Symposium Title: STRATEGIC INNOVATION IN SMALL FIRMS: LESSONS FROM INNOVATIVE COMPANIES WITHIN THE OECD

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Abstract

What types of innovations do small firms develop? How do small firms manage their innovation processes? How does the national innovation system impact on the commercialisation of innovations? This symposium addresses these questions using selected results from a major international research programme on strategic innovation processes in small firms conducted in eleven OECD countries. The first presentation provides the background, programme overview, and the theoretical frameworks used in this study. Key findings from small innovative firms in four countries are presented - Switzerland, New Zealand, Canada and the USA; and a comparative analysis from Australian and France will also be discussed. The final presentation includes major results from the whole study, and plans for further analysis and future research. This is a unique research programme which is developing new theory and insights which can inform policy, as well as diagnostics which can be used by entrepreneurs and small business owners to evaluate new innovations and to assist with their commercialisation processes.

Divisions/Interest Groups:

Technology and Innovation Management (TIM)

Entrepreneurship (ENT)

Keywords (3 per division)

TIM: strategy, technology and innovation; management of technology and innovation;

entrepreneurship and new ventures

ENT: small business; countries and culture context or comparisons, economic development and

growth

Symposium Overview

This symposium presents key findings from a major international research programme on strategic innovation processes in small firms[1] conducted in eleven OECD countries. Key questions to be addressed include: what types of innovations do small firms develop? how do small firms manage their innovation processes? and how does the National Innovation System impact on the commercialisation of innovations?

The management of innovation processes in small firms is an important area for research given limited prior research on innovative small firms and the potential significance of growth by small and entrepreneurial firms to economic development. Data was collected using a detailed survey instrument and in-depth interviews to profile the strategic management of innovation activities and innovation processes in small firms in each country, including the evaluation and implementation of new innovations. In addition, background information was collated on the characteristics of the SME sector and the features of the National Innovation System (NIS). At this stage, country-specific analysis has been conducted by each research team and preliminary analysis of the total database has been carried out by the leaders of the research network. This is a unique research programme which is developing new theory and insights which can inform policy, as well as diagnostics which can be used by entrepreneurs and small business owners to evaluate new innovations and to assist with their commercialisation processes.

The first presentation in this symposium provides the background, programme overview, and the theoretical frameworks used in this study. Key findings from small innovative firms in four countries are presented - Switzerland, New Zealand, Canada and the USA; and a

[1] For this study the OECD (2004) definition of small firms was adopted i.e. <250 full time employees

comparative analysis from Australian and France will also be discussed. The final presentation includes major results from the whole study, and plans for further analysis and future research.

In the **first presentation**, Mazzarol[2] will introduce the international research programme and outline the key theoretical models which have been used in this study. To evaluate the potential of a new innovation, Santi et al's (2003) Rent model was adopted to from a typology of eight different innovation types or Rent configurations. This model assesses an innovation based upon three components: volume of sales, the rate of margin, and length or duration of the innovation's life cycle. To examine the management processes involved implementing or commercialising new innovations Mazzarol & Reboud (2006) developed an Innovation Diagnostic Diamond (IDD) framework. This tool calculates indices for activities in four key areas – Strategy, Market, Innovation, and Resources. These indices are calculated on a 1-10 scale and plotted on a diamond-shaped radar graph to provide a visual representation of the firm's performance. This diagnostic enables entrepreneurs, managers and investors to see at a glance how well the firm's activities are organised. With this tool, areas of weakness in innovation management can also be identified and then addressed.

For the **Switzerland** study, Volery profiles 8 case studies (from his sample of 40 SMEs) with new innovations illustrating 3 of the innovation types – "Champion", "Flash in the Pan" and "Shrimp". From analysis of survey data and in-depth interviews with these small firms, he develops 4 propositions for further analysis and testing including: business models which do not deter SME from generating large sales volumes; larger SMEs have more elaborate innovation assessment and higher probability of implementing innovations with more favourable Rent

[2] Tim Mazzarol (U. of Western Australia) has co-lead this research programme with Sophie Reboud (Groupe ESC Dijon)

configurations; an unfavourable Rent configuration does not necessarily reflect a poor innovation management process.

For the **New Zealand** study, Clark surveyed 95 small firms that were active innovators and examined differences based upon the numbers of innovations in the past 3 years. The propensity to innovate was not based on size as there were active innovators of all sizes and the differences were not significant; however, these were established companies (average age 20.8 years) and not start-ups. The impact of innovation activity on innovation management processes was assessed using 4 indices for Market, Innovation, Resources and Strategy processes. Significant differences by innovation level were only found with the Resource index. Average results from these innovative New Zealand SMEs were high for all of these processes signalling that they are well organised to commercialise their innovations.

From the **Canadian** study, Baronet reports on management of innovation processes in 64 innovative Canadian SMEs which are mostly manufacturers. Key results for the business climate, level of radicalness for new innovations, links between innovation potential and commercialisation, and attitude towards new innovations are outlined and discussed. Canadian firms scored well on the Market, Innovation and Resources indices, but a little weaker on the Strategy index (linked to an intuitive management style). In terms of innovation types, 2/3 of the innovations were product-service innovations and mostly incremental in nature. In addition, only 25% of the innovations were developed exclusively internally; however, 44% of the new innovations were high potential "Champion" innovations.

In the comparison of **France and Australia,** Reboud presents analysis of 66 French and 55 Australian SMEs in terms of their innovation activities and processes. Findings provide

partial support for small innovative SMEs to follow a niche strategy, and full support for using external networks to access existing resources rather than developing them internally. No significant differences were found between the Australian and French firms for the Resource, Innovation and Strategy indices. However, differences were found for the Market index, suggesting that the Australian firms were more likely to systematically analyse their market opportunities and research customer acceptance of their new innovations. Overall, few differences were found between owner-managers in these two countries which supports the proposition that their strategic decisions are more contingent on their strategic situation than their National Innovation System.

From the **USA** study**,** Olson will focus on 15 small firms that are all engaged in high-technology sectors. The proposition that SMEs will select more innovations with low, rather than high, sales volume is not supported in this sample[3]. In high-technology industries, innovations involving low capital costs and low development costs can be pursued by small firms. The proposition that SMEs with linkages to local technology centers and/or technology development programs will have more positive perceptions of the local climate compared with the national innovation climate was not supported.

