategic management perspective, Alvarez and Barney (2004) suggested that one of the fundamental objectives that entrepreneurs pursue is to combine resources in such a way that this process will result in a competitive advantage. This advantage will typically allow entrepreneurs to appropriate a rent from their (monopolistic) situation as innovator. Innovations give rise to rents, defined as "a return received in an activity that is in excess of the minimum needed to attract the resources to that activity" (Milgrom and Roberts, 1992, p. 621). Along these lines, Miles *et al.* (2003, p. 394) defined the innovation rent as "returns that arise from the existence, discovery, and successful commercial exploitation of entrepreneurial opportunities". Alvarez (2006) has identified what she refers to as "entrepreneurial rents", which are created when economic actors such as entrepreneurs combine resources into new and different configurations to create innovations that are generated under conditions of uncertainty. The value of these entrepreneurial rents is difficult to predict prior to their being adopted within the market. Once they are transacted in the market they become "quasi-rents", which are created under conditions of risk.

Since entrepreneurial activities are closely associated with rent-seeking behaviour (Dejardin, 2011), it is important for owner-managers to understand the nature of economic rent and how it is estimated to develop an appropriate strategy towards a particular innovation investment. In this study, the initial assessment of the innovation rent involves the analysis of three different levels of rent (Mazzarol and Reboud, 2005):

(1) Anticipated rent: the potential returns that could be generated from a particular innovation investment. This arises from the kind of innovation (e.g. creating substitution in existing markets or generating new markets), the characteristics of innovation (e.g. standing alone or integrating into a new system) and size of the potential using markets (e.g. the annual volume of worldwide market for an innovation). It conforms to the "entrepreneurial rent" concept proposed by Alvarez (2006).

(2) Residual rent: the analysis of the competitive strengths the innovation will have to face, considering characteristics of the environment of the potential using market, and the related erosion effects. This is closer to the "quasi-rent" concept of Alvarez (2006).

(3) Appropriable rent: the real appropriated returns from innovation, considering the analysis of competitive situation of the SME and its capability to launch the innovation. This is the actual rent extracted from the innovation and can be generated via control over assets (e.g. Ricardian rent), or capabilities (e.g. Schumpetarian rent).

The estimation of the anticipated rent indicates the firm's capacity in assessing the risk and returns from investment in the innovation. However, as noted many SMEs have difficulty in estimating the potential rent due to limited resources, a lack of reliable or comparative data on financial costs and benefits, plus the uncertainty surrounding the outcome of the investment. The limited ability of SMEs to estimate future rent returns stems from three reasons. First, SME innovators often focus on more the anticipated absolute value while neglecting the erosion of the rent, the bargaining of customers and suppliers and the competition effects (Martin and Scott, 2000). Second, the SME innovator may have an unstructured way of reasoning, and thus may act on an intuition rather than on a rational reasoning (Moeckler, 2003). This is a high probability in small firms where the entrepreneur 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 is difficult to anticipate. Hence, our study aims to investigate the anticipated rent so as to provide entrepreneurs an overall view of the estimated returns that could be generated from their innovation. This in turn determines their decisions in relation to such investment.

As proposed by Santi *et al.* (2003), the anticipated rent is measured by three elements:

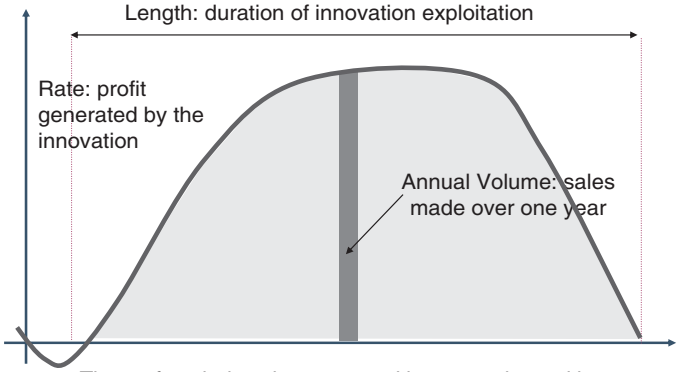
(1) the estimated volume of sales;

(2) the rate of profit margin; and

(3) the length of the lifecycle of an innovation.

Figure 1 illustrates this framework which was developed further by Mazzarol and Reboud (2005, 2006). The estimated volume of sales is determined by three indicators. The first of these is the potential geographic diffusion of the innovation within a given sector. The second is the owner-manager's estimation as to the potential annual sales that might be made on a worldwide basis after three years. The third indicator is their estimation of the potential diffusion of the innovation within one or more market segments (Hahn *et al.*, 1994). The rate of profit margin is related to the value and size of the competitive advantage created by the innovation. Three main factors influence the rate of margin. These include the process of generation of the innovation, the types of innovation and the kind of prior protection.

Finally, the length of the innovation's lifecycle depends on the technology used and the ease of copying the product or service (Teece, 1986). If the technological basis of the innovation rests upon fundamental research requiring extensive research efforts, the innovation will tend to have a long life cycle. By contrast, if the innovation is based on applied research and does not require major research work, its length of lifecycle may be limited. The technical ease to copy will also determine the probability and speed of competitive imitation (Reed and DeFillippi, 1990). The less transparent the innovation (because of technological complexity and specific know-how), the more difficult it is to access the knowledge inherent in the innovation (Tang and Murphy, 2012).



Sources: Santi *et al.* (2003), Mazzarol and Reboud (2005, 2006)

Figure 1.
The model of estimating anticipated rent

The ability to patent the technology and to enforce the patent effectively will further increase the lifecycle of the innovation (Hanel, 2006). Based on the aforementioned measurement of the anticipated rent, our objective was to identify factors critical to determining the entrepreneur's assessment of the potential innovation returns from an organisational perspective.

