



**ADVANCES IN ENTREPRENEURSHIP, FIRM EMERGENCE  
AND GROWTH  
VOLUME 8**

**INTERNATIONAL  
ENTREPRENEURSHIP**

**DEAN A. SHEPHERD**

**JEROME A. KATZ**

**Editors**

# INTERNATIONAL ENTREPRENEURSHIP

# ADVANCES IN ENTREPRENEURSHIP, FIRM EMERGENCE AND GROWTH

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ADVANCES IN ENTREPRENEURSHIP,  
FIRM EMERGENCE AND GROWTH VOLUME 8

# INTERNATIONAL ENTREPRENEURSHIP

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# AN INTRODUCTION TO THE SPECIAL VOLUME ON INTERNATIONAL ENTREPRENEURSHIP

Jerome A. Katz and Dean A. Shepherd

This eighth volume in the series *Advances in Entrepreneurship, Firm Emergence and Growth* focuses on international entrepreneurship. We are fortunate to draw on scholars both new to the field as well as some of those who founded this unique specialty. International entrepreneurship, perhaps more than any subfield of entrepreneurship, is a product of our particular *zeitgeist*. The last quarter of the 20th Century brought about one of the periods of the greatest internationalization in all phases of business.

This was the second great wave of globalization, with the first taking place at the turn of that century and ending only with the outbreak of World War I. Economist John Maynard Keynes described the heady experience of that wave of globalization as follows:

The inhabitant of London, could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages. (John Maynard Keynes (1919) *The Economic Consequences of the Peace*)

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In many ways, the second wave of globalization was much like the first at the level of big business, but perhaps quite different for smaller entrepreneurial firms. Not only did big business go global, developing and marketing brands across borders, but also the international growth of big business resulted in tremendous growth among small and medium firms, something not seen in that earlier wave of globalization. This growth occurred initially among subcontractors, but increasingly as competitors, as high-potential firms came into existence as “born international” businesses.

But the *zeitgeist* held more to fuel the fires of internationalization. The advent of the Internet as a global trading platform spurred this on even more, while the bold creation of the European Union worked to make firms throughout Europe instantly and easily international. Meanwhile, the emerging economies of Eastern Europe and the Five Tigers of Asia burst upon the scene with tremendous energy and determination to become a force in international business – with much of the energy coming from the entrepreneurial sector. This period culminated with the exponential growth of China as a global trading partner, in large part due to the Communist government’s opening up international trade opportunities to SMEs.

Today, we once again live in societies that sound much like that of Keynes’ London. We have access to products, services, capital, and information from all over the world. What is distinctive about this round of internationalization is that entrepreneurship is so much at the center of the growth. Whether born international or made international, SMEs and small high-growth ventures are at the forefront of globalization.

This makes for a particularly exciting period for researchers in international entrepreneurship, and the theoretical and empirical works of a growing body of experts are a testimony to that confluence of *zeitgeist* and economic growth. We are fortunate that several of the key entrepreneurship researchers who created the modern study of international entrepreneurship – Patricia MacDougall, Ben Oviatt, and Erkkko Autio – have offered their latest thoughts in this volume in papers done with some very promising newcomers to entrepreneurship research. One will also find many other familiar names among contributors – Sapienza, Mitchell, Wright, Locket, Kundu, and Honig – to name a few, and we also have the tremendous opportunity to introduce works by some of the finest new contributors to the field of international entrepreneurship – people such as, Maija Reinko, Joy Godesiabo, Stephanie Fernhaber, Tomas Karlsson, Friderike Welter, Leora Shakked, Arie Sadaovski, and Congcong Zheng.

The second chapter is entitled “International social capital, technology sharing, and foreign market learning in internationalizing entrepreneurial

firms.” In this chapter, Erkki Autio, Harry Sapienza, and Pia Arenius suggested that they were particularly motivated to conduct this study on the basis of their observation that even though theories of new firm internationalization and international relationship acknowledge the crucial importance of learning and knowledge acquisition, there is little empirical research on what affects these processes have in international contexts. While inter-organizational learning has been the object of an increasing research tradition, empirical studies on the topic in international contexts have been almost non-existent. Drawing on knowledge-based and organizational learning theories, they built a theoretical model that identified equitable social norms, relationship flexibility, interaction frequency, and technological and managerial compatibility as important determinants of positive relationship outcomes. They tested the model using a sample of 93 newly internationalizing Finnish software product firms, and analyzed the determinants of positive relationship outcomes in collaborative relationships between internationalizing new firms and their foreign partners. The results of the chapter show that relationship flexibility, interaction frequency, and technological and managerial compatibility constitute important determinants of technology sharing, technological learning, and the acquisition of foreign organizing knowledge in international dyads. This chapter makes an important contribution to the role of knowledge and learning in internationalizing new firms’ development of beneficial collaborative relationships.

In the third chapter, Sumit Kundu and Maija Reinko also investigate a Finnish industry. In “Explaining export performance: A comparative study of international new ventures in Finnish and Indian Software industry,” Sumit and Maija investigate the determinants of export performance of international new ventures, by focusing on the entrepreneurial or leadership characteristics of start-ups in high technology, specifically, the international growth and competitiveness of software companies in the small industrialized nation of Finland and the big emerging market of India over the past decade. Hypotheses are drawn from the entrepreneurship, international business, and strategic management literatures, they show that the phenomenal international growth of small software firms is due to a combination of both entrepreneurial and firm level characteristics, and that entrepreneurship matters as much as firm structure, at least for this stage of firm evolution.

From software to the Internet, the fourth chapter is entitled “Institutional and economic influences on Internet adoption and accelerated firm internationalization” by Jifeng Yu, Alice de Koning, and Benjamin Oviatt. This chapter focuses on accelerated internationalization and specifically, the

connection between the nearly simultaneous development of the Internet and the phenomenon of accelerated internationalization. They argue that while Internet technology seems likely to strengthen firms' capabilities to expand abroad, establishing international activities is itself likely to encourage the subsequent adoption of Internet technology in order to achieve greater efficiency. The focus of the chapter is the reciprocal causal relationship explored using a two-force perspective – economic and institutional – to explain the adoption of the Internet by organizations in the process of accelerated internationalization. By acknowledging the endogeneity of Internet adoption and internationalization, Jifeng, Alice, and Ben explore the shift in dynamics of strategies over time within an industry and propose what type of firms will be entrepreneurial leaders, when and why. These important contributions are highlighted by a detailed analysis of the book retailing industry in the United States.

The fifth chapter is by Stephanie Fernhaber and Patricia McDougall entitled “New venture growth in international markets: The role of strategic adaptation and networking capabilities.” In this chapter, they highlight and acknowledge the varied motivations of new ventures to internationalize and focus on new ventures' need to develop sets of firm-specific capabilities to be able to survive and grow in international markets. Specifically, capabilities to overcome the liabilities of foreignness. This chapter does an excellent job of building on the international new venture literature to provide new insights into how strategic adaptation and networking capabilities contribute to new venture growth in international markets. Specifically, they make a strong case that the liabilities of foreignness can be overcome (eliminated or minimized) by reliance on networking and the ability to adapt to changes in the environment. That is, opportunities and information provided through extensive networking will not only influence international growth directly, but can also strengthen the relationship between a new venture's strategic adaptation capabilities and growth in international markets. This chapter presents an important model and clearly articulates its implications for scholars and practitioners.

In the sixth chapter, Joy Godesiabois also acknowledges the importance of networking in the international context with her chapter entitled “Network analysis in an international entrepreneurial environment.” Joy builds on the “small world” phenomenon to offer a discussion of network analysis tools that can be applied to international entrepreneurship research. Specifically, network analysis methods have advanced to a point where a common vocabulary of research terms exists – terms such as density, structural holes, and centrality, there are well-established measures in network

research from sociology to corporate organizations and, as such, network analysis may introduce new methods and measures that could expand the horizons of international entrepreneurship research. The purpose of this chapter is not to provide a detailed explanation of method but rather an introduction to network analysis and its possibilities to hopefully whet the appetite of scholars on international entrepreneurship to consider this research tool. This chapter does an excellent job of introducing and distinguishing key terms, providing illustrative examples, and some interesting suggestions for the future of international entrepreneurship research.

The seventh chapter is an illustration of international entrepreneurship in itself “A cross-national comparison of incubated organizations: An institutional perspective” is written by Tomas Karlsson from Sweden, Benson Honig from Canada, Friederike Welter from Germany, Leora Shakked and Arie Sadaovski both from Israel. In this chapter, the authors use institutional theory to identify the constraints and enabling factors influencing entrepreneurship in two very different environments. Specifically, they compare incubated businesses in two countries, Israel and Sweden, with respect to the institutional pressures these businesses confront and how they deal with them. The comparison of the incubatee environments are based on semi-structured in-depth interviews, and the analysis follows a theoretically derived structured content analysis.

The eighth chapter is “Souping up the global value creation engine: The road to excellence in international entrepreneurship education.” In this chapter, Ron Mitchell provocatively argues that our current beliefs about entrepreneurs may be limiting the amount of entrepreneurship available to society; because they limit a way of thinking that may otherwise be virtually unlimited when viewed in the light of an alternate perspective, that is, the emerging deliberate practice paradigm. In the first part of the chapter, Ron uses border-spanning transaction cognition entrepreneurship theory, to propose that as a global society we have in certain ways been wrong in our approach to entrepreneurship education, and as a result that entrepreneurship education as an engine of global value creation might be “ready for a tune-up.” In the second part of the chapter, he acknowledges that in terms of the relationship between education and high-performance entrepreneurial results, entrepreneurs are special, creating them is general – that there is, a commonly available process for creating entrepreneurial expertise. The chapter concludes with the international implications of the emerging “practice school” of entrepreneurship education for the creation of global entrepreneurs and some suggestions for tuning up entrepreneurship education as a global value creation engine.

The ninth chapter of this volume on international entrepreneurship is entitled “When do venture capitalists make a difference? The export intensity of venture capital backed companies” by Andy Lockett, Mike Wright, Andrew Burrows, Louise Scholes, and Dave Paton. This chapter is one of the first studies to examine the internationalization of venture capital-backed firms. Based on a unique pan-European representative dataset, these authors examine the financial and non-financial contribution of venture capitalists to internationalization intensity by venture-backed firms at different investment stages and find a positive relationship between a VC’s non-financial contribution and change in export intensity. Adopting a path dependency perspective, they also find support for the hypothesis that the negative relationship between a VC’s contribution relating to financial issues and export intensity is greatest at the early stage. Andy, Mike, Andrew, Louise, and Dave highlight some interesting implications of their chapter for scholars and practitioners.

The final chapter is by Congcong Zheng and Susanna Khavul and is entitled “Capability development, learning and growth in international entrepreneurial firms – Evidence from China.” Applying the core capability construct and learning perspective in the international entrepreneurship setting, Congcong Zheng and Susanna Khavul argue that entrepreneurial firms going international face competing learning demands – developing core capability inside the firm and adjusting to a new environment outside the firm – and that excelling on both types of learning will lead to faster international growth.

It makes sense to return to Keynes’ insights about the first wave of globalization to help close out this introduction. The great economist concluded his observation of the mindset of those first beneficiaries of modern globalization in London with this:

But, most important of all, he regarded this state of affairs as normal, certain, and permanent, except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable. The projects and politics of militarism and imperialism, of racial and cultural rivalries, of monopolies, restrictions, and exclusion, which were to play the serpent to this paradise, were little more than the amusements of his daily newspaper, and appeared to exercise almost no influence at all on the ordinary course of social and economic life, the internationalization of which was nearly complete in practice.

In a world of tightly coupled financial markets, electronic news networks, and just-in-time interdependencies, the fragility of globalization is perhaps even greater today than it was in Keynes day. Cut off from the global economy, many small businesses and entrepreneurial firms would no doubt

survive, perhaps even better than their big business brethren. But that fragility should serve as a point of concern and research, by which researchers in international entrepreneurship increasingly consider not only the business context, but also the larger political context. If international entrepreneurship can not only help understand globalization, but also increasingly contribute those elements of knowledge that will help make it more sustainable socially and politically, perhaps it can help to take international entrepreneurship, as a discipline and as a practice further into the next century than globalization's first wave was able to do.



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# INTERNATIONAL SOCIAL CAPITAL, TECHNOLOGY SHARING, AND FOREIGN MARKET LEARNING IN INTERNATIONALIZING ENTREPRENEURIAL FIRMS

Erkko Autio, Harry J. Sapienza and Pia Arenius

## INTRODUCTION

Internationalizing new firms face the dual challenge of overcoming the liabilities of newness and liabilities of foreignness (Stinchcombe, 1965; Dunning, 1981; Zaheer, 1995). Because of their newness, new firms are constrained in their ability to access external resources required for survival and growth. Because of their foreignness relative to the foreign target market, internationalizing firms are disadvantaged relative to domestic firms when establishing business relationships. These disadvantages are exacerbated by the additional knowledge inputs required by the internationalization process itself: internationalizing firms face the dual challenge of both learning how to do business in a new national and institutional environment

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while also learning to manage the inherently complex international business organization (Johanson & Vahlne, 1990).

The skills required for managing a complex business operation can mainly be learned through internal experience. However, for many other types of critical knowledge inputs, the internationalizing new firm needs to secure access to external sources of knowledge and learning. In order to cope within the new institutional environment, the new firm needs to access “foreign organizing knowledge” (Johanson & Vahlne, 1977), that is, knowledge about local markets, institutions, and ways of doing business. This knowledge resides, by definition, in sources external to the new firm. The new firm also needs to develop an intimate access to knowledge about local customer needs and wants in order to optimize its offering for these. For these knowledge inputs, too, the internationalizing firm needs to secure access to external sources of learning. Therefore, the ability of an internationalizing new firm to access external sources of learning in foreign market environments should constitute an important determinant of its performance.

While knowledge and learning have been given a central role in theories concerning the internationalization of small- and medium-sized entrepreneurial firms (e.g., Johanson & Vahlne, 1977; Oviatt & McDougall, 1994; Sapienza, Autio, George & Zahra, 2005), the theories remain largely silent about how the critical inputs of external knowledge are realized. In received theories and frameworks on the topic, knowledge is usually seen as either acquired through “experiential learning” (e.g., Eriksson, Johansson, Majkgård, & Sharma, 1997), or it is treated as an endowed resource that enables the firm to rapidly expand its international operation (Oviatt & McDougall, 1994). In the former view, “foreign organizing knowledge” (i.e., organizational knowledge) is seen as accumulating gradually over time, as the internationalizing firm increases its resource commitments to the foreign market. In the latter view, it is the very mobility of knowledge, as embedded in products and services, which makes it possible for a young firm to expand rapidly beyond national borders. However, the received theories have little to say about what determines the efficiency with which the internationalizing firm connects to local sources of knowledge and learning, and why some firms may be better able to take advantage of their knowledge inputs than other firms (Autio, 2005).

The study of such issues is important for the advancement of our understanding in international entrepreneurship. Like all new firms, early internationalizing firms also face the liability of newness, which hampers their ability to access and mobilize resources. In an international context, this liability is exacerbated by the liability of foreignness (Zaheer, 1995; Zaheer

& Mosakowski, 1997). Together, these liabilities contribute to a high rate of mortality among early internationalizing firms (Sapienza, Autio, George & Zahra, 2005). Social capital has been shown to be an effective vehicle for resource (particularly, knowledge) mobilization for new firms (Yli-Renko, Autio, & Sapienza, 2001; Shane & Stuart, 2002). As we are moving toward a knowledge society in which knowledge constitutes the central resource for value creation by entrepreneurial firms, the study of knowledge-based influences on firms and their performance is likely to increase in relevance. However, while knowledge mobilization and acquisition have been studied in national contexts, only few studies have examined cross-border learning. Fewer studies still have explored international social capital (Yli-Renko, Autio & Tonnti, 2002; Arenius, 2002; Li, 2004; Yeoh, 2004). Because knowledge is arguably the most important resource particularly for knowledge-intensive internationalizing firms, it is therefore important to shed more light on the effect of social capital on external knowledge acquisition in internationalizing new firms.