In the **final presentation**, Mazzarol will discuss key findings from the total database of 567 small innovative firms in terms of an over-riding model of innovation management which includes three levels of analysis: the systems view, the organisational view, and the individual view. The systems level findings highlight the critical role played by customers in the innovation process, and the difficulty of securing the human capital for growth of small firms. The

[3] In the database 35% of the innovations examined in the whole study were low volume innovations.

organisational level analysis provides more detailed results using a range of measures. As signalled in the country-studies, small firms are not restricted to the type of innovation that they can commercialise. All eight of the potential innovation types were represented in this study. The "Champion" innovation was the dominant type of innovation (38.8%) which shows that small firms can develop potentially high performance innovations. The "Shrimp" innovation (11.6%), with lower potential returns, can also provide small firms with growth potential. While there are many determinants of innovation type, industry factors, access to markets and availability of resources (human, financial, and physical) were considered. At the individual level, the findings confirm the power of commitment as managers with either full or partial equity control within the business were more likely to have the power to proceed with an innovation and the conviction to do so.

Further analysis of the country specific data is planned, as well as additional analysis of the total database. Further research opportunities include following up with participating firms to enable longitudinal analysis, refinement of the measures, development of diagnostics for process technology innovations, as well as extending the data collection to specific industry sectors, and to other non-OECD countries. This programme also provides opportunities to gain insights into the organization of an ongoing international collaboration by academic researchers from many countries.

Why the Symposium should be of interest to the specified Sponsors

This Symposium will be of interest to scholars in the TIM division as it contributes new understanding of the management of innovation processes including evaluating new innovations and implementing or commercialising new innovations. This is a unique international research programme that has been conducted in 11 OECD countries to date; the findings provide new evidence of country-specific innovative activities and processes, as well as analysis from the total database. The research will not only contribute to theory of innovation processes in small firms, but also provides insights for policy makers, and diagnostics for entrepreneurs/managers to assist with their strategic decision making for new innovations.

This Symposium will be of interest to scholars in the ENT division as it focuses on the use of innovation processes to grow small businesses. Although small firms may have limited resources, that does not preclude them from being entrepreneurial and innovative. The findings show the importance of owner-managers and their use of networks to obtain the resources needed to get their new innovations to market. Small firms are the dominant organisational type in most economies around the globe - including the OECD countries which are the focus of this current study. Understanding innovation processes in small firms not only contributes to improving growth, but also provided impetus for the major driver of economic development.

In addition, this Symposium links to the Conference Theme as it demonstrates the importance of the passion of innovators in creating and implementing new innovations. Furthermore, it takes considerable passion and commitment for SME owners to grow their small businesses.

Format Description:

This symposium will begin with opening comments by the Chair and will proceed as seven presentations – of 10 minutes duration (maximum each). See titles and presenter details listed below. At the end of the presentations, we expect to have at least 10 minutes for Q&A.

Brief Introduction to Symposium

Chair: **Delwyn Clark**; U. of Waikato

Strategic Innovation in Small Firms within the OECD: Overview of the Research Programme

Presenter: **Tim Mazzarol**; U of Western Australia

Strategic Innovation in Swiss SMEs

Presenter: **Thierry Volery**; U. of St. Gallen

Strategic Innovation in Small Firms: Lessons from Active Innovators in New Zealand

Presenter: **Delwyn Clark**; U. of Waikato

Canada SMEs' Innovation Behaviour

Presenter: **Jacques Baronet**; U. of Sherbrooke;

Participant: **Johanne Queenton**; U. of Sherbrooke;

Participant: **Jacqueline Dahan**; U. of Sherbooke.

Management of Innovation in SMEs: A Comparison Between France and Australia

Presenter: **Sophie Reboud**; Groupe ESC Dijon

SME High Technology Innovations: USA Type and Climate Results

Presenter: **Philip D. Olson**; U. of Idaho;

Presenter: **Newell (Sandy) Gough**; Boise State U.

Strategic Innovation in Small Firms: Insights and Further Research

Presenter: **Tim Mazzarol**; U. of Western Australia;

Presenter: **Sophie Reboud**; Groupe ESC Dijon.

SYNOPSIS OF EACH PRESENTATION

1. Strategic Innovation in Small Firms within the OECD: Overview of the Research Programme

Tim Mazzarol (U. of Western Australia) and Sophie Reboud (Groupe ESC Dijon)

This research programme is focused on understanding the process of innovation management in small firms from a strategic perspective. It is a major study which involves collaboration between an international consortium of research partners in eleven OECD countries. The programme aims to contribute to theory development within innovation management and entrepreneurship, as well as providing insights which can inform policy. In addition, it has developed diagnostic tools which can be used by entrepreneurs and small business owners to evaluate new innovations and to assist with their commercialisation processes.

The management of innovation processes in small firms is an important area for research given limited prior research on innovative small firms and the potential significance of growth by small and entrepreneurial firms to economic development. While much of the theoretical foundations of entrepreneurial innovation have focused on the entrepreneur (Brush *et.al.* 2003), attention also needs to be given to the firm as a key unit of analysis. The small firm as a unit of analysis is important, as much of the literature relating to entrepreneurship has been constructed from studies that deal with them (Tan *et al.* 2009), however, problems of methodology and measurement exist (Bouckenooghe *et al*., 2007).

To understand the management of innovation in a small firm (defined as having fewer than 250 employees) requires attention to three primary units of analysis and several sub-units. These are the "systems view" which looks at the external task environment surrounding the firm; the "organisational view" examining the innovation management process within the firm, and the "individual view" that focuses on the managerial characteristics of the senior management team (D'Amboise & Muldowney, 1988; Tan *et.al.* 2009). These elements interact to drive and shape the strategic behaviour of the small firm (Mazzarol & Reboud, 2009). Analysis at the systems view encompasses the National Innovation System (NIS) within which the firm operates, including the 'common innovation infrastructure' and 'cluster specific environment for innovation' (Porter & Stern, 2001). Within the organisational view the focus includes inputs; knowledge management; innovation strategy; organisation and culture; portfolio management; project management; and the commercialisation process (Adams, Bessant & Phelps, 2006).

This research programme started in 2002 with collaborative work undertaken by the Burgundy School of Business (BSB) Groupe ESC Dijon Bourgogne and HEC Paris working with the Institut National de la Propriete Intellectuelle (INPI) (Santi *et.al.,* 2003). A primary focus of this work was the risk-return trade off and the strategy of protection of intellectual property in order to secure a competitive advantage for an emerging innovation within a small firm. In 2003 this project was expanded to Australia and involved a partnership with the University of Western Australia (UWA) and support from the Western Australian Government (Mazzarol & Reboud, 2005; 2006; 2008; 2009; Reboud & Mazzarol, 2006), and extending the focus to the commercialisation management process. In 2005 the programme was widened to

include international partners from institutions in Austria, Belgium, Canada, New Zealand, Switzerland, Spain, Italy, Germany, the United States as well as Australia and France.