2.2 Organisational view

It has been suggested that the strategic management behaviour of SMEs can be analysed by examining three distinct yet complementary perspectives:

(1) the task environment in which the firm seeks to operate;

(2) the organisational configuration of the firm; and

(3) the firm's managerial characteristics (D'Amboise and Muldowney, 1988).

This view has been endorsed by other writers (Tan *et al.*, 2009; Uhlaner *et al.*, 2013). In this analysis we focus on the organisational configuration and how it impacts on the perceptions of the firm's top management team. This is consistent with the conceptual approach taken by Alvarez and Barney (2004, 2005) who point to the role played by entrepreneurs in the allocation of resources within their control, and/or via alliance seeking to enable them to generate economic rents (Alvarez and Barney 2001).

To provide a coherent framework for examining the process of managing innovation within a firm we adopted a conceptual model proposed by Adams *et al.* (2006). Their review of the academic literature identified at least seven key units of analysis considered important when seeking to measure the process of innovation management within organisations. These seven measurement areas were:

(1) inputs management (e.g. people, physical and financial resources);

(2) knowledge management (e.g. idea generation, knowledge repository);

(3) innovation strategy (e.g. the strategic orientation and leadership);

(4) organisation and culture (e.g. structure and culture);

(5) portfolio management (e.g. balancing risk/return);

(6) project management; and

(7) commercialisation (e.g. market testing, research, marketing and sales).

These seven elements provide a useful framework for examining the way in which the resource of an innovator SME may be organisationally configured in the management of innovation. The following section develops testable hypotheses for examining the interplay between these seven units of analysis and the dependent variable anticipated rent.

3. Hypothesis development

3.1 Inputs

Inputs or resources are defined as the firm's financial, physical, human, commercial, technological and organisational assets that are used for developing, manufacturing and distributing products and services to customers (Barney, 1991; Wernerfelt, 1984). According to Barney (1991, p. 101), "firm resources include all assets controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". Not all resources, however, are strategically relevant for the entrepreneur. Only strategic resources which are valuable, rare and imperfectly

imitable create competitive advantage because they are the basis of the firm's competitive advantage, which in turn determines its ability to earn a profit.

Technical resources such as engineering and production equipment, manufacturing facilities and information technology systems have been found to have a positively impact on innovation (Song and Parry, 1997; Mitchell and Zmud, 1999). With regard to human resources, firms which have a pool of qualified human capital with advanced technical skills, know-how in R&D projects, and risk-taking propensity have a higher probability of implementing innovative activities (Hitt *et al.*, 2001; Canto and Gonzales, 1999).

Financial resources are considered as the most important measure of inputs, which allows firms to allocate funds to innovation investments. Those firms, which have available financial resources, will have greater capacity to support its innovative activities (Lee *et al.*, 2001; Canto and Gonzales, 1999). Facilities or physical resources such as the firm's plant and equipment, its geographic location and access to raw materials are also important resources influencing the implementation of the innovation (Adams *et al.*, 2006).

According to Rogers (2004), firms with larger pools of resources have stronger cash flows for developing innovation. This advantage is predominant if the external capital market is inaccessible due to high risks of innovation. In addition, these firms have a higher capability to tap into human capital skills and knowledge. In other words, there is often a positive and significant relationship between the stocks of resource inputs available to SMEs and their ability to successfully commercialise an innovation. This view is supported by Gans and Stern (2003) enriching the "Profit from Innovation" (PFI) model PFI (Teece, 1986). Maine and Garnsey (2006) also emphasised the importance of resources and access to complementary assets. Hence, we posit that firms which have a larger pool of resources are better positioned to detect and exploit the potential associated to a specific innovation over time and have potentials of generating higher rent:

H1. There is a positive relationship between the firm' stocks of resource inputs that facilitate the development of innovation and the anticipated rent.

3.2 Industry knowledge

According to the RBV approach to strategy, organisational knowledge is one of the most important intangible resources that can help to build a sustainable competitive advantage (Barney, 1991; Argote and Ingram, 2001) and underline new product success (Hoopes and Postrel, 1999). Additionally, Thornhill (2006, p. 692) suggests that "knowledge can possess the properties of value, rarity, inimitability and organisational engagement", which are "central to enabling superior firm performance". Knowledge management relates to a firm's ability in obtaining and communicating ideas and information both explicitly and implicitly.

Whittington *et al.* (1999) suggest that firms with superior industry knowledge often have high levels of systemic change and innovation. Uhlaner *et al.* (2007, p. 5) propose that tacit knowledge is "most effectively shared directly between individuals, either through conversation or direct observation", and is found to have positive effects on a firm's innovative ability (Damanpour, 1991). In addition, organisations that are able to stimulate and improve the knowledge of their human capital are better to cope with changes (Nonaka, 1994). Past research also suggests that the greater part of knowledge that SMEs acquire comes from outside the firm and is essential to their success

(Zahra and George, 2002). Thus, knowledge management and more specifically, industry insights, can be assumed to play an important role in the development of potential innovation rent:

H2. There is a positive relationship between the firm's industry knowledge management and the anticipated rent.

3.3 Organisational culture

Schmidt (1990) observed that culture and cultural fit are more important in SMEs than other organisations. Organisational culture and structure can create environments in which innovation can be encouraged or hampered (Adams *et al.*, 2006). An open culture is often seen in many innovative firms because it stimulates the exchange of ideas with both the internal and external environment (De Jong and Brouwer, 1999). Open cultures are characterised by mutual trust and respect, and, as such, they provide a conductive environment for the exchange of ideas. Similarly, McFadzean (1998) found that a flexible and open environment promotes the creativity within the organisation and facilitates idea generation for the commercialisation purposes.

