Sources of slack and innovation in small firms

Introduction

In this paper we model how slack and scope economies interact to support small firm performance. We define and operationalise two types of slack: resource slack and capability slack. Resource slack stems from the surplus of financial and human resources, and capability slack allows the redeployment of resources through external use of industrial networks and internal use of planning. Both of these are necessary to realise scope economies, which we operationalise as innovation breadth or scope. Together slack and scope economies drive performance, as fungible resources are deployed to innovate and generate new products and services or improved processes.

While the importance of innovation for growth and performance is well established at the level of economies, industries (Schumpeter, 1942; Mowery and Rosenberg, 1991) and even large firms (Thornhill, 2006), empirical research in small firms has delivered mixed results (Rosenbusch, et al. 2011). Greater acknowledgement of the complex and highly contextual nature of the relationship has followed (Baldwin and Gellatly, 2003), which has led to a plethora of moderation and mediation studies that examine external and internal (e.g. Grönum, et al. 2012; Leal-Rodríguez, et al. 2015) influences on this relationship. We extend this work and take the resource based view that innovation flourishes in conditions where sufficient slack exists.

To this end we examine the connection between innovation and performance against the background of established theories of growth through slack and scope economies (Chandler, 1990; Penrose, 1959) to show that small firms need to (1) generate two types of slack, resource and capability slack, to (2) be able to achieve economies of scope across multiple innovation types, and that (3) these slack and scope activities are essential for small firms to achieve performance. Thus, rather than taking the sanguine view that innovation is always good for small firms, we adopt a more realistic view that it may be a risky investment activity where success depends on the ability of firms to sustain the investment, execute the innovation and capture economic value from the new product, process or service.

Theoretical model

To do this, our investigation attempts to bridge two theoretical perspectives. First, researchers often argue that slack is necessary to innovate (Kim and Miner, 2007; Leonard-Barton, 1992). This proposition is supported by Penrose's (1959) theory that firms grow and diversify through the utilization of slack resources (Bromiley, 1991; George, 2005). However, slack can also be used for unproductive purposes with a negative impact on innovation in small firms (Harris, 1994; Nohria and Gulati, 1997). Further, resource slack is often associated with firm size and age (Autio, et al. 2011) and therefore less likely to be present in small firms. Therefore small firms may use atypical sources of slack; drawn from different types of resources and capabilities. These types of slack may interact to increase the range of innovation types that small firms attempt, thereby improving performance (Grönum, et al. 2012).

Since resource slack is important for growth and performance, small firms may find that the best way to create it is by leveraging the resources of other firms. Firms with fewer capabilities most likely lack the available human and financial resources to

effectively utilise slack resources. The idea of capability slack comes from a central tenet of Penrose's (1959) theory of firm growth, namely that managerial capabilities (which Penrose called 'administrative services') are necessary to coordinate growth. These capabilities redeploy resources to perform different services and processes, which we refer to here as capability slack (Teece and Pisano, 1994). Therefore, while more traditional forms of resource slack may render variable innovation outcomes, when it is directed and extended with these managerial capabilities, innovation performance improves.

Second, we use ideas from Chandler (1990) to show how small firms can create and apply scope economies to gain performance advantage. Firms can improve performance by realizing economies of scope from applying slack resources to new activities (Eisenhardt and Martin, 2000). This mechanism is particularly important for understanding how innovation can sustain growth and performance. We argue that economies of scope in the knowledge base of the firm can result in multiple forms of innovation. The use of innovation scope as a measure of scope is novel. Although Chandler's (1990) conceptualization of scope economies has become a major contribution to strategy and business economics (Teece 1993), he did not provide guidance about how to operationalize scope empirically. Few attempts to do so are found in studies of firm size effects (Bercovitz and Mitchell, 2007) and on a macro level in the finance industry (Cavallo and Rossi, 2001).