In this chapter, we seek to contribute to received theories and frameworks on international entrepreneurship by studying the determinants of external knowledge acquisition in internationalizing new firms. In particular, we seek to analyze the facilitating influence of relationship-specific social capital on the sharing and acquisition of technological and foreign market knowledge in relationships between internationalizing new firms and their collaboration partners in foreign target markets. Focusing on the single most important international collaborative relationship of a group of independently held, small Finnish software firms, we develop a model that explicates the influences of relationship-specific social capital on efforts to share technological knowledge with the international partner, on technological learning outcomes from the collaborative relationship, and on the acquisition of “foreign organizing knowledge” through this relationship.

By doing so, we seek to make several contributions to the understanding of international entrepreneurship and the internationalization process of small- and medium-sized knowledge-intensive firms. First, we contribute to the opening-up of the black box of technological and internationalization learning in international collaborative relationships, thereby shedding light on a central resource-acquisition mechanism for internationalizing firms. Second, we extend the applications of the emerging theory of firm-specific social capital and relational learning to international contexts. So far, the applications of social capital have been predominantly limited to national contexts (e.g., Tsai & Ghoshal, 1998; Yli-Renko, Autio & Sapienza, 2001; Shane & Stuart, 2002). Third, we seek to advance theory development on

international entrepreneurship, focusing particularly on the determinants of knowledge acquisition during the internationalization process. Fourth, we seek to contribute to the operationalization of social capital and knowledge acquisition constructs by developing and testing these in the context of internationalizing Finnish software firms.

Our chapter is structured as follows. First, we review received theories on the internationalization process of small- and medium-sized firms, focusing particularly on the roles assigned to knowledge and to the acquisition of knowledge in these theories. Second, we develop a theoretical model that explicates relationships between international social capital, technological knowledge sharing, and the acquisition of technological and foreign organizing knowledge in international collaborative relationships. Third, we test the model empirically in a sample of 92 Finnish software firms. Finally, we discuss our findings and the implications of these for theory development in international entrepreneurship.

## THEORETICAL FRAMEWORK

### *Knowledge and Learning in Internationalization Theories and Research*

The internationalization process theory (Johanson & Vahlne, 1977, 1990), in its basic form, puts foreign market knowledge at the center of the internationalization process: “The internationalization model in its original version explicitly used only one (explanatory variable) – the firm’s knowledge (about foreign market)” (Johanson & Vahlne, 1990, p. 17). The theory depicts the internationalization process as a continued interaction between “state” and “change” variables. Market commitment and market knowledge (state variables) influence commitment decisions and current activities (change variables) – these, in turn, feedback to commitment and “foreign organizing knowledge.” Here, foreign organizing knowledge represents Penrose’s (1959) managerial knowledge in a foreign market context – competencies required for the successful coordination of business activities created through the entrepreneurial pursuit of productive possibilities created by resources controlled by the firm. In the internationalization process theory, the gradually accumulating foreign organizing knowledge increases both the firm’s ability to coordinate its international activities as well its willingness to make resource commitments to these (Hadjikhani, 1997). The theory thus makes a fundamental distinction between, first, the resources

and activities of the firm, and second, the managerial knowledge required for coordinating and mobilizing these.

Foreign market knowledge is firm and country specific, and current activities are the primary source of experiential knowledge (Johanson & Vahlne, 1990, p. 12). Eriksson, Johansson, Majkgård and Sharma (1997) proposed two learning phases in internationalization: (1) internal learning on how to internationalize (firm specific internationalization knowledge), and (2) foreign market learning (country specific knowledge). In internationalizing, a firm must first develop structures and routines that are compatible with its internal resources and competence. These structures and routines are built gradually as a consequence of learning both a firm's capabilities and foreign market needs (Barkema & Vermuelen, 1998). Firms need to build cognitive frameworks that show what further knowledge about foreign markets is relevant. The structures and routines can guide the search for experiential knowledge about foreign markets and institutions. In the second phase, firms must gain foreign market knowledge. According to Eriksson et al. (1997), the accumulation of foreign market knowledge requires durable and repetitive interactions abroad, since to gain knowledge, a firm must repeatedly apply it (Cohen & Levinthal, 1990). Therefore, bringing in international expertise as such would not necessarily help the firm, if the knowledge is not repetitively applied into practice.

Thus, in the process theory of internationalization, knowledge about local business practices, local business environment, market situation, customers, market specific product requirements, and competition in the local market, is gained through first-hand experience. No external sources of knowledge inputs are identified by this theory. The speed of knowledge accumulation is determined by the extent of resource allocation to foreign business operations – the greater the exposure of the firm to foreign markets, the more pervasive the accumulation of foreign organizing knowledge will be. Because this knowledge is largely embedded in organizational routines and memory, it will have a regulatory effect on the strategic choices that the organization is likely to make.

The new venture internationalization theory emphasizes different aspects of Penrose's (1959) theory of the growth (McDougall et al., 1994; Oviatt & McDougall, 1994; Autio, 2005). In this framework, the emphasis is very much on the proactive recognition and pursuit of opportunity, instead of reactive and gradual escalation of resource commitment. International new ventures are created because they possess unique knowledge and competencies that allow their internationally experienced and globally networked managers to pursue rapid international expansion from early on. Rapid

internationalization is made possible, not only by the entrepreneurial services provided by top managers, but also by the knowledge-intensity of the firm's core resources (Oviatt & McDougall, 1997). Knowledge resources, such as special technological competencies, are inherently more mobile than, e.g., manufacturing equipment. Rapid international expansion becomes possible when the highly mobile knowledge-intensive resources are combined with fixed assets in the foreign market. Thus, in the new venture internationalization theory, knowledge plays a dual enabling role: first as the source of entrepreneurial services that lead to opportunity pursuit, and second, by making rapid international expansion physically possible.

The new venture internationalization framework focuses predominantly on explaining how an early and rapid international growth can be possible for some entrepreneurial firms, often in knowledge-intensive industry sectors, and it does not discuss the processes of learning and knowledge accumulation during the internationalization process itself. However, some empirical studies drawing on this framework have focused on internationalization learning processes. In their study of early internationalizing high-technology firms, Autio, Sapienza and Almeida (2000) argued that an early internationalization may confer certain learning advantages that may be difficult to replicate by older firms. They labeled these advantages as "learning advantages of newness," which may influence both the ability of the internationalizing firm to see and process international growth opportunities as well as its motivation of pursuing these. Because of their shorter organizational history, internationalizing new firms have fewer routines and standard tools to unlearn, and the absence of historical package may enable them to take learning steps faster than older firms. Building on this work, Yli-Renko, Autio and Tontti (2002) examined the influences of firm-level social capital on the acquisition of both technological and foreign market knowledge during the internationalization process. For the acquisition of foreign market knowledge, they found significant positive influences for both the intensity of relationships with foreign customers and for the established contact network of the company's management. For technological learning, they found significant associations with firm-internal social capital and foreign customer involvement, suggesting that technological learning can also be influenced by international exposure.

Technological knowledge does not only enable international growth, it may also be influenced by internationalization (Zahra, Ireland & Hitt, 2000; Jeong, 2003). Zahra et al. (2000) demonstrated significant effects of foreign market diversity, intensity of internationalization operation modes, and active knowledge integration, which can exercise an important influence on

breadth, depth, and speed of technological learning occurring within the firm. Jeong (2003) reported a positive relationship between international diversification and product innovation performance in U.S. and Chinese firms. In both studies, the link between firm international diversification and technological learning was argued to arise from the firm's exposure to varied environments, which boosted new knowledge creation opportunities through knowledge combination.

To summarize, empirical studies suggest richer and more varied relationships between learning and internationalization processes than what received theorizing on the topic appears to suggest. Also, in spite of the recognition of the importance of external influences on learning (Zahra et al., 2000), few studies so far have explicitly examined patterns of external knowledge acquisition during the internationalization process. Because an important part of external learning is likely to occur in dyadic relationships between firms, we next take a brief look at received theories on this topic. In particular, we focus on the influence of firm-specific social capital on learning and knowledge acquisition.

### *Social Capital and Organizational Learning*

Social capital has been identified as an important influence on resource mobilization and organizational learning. The concept has been recently applied in a wide range of organization studies, where it has been used in connection with the social context of organizations and in inter- and intra-organizational relationships (Burt, 1992; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). Social capital has been considered to reside in, e.g., the relationships between individuals and in management teams (Leana & Van Buren, 1999; Moran & Galunic, 1998; Foo, Ancona, & Degroof, 1999), among the units of an organization (Tsai & Ghoshal, 1998), in the market ties of an organization (Baker, 1990), and in industry networks between firms (Walker, Kogut & Shan, 1997).

Social capital is often defined as the sum of resources that a firm (individual, organization) can access or mobilize by virtue of possessing a durable network of relationships (e.g., Bourdieu & Wacquant, 1992). Studies in this vein have considered, e.g., the importance of network structures and positions for resource mobilization and for the acquisition of (mostly explicit) information (e.g., Burt, 1992; Walker et al., 1997). In this tradition, the primary emphasis has been on treating the network as a source of (mostly explicit) information for the focal actor, and the complexities



involved in the exchange of experience-based (tacit) knowledge which have not been given much attention. A problem of the approach of defining social capital in terms of resource mobilization, from our perspective, is that it confuses the asset and its outcomes. Therefore, for the purposes of this study, we adopt a different definition of social capital. In this study, we define social capital as the amount and quality of internal and external relationships possessed by an individual or a social unit (e.g., Coleman, 1988, 1990). This definition incorporates both the dyadic relationships within the firm and between firms, as well as the relational assets built into those relationships (Dyer & Singh, 1998). We define social capital this way because of our interest in the effect of social capital on knowledge mobilization.

During recent years, studies of social capital have been extended toward analyzing the outcomes of individual (dyadic) network relationships. In this, “relational” view (as opposed to the “network structural” view referred to above), the main attention has been focused on studying how firms can leverage individual dyadic relationships for the exchange and acquisition of both tacit and explicit knowledge and for mutual learning (Nahapiet & Ghoshal, 1998; Dyer & Singh, 1998; Lane & Lubatkin, 1998; Shane & Stuart, 2002). Studies in this vein have looked at how firms (both individuals and organizations) can build social capital into dyad relationships so as to leverage them for the acquisition of both tacit and explicit knowledge and for the build-up of knowledge-based competitive advantage (Yli-Renko, Autio & Sapienza, 2001; McEvily & Zaheer, 1999; Newey & Shulman, 2004; Inkpen & Tsang, 2004; Sapienza, Parhankangas & Autio, 2004). Here, the primary emphasis has been on treating the dyad as a resource that the focal actor can leverage for the acquisition of both tacit and explicit knowledge.<sup>1</sup>

In interorganizational relationships, social capital facilitates learning because of its effect on knowledge access, knowledge disclosure, and knowledge transfer (Nahapiet & Ghoshal, 1998; Sapienza et al., 2004). A wide network of external contacts will have an enabling effect on learning because it renders a great amount of knowledge potentially available to the firm. The actual access to this potential knowledge is facilitated by the build-up of relational assets, such as trust, liking, familiarity, and identification that solicit the disclosure of valuable knowledge for the focal firm (Coleman, 1988, 1990). The transfer of this knowledge is facilitated by cognitive assets that facilitate both the identification of valuable knowledge and its communication to and assimilation by the focal firm (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). The greater the amount of relational assets built into dyadic relationships, the greater will be the dyadic absorptive capacity, and

the greater the amount of learning and knowledge acquisition that is likely to occur in the dyad (Lane & Lubatkin, 1998; Ring & Van de Ven, 1994; Dyer & Singh, 1998).

### *International Social Capital*

So far, most studies of social influences on firm behavior and performance have focused on domestic contexts. This is natural, since social relations are typically intensified by physical proximity (Granovetter, 1985). For a social influence on firms to reasonably exist, some kind of shared social context, either physical (as in the case of Dutch diamond markets) or non-physical (as in the case of practitioner community membership) must exist. Given the traditionally domestic locus of such contexts, studies of international social capital have been, understandably, few. However, the globalization trend is rapidly changing this picture, as evidenced by the emergence of the “born global” phenomenon.

But how exactly should internationalization matter from the social capital perspective? To understand this, it is necessary to look at determinants of the liability of foreignness. The “liability of foreignness” literature defines this liability as higher cost of operation due to foreignness. Three essential mechanisms have been identified that discriminate against foreign firms in a given national market (Zaheer, 1995; Zaheer and Mosakowski, 1997). First, foreign-based firms incur higher costs of operation because of the inherently greater complexity of their operations. Higher costs may also arise from local regulations that may favor domestic firms or discriminate against foreign ones. A cost element is also associated with the need to customize products for the local market. Second, institutional and power influences may also discriminate against foreign-based firms. The lack of political influence may result in positional disadvantages in relation to domestic-based firms. Nationalistic buyers may favor domestic firms. And, in what Zaheer & Mosakowski (1997) refer to as lack of embeddedness, foreign-based companies may lack the necessary local connections required to make a business run smoothly and efficiently. The third major source of the liability of foreignness partly overlaps with those above: limited access to relevant information and resources in the local market. Because of their embeddedness deficit, foreign-based companies get locked out from the grapevine of information that carries weak signals about opportunities, resources, and market trends. Cultural differences may hamper foreign-based firms’ ability to interpret such information, even if it came across such information.

Many of the above mechanisms are related to those that give rise to liabilities of newness. According to [Stinchcombe \(1965\)](#), new “types” of firms face an uphill struggle before they are accepted as reliable trading partners. The perceived instability of new firms reduces the willingness of established firms to trade with them, thereby pushing up their cost of doing business. Because new firms lack the necessary connections, they may get locked out of relevant market information. These mechanisms resonate closely with the liability of foreignness. However, the liability of foreignness also differs from the liability of newness in important ways. The most important difference relates to the relative absence of a shared social context. In domestic business relationships, one may rely on a shared domestic context to reduce the threat of opportunism because of reputation penalty associated with such behavior. In international business relationships, this deterrent may be expected to be less powerful. Another distinguishing aspect of the liability of foreignness is the presence of institutional factors (such as regulations) that may discriminate against foreign-based firms.

Even though social capital may not be effective against institutional discrimination, it may alleviate some of the above mechanisms. In particular, social capital may facilitate tighter embeddedness, thereby facilitating access to information and resources. In this regard, one might expect social capital to work much like in the domestic context, although one may expect it to be more difficult and resource-consuming for a foreign-based firm to build similar relational assets as a domestic-based firm could. At present, however, there is insufficient empirical evidence to go beyond speculation.

Social capital has seldom been explicitly addressed in internationalization literature. Closely related issues have been discussed, however. Extensive use of alternative (network) governance structures has been seen as a precondition for international new ventures ([Oviatt & McDougall, 1994](#)), and the “new venture internationalization” framework emphasizes the critical facilitating function of firm founders’ international experience and contact networks for new firm internationalization ([McDougall, Shane, & Oviatt, 1994](#)). A common theme in many studies on new firm internationalization is the emphasis on networks and collaborative relationships as facilitators of international activities ([Oviatt & McDougall, 1995](#); [Coviello & Munro, 1995](#); [Etemad, 2003](#)). Networks rely extensively on social (i.e., informal) control of behavior through trust and moral obligation ([Dyer & Singh, 1998](#)). A network relationship may have high personal and economic value because the members usually share rents, and a deep relationship effectively reduces opportunism ([Larson, 1992](#)). For such relationships to exist in new ventures that cross national borders, logic suggests that founding teams

must usually include internationally experienced individuals. To the extent that reputations extend beyond national borders, cooperation should be possible without excessive opportunism even in international relationships.

The concepts and ideas in the social capital theory are most recognizable in the “network model of internationalization” (Johanson & Mattsson, 1988). The network model of internationalization describes industrial markets as networks of relationships between firms. The degree of internationalization of the “market” is in fact the degree of internationalization of the production net of the firm, which is composed of firms whose production and distribution activities are linked to a specific product area. Becoming established in markets – domestic and international – requires building relationships, either breaking existing ones or adding new ones. Thus, internationalization means that the firm establishes and develops positions toward counterparts in foreign markets, either through extension, penetration, or integration. International extension means establishing a position in new national nets, while penetration stands for developing positions and increasing resource commitments in the nets in which the firm is already present. Integration means increasing coordination between positions in different national nets.