An openness towards external stakeholders matters. Some of the greatest ideas often come from amongst creative throngs of experts, consumers, engineers, students or current users. For example, crowdsourcing can represent an effective way to harness the wisdom of crowds (Lichtenthaler and Ernst, 2009). Numerous studies testify to the importance of firms extensively "networking" in order to improve innovation potential (e.g. Vanhaverbeke and West, 2006). This leads to our fourth hypothesis:

H3. The more the firm involves internal and external stakeholders in the management of the innovation, the higher the anticipated rent will be.

3.4 Innovation strategy

Innovation strategy plays a significant role in determining the firm's innovative ability and commitment on innovation investments (Tushman and O'Reilly, 1997). De Jong and Brouwer (1999, p. 30) remarked that the innovation strategy is "a major directional and motivating instrument for developing innovative decisiveness". As such, the innovation strategy is an integrative part of the mission, objectives and budgets for innovation and has a positive impact on corporate financial performance (Zahra and Das, 1993; Markham, 1998). Several scholars confirmed the positive effects of innovation strategy on innovation (Li and Atuahene-Gima, 2001; Verhees and Meulenberg, 2004; De Jong and Vermeulen, 2006). As a result, the planning and implementing of an innovation strategy is a key factor in determining the level of innovativeness, which then drives the firm's financial performance (Crespell and Hansen, 2008). Thus we posit that firms which have a stronger focus on innovation in their strategy will expect a higher anticipated rent:

H4. There is a positive relationship between the firm's commitment to innovation as a major future strategy and the anticipated rent.

3.5 Portfolio management

In the context of innovation management, portfolio management is the process of managing a variety of innovation projects; including choosing and monitoring appropriate investments and allocating funds accordingly. The management of the innovation portfolio has been found to be an essential issue in developing innovations

because this is the phase where new projects are evaluated, selected and prioritised. Additionally, the management is considered to be "an organisational capability and attempt to determine a level of proficiency" (Adams *et al.*, 2006, p. 35) as it helps firms to allocate resources efficiently and diversify the risks. According to Mikkola (2001, p. 42), portfolio management is a powerful tool that allows "products and R&D projects to be analysed in a systematic manner, providing the opportunity for the optimization of a long term company's growth and profitability".

Therefore, a systematic process guided by clear selection criteria could help optimise the use of limited resources and enhance an organisation's competitive position (Adams *et al.*, 2006). Other scholars (e.g. Capon *et al.*, 1992) have suggested that most successful firms are found to develop both product and process innovation simultaneously. In addition, Athey and Schmutzler (1995) found that complementary and process innovation helps a firm improve its net revenue in the short term. Therefore, we formulate the following hypothesis:

H5. Firms which manage to combine both product and process innovation in the innovation portfolio will achieve higher anticipated innovation rent.

3.6 Project management

Project management refers to the evaluation of the efficiency of the project, tools used, communications and collaboration within the team members. According to Naughton and Kavanagh (2009, p. 4), project management is "a set of techniques to effectively manage change and change is a synonym of innovation". The efficiency of the project management can be measured by different tools of evaluation procedures and instruments (Adams *et al.*, 2006). Kerzner (2006, p. 5) defined a successful project management as "having achieved the project's objectives within time, within cost, at the desired performance or technology level, utilizing the assigned resources effectively and efficiently and accepted by the customers". The role of team project management is a critical issue. Therefore, the ability to collaborate and the quality and efficiency of team working should be emphasised. In addition, an efficient process that helps to manage the ambiguity of the innovation is critical to innovation. Hence, project management is considered to play an important role in contributing to the innovation success. We can thus make the following hypothesis:

H6. There is a positive relationship between a firm's efficiency in project management of innovation and its anticipated rent.

3.7 Commercialisation

Innovation commercialisation was identified by Adams *et al.* (2006) as the implementation phase to achieve commercially viable outcome for the firm. Herdman (1995) remarked that commercialisation is driven by firms' expectations that they can gain a competitive advantage in the marketplace for a particular product, process or service. Several scholars (e.g. Helfat and Raubiscek, 2000; Huang *et al.*, 2002) found that customer knowledge enhances the success of new product development and commercialisation. Marketing capabilities such as market investigation, market testing and promotion play an important role in commercialisation processes (Verhaeghe and Kfir, 2002; Adams *et al.*, 2006). As a result, the communication with the customers and suppliers make a significant contribution to innovation processes (Bessant, 2003; Slatter and Mohr, 2006). In managing the commercialisation process, the protection of intellectual property is

regarded as a significant tool for SMEs to promote the sustainability of innovation and strengthen the firm's competitive advantage (Candelin-Palmpvist *et al.*, 2012; Burrone, 2005; Gans and Stern, 2003). Hence, a formalised management process of commercialisation is likely to generate a higher anticipated rent over time, which leads to our final hypothesis:

H7. There is a positive relationship between a formal commercialisation management process and the anticipated rent.

4. Methodology

4.1 Sampling

A sample of 477 SMEs was drawn from seven countries within the OECD. This included: Australia (78 firms), Austria (78 firms), Belgium (51 firms), Canada (47 firms), France (68 firms), New Zealand (92 firms) and Switzerland (63 firms). The data collection was part of an international research project on innovation management of SMEs conducted from 2006 until 2008 which drew a slightly larger sample of 567 cases from 11 countries (Mazzarol and Reboud, 2011). The sampling process used in the original study was purposive rather than random in nature and involved identifying firms that were engaged in the commercialisation of at least one innovation.