At time of writing 567 cases of small firms have been collected using a common survey tool and case study protocol from 11 countries. The analysis is at the organisational level and focuses on how the management perceives the supportiveness of the NIS and overall task environment within their country. It examines past experience of each firm with innovation and the commercialisation of new products and services. A key feature is the analysis of a new innovation (e.g. product, process, marketing, administrative) that is under consideration for development. The criteria for evaluating this new innovation uses a framework known as the Rent Model (originally developed in the initial research with INPI). This Model evaluates the innovation against three criteria: i) the volume of anticipated or projected sales over the next three years; ii) the rate of anticipated or projected profit measured in both gross and net; and iii) the anticipated or projected life cycle or "length" of the innovation. Using the different combinations, there are eight different types of potential innovation in this typology; each with implications for how a firm should approach their strategic management and commercialisation.

A further analytical framework, known as the Innovation Diagnostic Diamond (IDD), examines how the firm is managing its innovation processes within four key areas: i) Strategy, ii) Market, iii) Innovation, and iv) Resources. This diagnostic uses 40 questions, with 10 items in each of these areas. In general, a firm that is highly systematic and formalised in its innovation management will achieve high scores on all four areas. While there is some evidence of a correlation between the Rent typology outcomes and the IDD, these two analytical tools measure different elements of the innovation management process.

The dataset collected for this project includes both quantitative survey and qualitative case study information. Initial analysis of the data suggests that at the *systems view* level while there is some evidence of differences in how firms perceive their respective NIS, in general there are more similarities between firms across the various countries (Tsui, 2008). This may reflect the common level of development within most OECD countries. Differences of a significant level appear to be related more to industry type, size, and level of innovation intensity and age of the firm. At the *organisational view* level findings highlight aspects of the innovation management process and how factors such as industry type, firm size and innovation intensity influence the configuration of the Rent and IDD frameworks.

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2. Strategic Innovation in Swiss SMEs

Thierry Volery (U. of St. Gallen)

The objective of this presentation is to provide insights into the innovation strategies deployed by Swiss SMEs. We focus our attention on three questions: (1) How SMEs make strategic innovation decisions? (2) How they assess potential risk-return profiles of future innovations? (3) How the innovation management process is organised?

In order to contribute to a deeper understanding of innovation in SMEs, this study takes a broad approach by including enterprises from various industries. We adopted a strategic perspective and we considered that the primary goal of innovation in the establishment of sustainable, distinctive competitive advantage which, in turn, is precondition for rent appropriation (McGrath et al., 1996). According to Santi et al. (2003), the potential rent of an innovation results from the volume, the rate of margin, and the length of the innovation.

Empirical evidence is based on a series of eight case studies on SMEs from the German-speaking part of Switzerland. The Rent configurations of the case studies include of three "Champions", four "Flash in the Pan" and one "Shrimp".

Case Study Discussion

The four companies with "Flash in the Pan" configuration (Wood Floor Ltd, Telecom Service Ltd, Building Services Ltd and Textile Testing Ltd) have one thing in common: they do not have capital-intensive production. Wood Floor Ltd is wholesaler of wood flooring, Telecom

Service Ltd offers services to telecommunications companies, Building Services Ltd sells licenses or its technology, and Textile Testing Ltd provides testing services for the apparel and textile industry. The nature of their businesses allows them to generate high turnover with relatively few employees (these companies have on average between 10 and 25 employees). Small firms like, Building Services Ltd or Textile Testing Ltd, can serve the European or even the worldwide market with their products. For instance, everything customers have to do in order to buy the testing procedures is to send their apparel samples to Textile Testing Ltd.

"Flash in the Pan" configurations can be associated with low or high rates of profit. In the sample, three of the four companies with this configuration have a low rate of profit (Wood Floor Ltd, Building Services Ltd, Textile Testing Ltd) and one has a high rate of profit (Telecom Service Ltd). The reasons for low profitability can be manifold. In these cases, Wood Floor Ltd has much larger competitors with more market power, Building Services Ltd has to fight against imitators, and Textile Testing Ltd has to cope with competitors from low-cost countries exerting price pressure on the whole industry. In all three cases, competitive pressures from incumbent firms are currently high with significant erosion effects on the appropriable Rent. Even though the Rent configuration refers to planned innovations, it can be assumed that the current competition intensity determines the respondents' evaluation of the innovation's future profitability.

The third factor determining the "Flash in the Pan" configurations is the short length of lifetime. Most of these companies rated their planned innovations as (very) easy to copy from a legal, as well as technical perspective. This is particularly interesting in the case of Telecom Service Ltd, since it is the only one predicting high profitability for its innovation. In contrast to

the other three companies, Telecom operates in an industry with less competitive pressure. The high profitability of the innovation might attract new entrants, thereby eroding the Rent.

P1: There are business models where scarce resources and limited production capacity do not deter SME from generating considerable sales with their innovations.

The three companies with "Champion" configurations create tangible products. Software Ltd AG produces software, Ribbons Ltd manufactures ribbons and Machinery Ltd produces machines in the area of post press processing. Furthermore, these three companies are the biggest companies in the sample. If the software developers working in Slovakia for Software Ltd are added to the firm's headcount, these three firms are by far the biggest companies in the sample. Also, the three "Champion" innovation firms have the highest IDD average values.

P2: Larger SMEs have more elaborate processes for innovation assessment, leading to a higher probability that only innovations with favorable Rent configurations will be implemented.

Finally, there is one company (Publishing Ltd) with a "Shrimp" configuration. The strong erosion effects from the competitive environment were clearly revealed in the personal discussion with the company manager: the overall market is shrinking through the reallocation of advertising expenditures, information becomes more and more freely available in the internet, the market entry costs decreased and there is a substitution threat through large players (e.g. Google, Yahoo!). These factors influence volume, rate and length of the planned innovation negatively, leaving only a small innovation Rent for appropriation. This unfavorable Rent configuration does not necessarily mean that the firm has a poor innovation management process. There are several reasons for a planned innovation to lead to unfavorable Rent profile.

First, the innovating firm has evaluated the risk-return structure thoroughly and wants to commercialize the innovation notwithstanding its "unfavorable" Rent configuration. This can be the case if the intensity of competition in a certain industry is high and the Rents generated by an innovation will underlie fast erosion by all kinds of competitive (re-)actions (for instance, competitors imitate or out-innovate the firm fast, switching costs for customers are low etc.). Nonetheless, the firm needs the innovation to keep up with competitors or the exit barriers in the industry are high. An example for this kind of relationship is Textile Testing Ltd. The manager did not seem to be surprised about the unfavorable Rent profile of the planned innovation since it was exactly what she expected: "*Sometimes, we're surprised ourselves that we still exist*".