While firm-level social capital has been increasingly studied in the context of domestic relationships, its explicit applications in international settings have been almost nonexistent (Yli-Renko et al., 2002). Thus, while we know how knowledge-intensive new firms can build social capital into their domestic network relationships so as to enhance their relationship outcomes and the formation of organizational advantage, we know very little about the uses of social capital in international relationships. In domestic contexts, firm-level social capital has been demonstrated to be an important determinant of learning and relationship outcomes. Because internationalization is crucially important for the prosperity of knowledge-intensive firms, it is important to study whether similar benefits can be obtained in international collaborations where the form and impact of social capital might be very different from what can be observed in domestic contexts.

## **HYPOTHESES**

Above, we have reviewed received theorizing on internationalizing process, focusing particularly on knowledge acquisition and learning and the effect

of dyadic social capital on these processes. In the following, we will lay out our formal hypotheses and theoretical model for empirical testing. Our hypotheses focus, first, on the effect of social capital on knowledge disclosure in an international dyad; second, on the effect of flexibility and temporal slack created by it; third, on the effect of interaction frequency; and fourth, on the effect of initial conditions that affect the cognitive dimension of social capital and thereby the efficiency of knowledge transfer within an international dyad.

### *Effects of Relationship Flexibility*

Yli-Renko (1999) noted that “high contractual governance flexibility exists when the exchange partners are willing to accept actions consistent with but not necessarily included within the parameters of existing legal agreements.” A high level of commitment to a key partner may involve significant benefits for an internationalizing new firm. A close and well-functioning partnership may confer the internationalizing new firm leveraging opportunities, “whereby resources can be gained and competitive advantages realized” (Larson, 1992). However, an investment in building an international partnership will also carry opportunity costs, as efforts dedicated to any given partnership will deduct from the capacity of the internationalizing new firm to commit to alternative partnerships. Therefore, the smooth operation of the partnership is important for the realization of its potential benefits. Once the internationalizing new firm commits to an international partnership, the increased risk and complexity, combined with the inherent uncertainties of technology-intensive international markets, creates a need for flexibility in the governance of international partnerships.

The importance of smooth governance of a relationship for learning and knowledge-sharing outcomes is due to several reasons. First, relying on contracts to govern a relationship is expensive, particularly so in uncertain environments (Yli-Renko, 1999). If a partnership relies excessively on contracts, frequent contractual changes and adjustments are likely to be necessary because of unpredictable changes characteristic of uncertain environments. Second, an international contract is likely to be expensive in the first place, because the foreign partner enjoys knowledge asymmetry advantages due to its presence and history in the target market. Third, relying strictly on contracts is likely to be slow and may hamper creativity and informal knowledge exchange: “one gets performance only to the letter of the contract” (Macauley, 1963).

In their study, Yli-Renko et al. (2001) found that flexible governance mechanisms were particularly important in situations characterized by a high degree of exchange dependency on its key customer. Specifically, they observed an important influence of relationship-flexibility on new-product development in the relationship – a proxy of technological learning and knowledge sharing efforts. In high-dependence situations, they argued, reliance on flexible governance mechanisms boosts knowledge sharing and provides the slack necessary to deal with unexpected eventualities as soon as they arose. In low-dependence situations, they argued, governance flexibility did not have a similar effect due to the likely absence of knowledge-sharing routines in the first place. Importantly, they observed the same effect not only for technological learning but also for business learning, as reflected in sales cost reduction. Thus, relationship flexibility can facilitate both technological and business model learning.

To summarize, an overt reliance on contractual safeguards, instead of self-reinforcing social governance mechanisms, to govern an international collaborative relationship is likely to significantly hamper the creation of positive relationship outcomes, particularly in technology-intensive and uncertain environments, because such reliance will tie up resources, increase the need of formal monitoring, and reduce positive side-effects and knowledge spillovers resulting from informal exchanges between parties. Governance flexibility is only demonstrated through actions that display a willingness to go beyond the strict tenets of the contract to help or support a partner. Based on the principle of reciprocity, such actions will encourage the exchange partner to share technology or technical knowledge beyond what is specified. Further, such additional exchanges increase the understanding of each partner of the other's knowledge base, and hence increases the opportunity for broader and deeper learning. Finally, this expanded interaction enhances the partners' understanding of cultural nuances in the manner of engaging in and receiving these exchanges. Such understanding will accelerate the acquisition of foreign organizing knowledge. Therefore, we posit:

**Hypothesis 1a.** Relationship flexibility will be positively associated with active sharing of technology within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 1b.** Relationship flexibility will be positively associated with technological learning within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 1c.** Relationship flexibility will be positively associated with the acquisition of foreign organizing knowledge within dyads between internationalizing new firms and their foreign partners.

### *Effects of Interaction Frequency*

Frequent interaction facilitates knowledge sharing and learning in a dyad because it facilitates the build-up of relation-specific social capital and because of its direct influence on learning in a relationship. Interaction is a critical precondition for the development and maintenance of dense social capital (Bourdieu, 1985). Frequent interaction helps build relational assets, such as personal familiarity and mutual liking, that are required to solicit mutual knowledge disclosure (Nahapiet & Ghoshal, 1998). A high and sustained interaction frequency also solicits the build-up of trust and thus, increases the willingness of the parties to share knowledge (Ring & Van de Ven, 1994). Such relational assets enhance partner-specific absorptive capacity because frequent interactions solicit the creation of overlapping knowledge bases, and they are also likely to foster the creation of interaction routines that maximize the frequency and information intensity of inter-organizational interactions (Dyer & Singh, 1998). Strong interaction ties have a positive influence on both the trust and perceived trustworthiness between the partners, both of which are important determinants of knowledge sharing and learning (Tsai & Ghoshal, 1998).

Frequent interaction in a dyad also has a direct impact on learning. Learning complex knowledge requires face-to-face interactions between the internationalizing new venture and its international partner (Huber, 1991). Frequent and close social interaction helps partners to learn to know each other and to recognize potentially valuable knowledge held by the other party. Interaction also enables development of codes and languages that facilitate the creation of intellectual capital. Frequent communication permits partners to know each other and to share important information. These mechanisms are particularly important for the transfer of ambiguous and tacit knowledge that are crucial for the creation of sustained competitive advantage: the greater the ambiguity of the information, the more knowledge codification programs need to be implemented to facilitate intended transfer (Simonin, 1999), and greater the need of the parties need to interact.

International context produces additional difficulties and challenges for managers. Inappropriate communication capabilities between the partners are likely to prevent both the acquisition and diffusion of knowledge.

Therefore, we expect the effect of interaction frequency to be especially significant in international context. Summarizing, we posit:

**Hypothesis 2a.** Interaction frequency will be positively associated with active sharing of technology within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 2b.** Interaction frequency will be positively associated with technological learning within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 2c.** Interaction frequency will be positively associated with the acquisition of foreign organizing knowledge within dyads between internationalizing new firms and their foreign partners.

### *Effects of Technological Compatibility*

Technological compatibility between partners in a dyad is important because of its effect on the efficiency of knowledge transfer and sharing. Technological knowledge is firm-specific, differentiated knowledge about specific applications, which is largely cumulative within firms (Kogut & Zander, 1992). Because of the path-dependent nature of technological learning, no two partners are likely to possess exactly similar technological knowledge bases. Organizational learning theories suggest that learning is most efficient close to existing knowledge domains because companies are better able to evaluate the value of related knowledge, and they are better able to interpret it in the light of their existing knowledge (Cohen & Levinthal, 1989, 1990, 1994). Because new knowledge is often created through the combination of existing knowledge items (Kogut & Zander, 1992), related new knowledge is more easily assimilated into the existing knowledge base of the firm. Also, because related new knowledge is less likely to conflict with the established dominant logic and the established mental models, there is less resistance to the take-up of new related knowledge.

Because of such reasons, technological knowledge sharing and technological learning should be more efficient in dyads constituted by firms whose technological knowledge pools overlap significantly with one another. When the technological knowledge bases of the partners are similar, they are more likely to use similar language and share similar technological schemata, which will make the transfer and communication easier and more efficient



(Cohen & Levinthal, 1990; Nahapiet & Ghoshal, 1998). Previous related knowledge will also increase the efficiency of search heuristics in the collaboration, as the participating firms are better able to recognize potentially valuable knowledge items.

The above arguments are supported by empirical evidence. Cohen and Levinthal (1990) reported a significant relationship between technological relatedness and learning from external sources. Sapienza, Parhankangas and Autio (2004) reported evidence that technological relatedness exercised an important influence on technological learning in the relationship between a spin-off firm and its parent. They also observed a U-curve relationship, in which both too low and too high levels of technological relatedness were associated with sub-optimal technological learning. At low levels of relatedness, they argued, learning is hampered because knowledge dissimilarity hampers communication. At very high levels of relatedness, learning may suffer because the potential for new knowledge combinations suffers. They also speculated that the real shape of the relationship could be an inverted J-curve.

Even though technological relatedness has been extensively studied, received inquiries have been confined to the domestic context. The increased efficiency that accrues to exchanges with high technological compatibility increases the incentive to share technology and to learn from the sharing. When the partners realize that exchanges can be efficient and productive, they are more likely to engage in sharing and attend carefully to the lessons from these. As the above discussion suggests, we expect technological compatibility to enhance technological learning and knowledge sharing within an international dyad:

**Hypothesis 3a.** Technological compatibility will be positively associated with active sharing of technology within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 3b.** Technological compatibility will be positively associated with technological learning within dyads between internationalizing new firms and their foreign partners.

### *Effects of Management Compatibility*

Finally, we expect the compatibility of managerial and organizational cultures to be positively associated with both the acquisition of foreign organizing knowledge and technological learning. When two units are

strategically related and share similar management cultures and combine well to form a balanced whole, their common interests motivate them to exchange information and resources in a way that both parties can benefit (Tsai, 2000). Cultural compatibility increases anticipated value of collaboration, thereby increasing knowledge sharing. In order for parties to engage in cooperation, they must anticipate that interaction, exchange, and combination will prove worthwhile, even if they remain uncertain of what will be produced or how (Nahapiet & Ghoshal, 1998). Relative absorptive capacity is jointly determined by the relative characteristics of the partner firms. One firm's ability to learn from another firm is dependent on the similarity of both firms, knowledge bases and organizational structures and compensation policies, which are important components of managerial and organizational culture (Lane & Lubatkin, 1998).

The compatibility of management cultures also serves to overcome national cultural differences. Meschi found that organization culture seems to be far more enduring than national culture (Meschi, 1997). That is, the effects of national distance on learning in the context of international joint ventures decreased considerably more than those of organizational culture, implying that managerial compatibility is even more important than national-cultural compatibility. Over time, organizations can overcome differences caused by different national origins, but organizational and managerial differences are harder to overcome. These have an enduring negative influence on learning from the international partner. Thus, we would expect than in international context, the effect of managerial compatibility is even more evident. Summarizing:

**Hypothesis 4a.** Compatibility of management systems and culture will be positively associated with active sharing of technology within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 4b.** Compatibility of management systems and culture will be positively associated with technological learning within dyads between internationalizing new firms and their foreign partners.

**Hypothesis 4c.** Compatibility of management systems and culture will be positively associated with the acquisition of foreign organizing knowledge within dyads between internationalizing new firms and their foreign partners.

## METHODOLOGY

### *Sampling Strategy*

Because knowledge sharing and learning are the central focus of our chapter, we chose to collect our empirical sample from among newly internationalizing software product firms in Finland. This population has several characteristics that make it particularly suitable for the study of international social capital, learning, and knowledge acquisition. By their nature, software companies are knowledge intensive. Particularly in technology-based sectors, such as software product business, many of the early development processes of young firms are regulated by knowledge and learning. Indeed, knowledge is arguably the single most important resource for such firms, and therefore, learning and knowledge acquisition are key processes that determine their organizational performance (Autio et al., 2000). Because of the importance of knowledge acquisition for technology-intensive new firms, they can be expected both to actively seek to capitalize on learning opportunities, and they are also likely to be more conscious about learning and knowledge acquisition benefits derived from different sources. Furthermore, because Finland's is a knowledge-intensive and open market economy, the act of going international does not represent a choice of whether or not to do it, rather, when to do it. Because the domestic market is relatively small, technology-intensive firms such as software product firms are forced to go international relatively early in their lives, and the danger of potential sampling bias caused by focus on internationalizing firms should therefore be smaller.

The empirical sample was drawn from the database of the Statistics Finland, which maintains the most comprehensive database on companies in Finland. According to Statistics Finland there were 4,209 software product businesses under the relatively broad classification of 72,200 that includes software design, production, and consultation in the software product area. Within this base population we narrowed our focus further on software product firms so as to eliminate disturbing influences resulting from variation in external conditions. The elimination of external disturbing influences was further enhanced by our choice to carry out the survey within a narrow time frame of 2 months.

In the Finnish industry classification system, there is no dedicated code assigned for software product firms. In spite of the general technology-intensity of the Finnish economy, this is still a relatively young business sector, as Finnish software firms have traditionally focused on the design of

customer-specific customized software. Therefore, in order to achieve as wide a coverage as possible, we contacted the Finnish Software Product Business Association, which maintains the most comprehensive contact list for software product firms in Finland. The contact list initially obtained from this association was then checked by nationally leading experts and practitioners in software product business area, including the director responsible for software product business of Tekes, the National Technology Development Agency. This agency is overwhelmingly the most important provider of financial assistance for technology development projects, and it enjoys an unparalleled reach among the community of technology-based new firms in Finland. Because of the quality of our experts, we are confident that our initial list of software product companies was as representative as possible of the population of Finnish software product firms. A total of 700 companies matched our initial selection criteria.

#### *Survey Design and Response Pattern*

The data was collected with a mail questionnaire survey addressed to the CEOs of the companies. All questionnaires were accompanied with endorsement letters signed by nationally prominent figures in the area. The questionnaires had been tested and their wordings fine-tuned in several face-to-face interviews with CEOs of software product companies, so that all wording ambiguities and academic jargon could be removed and consistency in responses enhanced. The first mailing was carried out in April, and reminder letters were sent out in May. Of the 700 questionnaires mailed, 71 were returned because of incorrect address information, suggesting either the closure of the firm or change of business premises. In addition 14 companies had merged with an other company. In all, we received 278 replies, indicating a response rate of 40%. This compares highly favorably to other similar surveys. Of the 278 returned questionnaires, 250 were sufficiently complete for analysis. Of these 250 replies, 121 (48%) indicated export activities, and 93 companies reported international partnerships. This group of respondents constituted our final empirical sample.

#### *Construct Operationalization – Relationship Outcome Variables*

In order to avoid common method bias and increase the validity and reliability of our data, previously validated multi-item operationalizations

were used when available. Harman's one-factor test was used to further check the possibility of common method variance, with satisfying results.

In order to achieve the clearest possible focus, the respondents were asked to only think of their single most important international partner, in terms of cooperation intensity, when responding to the questionnaire. For richer variance in the data, 7-step scales were used for all qualitative operationalizations. The factor loadings of all multi-item scales were checked and found acceptable.

The operationalization of *acquisition of foreign organizing knowledge* was derived from the process theory of internationalization (Johanson & Vahlne, 1977, 1990; Eriksson et al., 1997). The statement items inquired how much information the internationalizing software product firm had been able to obtain from its partner with regard to: (1) competitors in the local market; (2) market-specific technical requirements; (3) customers and general market situation in the local market; and (4) business practices and the general institutional environment in the local market. The internal reliability coefficient of the resulting four-item scale was acceptable ( $\alpha = 0.88$ ).