In this analysis, the original database from the above mentioned study was used and several firms and countries were removed due to missing or incomplete data, outliers or size (e.g. firms with over 250 employees). Despite the sample comprising firms from several countries, tests of country of origin in relation to the variables used in this analysis found no statistically significant differences. Any minor differences that were found appear to have arisen as a result of factors unique to the country sample rather than the country of origin. For example, most of the firms selected for the Belgium sample were micro-enterprises engaged within the Flemish creative industries sector. Their innovation management behaviour was typical of similar firms found in other countries, but a-typical of the entire sample when examined from a country perspective.

The firms selected for the final sample were from a range of industry sectors, among which manufacturing accounted for approximately 31.2 per cent of the total. The other major group comprised service firms, including retailing. The average age of firms was 22 years and the average level of investment on innovation was 22.8 per cent. We defined SMEs as a business with less than 250 employees and with the annual turnover of less than 50 million Euros (OECD, 2004). The data used in this study had been collected via face-to-face interviews with the entrepreneurs or senior executives of the SMEs. These interviews collected both qualitative and quantitative data with the latter gathered via use of a questionnaire deployed within an Excel spread sheet. This was a diagnostic assessment tool that enabled data to be collected and a report generated, which helped the respondents assess their own approach to both the estimation of the potential rent, and the innovation management processes employed. This also assisted in validating the responses and enhancing reliability of the data collected. Each interview typically took around one hour and involved broader discussions of the respondent's views on the external environment and their past experience of commercialisation. For the purposes of this study only the quantitative data was used.

4.2 Variable measurement

4.2.1 Dependent variables. In measuring the anticipated rent, we considered both its separate components (i.e. volume, rate, length) and the sum of these three elements.

The measurement was based on the owner-manager's assessment of the anticipated rent and the items were measured on a five-point Likert scale. The volume of potential sales was measured as the mean value of the estimated potential geographic diffusion of innovation within the firm's sector, the potential annual sales for such innovation on a worldwide basis over three years and the potential diffusion of innovation within segments of the firm's market. The rate of anticipated profit margin was measured as the mean value of the estimated gross profitability, the net profitability and the ability of the innovation to generate potential new market. The anticipated length of the innovation's life cycle was measured by the perceived level of the innovation's technical complexity, the imitability of the innovation in terms of technical and legal aspects. The final dependent variable, the rent index, was formulated as a synthesis of all these components.

4.2.2 Independent variables. The seven units of analysis as identified by Adams *et al.* (2006) were measured using 21 items selected from the diagnostic assessment questionnaire deployed in the original international study (Mazzarol and Reboud, 2011). The first of these independents was "inputs", consisting of four items that assessed the firm's possession of key technological, human, financial and physical resources, as suggested by Song and Parry (1997), Mitchell and Zmud (1999), Hitt *et al.* (2001), Canto and Gonzales (1999), Lee *et al.* (2001). The second independent variable, "industry knowledge" was measured by four items referring to the firm's systematic assessments of bargaining powers of customers, suppliers and competitor reaction. These measures are consistent with other measures of formality and market awareness used in earlier studies (Lyles *et al.*, 1993; Oden, 1997; Hoopes and Postrel, 1999).

The third independent variable, "organisational culture", was estimated with five items measuring the extent to which the firm engaged the internal and external consultation in developing innovations, based on Vanhaverbeke and West (2006) and De Jong and Brouwer (1999). The fourth independent variable, "innovation strategy", was a single item based on Adams *et al.* (2006) and De Jong and Brouwer (1999) assessing if a key focus of the firm was the generation of new innovations. The fifth independent variable, "portfolio management", was also estimated with a single item that comprised four categories: product innovation, process innovation, both product and process, or other types (such as marketing and administrative innovations), based on Capon *et al.* (1992) and Athey and Schmutzler (1995).

The sixth independent variable "project management" was estimated with three items relating to the firm's possession of experienced project management team, the access to external expertise and government supporting programmes. As the commercialisation process relates to the introduction and launching of innovations into the market (Miller, 2001; Adams *et al.*, 2006), measures for the variable "commercialisation" was estimated using four items referring to the innovation testing and the formal access to the intellectual properties protection (Candelin-Palmpvist *et al.*, 2012; Burrone, 2005; Gans and Stern, 2003)

4.2.3 Control variables. We included four control variables: firm size, firm age, R&D intensity and industry. Firm size has been found to have a positive relationship with the innovation commercialisation (Forsman and Rantanen, 2011) and the firm innovativeness (Dibrell *et al.*, 2011). In this study, the size of firms was measured by the number of employees. Drawing on the definition of SMEs (OECD, 2004), we distinguished between micro (fewer than ten employees), small- (from ten to 49 employees) and medium-sized (from 50 to 249 employees) enterprises. In the selected

sample, there were 34.6 per cent micro enterprises, 31.9 per cent small enterprises and 33.5 per cent medium-sized enterprises.

In relation to firm age, several studies suggested that, as firms grow older, their capacity to innovate and their profitability decline (Huergo and Jaumandreu, 2004). Older firms are typically characterized by a "burden" of age. Balasubramanian and Lee (2008) found that the economic implication of this effect is substantial: each additional year reduces the impact of a 10 per cent increase in R&D intensity and the firm's market value by over 3 per cent. In this study, we measured the age by the number of years in activity. We distinguished between young firms (e.g. $<$seven years old); adolescent firms (e.g. seven to 21 years old); and mature firms (e.g. $>$21 years old), based on Mazzarol *et al.* (2010). There were 23.8 per cent of young firms, 41.9 per cent of adolescent firms and 34.3 per cent of mature firms in the sample.