Second, the innovator sees the innovation as part of an overall strategic plan which will secure the future survival in the marketplace. Even though the innovation itself will yield returns barely covering the costs of its development and market introduction, this innovation can be crucial for future business development. For instance, if Publishing Ltd extends its online-offer by providing well-investigated content for B2B users, this can be rather unprofitable in the beginning. However, it can lead customers to prefer Publishing Ltd's content over other web-content which is freely available and can be source of customer loyalty. In the future, this might be the reason why Publishing Ltd will survive the structural change in its industry.

P3: An unfavorable Rent configuration (e.g. "Shrimp") does not necessarily mean that the firm has a poor innovation management process.

The case analysis also suggests that sound innovation management process is usually associated with a favorable Rent configuration. When the firm has a sound process in place, it will be able to determine the potential risk-return-profile of the innovation and to decide if it is

willing to take these risks. This is only possible if the company reduced the uncertainty of this assessment through the collection and analysis of relevant data about competitors, customers, and other industries variables. This insight was gained during discussion of the Rent configurations with interviewees. For instance, the manager of Machinery Ltd argued that the "Champion" configuration of the planned innovation did not surprise him since if he expected something different the company would not carry out the innovation. This suggests that high scores of the diagnostic diamond are correlated with favorable Rent configurations (e.g. the "Champion" or "Oasis"), and a thorough analysis preceded the assessment of the innovation.

P4: There is a positive relationship between the Rent configuration and the innovation management process (i.e. the diagnostic diamond).

Conclusion

These cases illustrate a variety of Rent configurations, including "Champions", "Flash in the pan" and "Shrimp". This result is particularly interesting given the expectation that the "Oasis" configuration may suit SMEs best. All configurations pose one or more threats to the company: for instance, "Flash in the pan" and "Champion" configurations are characterized by high volumes, possibly exceeding the limited production capacity of an SME. This indicates a high heterogeneity in the way SMEs make strategic innovation decisions. However, results suggest that larger SMEs have more elaborate processes for innovation assessment, leading to a higher probability that only innovations with favorable Rent configurations will be implemented. A thorough assessment of the potential risk-return profiles of future innovations will also have positive impacts on how the innovation management process is organised.

3. Strategic Innovation in Small Firms: Lessons from Active Innovators in New Zealand

Delwyn Clark (U. of Waikato)

As innovation is a key driver of economic growth and social development (Marchese 2009, Lewis 2008), innovation processes are examined at multiple levels of analysis including national, regional and organisational perspectives (OECD, 2004; 2007; Adams et al, 2006). Given the dominance of small firms in most economies (OECD, 2004), innovation in small firms is of significant interest for SME managers, entrepreneurs, advisors, academics and policy makers. Innovation is a high priority in New Zealand given the challenges to improve per capita income (from 22nd in OECD), productivity and competitiveness in an economy with 99.5% of companies employing less than 100 employees.

This presentation reports key findings from the first in-depth study of innovative New Zealand SMEs. The study addressed a series of **research questions** including: What are the characteristics of innovative New Zealand SMEs? What types of innovations are innovative New Zealand SMEs developing? How do innovative SMEs evaluate potential new innovations? What is the status of their innovation management processes? How do they perceive the innovation context in New Zealand? What are the policy implications of the findings from this study?

From the empirical evidence, two specific propositions will be examined in this presentation:

P1 - Due to resource scarcity, smaller innovative firms will be more likely to have lower levels of innovation activity.

P2 - Small firms with lower levels of innovation activity will be less likely to have effective innovation management processes (and will have lower IDD scores)

Methodology

Data was collected on innovation activities and processes in SMEs from a purposeful sample of New Zealand companies selected on criteria for size, trading history and innovation activity. Size limits were based upon OECD definitions for SMEs from 10-250 employees and annual turnover up to NZ$100 million. As evidence of trading history was required, start ups and very early stage ventures (under three years of operations) were excluded. As evaluation of one new innovation was a key part of the study, evidence of innovation activity was a primary selection criterion. Industry/sectors with well-defined products and high levels of innovation and commercialisation were targeted. Companies were invited to participate by phone and email, after background research on their profiles had been reviewed. Face-to-face interviews were conducted with 95 owner-managers or senior executives using a diagnostic questionnaire.

Results and Discussion

The characteristics of the New Zealand SMEs which were of particular interest include the age profile showing that they were well established (average age 20.8 years), the size profile showing they were relatively large by New Zealand standards (average size 56 FTE, $13.8M gross annual turnover), and the scale of growth over the previous three years demonstrating significant performance improvements (FTE 17%; gross annual turnover 65%). While the study required companies to have some current innovation activity, finding such high levels of

innovation activity was surprising. The companies were clearly active innovators based on their focus on new innovations, numbers of new innovations, and levels of investment in new innovations (average 19%). Interestingly, Proposition 1 was not supported as the propensity to innovate was not based upon size. There were active innovators of all sizes in this sample of New Zealand SMEs and the differences in the numbers of innovations by size were not significant (Chi Square = 6.834, p=0.336). Note, these are established companies engaging in innovation rather than new start-ups and hence they are more likely to have capabilities for product innovation and established networks which enable co-operation to obtain resources (Winters & Stam 2007).

In terms of the types of innovation that were being developed, the results show that all of the New Zealand SMEs had a portfolio of different types of innovation. Of the five innovation types examined, product/service innovations were the dominant type of innovation, with many companies also actively innovating in market development, and to a lesser extent in process technology. High potential innovations called 'Champions' were evaluated for 55% of the SMEs, which reflects the nature of this sample as experienced innovators.

The context for innovation was considered by examining perceptions of a series of external environmental factors. The top scoring factors were the New Zealand lifestyle, access to high quality research centres and access to external financing to fund future growth. The three factors which are potentially inhibitors to innovative growth were access to skilled employees, access to managerial staff, and the regulatory framework for business in New Zealand. Significant differences by innovation levels were found for external financing access, and also for skilled workforce access.

The status of innovation management processes in innovative New Zealand SMEs were assessed using four key indices for Market, Innovation, Resources and Strategy processes (Mazzarol & Reboud, 2006). The average results, shown in Table 1, were very high across all of these processes which signals that they are well organised to commercialise their innovations. The ability to manage the processes for developing and implementing new innovations is fundamental for growth of SMEs, and these New Zealand companies were very well positioned for such growth. Significant differences by level of innovation was found for the Resources index and for two of the key factors within this index – adequate staffing resources and adequate financial resources. This finding is consistent with the context results in which staffing and venture capital were identified as being concerns and potentially inhibitors of further innovation and growth.