*Technological learning* items were derived from previous research and theory focusing on interorganizational technological learning (Cohen & Levinthal, 1990; Dyer & Singh, 1998; Yli-Renko, 1999). The items assessed how important the partner had been as a source of technological information, how well the company had been able to learn new technological competencies from its partner, how important the partner had been for the formation of technology-based competitive advantage, and how efficiently technological knowledge obtained from the partner had been assimilated in the recipient firm's organization. The internal reliability coefficient of the resulting four-item scale was acceptable ( $\alpha = 0.71$ ).

*Technology sharing* ( $\alpha = 0.74$ ) was measured with a 3-item scale assessing how actively the partners tried to share advanced technological information, IPR (Intellectual Property Rights), and know-how with each other.

### *Predictor Variables*

*Relationship flexibility* was measured using items designed to assess the level of contractual flexibility of the relationship (Heide & Miner, 1992; Noteboom et al., 1997; Yli-Renko, 1999; Yli-Renko, Sapienza & Hay, 2001). The items reflected the flexibility of the partners in using written contracts as governance devices and also their willingness to be flexible when necessary. The resulting 3-item scale depicted acceptable internal reliability ( $\alpha = 0.87$ ).

*Interaction frequency* was measured with a single item that assessed how they interacted with their partner, with the choices ranging from daily; several times a week; weekly; several times a month; monthly; more seldom. *Technological compatibility* ( $\alpha = 0.71$ ) was measured using three statements derived from theorizing and empirical research on technological relatedness (Davis, Robinson et al., 1992; Steensma, 1996). The three items assessed how complementary the two companies' products, technologies, and related business resources were to one another. *Management cultural compatibility* ( $\alpha = 0.82$ ) items were derived from previous theorizing on the cognitive dimension of firm-level social capital (Nahapiet & Ghoshal, 1998). The two items measured how close the organizational cultures of the partners were to each other and how harmonized their management styles and operations were.

### *Control Variables*

The *form of cooperation*, particularly the degree of organizational control inherent in it, is likely to affect technological learning (Zahra et al., 2000). Therefore, we controlled the form of cooperation with 7-item scales that assessed the intensity of various forms of cooperation in the collaborative relationship, ranging from R&D collaboration to helpdesk support. The *age at first international entry* is likely to impact the learning capabilities of the internationalizing firm (Autio et al., 2000; Sapienza et al., 2005). Therefore, we controlled this variable, measured as years of the firm's age at the time when it received its first sales income from abroad. Finally, because learning is cumulative, the *duration of the relationship* is likely to impact knowledge acquisition from that relationship, and it was therefore controlled in the analysis. The duration of the relationship was measured as years since the relationship started.

Because our focus was on the most important international partner relationship, we used single-respondent ex-post survey as our main source of data. This method raises issues of reliability, respondent bias, and validity. Because of our focus on dyad outcomes between two firms, independent, secondary sources of validation data did not exist. Many respondents expressed the wish that we should not contact their collaboration partner abroad for second opinions. Therefore, to examine construct reliability, we resurveyed the original respondents 10 months after the data was originally collected. While this test does not prove validity, it does give an indication of inter-rater as well as test-retest reliability. We resurveyed altogether 67

**Table 1.** Re-Test Reliability of Survey Data.

Variable	Correlation Coefficient (Spearman)	Significance (one-tailed) ( <i>p</i> )
Foreign organizing knowledge acquisition	0.332	<0.007
Technological learning	0.404	<0.001
Technology sharing	0.341	<0.008
Relationship flexibility	0.231	<0.04
Interaction frequency	0.326	<0.008
Technological compatibility	0.254	<0.027
Management cultural compatibility	0.230	<0.04

randomly selected firms by telephone. In approximately 50% of the cases, the respondent was the same person who had provided the original answers, and the remaining interviews were carried out with a different, equally knowledgeable person within the organization. The correlation coefficients, and related significances, of the second survey data are shown in [Table 1](#).

As can be seen in [Table 1](#), all retest reliabilities were high, thus increasing our confidence in the general reliability of the data. We also checked correlations separately for situations where the retest respondent was the same person as the original respondent, and for situations in which the retest responses were given by a different person within the organization. No differences could be observed in the response patterns of the two groups, which provide good evidence of both retest and inter-rater reliability of the measures. In particular, the outcome variables depict a high degree of stability over time. Also the predictor variables show good retest and inter-rater reliability. Overall, the retest survey produced evidence of good stability of the measures over time and between respondents, hence attesting good reliability of the questionnaire operationalizations.

## RESULTS

[Table 2](#) presents summary statistics and zero-order correlations among the outcome, predictor, and control variables. The zero-order correlations show that collinearity is not a problem in our empirical data – a conclusion supported by an analysis of the variance inflation factor (VIF) analysis of the OLS (Original Least Squares regression) regression equations, all of which were found to be at acceptable levels.

**Table 2.** Correlation Matrix.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Technology sharing	(3.08)															
2 Technological learning	0.21	(3.52)														
3 Foreign organizing knowledge	0.19	0.18	(3.88)													
4 Interaction frequency	0.46	0.29	0.34	(3.18)												
5 Relationship flexibility	0.50	0.09	0.29	0.39	(5.24)											
6 Equity and fairness	0.33	-0.05	0.14	0.34	0.69	(5.63)										
7 Technological compatibility	0.48	0.15	0.15	0.26	0.46	0.31	(4.79)									
8 Management compatibility	0.39	0.23	0.23	0.24	0.45	0.22	0.36	(3.75)								
9 R&D partnership	0.35	0.30	0.12	0.21	0.27	0.13	0.14	0.23	-							
10 Subcontractor partnership	-0.02	0.08	-0.04	0.02	0.12	0.00	-0.17	0.00	0.18	-						
11 Localization partnership	-0.03	0.08	0.26	0.08	0.00	-0.15	-0.05	-0.02	0.43	0.21	-					
12 Production partnership	0.22	0.11	0.21	0.22	0.08	-0.07	0.33	0.07	0.11	-0.02	0.29	-				
13 Helpdesk partnership	0.14	-0.03	0.34	0.45	0.27	0.07	0.13	0.11	0.13	-0.02	0.31	0.27	-			
14 Training partnership	0.11	-0.12	0.42	0.26	0.18	0.02	0.14	0.23	-0.05	-0.15	0.26	0.25	0.66	-		
15 Age at first international entry	0.11	0.14	0.14	0.05	0.04	-0.06	0.08	0.02	-0.02	-0.12	0.15	-0.04	0.18	0.26	(3.70)	
16 Relationship duration	0.23	0.26	0.06	0.16	0.14	0.15	0.21	0.11	-0.08	-0.25	-0.12	0.15	0.09	0.12	0.31	(3.75)

*Note:* Distribution means shown in parentheses. Correlation coefficients greater than 0.22 are statistically significant at  $p \leq 0.05$ ; two-tailed tests.



At the time of the survey, the sample firms were, on average, 8 years old, the median of the distribution being 6 years. They employed altogether 46 employees (median: 9 employees), and they had generated their first international sales at an average age of 3,7 years (median: 2 years). These descriptives confirm the general entrepreneurial nature of our empirical sample and show that Finnish software product firms begin their internationalization process at a remarkably early age. The most important international partnership of the respondent firms had lasted, on average, 3.8 years (median: 3 years), suggesting that international partnerships are started slightly earlier than when internationalizing firms realize their first international sales.

The tests of Hypotheses 1–4 are shown in Tables 3–5. Hypothesis 1 proposed that relationship flexibility should be positively associated with relationship outcome variables. In Tables 3–5 we can detect significant

**Table 3.** Effects on Technology Sharing.

	Std $\beta$	Std $\beta$
	(Constant) <sup>***</sup>	(Constant) <sup>+</sup>
<b>Controls</b>		
Relationship duration	0.151	0.056
Subcontracting partnership	0.051	0.010
Localization partnership	-0.107	-0.028
Production partnership	0.186	0.078
Help desk partnership	0.080	-0.109
Training partnership	0.011	-0.017
Age at internationalization	0.049	0.058
<b>Predictors</b>		
Interaction frequency		0.293 <sup>**</sup>
Relationship flexibility		0.231 <sup>*</sup>
Technological compatibility		0.235 <sup>*</sup>
Management compatibility		0.128 <sup>+</sup>
Adj $R^2$	0.009	0.340
$F$	1.126	5.356 <sup>***</sup>
$F$ change		11.772 <sup>***</sup>
df	93	93

*Note:* Dependent variable: Technology sharing one-tailed significances, controls two-tailed.

\* = 0.05

\*\* = 0.01

\*\*\* = 0.001

<sup>+</sup> = 0.1

**Table 4.** Effects on Technological Learning.

	Std $\beta$	Std $\beta$
	(Constant) <sup>***</sup>	Constant <sup>**</sup>
<b>Controls</b>		
Relationship duration	0.290 <sup>**</sup>	0.249 <sup>*</sup>
Subcontracting partnership	0.109	0.104
Localization partnership	0.098	0.130
Production partnership	0.082	0.029
Help desk partnership	0.024	-0.067
Training partnership	-0.205	-0.244 <sup>+</sup>
Age at internationalization	0.075	0.085
<b>Predictors</b>		
Interaction frequency		0.291 <sup>**</sup>
Relationship flexibility		-0.138
Technological compatibility		0.054
Management compatibility		0.234 <sup>*</sup>
Adj $R^2$	0.060	0.153
$F$	1.842 <sup>+</sup>	2.524 <sup>**</sup>
$F$ change		3.364 <sup>*</sup>
df	93	93

Note: Dependent variable: Technological leaning from partner one-tailed significances, controls two-tailed.

\* = 0.05

\*\* = 0.01

\*\*\* = 0.001

+ = 0.1

positive associations for technology sharing and for the acquisition of foreign organizing knowledge (statistically almost significant association at  $p < 0.10$  level). Interestingly, relationship flexibility was negatively, even though not statistically significantly, associated with technological learning outcomes. Hypothesis 1 thus receives moderate support in our empirical data.

Hypothesis 2 proposed that interaction frequency should be positively associated with relationship outcome variables. As can be observed in Tables 3–5, there are statistically significant associations with each of the relationship outcome variables. Thus, Hypothesis 2 received strong support in our empirical data.

Hypothesis 3 proposed that technological compatibility should be positively associated with both efforts to share technology as well as

**Table 5.** Effects on the Acquisition of Foreign Organizing Knowledge.

	Std $\beta$	Std $\beta$
	(Constant)***	(Constant) <sup>+</sup>
<b>Controls</b>		
Relationship duration	0.017	-0.033
R&D partnership	0.023	-0.089
Subcontracting partnership	-0.051	-0.092
Localization partnership	0.132	0.207 <sup>+</sup>
Production partnership	0.081	0.70
Help desk partnership	0.242*	0.109
Age at internationalization	0.051	0.059
Technological compatibility		-0.054
<b>Predictors</b>		
Interaction frequency		0.188*
Relationship flexibility		0.185 <sup>+</sup>
Management compatibility		0.123
Adj $R^2$	0.062	0.130
$F$	1.876 <sup>+</sup>	2.388*
$F$ change		3.238*
df	93	93

*Note:* Dependent variable: Foreign organizing knowledge acquisition one-tailed significances, controls two-tailed.

\* = 0.05

\*\*\* = 0.001

<sup>+</sup> = 0.1

technological learning. However, even though positive associations are depicted for each of the two relationship outcome variables, only the association between technological compatibility and efforts to share technology emerges as statistically significant at the  $p < 0.05$  level. Therefore, Hypothesis 3 receives only moderate support.

Hypothesis 4 proposed that the compatibility of management and organizational cultures should be positively associated with each of the relationship outcome variables. We can indeed observe a statistically significant positive influence both for technology sharing and technological learning (almost significant association). However, the association between management compatibility and foreign organizing knowledge acquisition, while positive and rather strong, is not statistically significant. Therefore, Hypothesis 4 received moderate support.

## DISCUSSION

We set out in this study to analyze the determinants of positive relationship outcomes in collaborative relationships between internationalizing new firms and their foreign partners. Our study was motivated by the observation that even though theories of new firm internationalization and international relationship acknowledge the crucial importance of learning and knowledge acquisition, there is little empirical research on what affects these processes in international contexts. While interorganizational learning has been the object of an increasing research tradition, empirical studies on the topic in international contexts have been almost nonexistent. So far, internationalization learning and the acquisition of technological knowledge in international contexts have been mostly treated as a black box (with magnificent exceptions such as (Zahra et al., 2000)), and both theory and empirical studies have tended to assume a linear and straightforward relationship between the allocation of resources to cross-border operations and the acquisition of managerial competencies and capability of operating in foreign business environments. Given the (arguably) increasing pace of globalization, this appears a glaring omission in received literature, one that our study has attempted to address.

Our study sought to make four distinct contributions to the literature on international entrepreneurship: (1) contribute to the opening-up of the black box of technological and internationalization learning in international collaborative relationships; (2) extend the applications of the emerging theory of firm-specific social capital and relational learning to international contexts; (3) advance theory development on international entrepreneurship, focusing particularly on the determinants of knowledge acquisition during the internationalization process; and (4) contribute to the operationalization of social capital and knowledge acquisition constructs in international contexts. To this end, we built a theoretical model that drew on knowledge-based and firm-level social capital and organizational learning literatures and identified equitable social norms, relationship flexibility, interaction frequency, and technological and managerial compatibility as important determinants of positive relationship outcomes.

Our theoretical model received good support in a sample of 93 newly internationalizing Finnish software companies. In particular, our analysis shows that relationship flexibility is an important determinant of both technological knowledge sharing, the acquisition of foreign organizing knowledge, and technological learning in international dyads. Our findings also show that interaction frequency is an important determinant for all kinds of

knowledge-intensive relationship outcomes. Furthermore, we were able to observe positive associations between technological compatibility and technological learning and knowledge sharing outcomes, even though the statistical significance of the associations was not strong. However, we were able to demonstrate only weak support for the hypothesis that management cultural compatibility, operationalized on the basis of theorizing on cognitive social capital, perhaps suggesting that this form of social capital may not be as relevant in international collaborations as it has been shown to be in domestic contexts. In particular, we failed to detect a significant association between management compatibility and the acquisition of foreign organizing knowledge in our empirical data.

In addition to those discussed above, our findings carry several implications for both research and practice. First, our results indicate that relative absorptive capacity is not only determined by the relative characteristics of the partner firms (Lane & Lubatkin, 1998) (in our study management and technology compatibility), but also characteristics of the relationship itself such as interaction frequency, social norms of equity and fairness, and relationship flexibility play an important role. This finding emphasizes the dynamic nature of international collaborative relationships and informs managers that the management of the partnership may matter even more than the choice of the partner itself. Second, our findings carry implications for the choice of international entry modes: in order to learn, an internationalizing new firm must choose entry modes that offer opportunities for interaction. While such modes may demand greater attention and management time, they are also likely to deliver important learning benefits for the internationalizing firm, thereby contributing to long-term competitive advantage.

On a more general level, our study suggests several pointers for further study in international entrepreneurship. New firms are particularly prone to both liabilities of newness and foreignness. Constrained access to external knowledge and resources constitutes a key handicap to such firms. Our study has demonstrated that social capital may facilitate access to knowledge and external resources in international relationships: one implication of this finding is that ability to build up and leverage social capital in international exchange relationships may constitute an important determinant of the success of international entrepreneurial endeavors. We believe that any theory of international entrepreneurship, therefore, should explicitly address both international resource mobilization as well as the role of social capital in this process.

Another important implication of our findings concerns the determinants of organizational advantage in international entrepreneurship. Most

received studies tend to focus on the determinants of internationalization success. Our empirical findings confirm some earlier results which suggest that internationalization can operate as a potent catalyst of technological learning (e.g., Hitt, Hoskisson, & Kim, 1997; Zahra et al., 2000; Yeoh, 2004). Through this effect, internationalization, in itself, can become a source of competitive advantage. This is an important consideration, since entrepreneurship, in essence, is largely about the creation of value through the establishment and exploitation of temporary organizational advantage (Schumpeter, 1996). Given the importance of technology as a source of competitive advantage for internationally entrepreneurial firms, we believe that received research in international entrepreneurship may not have sufficiently considered the effect that internationalization has on the internationalizing organization. There is some recent research and theorizing that suggests that such effects may extend beyond technological capabilities: internationalization can boost the firm's dynamic capabilities, thereby leading to a long-term growth effect (Autio et al., 2000; Sapienza et al., 2005). It is therefore important, we believe, to look beyond the process of internationalization itself and turn one's eyes back to the internationalizing firm.