R&D intensity, which is often measured as the ratio of R&D on annual sales, has traditionally been used as a proxy for SME's capacity to innovate (Baldwin and Hanel, 2003; Adams *et al.*, 2006). Firms with greater than 5 per cent of annual turnover invested in R&D are viewed as high-tech, those with 3-5 per cent as mid-tech and those with less than 3 per cent as low-tech (Hirsch-Kreinsen *et al.*, 2008). In our study R&D intensity was measured on a scale ranging from 1 (bottom 20 per cent) to 5 (top 20 per cent).

The industry was the fourth control variable. This variable may have an effect on organisational characteristics and structures, which affects the firms' capability in exploiting innovation opportunities (Porter, 1980; Donate and Guadamillas, 2011). Hence, SMEs in our database were classified into three groups including manufacturing, services and retailing, and other industries.

4.3 Data analysis

A general linear model (GLM) was chosen to examine the impacts of the organisational factors on both the innovation rent as a whole and on its three components (volume, rate and length). A series of independent ordinal variables are the seven elements of the organisational view derived from the Adams *et al.* (2006). Before conducting the regression analysis, the reliability of all the constructs are confirmed by undertaking the partial least squares software tool. All constructs had the composite reliability coefficients (CRC) higher than 0.7 and the average variances extracted (AVE) higher than 0.5, which indicates strong reliability (Fornell and Larcker, 1981). Tests for multicollinearity among the variables were also undertaken by running the Variance Inflation Factor (VIF) and Durbin-Watson statistics. The VIF scores are well below 4.0 and the Durbin-Watson score are approximately 2, suggesting that multicollinearity was not a problem (Montgomery *et al.*, 2012).

In the first phase, the direct effects of organisational factors on the rent as well as on the volume, the rate and the length are examined, using GLM statistics. The second phase integrates both independent and control variables including firm size, firm age, R&D intensity and industry differences. All the GLM analyses are conducted at the 95 per cent of interval confidence. Significance is estimated at the 0.01 and 0.05 levels.

5. Results

The results shown in Table I indicate the overview of the descriptive analysis, the reliability coefficients and the correlation matrix between variables. The strong values of the CRC and the AVE of all multiple item constructs confirmed the reliability of the variables. All dependent variables were significantly correlated with all the

Table I. Descriptive analysis and correlation of variables

Variables	Mean	SD	CRC	AVE	1	2	3	4	5	6	7	8	9	10
Inputs	3.74	0.77	0.80	0.50	–									
Knowledge	3.43	0.76	0.82	0.52	0.21**	–								
Culture	3.94	0.58	0.80	0.51	0.1*	0.19**	–							
Strategy	4.13	1.04	–	–	0.15**	0.2**	0.28**	–						
Portfolio	–	0.94	–	–	0.01	0.07	−0.03	0.09	–					
Project	3.66	0.89	0.77	0.52	0.29**	0.37**	0.25**	0.37**	0.07	–				
Commercialisation	2.99	1.15	0.82	0.53	0.14**	0.27**	0.23**	0.25**	0.11**	0.39**	–			
RENT	28.5	18.7	–	–	−0.04	0.18**	0.3**	0.34**	0.22**	0.32**	0.42**	–		
Volume	3.07	0.95	0.78	0.55	−0.03	0.19**	0.24**	0.24**	0.15**	0.27**	0.29**	0.73**	–	
Rate	2.96	0.81	0.93	0.87	−0.02	0.1*	0.26**	0.35**	0.19**	0.19**	0.24**	0.71**	0.34**	–
Length	2.87	0.82	0.77	0.53	0.04	0.13**	0.2**	0.25**	0.22**	0.32**	0.5**	0.69**	0.34**	0.34**

Notes: $*p \leqslant 0.05$; $**p \leqslant 0.01$

independent variables. The higher standard deviation of variable rent index indicated its wide dispersion in the sample.

Table II shows the results of the eight linear general models with controls for firm age, size, R&D intensity and industry. The β coefficients, R^2 and adjusted R^2 statistics, F-value are also shown. As depicted in Table II, R^2 and adjusted R^2 indication of all the models improve when integrating control variables. For example, there is an increase of 4 per cent in the adjusted R^2 in comparison between model 1 and model 2, indicating the role of control variables in enhancing the higher percentage of significant variance. In addition, the results are significantly different when we examine the overall anticipated rent and each of its components (volume, rate and length of innovation).

In the first phase, direct relationships between the seven organisational factors and the anticipated rent, volume, rate, length were tested and illustrated in models 1, 3, 5 and 7. The results indicated a significant impact of organisational factors on these dependent variables. More specifically, the first factor (inputs) was found to have a negative effect on the volume of sales ($\beta = -3.76$) and the rent index ($\beta = -0.18$) as a whole. This suggests that the resource endowment is not seen as a barrier for these SMEs in innovation management, which rejects *H1*. The second factor industry knowledge was found to have insignificant relationship with the rent as well as its components, indicating its indirect effect on any of the anticipated rent measurement. This in turn rejects *H2*. The third factor, organisational culture, positively influences the rent index, the volume and the rate of margin. It means that firms which have an open culture and system in innovation management are more likely to generate higher volume of sales and higher rate of margin from innovation investments. Variable portfolio management and commercialisation are found to have positive significant