Table 1 Innovation Management Processes

Innovation	**Number of Innovations**			**Sample**	**Probability**
Index	**1-5**	**6-10**	**>10**	**Mean**	
Market	8.11	8.07	8.19	8.15	0.919
Innovation	7.56	7.83	8.05	7.91	0.219
Resource	7.73	7.39	8.09	7.86	0.016**
Strategy	7.39	7.64	7.46	7.49	0.807

Notes: ** probability shows mean differences are significant ($p<0.05$)

To evaluate Proposition 2, the innovation management indices were compared for the three groups of companies sorted by the level of innovative activity. As shown in Table 1, differences in means were not significant for the Market, Innovation and Strategy indices. However, differences in means for the Resource indices were found to be significant ($p < 0.05$) for the three levels of innovation activity; but Proposition 2 is not supported as the indices do not increase with increasing innovation activity levels. Two of the key factors included in the Resource index, which are fundamental to successful implementation of new innovations, are adequate staffing resources and adequate financial resources. Means for these two factors were also significantly different for the three groups of innovation activity (staffing resources $p=0.024$; financial resources $p=0.049$). Much higher mean scores were found for many of the other types of resources need to develop and implement new innovations e.g. technological resources, project management expertise, access to expert assistance, physical resources, management board.

Conclusions

Finding that small active innovators can generate new innovations and bring them to market successfully irrespective of company size augurs well for New Zealand and other small economies with high proportions of SMEs. Furthermore, small firms can organise their innovation management processes systematically and effectively irrespective of their levels of innovation activity. Further research is needed to understand how small innovative firms obtain the various types of resources needed to develop and implement their innovations.

4. Canada SMEs' Innovation Behaviour

Jacques Baronet, Johanne Queenton & Jacqueline Dahan (U. of Sherbrooke)

Even though Canadian small and medium-sized firms enjoy a relatively positive business environment, they operate with lower levels of investment in innovation than firms from other OECD nations. Indeed, Canadian SMEs represent only 12.5% of all research and development expenses in Canada, and Canada's R&D expenses as a percentage of GDP is lower than the OECD average. Moreover, the distribution of R&D expenses in Canada, as in many other countries, shows a Pareto distribution where a minority of firms account for a very large portion of all R&D expenses.

Research Questions

How do Canadian SMEs manage innovation? How do they manage the risk involved in innovation? Do they manage it on their own? Or do they collaborate with outsiders in order to decrease their innovation risk?

Research Methods including sampling

Using Mazzerol and Reboud's (2006) model, we studied how a convenience sample of 64 innovative Canadian SMEs manages the risk inherent in innovation activities. The SMEs were drawn from a list of innovative firms from Alberta, Ontario and Quebec on the Industry Canada website. Those firms show higher annual compounded growth at 10.3% than the Canadian average and higher levels of R&D expenses as a percentage of sales at 15.9%. They also differ

from the population of firms in Canada as they are mostly manufacturing firms, with a few operating in the service and technology sectors. Therefore, they form a good, though small, sample of Canadian innovative firms.

Results and Discussion

Business climate. Looking at their business climate, the managers of Canadian innovative SMEs perceive it as neutral, seeing it as neither very good nor very bad. They consider Canada's communication infrastructure to be a positive aspect of the Canadian business environment and the relative high cost of doing business a negative one. In addition, the Canadian business climate appears to have some influence on Canadian SMEs' innovation behaviour (adjusted $r^2 = .303$). In fact, among the ten factors from the study, only three seem to have a statistically significant impact on the level of R&D expenses: government support for local innovators has a positive influence ($\beta = .306$), as well as ease of recruitment of talented managerial staff ($\beta = .347$), whereas access to external financing (or a relative lack thereof) has a negative one ($\beta = -.575$).

As in most other countries, Canadian SMEs rate their customers as having a large influence on their commercialization of innovations. Otherwise, Canadian SMEs are influenced mostly by internal stakeholders (shareholders, board members and top managers). However, this influence is not confirmed by our statistical analyses.

New innovations and level of radicalness. The number of innovations introduced within the past three years by Canadian SMEs is positively correlated to firm size (Spearman's rho = .337; $p < .01$). Almost two thirds of the innovations introduced are product-service innovations

and appear to be mostly incremental in nature, substituting an existing product and integrating into an existing system. In addition, only 25% of the innovations were generated exclusively internally. The majority of innovations required working with customers, suppliers, research centers, or larger networks.

How the new innovation was generated seems to have an impact of its level of radicalness ($F = 2.69$, $p < .05$). Indeed, innovations generated with research centers were more radical, creating a new dominant design and offering a new technological platform, than innovations generated exclusively internally or with other collaborators. Consequently, the intellectual property involved with these innovations was more likely to be protected (4.6 on a scale from 1 to 5) than innovations generated alone or with other collaborators ($F = 2.59$, $p <.036$). In fact, the radicalness of the new innovation in general is positively correlated to IP protection (Spearman's rho = .260, $p < .04$). Finally, firms generating their innovations alone spent more on R&D (almost 29% of sales) than firms collaborating with outsiders (between 3% and 17% of sales for other types of innovation collaborations).

Rent configurations and commercialization indices. Out of the eight Rent configurations in Mazzerol & Reboud's (2006) model, we find that 44% of the new innovations created by Canadian SMEs were of the "Champion" configuration, estimated to have a high potential volume of sales, a high rate of profitability and a high lifecycle for exploitation.

In addition, Canadian firms score well of the three of the four indices of commercialization management: Market, Innovation, and Resources. However, they appear to be a little weaker on the Strategy index. According to our interviews, this relative weakness might be related to an intuitive management style practiced by the entrepreneurs and top managers of

the Canadian SMEs in our sample. This is reflected in the high level of power that the managers personally have in the decision making process concerning innovations by their firm.

Interestingly, when we combine the Rent configuration with the commercialization indexes, we observe that the "Champion" and "Oasis" with high rate of profitability are strong on all four indices, whereas others score above average on only one or two indices, and the Shrimp and Joker configurations score below average on all four indexes. Indeed, positive correlations can be observed between some of the indices and the profit rate and duration of the Rent configurations.

Attitude towards innovation. Concerning the Canadians SMEs' attitudes towards the new innovation they consider introducing, it is very likely that the firms will go ahead with the new innovation notwithstanding its Rent configuration, its radical or incremental nature, or the fact that it is a product, process, marketing, market development, or management innovation. In fact the factor having the only statistically significant impact on this decision to go ahead with the new innovation is the personal power possessed by the top manager of the firm ($\beta = .606$; adjusted $r^2 = .314$), even if we add to the equation the new innovation's volume, rate and duration, the level of R&D expenses and past innovations, the four indexes of commercialization management, and the opinions expressed by internal and external stakeholders.