Given the centrality of the liabilities of newness and foreignness for internationalizing entrepreneurial firms, our literature review suggests that these notions may have received insufficient consideration from international entrepreneurship researchers. More theoretical and empirical work is required, we believe, to understand the underlying mechanisms of the liability of foreignness, as well as its effects on the internationalizing firm. One interesting issue, in this regard, concerns potential interactions between the liabilities of newness and foreignness: to what extent are these two liabilities independent from one another? Conversely, does the liability of newness accentuate the liability of foreignness? And what are the major underlying drivers of the liability of foreignness in different industrial contexts? We believe that theoretical work in this domain is important to advance the field of international entrepreneurship.

By looking at the effects of international dyadic relationships, our study complements the received "network perspective" to internationalization (e.g., Johanson & Mattsson, 1988). In the network perspective to internationalization, the main focus is on the facilitating effect of the firm's production net on its internationalization process: the firm internationalizes because its production net internationalizes. Here, we have looked at how firms can gain advantages by establishing and exploiting network relationships in foreign contexts. Thus, the network presents itself not only as a driver of internationalization, but also as a source of knowledge and learning. Thus, the

internationalizing firm is seen, not only as a passive component of the internationalizing production net, but as an active agent that builds and leverages network relationships to advance its organizational goals.

### *Limitations*

The generality of our findings is restricted by our method, sample, and focus. Our study was based on a cross-sectional survey and as such cannot inform us of the long-term dynamics of international collaborations. The potential for ex-post rationalization cannot be neglected even though our tests suggest that common method variance should not be a major problem in our data. While our focus on Finnish software firms helped eliminate possible biases resulting from internationalization choices, they created a potential problem of culture- and country-specificity. Because Finland's is a small and open economy, internationalization is not really as much a choice as it is a necessity. Virtually the only real issue about internationalization, for Finnish firms, concerns its timing, that is whether to internationalize early or late. In larger domestic settings, the pressures to internationalize are not as great. It may well be that different dyad dynamics could result. Finally, we have chosen to focus on the single most important international partnership, thereby ignoring learning benefits resulting from several collaborations. This pegs the question: is relationship-intensive mode of internationalization better than relationship-extensive mode? Is it better to invest much time into one or few relationships, or will the cultivation of a larger number of less deep relationships lead to greater technological learning through greater knowledge diversity? This is an interesting question with important implications for entrepreneurial strategies.

### **NOTE**

1. Note that Nahapiet and Ghoshal (1998) defined social capital along the lines of Bourdieu and Wacquant (1992).

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# EXPLAINING EXPORT PERFORMANCE: A COMPARATIVE STUDY OF INTERNATIONAL NEW VENTURES IN FINNISH AND INDIAN SOFTWARE INDUSTRY

Sumit K. Kundu and Maija Renko

## INTRODUCTION

In explaining international expansion and performance, the traditional explanation in international business literature has mainly offered country, and firm-level structural explanations for performance. Moreover, this literature has been biased toward larger, established multinational manufacturing companies (Dunning, 1958; Hymer, 1960; Aharoni, 1966; Vernon, 1966). This was understandable as, for much of the 20th century, manufacturing occupied the dominant share of the economy. However, by the early 1960s, the service sector already accounted for more than half of the domestic economic activity in developed nations. Today, even in international operations, the share of services is rapidly increasing. For example, the share of services in U.S. exports in 1997 had grown to 27%, and to 16% in U.S. imports (Contractor, 1999). Moreover, in sectors such as information technology, telecommunications or biotechnology, recent years have seen a proliferation of

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entrepreneurial start-up companies, where the characteristics of their founders and leaders appear to have as much, or greater, impact on performance, as traditional firm-level explanations. Since the late 1980s, the growth of venture capital markets and rise in entrepreneurship have been observed in technology-driven industries (*The Economist*, 1993; Gupta, 1989; Mamis, 1989). Could entrepreneurial and leadership factors assume greater importance in explaining performance, especially international performance, of younger companies in such sectors? This is the broad hypothesis pursued in this study.

Research on international entrepreneurship has focused on themes such as (a) comparisons between non-exporters and exporters (Kedia & Chhokar, 1985); (b) entrepreneurial activities in different countries (Ohe, Honjo, Oliva, & MacMillan, 1991); and (c) the impact of public policies on small firm exports (Rossman, 1984). Interest in exporting, or international expansion, was supposed to typically occur at a stage considerably after the inception of a firm. Small firms that were already international at or near inception were not considered in the mainstream research (Welch & Loustarinen, 1988).

The export marketing literature frequently uses “stage” theories of the multinational enterprise to explain the growth of firms. However, they have also attracted significant criticism (Turnbull, 1987). Some researchers have argued that existing theories of internationalization are inappropriate for service sectors (Sharma & Johanson, 1987; Engwall & Wallenstal, 1988; Buckley, Pass, & Prescott, 1992). According to Young (1987) high technology industries, characterized by high research and development costs, shorter product life cycle, and concentrated markets should see a speeding-up of the international expansion process.

This chapter proposes that, in today’s new economic landscape, the international expansion of small high technology firms need not follow the gradual or incremental path of internationalization espoused by Johanson and Vahlne (1977). It investigates growth of firms that are international from the start – “international new ventures” (Oviatt & McDougall, 1994) in the small industrialized nation of Finland and big emerging market of India. Such firms are indicated in the second quadrant of the conceptual framework of the Oviatt and McDougall study.<sup>1</sup> Quadrant II in Oviatt and McDougall framework is a relatively unexplored research area, where the focus is on the strategies of firms that are both young start-ups, but at the same time already exhibit a high percentage of foreign sales. These typically tend to be small, fast-growing companies. The entrepreneurship literature (Erramilli & D’Souza, 1993) highlights two important variables for such firms, namely, resource constraints and resource commitments under conditions of uncertainty. Both of these characteristics influence the international growth and behavior of small-sized firms.

International start-up companies in technology-driven industries such as software have to be more proactive in selling their products/services outside their home country. Internationalization is partly due to lack of demand for products and/or services in their respective home countries. A recent study by Contractor and Kundu (2004) examines the role of export driven entrepreneurship in economic development for the software industry in China, India, and Taiwan. International new ventures can be partially explained with the help of several international business theories, viz., monopolistic advantage theory (Hymer, 1976), stages model of internationalization (Johanson & Wiedersheim-Paul, 1975; Johanson & Vahlne, 1977, 2003), internalization theory (Williamson, 1975), and network approach (Johanson & Mattsson, 1988). Several empirical studies as depicted in the table below have analyzed the growth of international new ventures using the above theoretical frameworks but none of them posits a holistic explanation. We argue for the need to have an integrative framework to explain international entrepreneurship in high technology industries such as software and to provide an eclectic model drawn upon the studies published in international business and entrepreneurship.

Theoretical Framework	Empirical Studies
Stages model theory	Bell (1995) Oviatt and McDougall (1995) Bloodgood, Sapienza, and Almeida (1996) Reuber and Fischer (1997) Rasmussen, Madsen, and Evangelista (2001) Coviello and Munro (1997) Jones (1999) Autio, Sapienza, and Almeida (2000)
Monopolistic advantage theory	Rennie (1993) Oviatt and McDougall (1995) McAuley (1999) Shrader, Oviatt, and McDougall (2000) Aspelund and Moen (2001)
Internalization theory	Shrader (2001)
Network theory	Coviello and Munro (1995, 1997) Oviatt and McDougall (1995) Preece, Miles, and Baetz (1998) McAuley (1999) Aspelund and Moen (2001)

Finnish and Indian software industries were selected as the focus of this study because: (1) there are relatively few studies on the internationalization of high technology service industries; (2) the growing importance of the software sector in the overall balance of payments for both industrialized and industrializing nations; (3) in India's case, economic reforms that began in mid-1991 with the advent of liberalization, deregulation, and privatization have fostered a new breed of technologically sophisticated entrepreneur; (4) in Finland's case, a rapid growth of the software industry as well as its international focus evidenced by its share of exports; and (5) we wish to compare performance factors in the two nations with respect to the entrepreneurial factors and firm-specific attributes.

It is important to understand that due to structural differences in the Indian and Finnish software industry, we expect that impact of entrepreneurial and firm-level variables on export performance will differ. In an earlier study by Kundu and Katz (2003), entrepreneurial variables were important in explaining export performance. In Contractor and Kundu (2004), firm-level variables accounted for more variation in export performance than entrepreneurial variables for Taiwanese software firms.

## EXPORT PERFORMANCE LITERATURE

The literature on export performance goes back to 1950s, but is relatively new for small high technology-driven companies. Here we highlight some of the important scholarly works on export performance for small-technology-driven firms based in different countries challenging stage theory. The work by Moen (2002) assesses export performance on firm competencies, managerial orientation, export strategy, and market conditions in Norway and France. The above work builds upon Aaby and Slater (1989) and focuses on founder characteristics, and market conditions. The study by Moen and Servais (2002) uses the Stages Model to investigate 677 SMEs (small- and medium-sized enterprises) gradual internationalization process located in Norway, France and Denmark. In the Journal of International Entrepreneurship (2003), two studies by (i) Svante Andersson and Ingemar Victor, 2003; and (ii) Rodney B. McNaughton examined innovation internationalization in born global firms in Sweden and stress the importance of networks to enhance their export performance. Oviatt and McDougall (1995) studied 12 high technology international new ventures in Czech Republic, France, Germany, U.K., and U.S.A., and conclude that successful global start-ups display global vision from inception, have internationally

experienced founders, possess strong international business networks, exploit preemptive technology, own unique intangible asset, link product/service extensions closely, and tightly manage organization.

A number of studies in the past have examined the impact of firm and managerial characteristics on firm-level export performance (Leonidou, Katsikeas, Constantine, & Piercy, 1998; Axinn, 1988; Cavusgil & Zou, 1994; Naidu & Prasad, 1994; Cavusgil & Kripalini, 1993). Many of their conclusions and hypotheses are difficult to apply to smaller entrepreneurial companies with the exception of Chetty and Hamilton (1993); Nakos, Brouthers, and Brouthers (1998); Naidu and Prasad (1994); and Louter, Ouwerkerk, and Bakker (1991). Most studies have focused on *big* exporting firms based in large developed nations. However, the specific determinants of business success have shown to be different between SMEs and large firms (Caloghirou, Protogerou, Spanos, & Papagiannakis, 2004). As the economic contributions of small- and medium-sized firms, in both developed and developing nations, are growing in significance (Dichtl, Leibold, Koeglammayr, & Muller, 1984, Jaffe & Pasternak, 1994), we need new explanations for performance and strategy.

## THE FINNISH SOFTWARE INDUSTRY

Finland with its population of 5 million people is one of the world's most competitive economies and most technologically developed welfare and information societies. Two recent studies, The Global Competitiveness Report (WEF, 2003) and IMD World Competitiveness Yearbook (IMD, 2003) place Finland at the very top in the world statistics on competitiveness. Solid technological infrastructure, open competition, government's active role in the development of an information society, technology-oriented citizens, and knowledge-based metropolitan areas provide a basis for the development of high technology industries, such as software. High technology exports from Finland have tripled over the past 5 years, and in industrial productivity Finland has caught up with the United States. Investment in research and development has increased strongly in Finland for almost 20 years, and investments in R&D by companies are among the highest in the world. At the moment, Finland invests 3.6% of GNP to research and development. (ICT Cluster Finland Review, 2003; National Technology Agency of Finland, 2004).

The size of the Finnish software market in 2001 was slightly less than EUR 1.1 billion (European Information Technology Observatory, 2002).



The value of the software product business of Finnish companies was EUR 892 million for the same period, with the share of exports rising to more than EUR 400 million (Hietala et al., 2002) (see Fig. 1). Nowadays, there are about 1,100 companies in Finland operating in software or closely related fields<sup>2</sup> (Finnish Software Business Cluster, 2004). Most of these firms are small; in industry data from 2001, the median sales turnover of the Finnish software firms was about EUR 500,000, and 70% of firms employed less than 20 people. Small size of the firms together with their typical focus on technology and science instead of markets and commercialization has somewhat hindered internationalization of the sector. However, this large group of small companies continuously innovates and creates new product ideas (National Technology Agency of Finland, 2003).

Finnish software companies are mainly owned by their founders and their family members, with only minor foreign and external ownership. European companies have lagged behind the U.S. firms in the packaged software segment, due to small and diverse home markets, low degrees of standardization and internationalization, and weak links to universities (Torrisi & Malerba, 1996). Currently, however, at least the Finnish software sector is witnessing development from custom software developed for local markets toward mass-market software intended for international distribution (Finnish Software Business Cluster, 2004). In Finland, as well as elsewhere in the world, many of the segments that have been viewed mainly as the customers of software companies have entered the field of software businesses and produced software spin-off companies. This has been possible as a result of

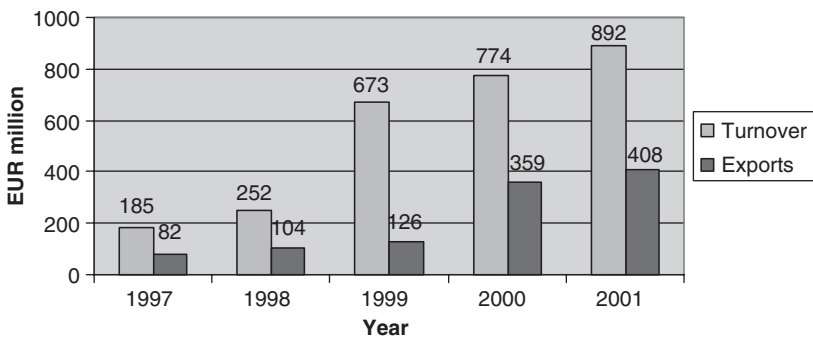


Fig. 1. Development of Software Business and Exports in Finland, 1997–2001. (National Technology Agency of Finland, 2003. Based on Center of Expertise in Software Business surveys from 1997 to 2001.)

technological convergence toward open and standardized software interfaces from closed manufacturer-specific and hardware-driven solutions (Tyrväinen, Warsta, & Seppänen, 2004).

The growth of Finnish software business sector has been extremely rapid (see Fig. 1). The core technology areas of Finnish software SMEs – and the core technologies of a recent software technology program of the Finnish National Technology Agency – include applications for the Internet service infrastructure, applications for mobile communications, and new enterprise management software for companies. Other focus areas include computer security, entertainment software, systems and software development tools, software for mobile and other new platforms, modernization of existing applications, new media technologies, component-based software products, and software component products (National Technology Agency of Finland, 2003).

Despite industry growth, small software firms are struggling with profitability problems. In 2001, most of the companies that participated in a survey on Finnish software businesses made no profit. According to the same survey, Finnish software companies usually start internationalization with direct sales to other countries. About 37% of the companies that participated in the survey had international sales. Internationalization most often begins with the Swedish, American, and Estonian markets and the most important export countries are Sweden, Germany, United States, and Great Britain (National Technology Agency of Finland, 2002).

Because of the small domestic markets – less than 0.5% of the global software market – growth-seeking firms have to aim at international markets. Even though the size of domestic market is small, some of the potential customer companies there are large, international players that can serve as pilot customers and gateways to international markets (National Technology Agency of Finland, 2003). Findings of Finnish, Irish, and Norwegian software internationalization by Bell (1995) supported to some extent the concept of “psychic distance” as an important factor in the selection of export markets; in his sample, 50–70% of firms entered “close” markets in the initial stages of export development. Finnish firms targeted Sweden, Norway, and the former U.S.S.R – countries which are geographically and culturally proximate. However, the data also revealed that some 30–50% of firms had initiated exports with sales to countries that could not be considered as either psychologically or geographically proximate. In Bell’s study (1995) factors that strongly influenced firms’ initial and subsequent market selection decisions in addition to distance were client following, sectoral targeting, and computer industry trends.