	Rent		Volume		Rate		Length	
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Direct effects								
Intercept	−27.64***	−21.71	0.76*	1.09	0.63	0.87*	0.92**	1.13***
Inputs	−3.76***	−3.6***	−0.18**	−0.19**	−0.09	−0.03	−0.07	−0.10*
Knowledge	0.10	0.16	0.10	0.09	−0.03	−0.04	−0.08	−0.08
Culture	5.57***	5.2***	0.26***	0.24**	0.25***	0.22**	0.09	0.08
Strategy	3.12***	2.45***	0.08	0.05	0.23***	0.2***	0.07	0.06
Portfolio	3.56***	3.18***	0.12**	0.10*	0.15***	0.14***	0.15***	0.15***
Project	2.6**	2.44*	0.16**	0.14*	0.02	0.05	0.13**	0.11*
Commercialisation	4.78***	4.22***	0.12**	0.10**	0.10**	0.08*	0.3***	0.29***
Controls								
Firm size		1.63*		0.15*		−0.03		0.08
Firm age		−2.70*		−0.16*		−0.13**		−0.06
R&D		2.90***		0.12***		0.12***		0.03
Industries								
Manufacturing		−2.30		−0.02		−0.19		0.009
Services/retailing		−1.94		−0.09		−0.07		−0.07
Others		0[a]		0[a]		0[a]		0[a]
R^2	0.32	0.36	0.18	0.22	0.20	0.27	0.31	0.32
Adjusted R^2	0.30	0.34	0.16	0.19	0.19	0.24	0.30	0.30
F-value	28.68	18.67	13.5	9.15	15.61	12.07	28.4	15.45

Table II.
Coefficients of linear general models

Notes: [a]Reference group. Confidence interval 95 per cent. *$p \leqslant 0.05$; **$p \leqslant 0.01$; ***$p \leqslant 0.001$

impacts on all the volume, the rate and the length. This result indicates their stronger impacts on the anticipated rent as a whole. This shows that firms which have a diversified portfolio of innovations and approach a systematic management of the commercialisation process are likely to expect a higher volume of sales, profitability and longer life cycle of innovation.

In the second stage, four additional control variables including firm size, firm age, R&D intensity and industry were included and presented in models 2, 4, 6 and 8. The adjusted R^2 among these models ranged from 19 per cent to 34 per cent, indicating a much stronger predictive power, in comparison with the first test with only independent variable variables. Among these control variables, the industry difference among these SMEs has no effect on the anticipated rent. While firm size has a positive influence on the estimated volume of sales, firm age imposes a negative impact on both the volume and rate of margin. By contrast, R&D was positively associated with the estimated volume of sales and the rate of margin. All these control variables had no effect on the length of innovation.

Surprisingly, the firms' resource endowments were not perceived as the main restriction for entrepreneurs to boost the anticipated volume of sales or the length of the innovation's life cycle. The negative coefficient of the variable "inputs" rejects our first hypothesis once more and suggests that a large resource endowment may actually have a negative impact on entrepreneurs or senior managers' optimism over anticipated rent returns to investment in the innovation's commercialisation.

Similar to the first test, variable industry knowledge had no direct impact on the rent index as well as its components. These results again reject the second hypothesis. Project management was positively associated with the anticipated volume of sales and the length of innovation life cycle, but imposed none effect on the rate. Hence, this provides partial support for the sixth hypothesis. Variable organisational culture was positively associated with the volume and the rate; it had no influence on length. Similarly, innovation strategy was perceived as a key determinant of the anticipated rate of profit, but it had no effect on the anticipated volume of sales or the length of the innovation life cycle. Hence, *H3* and *H4* were only partly supported. Overall, the variables portfolio management and commercialisation were the most influential organisational factors in determining the anticipated rent. This can be seen in their significant coefficients across all the dependent variables. *H5* and *H7* are therefore fully supported.

6. Discussion

Our findings show that two of our seven hypotheses were rejected, two were fully supported and three were partially supported. The rejection of *H1* and *H2* suggest that the firm's possession of stocks of resource inputs and industry knowledge are not significant influencers on the owner-manager's perception of anticipated rent. While this seems at variance with conventional management thinking, it is consistent with theories associated with the behaviour of entrepreneurial firms. As noted in the review of the literature, entrepreneurs tend to work less from their possession or control of resources (both tangible and intangible), and more from their optimism that they can build alliances and develop competencies to generate what Alvarez (2006) labels as "entrepreneurial rents". This approach is more consistent with the employment of Schumpeterian rent than Ricardian rent (Makadok, 2001), and supports the extant theory of the entrepreneurial firm (Alvarez and Barney, 2004).

The partial support for *H3* and *H4* demonstrates this trend with culture and strategy found to be influential on the anticipated rent via expectations for future sales and profit margins. These are areas that typically allow entrepreneurs of SMEs to make assessments based on direct interaction with customers or their past market experience. This has been found in services firms where market orientation (e.g. service quality, customer and employee satisfaction and engagement, plus market share analysis) serves to stimulate innovation (Agarwal *et al.*, 2003). Innovation within SMEs has also been found to benefit from enhanced social capital building (Cooke and Wills, 1999), which is consistent with the process of developing culture. However, the ability to forecast future product life cycles is less likely to be influenced by such factors. Here the emphasis is upon technical and legal issues able to create isolating mechanisms that can enhance the firm's ability to convert an entrepreneurial rent into a quasi-rent when competing in competitive markets (Alvarez, 2006).

The partial support for *H6* highlights a similar trend. As shown in Table II, even though there was a significant overall relationship between project management and anticipated rent, only volume and length were found significant in subsequent analyses. However, the lack of significant relationship between project management and the anticipated rate of profit should not be surprising. By its nature, project management is about the process of new product development and is concerned with the presence of an experienced project management team, the ability to access external expertise if required, and the ability to secure additional resources such as government grants or venture capital financing. It is therefore concerned with the speed of market diffusion as driven by the firm's technical competencies and third party funding, and the ability to generate isolating mechanisms via technical complexity that can offer enhanced life cycles. Profit margins as measured by the rate variable are less likely to be influenced by this process.