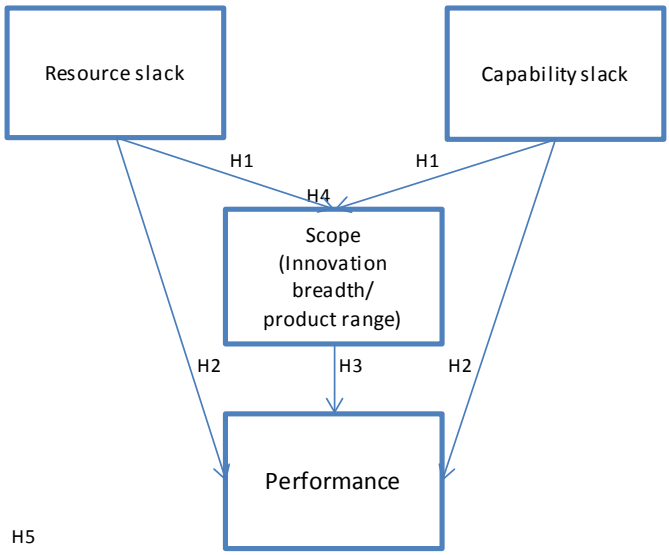

Figure 1: Research model

Building on these to perspectives, we argue that firms need slack resources to attain scope. Here we contribute the additional nuance of the connection between resource slack as well as capability slack in the relationship between innovation, scope economies and performance. This theoretical approach has not previously been used to explain how small firms use their scope of innovation, or innovation breadth, to accrue performance benefits. The idea is intriguing though, seeing that both slack and scope has

been linked to performance (Bercovitz and Mitchell, 2007). Figure 1 summarizes our model.

Research method and findings

We test our model with longitudinal data from 396 small-to-medium sized (SMEs) Australian firms, defined as firms employing fewer than 200 full time employees. Data were gathered using an adapted version (Cosh, Fu and Hughes, 2012; Freel, 2005; McCarthy, Oliver and Verreynne, forthcoming) of the Community Innovation Survey methodology (OECD 2005) in 2010 and 2012, attaining a response rate of eight and 12 percent respectively. Of these, 413 firms responded to both surveys and the 396 of them employing 200 or fewer full time equivalent employees in 2011 are used for the analysis in this paper. A random stratified sample (by size, industry and state) was drawn. Responses mirrored these strata well, reflecting a true cross section of Australian firms.

The survey instrument measured organizational demographics, organizational practices, innovation types and performance. To measure the constructs in our model, we used measures previously created (e.g. Cosh et al. 2012; Freel and Harrison; 2007). *Resource slack* was measured using firm size (Bercovitz and Mitchell, 2007) and profits in the preceding three year period (Bourgeois, 1981). *Capability slack* was measured using at a measure of planning sophistication (Verreynne, Meyer and Liesch, 2014) and the use of networks (Gronum, Verreynne and Kastelle, 2012). Firms with better planning can coordinate organizational changes more effectively, leaving managerial resources available for other activities including innovation and strategic change. Firms that use networks also have access to a broader range of capabilities through these ties and are also able to use these networks as sources of information about new opportunities (Steen and Liesch, 2007). *Innovation scope* (Bercovitz and Mitchell, 2007; Gronum, et al., 2012) was a measure of innovation breadth, counting the different types of innovation that firms introduced. *Perceived performance* was measured by asking firms about the importance they attach to 11 different types of performance as well as their satisfaction with their performance on the same measures. Importance and satisfaction were multiplied and the 11 measures aggregated to provide a weighted average index of perceived performance (see Brockman, Jones and Becherer, 2012; Li, Veliyath and Tan, 2013, Verreynne, et al. 2014). Typical control variables, including firm age and industry, were included in all analyses.

OLS regression supports the importance of both forms of slack for innovation scope and performance. When interacting, these relationships increase in strength. However, innovation scope only mediates the relationship between capability slack and performance, and not resource slack.

Discussion and conclusions

Several implications emerge. Theoretically, we first augment the resource-based literature to distinguish between two types of organizational slack, namely capability and resource slack. This distinction is important as we argue that small firms need resource slack to unlock capability slack. Highly developed management capabilities will matter most to performance in the presence of resources that can be redeployed. Our arguments are supported by the dynamic capability literature (Eisenhardt and Martin, 2000), which show that firms need resource slack to experiment with their resources and develop new

capabilities (George, 2005). Our findings provide support for an interaction effect between these two types of slack when regressed on innovation breadth, which supports the importance of having both types of slack present at the same time.