## THE INDIAN SOFTWARE INDUSTRY

India's 625-company software industry is arguably one of the subcontinent's greatest success stories, registering a phenomenal average growth rate of 48.11% a year, from \$553 million in 1993–94 to \$2,800 million in 1997–1998 (Statistical Year Book, 1998). With exports accounting for 64.8% of this amount (\$1,814 million), the role of exporting in this industry is indisputably significant, making this industry an excellent choice for an internationalization study.

The incidence of firms exporting in the industry has also been steadily growing. Table 1 depicts a breakdown of software exporters based on their export turnover. For example, in 1997–1998, 49.6% of firms exported at least \$28,170, annually. In 1996–1997 this percentage was 40.5% and in 1995–1996, it was only 38.3%. The \$1,814 million in industry exports sales for 1997–1998 is broken down by market destination in Table 2. North America (mainly the U.S.A.) is the largest market (US\$1,035 million), accounting for 57.06% of India's export of computer software and services. Indian software exports to the European market accounted for 26.22% (US\$475.5 million). Table 3 depicts the prolific international growth of the Indian software industry. It is compiled from the data comparing major destinations for computer software and services for the period 1992–1993 to 1997–1998. Overall the growth in exports of computer software and services during the period has been phenomenal.

The choice of 1992–1993 as a starting year for comparison is intentional. Structural reforms of liberalization, deregulation, and privatization began in

**Table 1.** Firms in Indian Computer Software and Services Firms by Export Turnover Amount.

Export Turnover	1997–1998	1996–1997	1995–1996
Over \$2,816,901	13	5	4
\$1,408,450–\$2,816,901	10	8	6
\$704,225–\$1,408,449	20	19	15
\$281,690–\$704,224	45	26	17
\$28,170–\$281,689	222	182	51
Up to \$28,169	315	352	253
Total number of firms	625	592	410

Source: Statistical Year Book (1998). Electronics and Computer Software Export Promotion Council, New Delhi, India.

**Table 2.** Indian Computer Software and Services Industry Export Sales Destinations.

Destination	Percentage of Export Market
North America	57.06
Western Europe	26.22
Non-EC Countries	0.13
Africa	1.05
Middle East	1.20
S. E. Asia	12.13
Australia and New Zealand	2.13
Others	0.80
Total	100.00

Source: Statistical Year Book (1998). Electronics and Computer Software Export Promotion Council, New Delhi, India.

**Table 3.** Indian Computer Software and Services Industry Export Growth.

Year	Exports (US\$ million)	Growth (%)	Average Growth (%)
1992–1993	259.65		
1993–1994	329.03	26.72	
1994–1995	475.48	44.51	
1995–1996	791.05	66.37	
1996–1997	1158.59	46.46	
1997–1998	1813.33	56.51	48.11

Source: Statistical Year Book, 1998. Electronics and Computer Software Export Promotion Council, New Delhi, India.

mid-1991. Therefore, 1992–1993 was the first year under the model more oriented toward trade and exports. Thus the findings of increased exporting can also be viewed as an indication of the economic benefit of trade-liberalization policies, although that is not the primary focus of this chapter.

It is evident from the data in Tables 2 and 3 that the Indian software industry is experiencing a period of substantial growth in terms of the number of firms, their growth in sales, and in particular their growth in exporting, both in terms of number of firms and levels of export sales. These factors make it highly likely that the Indian software industry represents one of the best business locales in the world in that to find new-international or born international firms. Given this promising population, what is needed next is a theoretical model to guide the research. All the firms surveyed in

the Statistical Year Book provide a multitude of information technology-related services ranging from body shop operations to designing complex systems. The above companies derive more than 50% of their total revenues from foreign clients.

Most importantly for India, the entrepreneurial qualities inherent in software exports may represent a powerful example for other sectors, as well as stimulate a faster liberalization of Indian government policy (Arora & Athreya, 2001). It is important to note that with India's economic reforms launched in 1991, the government of India formulated proactive policies to strongly promote the software sector. Starting in 1986, the government announced a software policy that included a development agency, export subsidies, tax holiday provisions, and software technology parks scheme. In a recent paper by Contractor and Kundu (2004), five factors are identified as necessary and sufficient conditions for India's export success, namely, liberal economic policies, engineering and technical capabilities, infrastructure, and rise in entrepreneurial values.

## **THEORY BACKGROUND AND HYPOTHESES FOR EXPORT PERFORMANCE**

In this section we present a conceptual framework on accelerated international entrepreneurship unifying the traditional arguments presented in entrepreneurship and international business literature. Our focus has been to examine the growth of international new ventures and/or born global firms in a high technology industry. Hypotheses related to (a) entrepreneurial characteristics, and (b) firm characteristics have been put forward to explain their relative impact on export performance. As indicated earlier – do entrepreneurial factors assume greater importance in explaining firm performance, especially international performance, for international new ventures? In the past, researchers have analyzed export performance using a variety of theoretical frameworks namely, stages model, network theory, organizational learning, resource-based perspective, transaction cost theory, and risk management theory. Our study argues that all of the above are partial explanations of internationalization, and to fully understand the phenomenon there is a need for integrating arguments in entrepreneurship and international business research.

The nine hypotheses presented below are depicted in a conceptual framework (Fig. 2) capturing the elements of international entrepreneurship,

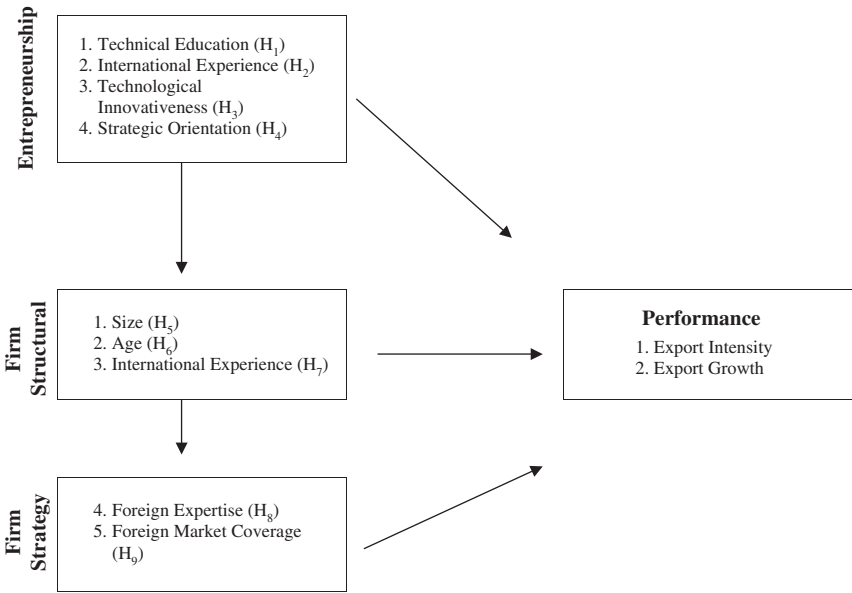


Fig. 2. Conceptual Figure – Theory of Accelerated International Entrepreneurship.

where nine variables (four entrepreneurial and five firm-specific) are proposed as explaining performance. Export performance (dependent variable) is measured by export *intensity* (exports as a percentage of total sales) and *growth rate* (yearly change). Firm-specific variables, in turn, are grouped into “structural” and “strategy.” Structural variables relate to size, age, and international experience of the firm – in short, the history of the company. By contrast, the firm strategy variables, cover the employees’ (as opposed to the entrepreneur’s) foreign expertise and geographical scope, or foreign market coverage. Combining the two strands of literature in entrepreneurship and international business, we propose a theory of accelerated global entrepreneurship to explain the prolific growth of international startups in technology-driven industries such as software.

### Entrepreneur Characteristics

Most export determinant studies have treated “structural” variables such as firm size and experience (e.g., Chetty & Hamilton, 1993; Bonaccorsi, 1992;

Patibandla, 1995). The behavior, attributes, and background of key managers, in the context of internationalization, has been treated in relatively few studies (Axinn, 1988; Dominguez & Sequeira, 1993; Holzmuller & Kasper, 1990). Even fewer studies have examined export performance based on the entrepreneur's background and behavior in small firms (e.g., Kirpalani & Macintosh, 1980; Leonidou et al., 1998).

As most software companies in Finland and India are young, and overseas markets are perceived as more exciting and exacting than domestic business, entrepreneur characteristics should provide significant explanations for performance. Four relevant characteristics of the entrepreneur are:

1. Education level (Axinn, 1988; Mayer & Flynn, 1973; Reid, 1983; Simpson & Kujawa, 1974)
2. Overseas experience (Axinn, 1988; Dichtl, Koeglamaayr, & Mueller, 1990; Mayer & Flynn, 1973)
3. Technical innovativeness (Bloodgood et al., 1996; Rogers & Schumaker, 1971; Timmons, Smollen, & Dingee, 1985)
4. Strategic orientation (Quelch & Hoff, 1986; Wind, 1986; Levitt, 1983; Huszagh, 1986; Jain, 1989; Wills, Samli, & Jacobs, 1991).

The above factors were chosen for this study based on in depth interviews with CEOs and/or founders of software start-up companies based in India. Educational background and international experience of the entrepreneur were considered to be the critical factors for export success of these firms. Here we test the equi-significance of the variables in different national environments to ensure compatibility across the two country samples. Ex-ante we do not know the statistical significance of the variables under examination.

Does the educational level of the entrepreneur have an impact on export performance? Many entrepreneurs in both Finland and India's software sector appear to have technical backgrounds or management education. An educated entrepreneur with a professional degree is more "outward looking," and thus willing to explore foreign markets. This is based on our data that suggests over 60% of the CEO's have a Master's degree for Indian firms and approximately 48%<sup>3</sup> for Finnish firms, which in turn enables them to better understand foreign markets. To crack export markets, especially in nations such as the U.S., is seen as a litmus test of quality and performance. Incidentally, bulk of the export by Indian companies is targeted toward the United States, and for Finnish firms, Western Europe, and Scandinavian countries account for 73% of export sales. The hypothesis here, proposes a positive relationship between educational level of the entrepreneur and

export performance of the firm, following Axinn (1988), Mayer and Flynn (1973), Reid (1983), and Simpson and Kujawa (1974). We hypothesize that:

**Hypothesis 1.** The level of professional and/or technical education of entrepreneurs will be positively associated with export performance of their firms.

In the international business literature “experience” is expressed as the number of years since the initial international expansion of the firm with the focus being on organizational or institutional expertise, as opposed to that of the entrepreneur. Larger firms develop international departments with international expertise, which may be unrelated or lack correlation with top managers’ international experience. Here we are focusing on the *entrepreneur’s* experience, most of it prior to their company’s recent start-up. This was identified as one of the important determinants for export success from our interviews with Indian entrepreneurs. Some studies relate overseas experience with exports (Axinn, 1988; Dichtl et al., 1990; Mayer & Flynn, 1973).

In more than half of the Finnish and Indian subsample, entrepreneurs appear to have had some foreign exposure, with travel and contacts abroad. Such entrepreneurs are less likely to be inhibited by cultural/psychic distance, and more prone to exporting their products to distant countries. We hypothesize that:

**Hypothesis 2.** Firms whose entrepreneurs have greater international experience will exhibit a stronger export performance.

The third entrepreneurial attribute used in this study measures technological innovativeness and dynamism of the entrepreneur. The abilities of top management team have been identified as a key source of competitive advantage for new ventures (Bloodgood et al., 1996). Innovativeness of the entrepreneur has been measured by an Innovation Scale developed by Rogers and Schumaker (1971). Recent studies by Knight (2004, 2000), Harveston, Kedia, and Davis (2000), Kedia and Mukherji (1999) suggest a strong relationship between entrepreneur’s innovative abilities and export performance. The high growth of Indian software firms has often been attributed to dynamic and proactive chief executive officers. Firms with high-potential products often plan to start their operations on an international basis (Timmons et al., 1985). We hypothesize that:

**Hypothesis 3.** Entrepreneurs with strong innovative abilities will have stronger export performance in their firms.



The final variable treats the strategic orientation of the entrepreneur. We examine the scope and ambition of chief executive officers and their strategic thrust to internationalize the venture. A combined strategic orientation of localization (Quelch & Hoff, 1986; Wind, 1986) and globalization (Levitt, 1983; Huszagh, 1986; Jain, 1989) sometimes called “glocalization” (think global act local) has been extensively cited in the international marketing literature, as a precondition of success in international markets (Wills et al., 1991). Entrepreneurs willing to create adaptive sales approaches to meet the diverse needs of different export markets, while at the same time striving for global optimization, are the ones said to be most successful internationally. The globalization of software industry has been driven by simultaneous achievement of global efficiency and local responsiveness. Thus the hypothesis:

**Hypothesis 4.** Entrepreneurs with “glocalization” (think global and act local) orientation and abilities will perform better in international markets.

#### *Firm-Level Characteristics*

A key objective of this chapter is to test whether the characteristics of the *entrepreneur* matter, in explaining performance of international new ventures – an area in which literature is sparse. But a much larger literature (exemplified by Cavusgil & Zou, 1994; Aaby & Slater, 1989, and others) linking firm characteristics with internationalization performance cannot be ignored. Indeed, a secondary goal is to see which of the two variable groups (entrepreneur or firm) is more important in explaining the performance of international new ventures originating from Finland and India.

The choice of the firm-level factors for this study has been derived from the international business literature. Since the works of Dunning (1958) and Hymer (1960), a majority of scholarly studies analyzing the internationalization of manufacturing firms have extensively looked into firm ownership-related factors namely size, age, international experience of the firm, and geographic scope. Five firm-specific characteristics are examined below: size of firm, age, international experience, geographic scope, and foreign expertise of employees. The first three factors, namely firm size, age, and international experience have been examined in several international business scholarly studies (Horst, 1972; Buckley & Casson, 1976; Buckley & Pearce, 1979; Ball & Tschoegl, 1982; Tschoegl, 1983; Aharoni, 1966; Davidson, 1980) pertaining to both manufacturing and service multinational enterprises. The international new ventures in the Finnish and Indian software

industry can be categorized as Export/Import Start-ups (Oviatt & McDougall, 1994) that focus on serving a few nations with which the entrepreneur is familiar. During our in-depth interviews with entrepreneurs and/or chief executive officers of Indian software firms, we observed the importance of foreign experience of employees and firm's focus on regional vs. global coverage of markets in highlighting as some of their core competencies. The software firms in India had a comprehensive geographical coverage, with a focus on the triad. In the case of Finnish software industry, we would categorize them as geographically focused start-up international ventures, as majority of the firms cater to the needs of a particular region of the world (Western and Northern Europe), and their competitive advantage is found in the coordination of multiple value-chain activities, such as technological development, marketing, and human resources. Also since some of the Finnish software firms are not stand-alone entities and are a part of large computer organizations, successful coordination that involves socially complex environment and/or tacit knowledge is essential.

Despite the generally small size of Indian firms (we define a small enterprise as one having less than 50 employees (Naidu & Prasad, 1994)) a sufficient variation exists in the size variable. Many studies have examined the relationship between size and international market performance (Axinn, Savitt, Sinkula, & Thach, 1995; Bonaccorsi, 1992; Calof, 1994; Cavusgil & Zou, 1994; Chetty & Hamilton, 1993; Kaynak & Kuan, 1993), and found a positive association. But other scholarly works have found a negative relationship (e.g., Naidu & Prasad, 1994; Louter et al., 1991; Cooper & Kleinschmidt, 1985). Yet others posit a U-shaped relationship. These mixed results may arise, in part, from samples that include firms from many sectors, or by the size variable being itself moderated by variables such as product cycle maturity, industrial concentration, etc. Hence past studies show a mixed picture.