The support for *H5* and *H7* support both Makadok's (2001) concept of Schumpeterian rents and Alvarez's (2006) concept of entrepreneurial rents. In both cases there is an assumption that the entrepreneurial firm can engage actively within a chosen market without the pre-existing ownership or control of unique and specialised resources. Its basis for competitiveness is its ability to configure its limited resources and those of its strategic alliance partners into new products and processes that can be commercialised. Knowing its customers and generating new value propositions for them is a fundamental in entrepreneurial business models (Zott and Amit, 2010). The need for an entrepreneurial SME to focus on not only product and process innovation but also the market-oriented commercialisation process in order to feel confident about future economic rent streams found here is broadly consistent with earlier research. For example, the need for SMEs to maintain flexibility in matching new products to customer needs (Lindman, 2002). Also the interplay between collection of customer or market-related information (e.g. as part of the commercialisation process), and the development of innovative new products (Varis and Littunen, 2010).

These findings also suggest that the optimism entrepreneurs may have while considering future investments in the commercialisation of an innovation is likely to be influenced in part by the firm's size and level of R&D intensity. The greater the level of investment in R&D (e.g. R&D intensity) the more optimistic the firm's senior management were found to be. This is not surprising given that a significant investment in R&D would suggest that the firm was seeking to get an abnormal rent from whatever innovation it was developing. However, increasing firm size and age appear to lead to less optimism in relation to the anticipated rent. This may reflect either a process of

diminishing returns to such investment, or the impact of a path dependency whereby the firm's leadership is less likely to expect significant change from innovation. Larger or more mature firms can be expected to have more established market environments and a greater level of knowledge over what their customers will be willing to buy, the prices they can secure and their capacity maintain their products or services within the market over time. These findings are broadly in line with the findings from earlier studies (Lindman, 2002; Loderer and Waelchli, 2010).

The industry differences between firms were found to have no effect on the perception of the anticipated rent that could be generated from investment in the innovation. This suggests that the anticipation of future rent returns to investment in the development of new products or services are not significantly different across industries. While there are undoubtedly some differences between manufacturers, retailers and biotechnology SMEs in relation to how they physically generate new products and services, there seems to be no difference between such firms as to how their senior management assesses the anticipated rent return.

To sum up, the GLM analysis indicates that organisational factors such as the firm's culture, innovation strategy, portfolio and project management, and formal commercialisation (all of which reflect a systematic process of innovation management) have a significant positive relationship with either the anticipated volume of sales, rate of margin or the duration of innovation life cycle. These results demonstrate a potential application of the conceptual framework outlined by Adams *et al.* (2006), although within small entrepreneurial firms the importance of these seven units of analysis are likely to be variable. This research also provides supporting evidence of the theory of entrepreneurial rents as suggested by Alvarez (2006), and illustrates some of the potential dynamics that might take place within the decision making of entrepreneurial leaders of SMEs engaged in evaluating the future rental streams from innovation.

Our results also suggest that small firms that have an open organisational culture that includes both employees and external stakeholders in developing innovations systematically may perceive higher returns on innovation. Even though open organisational culture imposes a positive effect on the anticipated volume of sales and rate of margin, it appears to have no influence on the length of innovations. This need for a more open approach to culture and stakeholder engagement in new product development has been previously identified by Lindman (2002).

Regarding the innovation strategy, the commitment of small firms in making innovation a key goal also seems to be positively associated with such optimism, which is not surprising. In other words, firms which are innovation-oriented enhance the entrepreneurs' optimism over the potential rate of margin. However, such firms may also need to possess good portfolio skills, as well as the expertise to support this work. Additionally, a comprehensive project management is perceived as a significant determinant on the estimated volume of sales and the length of innovations. A comprehensive communication and coordination within the project management team helps to lengthen the life cycle of innovations. These findings are consistent with previous studies (see Capon *et al.*, 1992; Athey and Schmutzler, 1995; Humphreys *et al.*, 2005). Finally, their approach to the final stage of commercialisation also seems important. In addition, the ability of the firm in testing and protecting intellectual property rights appears to build the confidence of the entrepreneurs that the outcome of their commercialisation will be positive. Surprisingly, the inputs are found not to be a restriction in stipulating the volume of sales, thus motivating small firms to engage in the commercialisation process of innovations.

The efficient allocation and configuration of resources can be a key to competitive advantage (Barney and Clark, 2007), and the propensity to seek the appropriation of above an average rent through the configuration of limited resources is the foundation of the entrepreneurial firm (Alvarez and Barney, 2004). However, the ability of many SMEs to successfully engage in innovation and commercialisation is often restricted by their lack of resources, weak or unsystematic marketing and management competencies, and inadequate use of appropriate third party advisors (Vermeulen, 2005). Yet our findings demonstrate that small firms can be active innovators in spite of their limited scale and resources. These companies have often better results with the limited resources at hand and they have to "make do" with what they have. Despite their limited resources SMEs can actively pursue innovation opportunities and their motivation to do so is likely to be influenced less by their access to resources than by their sense that they have the capacity and systems to achieve positive outcomes.

7. Conclusion, limitations and implications

In conclusion, the study provides an aggregate analysis of the relationship between the management of innovation within an SME and the anticipated returns to investment in the commercialisation of an innovation as perceived by the entrepreneur or senior managers running the company. More specifically, this study provides some empirical support to the conceptual framework of innovation management proposed by Adams *et al.* (2006). It also contributes towards a better understanding of the theory of the entrepreneurial firm through its focus on how the dynamics of entrepreneurial rent creation might take place as postulated by Alvarez and Barney (2004; 2005) and Alvarez (2006). The original rent framework proposed by Santi *et al.* (2003) aimed to address the problem of how SMEs approach their assessment of whether or not to invest in future innovations when they cannot undertake conventional financial analysis. Their solution was a strategic analysis involving three stages generating an "anticipated", "residual" and "appropriable" rent forecast. These equate broadly with the "entrepreneurial" and "quasi-rents" concept proposed by Alvarez (2006); and the "Ricardian" and "Schumpetarian" rents that are derived from either tangible assets or capabilities (Makadok, 2001). This study, focusing on the "anticipated rent" provides new insights into the way such "entrepreneurial" rents might be assessed by entrepreneurs seeking to commercialise innovations.