Conclusion

We wanted to examine how Canadian SMEs manage innovation and how they manage the risk involved in innovation. Also we were interested in finding out if they manage it on their own or if they collaborate with outsiders in order to decrease their innovation risk. After our

study of 64 Canadian SMEs, we can conclude that they have developed a good commercialization management base, as observed by the four indices. However, Canadian SMEs are still managed rather intuitively by their top managers as is illustrated by the top managers' personal power in decision-making and the relative importance of internal stakeholders in commercialization decisions. Nonetheless, Canadian SMEs are able to develop regularly a high number of innovations having high potential volume, profit rate and duration for exploitation, and at the same time to collaborate with external stakeholders using open innovation as a mean to generate new innovations. Thus, they are able to use their innovations to grow at a relatively high rate.

5. Management of Innovation in SMEs: A Comparison between France and Australia

Sophie Reboud (Groupe ESC Dijon) and Tim Mazzarol (U. of Western Australia)

This presentation focuses on a comparison of small firms in France and Australia that were engaged in the commercialisation of an innovation. Key research questions that were examined were: i) how do entrepreneurs from small innovator firms screen the risk-return profile of new innovations prior to investment; ii) how well do small firms manage their commercialisation process and what impact does innovation management have on their success, and iii) how does the national innovation system in which these entrepreneurs operate impact on the success or failure of their commercialisation? A review of the literature identified three main potential drivers of the innovation management process in SME. These were the market, especially the efforts made to better identify, target and protect a niche market, the network as it gives access to more resources, and the national system of innovation. Three specific research hypotheses addressing our research questions were developed as follows:

P1 – Due to resource scarcity the small innovative firm is more likely to seek to secure a niche within the market than to follow a more generic positioning strategy.

P2 –Due to resource scarcity and risk perception, the small innovative firm is more likely to seek access to existing resources from external strategic networks rather than trying to develop them internally,

P3 –Strategic decisions within the small innovative firm is likely to be contingent upon the entrepreneur and the strategic situation rather than the National Innovation System.

Methodology

A total of 121 cases were analysed, 55 in Australia and 66 in France. The study included a survey and more in-depth face-to-face interviews when the owner manager of the SME would volunteer. The main focus of the research was a comparison of firm characteristics, of their teams, their perception of the innovation context in their own country, their approach of decision making process, and their perception of passed success and failures. The methodology involved a case study survey to collect quantitative data and where this was relevant statistical analysis was employed. In keeping with Yin (1989), we looked for stabilities in the profiles of risk assessment and in performance in innovation diagnosis, and made comparisons of the two samples. The case study firms were drawn from a variety of industries, although the largest proportion (36%) was manufacturers. In keeping with the OECD definition of small firms, the firms had less than 250 full time employees. The respondents in the sample were predominately male (94%). The majority of the respondents (65%) described themselves as "owner-managers" or "executive manager/principal shareholder", suggesting that they have full responsibility for all decisions. The French firms (43 FTE) were slightly smaller than their Australian counterparts (83 FTE).

Findings

Most firms from both countries were satisfied with their national hard infrastructure in relation to such things as telecommunications and transportation networks. However, there was less satisfaction with soft infrastructure such as government support for innovation, access to financing, publicly funded R&D centres, or the compliance costs caused by regulations. The French firms were found to be more negative on average than their Australian counterparts

in relation to soft infrastructure support systems within the NIS. The Australia firms were more positive over their environmental lifestyle as a positive benefit to innovation. No perceived differences were found between the two countries over geographic distance to markets, which seems surprising given the relative isolation of Australia from mainstream international markets. Most firms felt that their access to finance could have been better, with Australian firms marginally more positive than their French counterparts. Most firms preferred to finance from retained profits and this was particularly the case for the French. Equity financing was the least preferred option, but the French firms were found to be significantly more negative towards this type of financing than their counterparts in Australia. Analysis of the innovation management process indicated that the Australian firms were more likely than their French colleagues to generate "Champion" innovations (high potential for sales, profit and a long life cycle). Such innovations are more likely to be radical or disruptive in nature. By comparison the French firms were more likely to have generated incremental innovations known as "Shrimp" (relatively low sales volume, modest profit returns and a shorter life cycle).

The differences between the two national samples in relation to their management of innovation were measured using the Innovation Diagnostic Diamond (IDD) framework. No significant differences were found between the Australian and French firms in relation to the Resource, Innovation or Strategy indices, reflecting that they were not different in how they behaved over allocation of resources, protection of intellectual property rights or the analysis of their innovation from a planning perspective. However, differences were found in terms of the Market index, suggesting that the Australian firms were more likely than those from France to systematically analyse their market opportunities and research customer acceptance of their

innovation prior to commercialisation. For example, a significant difference was found in the analysis of the potential benefits perceived by the customer and of their perception of the cost and risk they face when adopting the innovation. Of less significance was the pricing strategy, French respondents being less interested in systematically addressing this issue. French managers were more reluctant to assess their innovation by external actors and involved their customers less in its elaboration process. French respondents also seemed to lack financial resources more than anything else. Not surprisingly they chose more systematically to do a financial simulation before proceeding. The French were more likely to believe their innovation could be commercialised without outside help, and less likely to make use of formal Boards.

Discussion of Findings

The findings provide partial support for proposition 1, in almost all cases the firms sought to follow a niche strategy by selling to a lead customer. However, it is not fully supported as the analysis of customer needs and constraints was not systematically conducted, especially in France. Proposition 2 was supported for the partnerships with customers but the owner managers in our sample would develop quite a few partnerships with other partners and would not ask them for advice. Although the owner-managers of the SMEs perceived their firm's resources to be low, they preferred to undertake the commercialisation of their innovation alone with only lead customers and internal managers for advice. Proposition 3 was supported. Very few differences were found between France and Australia. The differences included, first, an orientation towards product innovation (rather than market or process) was highlighted amongst Australian firms that would develop more radical innovations. Second, the level of detail in the

analysis of target markets, including their constraints and the protection of IP was stronger within the Australian firms. Third, differences in the economic situation might explain part of these results, and the effort the Australian Government has put into fostering commercialisation of innovations may also contribute to some of the Australian responses. The results suggest there are few differences between owner-managers of the two countries; supporting the view that their management was more contingent on their strategic situation than their National Innovation System.

Conclusions

The findings from this study suggest that firms with a more radical innovation to commercialise are more likely to focus on the customer and market adoption in a systematic or formal way than those with more incremental innovations. This is understandable where a small firm is seeking to launch a radical or disruptive innovation and needs customer feedback to reduce the perceived risk of the investment. A more systematic approach to commercialisation, especially in the analysis of the external environment, seems to enhance performance (note the performance was superior in the Australian sample). The results suggest that the NIS may not be well designed for support to smaller firms which often are unable to engage with major R&D centres or actively seek government support. Most small firms are less likely to seek equity financing as a first option if they can fund their commercialisation from retained profits or debt. The higher level of interest in equity financing by Australian firms may suggest that there is a relationship between more radical innovation and the need for such financing. The research is limited to a small number of cases and the data available was limited to a relatively short survey.