However, one cannot ignore the size variable as it is important for corporate policy (in terms of merger and acquisitions being justified by scale considerations) and public policy (in terms of incentives offered by governments to "small" businesses – particularly in India's software sector). Hence it appears best to test the size variable as an explanatory factor, but hypothesize an agnostic position on its impact on international performance. We posit a null hypothesis that:

**Hypothesis 5.** Firm size will have little impact on the export performance of firms in the software export sector.

The impact of firm age on export behavior has been tested in Axinn et al. (1995), Kaynak and Kuan (1993), and Ogram (1982). Over time, as companies face more competition in their saturated home markets, they are said to look for opportunities abroad (Liouville, 1992), and commit more resources to exports (Ursic & Czinkota, 1984). This would suggest a positive relationship between firm age and export performance. On the other hand, in the international expansion process (Johanson & Vahlne, 1977) early expansion by exports leads to a later decline in exporting, which is then replaced by other entry modes, i.e., a negative relationship. The literature has offered no conclusive direction on the link between firm age and export performance – especially when related to international new ventures. Formulating a hypothesis for the age variable is therefore problematic. A more conservative approach would be to test the null hypothesis, and assert that:

**Hypothesis 6.** Firm age will have little impact on the export performance of the firm.

The next firm-specific variable examines the impact of firm's international experience on export growth and performance. Will longer company experience abroad (*Ceteris paribus* and cross-sectionally) improve the firm's export performance vis-à-vis others? A majority of studies observe a positive relationship between international experience and export performance (Cavusgil & Zou, 1994; Diamontopoulos & Inglis, 1988; Kaynak & Kuan, 1993), as the firm gains in foreign market knowledge and understanding the requirements of customers abroad. Also, it has been pointed out in several studies that prior investments in one country have a positive impact on investment in other countries (Aharoni, 1966; Johanson & Vahlne, 1977; Davidson, 1980). There is a learning curve or experience effect that reduces foreign operating and coordinating costs. It should be noted, on the other hand, that one study, Louter et al. (1991) found that less experienced firms performed better.

The value-chain analysis<sup>4</sup> for the Software sector, shown in Fig. 3, proposes a progression of activities undertaken by a firm as it gains experience. Initially starting with basic tasks such as data entry; moving on to programming, coding, and testing; then progressing to turnkey and overall design jobs; and finally to packaged software marketing, a company is hypothesized to move from the bottom of the pyramid to the top – as it gains international experience. It takes several years of *international* operations to move up the value chain. A majority of the Indian as well as Finnish software firms have been in existence for less than 10 years, and 75% of

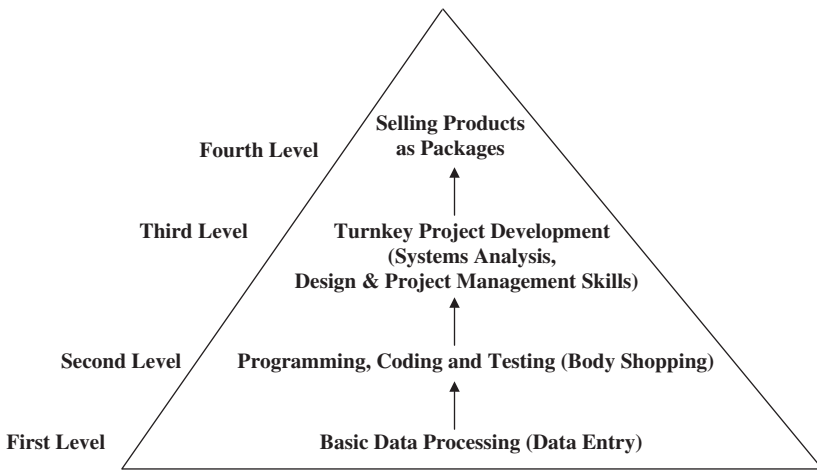


Fig. 3. Value-Chain Analysis in Software Industry.

the Indian firms are engaged in the first two levels of the value chain. (By contrast, the mere age of firm – the number of years of existence in the domestic market – need not be correlated to international performance, but rather the years of its *international* experience. In the Indian and Finnish domestic markets, it is relatively difficult for firms to move up the software sector’s value-chain).

Given the above, as well as the preponderance of opinion in the academic literature that posits a positive link between firm experience and exports, we propose that:

**Hypothesis 7.** The number of years of a firm’s international experience will be positively associated with export performance.

Firm performance in many economic studies is linked to employees’ skills and training. In particular, is the *foreign* training of employees a critical determinant of success in *overseas* markets? Foreign training of employees enables the firm to identify opportunities, build relationships, and minimize costly mistakes abroad. It is also a reflection of the top management’s commitment to recruit, retain, and develop a core group of foreign-market-experienced employees for the international success of the firm. The number of such trained employees in export marketing had a strong impact on the export performance of the firm as confirmed in [Kaynak and Kuan \(1993\)](#). Other studies examined the quality and quantity issue for successful

vis-à-vis unsuccessful exporters in Scotland (Diamontopoulos & Inglis, 1988). In terms of Fig. 3, our contention is that foreign-trained employees would be related to value-chain progression in export markets. Hence in this study, we propose a positive relationship between employees' foreign training and export performance. Thus:

**Hypothesis 8.** Firms with a larger number of foreign-trained employees will have a better export performance.

Are geographic scope (or number of foreign markets served) and export performance positively correlated? The counter hypothesis is that firms may become export-intensive by concentrating on a few foreign markets. (Recall also that our intended operationalization of export performance (as the dependent variable) has two dimensions – intensity as measured by exports in total sales, and export growth). Growth may be positively associated with number of markets served, but presumably only up to some saturation point. This is particularly problematic where a large number of software firms venture outside their home country within the first 2 years of formation. Empirical evidence is not complete; the number of regions the firm exported to since inception was shown to positively influence export activities in Cavusgil and Zou (1994) and Diamontopoulos and Inglis (1988). But compelling evidence, especially on growth, is lacking. The hypothesis nevertheless seems worth testing, and is stated as firms with larger foreign geographical coverage will be having higher export propensity and growth. Thus:

**Hypothesis 9.** Scope of foreign market coverage will be positively related to export performance.

## METHODOLOGY

### *Questionnaire Administration*

Firms in the Indian sample were drawn from *Directory of Indian Exporters of Computer Software and Information Technology Enabled Services, 1998–1999*, (Ministry of Commerce). Four hundred and fifty firms were identified in India having less than 50 employees and undertaking exporting in the first year of its existence. A pilot study in-depth interview was conducted for 20 firms in seven Indian cities followed by questionnaires mailed to Entrepreneurs and/or CEOs of these software firms. Some of the critical factors

for export performance were identified based on interviews with the owners of these companies. Of the 450 firms, 60 firms responded, and of the 60 firms, 47 provided usable responses.

Finnish firms were identified from the *Software Business Finland Company Directory* with 380 firms. According to the theme interviews conducted with software industry experts in Finland in January 2004 (three thematic face-to-face interviews), this directory is the most comprehensive and up-to-date listing of companies operating in software arena in Finland. Out of the 380 companies listed in the directory at the time of the survey (March 2004), we approached 365 companies, more specifically, their CEOs, with an email. The other 15 companies were too large to fit the sampling frame of the current study. From the 365 recipients of the email invitation, 75 managers of independent Finnish software firms filled in the survey (response rate of 21%). Out of these 75 firms, 49 are exporters. Only exporters included in the analysis are reported in this study. Survey data from Finland was collected by using an on-line questionnaire that managers could log on to through a link from the email invitation sent to them. Because of the good language skills of Finns in general and managers especially, the questionnaire was administered in English.

### *Models*

In this study, a log-linear specification (semilog specification) is used where the partial slope of a variable is a function of the level of the dependent variable. When the equation involves a dependent variable in logarithmic form, the partial slope is also a function of dependent variable. This specification is used where the explanatory variables are exponentially related to the dependent variable, or where interest lies in estimating the growth rate in dependent variable. In this study, export performance serves as dependent variable, and is measured by export intensity and export growth. For both entrepreneurial and firm characteristics, independent variables are exponentially related to the two different dependent variables.

#### *Primary Models:*

(1) Entrepreneurial characteristics

$$Y = Ae^{\beta_1} e^{\beta_2} e^{\beta_3} e^{\beta_4} e^{\epsilon}$$

where

$Y$  is the export growth rate or export intensity, respectively;

$X_1$  the educational background of entrepreneur;

$X_2$  the international experience of entrepreneur;

$X_3$  the technological innovativeness;

$X_4$  the strategic orientation.

(2) Firm characteristics

$$Y = Ae^{\beta_5} e^{\beta_6} e^{\beta_7} e^{\beta_8} e^{\beta_9} e^\varepsilon$$

where

$Y$  is the export growth rate or export intensity, respectively;

$X_5$  the size of firm;

$X_6$  the age of firm;

$X_7$  the international experience of firm;

$X_8$  the foreign expertise of employees;

$X_9$  the foreign market coverage;

where  $e$  is the base of the natural logarithm.

*Log Transformed Models Then Are:*

- (1) Entrepreneurial characteristics  $\text{Ln}(Y) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$
- (2) Firm characteristics  $\text{Ln}(Y) = \beta_0 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon$
- (3) Combined entrepreneurial and firm characteristics  $\text{Ln}(Y) = \beta_0 + \sum \beta_i X_i + \varepsilon$

where the definition of independent and dependent variables is the same as in the primary models.  $i = 1, 2, 3, \dots, 9$ .

#### *Dependent Variables*

Collecting performance data from small companies, most privately owned, and reluctant to disclose sensitive financial information to outsiders, is problematic, especially in a developing nation like India. Hence, direct questions requesting absolute dollar figures on sales or profits would lower the response rate to an unacceptably low level. A large number of empirical studies in the past have not used direct financial performance measures (e.g., Koh, 1991; Axinn, 1988), but have couched their questions as ratios and growth rates.

“Exports as a percentage of total sales” (Export intensity) has been widely used in the literature (Axinn, 1988; Burton & Schlegelmilch, 1987; Bilkey,

1985; Bello & Williamson, 1985). As an alternative performance measure, we also used "Percentage growth rate for exports." An *ex post* limitation of the above two dependent variables is that there is a fair degree of collinearity of 0.48 (India) and 0.36 (Finland) between the two measures. Hence, each is analyzed separately.

### *Explanatory Variables*

#### *Entrepreneur Characteristics*

*Technical education* was measured by asking the entrepreneurs/chief executive officers to indicate their undergraduate and/or graduate level of studies and field of specialization. *International experience* was measured by asking whether they possessed foreign expertise and the number of years of their personal international experience. *Technological innovativeness* of the entrepreneur was measured by an innovation scale developed by Rogers and Schumaker (1971) that ranges from technical "pioneer" to "traditionalist." The *international strategic orientation* of the chief executive officer was measured through a question pertaining to their "globalization" as well as "localization" thrust. We were interested in measuring the scope and ambition of the entrepreneur.

#### *Firm-Level Characteristics*

The *size* of firm was operationalized by (a) total sales and (b) number of employees. Because of the high correlation between them (0.668), just one measure, the number of employees, was used. The *age* of the firm was calculated based on the year the company was formed. *International experience* (in years) was calculated based on the year in which the firm started exporting on a consistent basis, as in Cavusgil and Zou (1994). However, in the regression analysis on Indian firms, the actual year when export started was used instead of the calculated number of years of international experience. Consequently, for India, we expect a negative sign to verify Hypothesis 7. The *foreign expertise of employees* was measured through a dummy variable, similar to Diamontopoulos and Inglis (1988). Finally, the *geographical scope* (or Foreign Market Coverage) of the firm measures the geographical dispersion or scope of foreign market coverage, along a local/regional/global sales coverage spectrum for the firm's customers.

A total of 96 responses were received, 49 from the Finnish subsample, and 47 from India, from a target list of 815 companies. The response rate in this study is 10.44% for Indian sample (47 out of 450) and 13.42% for Finnish



sample (49 out of 365). Out of the 49 answers received from Finland, three companies had to be removed from the dataset as they were clearly outliers. This was done to avoid biases in the regressions results. After this, our final sample size for Finland comprises 46 usable answers. Our response rates are somewhat lower compared to other studies on small- and medium-sized enterprises as in [Kaynak and Kuan \(1993\)](#). The low response rate does not necessarily mean that the validation or representativeness of the research is suspicious. For example, [Paxson, Dillman, and Tarnai \(1995\)](#) assert that low response rate should not be a problem and argue that poor response is the “result more from not using available knowledge” than to any factor inherent in business surveys (p. 314). However, for a developing nation like India, where research questionnaires circulated to executives are rare and a culture of business secrecy prevails, it may even be commendable. At any rate, a sample size of 93 is large enough to yield statistical significance.

## RESULTS AND DISCUSSIONS

[Table 4](#) reports results for the ANOVA test for comparisons between Finland and India. There are significant differences between the Finnish and Indian entrepreneurs on several variables. While the educational background and international experience of the Indian entrepreneurs is higher than that of Finnish entrepreneurs/chief executive officers, it is the latter factor that turns out to be statistically significant at 0.05 level. As for the firm-level characteristics, the two variables that are statistically significant are size (larger in India) at 0.01 level, and foreign market coverage (higher in India) statistically significant at 0.10 level. It should be noted that the operationalization of firm size is based on the continuum from one to five (1 = 0–10 employees; 2 = 11–25; 3 = 26–50; 4 = 51–100; 5 = Over 100 employees). Thus, the difference in absolute numbers of employees working in Indian vs. Finnish sample companies is remarkable. These comparisons reflect the somewhat different backgrounds of the software sectors in the two nations. Indian firms are larger, and their chief executive officer more highly educated. Finnish software firms, by contrast, are smaller and more regionally based.

In this study, we ran the late response bias estimation, and the results showed no statistically significant differences found ( $p < 0.05$ ) between early and late respondents based on both firm-specific characteristics and a set of operation-related information. Thus, non-response bias is not expected to affect the study results, and the data appear to reflect the population of interest.

**Table 4.** T-Test for Differences in Entrepreneurial and Firm Characteristics.

	Finland (N = 46)		India (N = 47)		<i>t</i> -Values for Differences in Means	
	Mean	SD	Mean	SD		
<i>Entrepreneurial characteristics</i>						
Educational background	3.39	0.88	3.72	0.54	-1.944	
Int'l experience of manager	0.61	0.49	0.81	0.40	-2.010	**
Technological innovativeness	2.2	1.00	2.11	1.07	0.462	
Strategic orientation	2.86	0.82	2.81	1.10	0.247	
<i>Firm Characteristics</i>						
Size of firm	1.80	1.04	3.55	1.38	-7.063	***
Age of firm	9.23	5.37	11.43	9.42	-1.060	
Int'l experience of firm	5.22	4.10	6.87	4.56	-0.975	
Foreign expertise of employees	0.67	0.47	0.60	0.50	0.866	
Foreign market coverage	2.40	1.23	2.85	0.36	-1.680	*

\*Significance at 0.10 level.

\*\*Significance at 0.05 level.

\*\*\*Significance at 0.01 level.

A log-linear regression model was used to explain the export performance of both the Finnish and Indian and software firms using (i) entrepreneurial attributes and (ii) firm-specific characteristics. To assess the relative impact of these two groups, independent variables for only entrepreneur characteristics were first loaded (Table 5), then only firm-level characteristics (Table 6) and finally, all explanatory variables (Table 7). Variation inflation factor (VIF) numbers were calculated to check for possible multicollinearity problems. The model specification for Table 5 was based on identifying factors through in-depth interviews by the authors, and that for Table 6 was a combination of survey of the international business literature and observations made by the chief executive officers. Several factors were identified that contributed toward the export performance of international new ventures in the software industry, but the ones used in this study were the critical ones as determined from the interviews and survey of the literature.

*Entrepreneur Characteristics Only (Table 5)*

These models examine the regression of entrepreneurial characteristics *only* on export performances of Finnish and Indian software firms. Both models

**Table 5.** Log-Linear Regression Results for Entrepreneurial Characteristics Only (Finland,  $N = 46$ ; India  $N = 47$ ).