Our finding that there was a negative impact of the "inputs" factor on the anticipated rent offers further insight into the innovation management behaviour of small innovative firms from a RBV. It suggests that such firms, led by entrepreneurial managers, may anticipate superior returns to investment in innovation regardless of their resource constraints. This raises some concern over how SMEs allocate and manage resources within innovation projects and the potential risk of over estimation of return in the initial assessment. It is why Santi *et al.* (2003) recommended a three-step process of validating the rent returns prior to investment.

This study also sheds additional light on the optimism of entrepreneurs over the potential returns from the commercialisation process. It suggests that the more structured or systematic the SME's management of innovation and commercialisation, the greater the optimism that the entrepreneur will have in relation to future returns to investment in innovation. This may seem self-evident, but the findings also indicate that varying combinations of the seven organisational factors originally identified by Adams *et al.* (2006) may influence management's perception of the anticipated rent, in particular whether they anticipate above average profit or length of life cycle.

This suggests a greater level of complexity may exist within the innovation management process and practice of small firms. A structured or systematic approach to management of innovation and commercialisation, even within small firms, appears to influence how the entrepreneur views the commercial benefits of an innovation, and specifically the anticipated rate of profit or length of life cycle that such an innovation might generate. Such perceptions can either encourage or discourage SMEs from engaging in innovation. The future growth and survival of SMEs is likely to depend on how actively they engage in innovation. Any evidence that can help entrepreneurs to make better assessments of the benefits of innovation, or to explain the organisational factors that might foster a more positive view of innovation by entrepreneurs, is potentially helpful to foster higher levels of SME engagement with innovation projects.

However, our study has several limitations. First, the sample was quite diverse in terms of size, age and industry. Although the influence of these factors were examined and reported, their impact on the perceptions of the firm's senior managers cannot be discounted. The sample also drew from a wide cross-section of countries and was purposive in nature due to the desire to select firms that were active innovators. Although we found no statistically significant differences between firms over these effects in relation to country of origin, our sample is not sufficiently comprehensive to totally discount country effect. While most OECD countries tend to have comparable national innovative systems, other external factors such as competition, market and business customs may significantly influence innovation management within SMEs. Therefore, caution is needed when generalising the results in other contexts.

7.1 Implications for research

Future research should investigate the interaction between the types of innovation undertaken by these firms, their innovation management and anticipated rent. In addition, different characteristics among sectors and sub-sectors in the sample should also be taken into account, instead of general industries. This is likely to require a further analysis drawing on case studies, for example, to provide a more comprehensive knowledge about these interactions as well as the nature of innovation management within particular sector. As our study focuses mainly on the organisational perspective, it is recommended to enlarge the scope of study to have a deeper insight into the innovation management of SMEs, considering external effects from the environment. In addition, a prospective longitudinal study should consider to examine both the "residual rent" and the "appropriable rent" to measure comprehensively the real rent generated and the erosion factors behind that drive the commercialisation performance.

Although we do not specifically examine the psychological characteristics of the entrepreneurs who responded to this study, the findings provide some insights into entrepreneurial optimism. As noted by Dushnitsky (2010) the concept of entrepreneurial optimism has begun to emerge within the literature. It is a separate concept to the notion of entrepreneurial opportunism and can have significant impact on the ability for an entrepreneur to accurately assess the risk and return of an invention. The optimism displayed by our respondents from the younger firms suggests that experience may temper their expectations over future returns to investment in innovation. It suggests that more research is needed in this area to determine the nature of this inverse relationship between optimism and age of firm.

7.2 Implications for policy and practice

The practical implications of our study are to provide entrepreneurs with insights into the key organisational factors that might determine their anticipated rent streams from

investment in innovation. It is essential for entrepreneurs of SMEs to recognise that their future rent returns from innovation will require consideration of factors influencing the volume of sales, the rate of profit and the length of the innovation's life cycle. Many entrepreneurs will approach the commercialisation of an innovation using the process of effectuation (e.g. assessing affordable loss rather than anticipated returns), and seeking to co-create the future with strategic partner (Sarasvathy, 2001). However, the ability to convert entrepreneurial rents into quasi-rents, as noted by Alvarez (2006) is conditional upon the entrepreneur's capacity to replace the uncertainty of decision making inherent in the former with the risk inherent in the latter.

This can be achieved through a more formal or systematic approach to the management of innovation. A cause-effect relationship is at work within small firms that sees better innovation management inputs and structure assisting with the achievement of enhanced anticipated returns to investment in innovation. As most SMEs are led by a single entrepreneur or owner-manager with the power to proceed or abandon the innovation, this study highlights the importance of getting the managerial process and organisational configuration right if more innovation is to be encouraged within the small firm sector.

The systematic screening of an innovation with this rent analysis technique can help small innovative firms to monitor the design of their innovation and improve it before their commercialisation. This is a virtuous circle that small business entrepreneurs need to enter. For those who already have experience of success in commercialisation these lessons are well known. For others who have yet to embark on the innovation journey, getting organised and systematically evaluating the way in which an innovation is to be managed through the commercialisation process is important. For policy makers and especially government agencies assisting SMEs in their innovation commercialisation, such analysis can also foster the dialog between experts and the SME managers by giving facts and figures and providing a common language to both parties.

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