6. SME High Technology Innovations: USA Type and Climate Results

Philip D. Olson (U. of Idaho) and Newell Gough (Boise State U.)

Innovation is a competitive strategy available to small and medium enterprises (SMEs) that is linked to making or doing something new. Two major factors impact the effectiveness of this strategy. First, concerns exist about the types of innovations SMEs should pursue—i.e., there are issues around SMEs assessing and selecting the most suitable innovations. Innovations differ in several ways and can be categorized based on the following variables: volume (V), as measured by sales; rate (R) of margin, as measured by profits; and length (L), as measured by duration or lifetime (Reboud & Mazzarol, 2004; Santi, Reboud, Gasiglia, & Sabouret, 2003). Each of the three variables, in turn, can be dichotomized into small versus large V, low versus high R, and short versus long L. This generates a typology with eight possible combinations.

An interesting research question is whether or not SMEs should pursue potential innovations that involve large sales volumes. . Although most people would agree such innovations are attractive, are they appropriate for SMEs? Reboud and Mazzarol (2003) argue that SMEs by definition are small in size and they may not have access to the capital necessary to exploit large volume innovations. For this reason, it can be argued that large volume innovations may not be suitable, or optimal, for SMEs. Hence:

P1 - SMEs will select more low volume type innovations (i.e., the Shrimp, Gadget,and Oasis A and B configurations) than high volume ones.

Note, that of the low volume type innovations, Oasis B appears to be the most attractive due to both its high rate and long lifetime. Researching this topic further would be of value in that it could help direct SMEs to the more suitable innovation types.

A second factor affecting the effectiveness of the SME innovation strategy is a country's innovation climate or the existence of regulations, resources and services that promote SMEs to use an innovation strategy. Some of this support can be viewed as existing at a SME's local level and others at the national (country) level. Examples at the local level include the availability of technology counselling programs and technology centers. A technology center can assist SMEs in a community by providing individualized operational and business services at reduced costs (Phan, Siegel, & Wright, 2005; Rice, Matthews, Kilcrease, & Matlock, 1995).

Examples of national level support include patent laws, tax laws, and visa requirements; items that are of an impersonal nature. National assistance by its nature has a general impact, but is unlikely to have the direct impact on SME innovation developments as local programs and centers (Phan, Siegel, & Wright, 2005; Westhead & Storey, 1995). Given these differences:

P2 - SMEs with linkages to local technology centers and/or to technology development programs will report a more positive perception of the local climate compared to their perceptions of the national innovation climate.

Sample Description

Data for this study was obtained from 15 small and medium enterprises (SMEs) who were receiving, to varying degrees, technology counselling and program assistance from personnel at a Northwest USA state program. This state program was established to aid small

firms' access to private equity or federal grants/funds for technology business development. The 15 SMEs had received varying levels of assistance at the time of the study: nine had received a high level of counselling; three a moderate level; and three a low level.

Another characteristic of the sample was that four of the 15 SMEs were also linked directly to a university-sponsored technology center, and were receiving planning and development services as well as facility resources like telecom, IT, and Web interties.

All 15 SMEs were associated with high-technology industries including computer software, computer electronics, semiconductor fabrication, financial technology, information technology, and E-commerce. The SMEs ranged in size from two employees to160; the mean size was 23.6. Size classification was as follows: eight firms were micro-size with less than 10 employees; five were small-size with 10 to 49 employees; and two were medium-size with 50 to 249 employees. Because the 15 firms were a sub-sample of the SMEs included in the larger sample of USA for the multi-country research project, they all meet the requirement of being able to provide information on a potential upcoming innovation.

Results

Regarding types of upcoming innovations the 15 SMEs were pursuing, only two were small volume types (one Oasis B and one Gadget) which does not support Proposition 1: SMEs will select more low volume type innovations (i.e., the Shrimp, Gadget, and Oasis A and B configurations) than high volume innovations. The high volume types that were being pursued by the remaining 13 sample SMEs were 11 Champions, one Joker, and one Flash in the Pan B.

Consider next the local and national innovation climate proposition results. To measure the local innovation climate, an index was developed by summing a SME's responses to the following two items: (1) It is easy for a business such as ours to access high quality research centers (e.g., universities, Federal labs) locally? (2) Government support for local innovators is strong? Similarly, to measure the USA national innovative climate, another index was developed by summing the following two items: (1) The regulations governing business operations in this country (e.g., patent laws, taxation) are excellent for our business? (2) The communications infrastructure in this country (e.g., roads, internet services) is excellent for our business? Each of these four items was scored on a five-point Likert scale, with five indicating the highest climate level. Both indices, then, ranged from two to ten.

For the 15 SMEs, the local mean index score was 6.5 versus the national (country) mean index score of 7.7. Hence, there was not support for Proposition 2 that SMEs with linkages to local technology centers and/or to technology development programs will report a higher level of local innovation support/climate than the level of national (country) innovation support/climate.

Discussion

Two factors may explain why Proposition 1 was not supported. First, an industry effect might allow SMEs to produce their planned innovations with low marginal costs, negating the need to be rich in capital. All 15 of the firms were in high-technology industries.

Hill and Jones (2004) state that in many high-technology industries the fixed costs of developing an innovative product are high, but the marginal costs of producing an additional unit of the product are low. One example is the software industry where development costs of a new

program can be high, but the costs of producing an additional copy of the program is close to zero. SMEs in such industries, then, may be able to exploit high volume innovations (e.g., the Champion type) even if they are not capital rich. This situation can be further enhanced if a SME is able to reduce the fixed, development costs of an upcoming innovation. This issue, or pursuing low development cost innovations (i.e., incremental versus rational innovations), is a second reason SMEs may be able to target potential high volume innovations.

The second proposition in this study was also not supported. This outcome was surprising, especially for people who view the local services being examined in this study as providing SMEs with privileged treatment. The following factors may help explain this result.

Technology centers and technology development programs provide SMEs with access to local resources that can be of assistance when developing an innovation. Such resources, however, particularly those linked to universities, can give the impression of being more academic than market/customer oriented (Clarysse, Wright, Locket, van de Velde, & Vohora, 2005; Siegel, Westhead, & Wright, 2003; Vohora, Wright, & Locket, 2004). Technology centers and technology development programs may also: employ counsellors who lack specialized commercialization experiences; not have a strong network of financiers and industry connections; and involve a stifling bureaucracy (Vohora et al., 2004).