Second, viewing productivity as a way to create slack in resource-restricted small firms is important. Typical measures of resource slack, such as profit or firm size, are less useful in small firms. In small-firms, firm size has little variance and size by itself tells us little about how effectively the resources are being used. Profit is a better measure of slack because it tells us about the availability of financial resources. However, this measure does not inform us of slack that relates to other resources such as people and knowledge. Our findings show that productivity does indeed help small firms to innovate more broadly and nurture performance.

Third, while authors such as Bercovitz and Mitchell (2007) have argued that scope is important for scale type measures such as slack, we show that within a one year lag there is an important relationship between measures of slack and the scope of innovation as measured by innovation breadth. However, our results indicate that labor productivity does indeed take time to pay off for innovation, and we suspect with more time points in our data we will in fact be able to show even stronger relationships with innovation and performance.

Last, we look at the mediatory role of scope (innovation breadth) to explain how slack relates to performance. This approach, which argues that some of the negative effects of organizational slack can be negated by focusing on its effective and efficient use, is useful to overcome some of the negative findings that have plagued the slack – performance relationship. Our findings indeed support a partial mediation effect for innovation breadth in this relationship.

On a practical level, we show that it is important to develop planning capabilities in small firms to ensure that innovation results in profitable growth. Such planning activities can help small firms to also perform well in other areas such as innovation. It is important that innovation breadth is also correlated with performance in the subsequent time period. Innovation is a 'whole of business' activity that should occur across products, processes and services to support changes to the entire business model and these are leading indicators of subsequent performance.

Last we note some of the limitations against which this research should be interpreted. First, our response rate was at the low end of acceptability. That said we show that it is common for this type of research. Importantly, we find no significant differences between our respondents and those from whom we drew the sample. Second, we use responses from a single survey by single respondents. This means that common-method bias may have affected the results. However, Siemsen, Roth and Oliveira (2010) show that when multivariate linear relationships are examined, common method bias generally decreases with the addition of more independent variables in a regression equation. In this study there are eight independent variables, suggesting that common method variance has been addressed to some extent in the analysis itself. Third, we include two measurement points in our analysis. Chan (1998) argues for at least three stages in longitudinal research to overcome the automatic linearity created when measuring variables at only two points in time, and to overcome the chance that true

change and measurement error may be confused. We partially address this by moving the time of the mediatory variable. In addition, we advance results from typical cross-sectional studies by having more than one measurement point.

REFERENCES

Autio, Erkko, George, Gerard and Alexy, Oliver (2011). International entrepreneurship and capability development – Qualitative evidence and future research directions. *Entrepreneurship Theory and Practice*, 35(1), 11-37.

Baldwin, John Russel and Gellatly, Guy (2003). *Innovation strategies and performance in small firms*. Cheltenham, UK: Edward Elgar.

Bercovitz, Janet and Mitchell, Will (2007). When is more better? The impact of business scale and scope on long-term business survival, while controlling for profitability. *Strategic Management Journal*, 28(1), 61-79.

Bourgeois, L. Jay. (1981). On the measurement of organizational slack. *Academy of Management review*, 6(1), 29-39.

Brockman, Beverly K., Jones, Michael A. and Becherer, Richard, C. (2012). Customer orientation and performance in small firms: Examining the moderating influence of risk-taking, innovativeness, and opportunity focus. *Journal of Small Business Management*, 50(3), 429–446.

Bromiley, Phillip (1991). Testing a causal model of corporate risk taking and performance. *Academy of Management Journal*, 34(1), 37-59.

Cavallo, Laura and Rossi, Stefania P. S. (2001). Scale and scope economies in the European banking systems. *Journal of Multinational Financial Management*, 11(4-5) 515–531.

Chan, David (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis and multiple indicator latent growth modelling. *Organizational Research Methods*, 1(4), 421-483.

Chandler, Alfred Dupont (1990). *Scale and scope: The dynamics of industrial capitalism*. Cambridge, Mass.: Harvard University Press.