One limitation to the study was the small sample size tied to only one technology counselling program and one technology center. Also, regarding the second proposition, respondents may have viewed the counselling and the technology center's access as reflective of the national rather than the local climate. And perhaps the university sponsorship was not viewed primarily as local.

7. Strategic Innovation in Small Firms: Insights and Further Research

Tim Mazzarol (U. of Western Australia) and Sophie Reboud (Groupe ESC Dijon)

The findings presented in this symposium represent only a small cross-section of the overall data gathered in this international research programme. Having collected 567 cases from 11 countries using a common methodology, this study offers a unique insight into the innovation behavior of small firms. Understanding innovation behavior within small firms requires focus on the systems, organizational and individual views. This study focused primarily at the organizational and systems level, although it does offer some insights into individual decision making by owners and senior managers.

Systems View

At the systems level most firms were positive about the hard infrastructure found within their National Innovation System (NIS), particularly telecommunications and transport systems, as well as access to research centres (e.g. universities). However, most firms were negative in relation to the cost of doing business and their ability to access high quality managers and skilled employees. In terms of the factors contributing to success or failure of past innovations, the most important were the innovation's ability to meet customers' needs, customers' attitudes towards the innovation and their ability to appreciate the benefits it offered, plus the willingness of customers to switch from alternative products or services. Of less importance were such things as competitor behavior, supplier bargaining power or the influence of complementary actors and government regulations. These findings highlight the critical role played by customers in the

innovation process of small firms, and also the difficulty that such firms often have in securing the human capital they require. As 62% of the firms in the study sample employed fewer than 50 people resources were generally limited.

Organizational View

From an organizational view the study examined many of the seven key elements identified by Adams, Bessant and Phelps (2006) as important to measuring innovation in small firms namely: i) inputs; ii) knowledge management; iii) innovation strategy; iv) organization and culture; v) portfolio management, vi) project management and vii) commercialization. In relation to inputs, the average level of investment in innovation was 22% of annual turnover with some firms investing around 100%. However, most firms viewed retained profits and debt financing as more important sources of funding than equity financing, and most firms rated venture financiers as of little value to their success. In terms of knowledge management the majority (64%) of firms believed that they had the competencies to fully commercialize their innovation alone, and 70% felt they had an experienced project management team available to work on the idea. From an innovation strategy perspective the most common type of innovation was the development of a new product or service, with about half of the sample seeking to develop process technology innovations or market development innovations (e.g. entering new markets with existing products). With respect to innovation culture most firms actively engaged their employees in the development of new innovations and considered innovation was a major focus for them as a business. Most had previous experience of commercialization.

In terms of portfolio and project management the Rent configuration and IDD frameworks provide useful insights. Table 1 lists the proportion of innovations found within each of the eight types where it can be seen that the most common type was that of the "Champion". While this may be initially viewed as an attractive opportunity, this type of innovation can pose a significant challenge for a small firm to successfully commercialize e.g. high sales volume typically requires access to a large national or international market and large production runs over its long lifecycle. This is often beyond the resources of most small firms. Other types of innovations, even the "Shrimp" with its lower profit return but smaller sales volume and short lifecycle may be better options for some small firms.

Table 1: Rent Configurations of the entire sample (n = 567)

RENT Type	Volume	Rate	Length	% of total sample
Champion	High	High	High	38.8%
Shrimp	Low	Low	Low	11.6%
Gadget	Low	High	Low	5.5%
Joker	High	Low	High	9.3%
Flash in the Pan A	High	Low	Low	7.8%
Flash in the Pan B	High	High	Low	9.2%
Oasis A	Low	Low	High	7.8%
Oasis B	Low	High	Low	10.1%

When examined against the IDD framework firms with "Champion" innovations were more likely to have higher Market Index Scores than those with "Shrimp", "Oasis A" or "Joker" type innovations, and the "Shrimp" was generally associated with the lowest Market Index Score. This pattern was also found for the other three elements of the IDD framework, with the

"Champion" type innovations being associated with the highest ratings on the Innovation, Resource and Strategy Indices, and those of the "Shrimp" the lowest. "Champion" innovations were also more likely to be associated with higher scores on all four indices of the IDD and "Shrimp" lower scores than the other types of innovation.

In terms of project management those firms with experienced project management teams were more likely to have successfully commercialized multiple innovations in the past than those without such teams. Finally, the commercialization behavior of these firms was found to rely heavily on the customer with a strong orientation amongst these firms to engage with lead customers in joint research and product development. The common marketing activity found amongst these firms was to have identified a customer ready to adopt the new innovation. Also important was whether the innovation was compatible with the customer's existing systems or technologies, and to fully explore the opportunities that this innovation offered to customers. Having previously collaborated with customers over the commercialization of innovations and researched how customers will understand the innovation were also rated as important. Of additional importance to the commercialization process was the firm's ability to secure all necessary compliances and authorizations for the innovation. Some consideration might also be given to assessing the threat of alternative technologies.

Individual View

At the individual level the study found that managers who had either full or partial equity control within the business were more likely to have the power to proceed with an innovation and the conviction to do so. A negative correlation was found between equity control and a

willingness to take notice of the views of other people within the firm. Entrepreneurs who owned and managed their firm were significantly less likely than executive managers without equity to value the opinions of other directors or senior managers within the business, and more likely to value the opinions of family members, other business people and accountants. Owner-managers were also less likely to view external financing from either debt or equity in a positive manner. These owner-managers were also less likely to have previously collaborated with customers over innovations and to feel that they knew how to find external expert assistance if required.

Conclusions and Opportunities for Future Research

Despite some between country differences, these findings suggest that small firms within developed economies (all were from OECD countries) are likely to have a more positive view of the hard infrastructure than the soft infrastructure (e.g. government support) within their NIS. They also highlight the critical role played by customers in shaping innovation behavior within small firms, and also their role in the new product development and commercialization process. The nexus between more formal and systematic portfolio and project management and the generation of "Champion" type innovations is also consistent with other research into new product development. Future research will need to examine the role of entrepreneurial orientation and leadership style on innovation within small firms. Also of importance will be the influence of size and age of the firm, ownership structure and type of industry. The study also provides insights into an ongoing international collaboration by academic researchers from many countries. Future research could include further data collection across non-OECD countries, refinement of the measures, and follow up with participating firms for longitudinal data analysis.

Organiser Declaration

I have received signed statements or emails from all intended participants formally agreeing to participate in the entire symposium, AND stating that they are not in violation of the *Rule of Three + Three.*

I understand that if this symposium is accepted, all of the listed participants must be registered for the meeting to take part in the session.

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Delwyn N. Clark

12/01/2010