Cosh, Andy, Fu, Xiaolan and Hughes, Alan (2012). Organisation structure and innovation performance in different environments. *Small Business Economics*, 39(2), 301–317.

Eisenhardt, Kathleen M. and Martin, Jeffrey A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10-11), 1105-1120.

Freel, Mark S. (2005). Perceived environmental uncertainty and innovation in small firms. *Small Business Economics*, 25(1), 49-64.

Freel, Mark and Harrison, R. (2007). *The Community innovation survey 4: Profiling Scotland's innovation performance*. Scottish Executive.

George, Gerard (2005). Learning to be capable: patenting and licensing at the Wisconsin Alumni Research Foundation 1925-2002. *Industrial and Corporate Change*, 14(1), 119-151.

Grönum, Sarel J., Verreynne, Martie-Louise and Kastelle, Tim (2012). Sourcing ideas: The role of formal networks in small and medium-sized enterprise performance. *Journal of Small Business Management*, 52(2), 257-282.

Harris, Douglas H. (1994). *Organizational linkages: Understanding the productivity paradox*. Washington, D.C.: National Academy Press.

Kim, Ji-Yub Jay and Miner, Anne S. (2007). Vicarious learning from the failures and near-failures of others: evidence from the US commercial banking industry. *Academy of Management Journal*, 50(3), 687-714.

Leal-Rodríguez, Antonio Luis, Stephen Eldridge, José Luis Roldán, Antonio Genaro Leal-Millán, and Jaime Ortega-Gutiérrez. (2015). Organizational unlearning, innovation outcomes, and performance: The moderating effect of firm size. *Journal of Business Research*, 68(4), 803-809.

Leonard-Barton, Dorothy (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13(S1), 111-125.

Li, Wan, Veliyath, Rajaram and Tan, Justin (2013). Network characteristics and firm performance: An examination of the relationships in the context of a cluster. Journal of Small Business Management, 51(1), 1–22.

McCarthy, Scott, Oliver, Barry and Verreynne, Martie-Louise. (forthcoming). Credit rationing in SMEs by banks in Australia. *Australian Journal of Management*.

Mowery, David C. and Rosenberg, Nathan (1991). *Technology and the pursuit of economic growth*, Cambridge, UK: Cambridge University Press.

Nohria, Nitin and Gulati, Ranjay (1997). What is the optimum amount of organizational slack? A study of the relationship between slack and innovation in multinational firms. *European Management Journal*, 15(6), 603-611.

OECD (2005). *Oslo manual: Guidelines for collecting and interpreting innovation data*, 3rd ed. Paris: Joint Publication of the OECD and the Statistical Office of the European Communities.

Penrose, Edith (1959). *The theory of growth of the firm*. Oxford: Blackwell.

Rosenbusch, Nina, Brinckmann, Jan and Bausch, Andreas. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing* 26(4), 441-457.

Schumpeter, Joseph A. (1942). *Capitalism, socialism, and democracy*. New York: Harper and Brothers (Harper Colophon edition, 1976).

Siemsen Enno, Roth Aleda and Oliveira Pedro (2010). Common Method Bias in Regression Models with Linear, Quadratic, and Interaction Effects. *Organizational Research Methods*, 13(3), 456-476.

Steen, John and Liesch, Peter (2007). A note on Penrosean growth, resource bundles and the Uppsala model of internationalization. *Management International Review*, 47(2), 193-206.

Teece, David J. (1993). The dynamics of industrial capitalism: Perspectives on Alfred Chandler's scale and scope. *Journal of Economic Literature*, 31(1), 199-225.

Teece, David J. and Pisano, Gary (1994). The dynamic capabilities of firms: an introduction. *Industrial and Corporate Change*, 3(3), 537-556.

Thornhill, Stewart. (2006). Knowledge, innovation and firm performance in high-and low-technology regimes. *Journal of Business Venturing*, 21(5), 687-703.

Verreynne, Martie-Louise, Meyer, Denny & Liesch, Peter. (In Press, online 1 November 2014) Beyond the formal-informal dichotomy of small firm strategy-making in stable

and dynamic environments. *Journal of Small Business Management*. http://onlinelibrary.wiley.com/doi/10.1111/jsbm.12143/full.