	Export Intensity				Export Growth			
	Finland		India		Finland		India	
		VIF		VIF		VIF		VIF
Educational background	-0.004	1.048	0.517***	1.371	0.73	1.008	0.568***	1.371
Intl experience of entrepreneur	-0.175	1.040	0.066	1.183	-0.158	1.023	-0.150	1.183
Technological innovativeness	-0.108	1.071	0.310**	1.011	-0.034	1.017	0.087	1.011
Strategic orientation	0.373**	1.038	0.123	1.569	0.398**	1.021	0.393**	1.569
Adjusted $R^2$	7.2%		23%		9.1%		17.3%	
F-value	1.703		4.445***		2.080		3.400**	

*Summary of Results*

	Hypothesis	Predicted relation	Export Performance			
			Export intensity		Export growth	
			Finland	India	Finland	India
	Entrepreneurial (E) vs Export performance					
H <sub>1</sub>	(E <sub>1</sub> ) Educational background	Positive	X	Support	X	Support
H <sub>2</sub>	(E <sub>2</sub> ) Intl experience of entrepreneur	Positive	X	X	X	X
H <sub>3</sub>	(E <sub>3</sub> ) Technological innovativeness	Positive	X	Support	X	X
H <sub>4</sub>	(E <sub>4</sub> ) Strategic orientation	Positive	Support	X	Support	Support

E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub>, E<sub>4</sub>: Entrepreneurial characteristics.

\*Significance at 0.10 level.

\*\*Significance at 0.05 level.

\*\*\*Significance at 0.01 level.

for India specified in Table 5 have significant  $F$  statistics, with an adjusted  $R^2$  ranging from 0.173 to 0.23. This suggests that entrepreneurship characteristics alone are capable of explaining a large fraction of variation on export performance for Indian firms. For the Finnish firms, the adjusted  $R^2$  ranged from 0.072 to 0.09. In the case of India, results for  $\ln(\text{Growth})$  are weaker as compared to  $\ln(\text{Intensity})$ , whereas in the case of Finland, the  $F$ -values for both dependent variables, viz., export intensity and export growth are not statistically significant. The VIF numbers are all comfortably low, in all cases below 2.0, which indicates multicollinearity is not an issue (Neter, Wasserman, & Kutner, 1985).

The first hypothesis, that entrepreneurs with technical and/or professional education will have strong export performance, was strongly supported for India, with significance better than 0.01, for both export performance measures, viz., export growth and export intensity. This suggests that specifically for software industry, entrepreneur/chief executive officer education level is a key ingredient for enhancing performance, and in general would be true for international new ventures across technology-driven industries. This factor was not statistically significant for Finland, which can be due to the nature of the sample. All the Finnish respondents have some education and most of them (38/46) have a Bachelor's ( $N = 16$ ), Master's ( $N = 18$ ), or Doctoral ( $N = 4$ ) degree. The marginal utility of having a master's vs. a bachelor's degree is not necessarily relevant for export performance.

The second hypothesis, that entrepreneurs who have had greater international business experience, in their *personal* background, will have stronger export performance in their companies, found no support in the data for either country. Given the nature of this industry, entrepreneurs do not have to possess significant international experience, as they can reach out to foreign buyers in the United States/Europe/Asia through a combination of formal and informal networks.

Hypothesis 3 stated that innovative entrepreneurs would have superior export performance. This hypothesis is supported in one of the four models, and fails to achieve significance for the export-growth-dependent variable in Finland and India. A majority of the Indian software firms' export business in our sample is accounted for by projects in the first two levels of the value-chain framework, and as a consequence entrepreneurs do not have to be pioneers (Rogers & Schumaker, 1971) to enhance their export performance. In the case of Finland, not surprisingly, none of the respondents identified him/herself as a technological laggard. In addition, only five respondents categorized themselves to "mainstream" category. Consequently, in a sample where 90% of respondents from Finland belong to the three groups of

**Table 6.** Log-Linear Regression Results for Firm Characteristics Only (Finland  $N = 46$ ; India  $N = 47$ ).

	Export Intensity				Export Growth			
	Finland		India		Finland		India	
		VIF		VIF		VIF		VIF
Size of firm	0.10	1.527	-0.234	1.483	-0.285	1.291	-0.128	1.483
Age of firm	-0.051	2.255	0.014	2.231	-0.029	2.072	0.237	2.231
International experience of firm	0.431*	2.266	-0.298	2.624	-0.585**	1.956	-0.438**	2.624
Foreign expertise of employees	0.087	1.161	0.361**	1.361	0.243	1.062	0.649***	1.361
Foreign market coverage	0.638***	1.299	-0.119	1.058	0.176	1.286	-0.178	1.058
Adjusted $R^2$	72.4%		14.5%		37.7%		29.1%	
$F$ -value	6.828***		2.561**		2.055		4.768***	

*Summary of Results*

Hypothesis	Predicted relation	Export Performance			
		Export intensity		Export growth	
		Finland	India	Finland	India
Firm ( $F$ ) vs Export performance					
H <sub>5</sub> ( $F_1$ ) Size of firm	<i>Null hyp.</i>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>
H <sub>6</sub> ( $F_2$ ) Age of firm	<i>Null hyp.</i>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>
H <sub>7</sub> ( $F_3$ ) International experience of firm	<i>Negative for India, positive for Finland</i>	Support	X	<sup>b</sup>	Support
H <sub>8</sub> ( $F_4$ ) Foreign expertise of employees	<i>Positive</i>	X	Support	X	Support
H <sub>9</sub> ( $F_5$ ) Foreign market coverage	<i>Positive</i>	Support	X	X	X

$F_1, F_2, F_3, F_4, F_5$ : Firm characteristics.

<sup>a</sup>Support of the null hypothesis.

<sup>b</sup>Significant but with sign opposite to the hypothesis.

\*Significance at 0.10 level.

\*\*Significance at 0.05 level.

\*\*\*Significance at 0.01 level.

**Table 7.** Log-Linear Regression Results for Entrepreneurial and Firm Characteristics (Finland  $N = 46$ ; India  $N = 47$ ).

	Export Intensity				Export Growth			
	Finland		India		Finland		India	
		VIF		VIF		VIF		VIF
Educational background	-0.040	2.009	0.453***	1.849	-0.156	1.468	0.374**	1.849
Intl experience of entrepreneur	-0.239	1.670	-0.088	1.354	0.204	1.744	-0.359***	1.354
Technological innovativeness	0.013	1.847	0.233*	1.192	0.301	2.105	-0.068	1.192
Strategic orientation	0.312	2.068	0.085	3.774	0.676**	2.063	0.058	3.774
Size of firm	0.159	2.295	-0.302*	1.698	-0.054	1.836	-0.271*	1.698
Age of firm	0.024	2.325	0.050	2.506	0.071	2.417	0.192	2.506
International experience of firm	0.465*	2.924	-0.185	2.854	-0.405	2.710	-0.324*	2.854
Foreign expertise of employees	0.145	1.715	0.342*	2.437	0.107	1.639	0.805***	2.437
Foreign market coverage	0.426**	1.797	-0.036	1.275	-0.127	1.882	-0.091	1.275
Adjusted $R^2$	73.3%		30.2%		34.6%		47.9%	
F-value	6.504***		3.211***		2.235*		5.696***	
<i>Summary of Results</i>								

**Table 7.** (Continued).

			Export Performance			
			Export Intensity		Export Growth	
Hypothesis			Finland		India	
Entrepreneurial (E) firm (F) vs Export performance			Finland		India	
H <sub>1</sub>	(E <sub>1</sub> ) Educational background	<i>Positive</i>	X	Support	X	Support
H <sub>2</sub>	(E <sub>2</sub> ) Intl experience of entrepreneur	<i>Positive</i>	X	X	X	Support <sup>b</sup>
H <sub>3</sub>	(E <sub>3</sub> ) Technological innovativeness	<i>Positive</i>	X	Support	X	X
H <sub>4</sub>	(E <sub>4</sub> ) Strategic orientation	<i>Positive</i>	X	X	Support	X
H <sub>5</sub>	(F <sub>1</sub> ) Size of firm	<i>Null hyp.</i>	Support <sup>a</sup>	Support <sup>b</sup>	Support <sup>a</sup>	b
H <sub>6</sub>	(F <sub>2</sub> ) Age of firm	<i>Null hyp.</i>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>	Support <sup>a</sup>
H <sub>7</sub>	(F <sub>3</sub> ) International experience of firm	<i>Negative for India, positive for Finland</i>	Support	X	X	Support
H <sub>8</sub>	(F <sub>4</sub> ) Foreign expertise of employees	<i>Positive</i>	X	Support	X	Support
H <sub>9</sub>	(F <sub>5</sub> ) Foreign market coverage	<i>Positive</i>	Support	X	X	X

E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub>, E<sub>4</sub>: Entrepreneurial characteristics; F<sub>1</sub>, F<sub>2</sub>, F<sub>3</sub>, F<sub>4</sub>, F<sub>5</sub>: Firm characteristics.

<sup>a</sup>Support of the null hypothesis.

<sup>b</sup>Significant but with sign opposite to the hypothesis.

\*Significance at 0.10 level.

\*\*Significance at 0.05 level.

\*\*\*Significance at 0.01 level.

“pioneers,” “technology enthusiasts,” or “early mainstream” in technological innovativeness, it is not surprising that the regression results do not show statistical significance for this variable.

The final hypothesis in Table 5 examines the impact of strategic orientation of the entrepreneur. The results indicate support for the hypothesis, that an entrepreneur’s strategic orientation that emphasizes “glocalization” is the way to achieve success abroad. For the Finnish sample, the results are significant for both versions of the dependent variables, ln(export growth and export intensity). Finnish exporters typically reach out to a variety of different national markets, i.e., various smaller and larger countries in Europe. These operations benefit from a “glocal” approach. In contrast, the most important export target for Indian firms is the rather homogeneous U.S. market.

#### *Firm-Level Characteristics Only (Table 6)*

The log-linear regression results for firm-level characteristics only are shown in Table 6. The overall  $F$  statistics for all but one model are significant. The adjusted  $R^2$  specifications range from 0.145 to 0.724. One cannot read too much into these statistics, but it is worth noting that higher adjusted  $R^2$  numbers are observed for Finnish sample. Also export intensity has a higher adjusted  $R^2$  than export growth for Finland, though the model for the later dependent variable is not statistically significant. In the case of Indian sample, both model specifications with the dependent variables, namely, export intensity and export growth are significant.

Hypothesis 5 examines the impact of firm size on performance measures. The regression coefficients with respect to size are not significant in any regression. The null hypothesis, that firm size will have no significant impact on export performance turns out to be supported for both Finland and India.

Hypothesis 6, also a null hypothesis, stated that there would be no statistical link between a firm’s age and its export performance. This null hypothesis was also supported. As there is often the fear, in other studies, of multicollinearity between age and international experience, VIFs were calculated for each explanatory variable and especially for these variables. In no case does any VIF exceed 2.624 which is low, and well below the threshold of 10.0 indicated by several statisticians as signaling a possible multicollinearity problem (Neter et al., 1985).

The next hypothesis examines the influence of the firm’s international experience on export growth and intensity. We had hypothesized a positive relationship. (However, this would be verified by an expected negative sign for Indian data since the international experience variable for India is coded



simply as the year in which first significant exports were recorded by the company). The expected negative relationship is verified in the Indian data and the results are significant ( $p < 0.05$ ) for export growth. In the Finnish data, firm's international experience has a positive effect on export intensity ( $p < 0.1$ ), meaning that firms with longer experience of exporting gather a larger share of their total sales from foreign customers. In the case of export growth in Finnish firms, however, the relationship is negative; the more experienced the firm is in exporting, measured as years of export experience, the slower its export growth ( $p < 0.05$ ). This indicates that inexperienced Finnish exporters have higher export growth than companies that are experienced exporters. This finding supports the idea of "born global" firms that internationalize rapidly.

As stated in Hypothesis 8, the extent of foreign experience of a firm's employees will have a positive impact on its export performance. This hypothesis is strongly supported for both models in the case of India. In the case of Finland, 67.3% of sample companies have employees that possess foreign experience. The slight positive relationship between this variable and export performance in Finnish firms is not significant. It is possible that companies whose employees do not possess international experience access external sources of knowledge and skills in order to perform foreign activities. All the skills do not necessarily need to reside within the borders of a firm. Access to resources necessary for exporting may come through formal and informal networks of a firm and entrepreneur.

The final hypothesis examines the scope or extent of foreign geographical coverage of the software exports. Hypothesis 9 was not supported for India, and in the case of Finland, it turns out to be statistically significant for export intensity. This is logical, as the measure of export intensity captures the share of foreign sales out of total sales whereas the measure of foreign market coverage measures the scope of the foreign customer base of the firm.

#### *Entrepreneurial and Firm-Level Characteristics Together (Table 7)*

The final regression in [Table 7](#) examines the full model consisting of *both* entrepreneur *and* firm-level characteristics on the performance measures of export growth and export intensity.

This also comprises a check on the robustness of a model. In the case of a weak model design, introducing additional independent variables (or in this case, a whole block of additional independent variables) can often alter the statistics, and sometimes even the sign, of the originally introduced

variables. If however, the statistics and significance of the originally introduced model remain substantially the same, then we can pronounce the model robust. Here, the intent is to see if in the full model (Entrepreneur *and* Firm-level variables) the same variables are significant and whether the same hypotheses are supported. This is the broad objective in Table 7; our earlier conclusions are unchanged – and barring a few minor exceptions discussed next, the same hypotheses are supported. Incidentally, VIF values in the full model are also comfortably low (see Neter et al., 1985) with all values below 4.0 correlations for variables are listed in Tables 8 and 9.

The only changes in the full model (Table 7) compared with the earlier results are in India's case, for the firm size and international experience of the entrepreneur. For these two variables, the earlier results had shown no significance. However, in Table 7, for India alone, the firm size variable has a negative sign (albeit at a low significance level of 0.10). Also, in one out of two runs for India in Table 7, the international experience of the entrepreneur variable has a negative and significant sign. If we are to give weight to these unexpected findings, they would suggest that it is the smaller software firms in India that are exhibiting the greatest export/sales ratios and the fastest growth. As an *ex post* rationalization, this is indeed plausible, at least in India. Unlike Finland, where much of software had been developed for hardware and chip manufacturers, dynamic and innovative stand-alone Indian software companies exist in the business. Indeed, this is seen in the distribution for Indian companies that are heavily skewed toward small start-ups, of whom a significant number are “born-global” companies, created with alliance or supply-chain links to foreign customers. It is entirely possible that the smaller Indian firms – more likely to be international from its inception – are the ones exhibiting higher export shares in turnover and higher export growth rates (although this cannot be taken as conclusive, since in Table 6 the size variable failed to reach significance and this does not apply to Finland, in any event.)

In the case of Finland, an interesting finding stems from the strategic orientation variable having positive impact (Table 7), but this time in only one of the two runs, i.e., for export growth. As discussed earlier, this finding suggests that Finnish firms targeting multicultural foreign markets benefit from a global sales approach. It is also of interest that for international experience of a firm and foreign market coverage, Finnish firms display a positive statistically significant coefficient for export intensity, and a negative non-significant coefficient for export growth. This suggests that as the firms gain more experience in exporting, also their export intensity increases, i.e., foreign customers account for an increasing share of total sales. This kind of

**Table 8.** Correlation for All Variables ( $N = 46$ ) (Finland).

Variables		Mean	SD	1	2	3	4	5	6	7	8	9	10
Educational background of entrepreneur	X1	3.39	0.881										
Technological innovativeness of entrepreneur	X2	2.2	1	-0.136 (0.368)									
Strategic orientation of entrepreneur	X3	2.86	0.816	0.004 (0.979)	-0.066 (0.654)								
International experience of entrepreneur	X4	0.61	0.492	0.066 (0.663)	-0.090 (0.539)	0.067 (0.649)							
Size of firm	X5	1.8	1.040	0.193 (0.198)	0.001 (0.996)	-0.060 (0.684)	0.086 (0.555)						
Age of firm	X6	9.23	5.366	0.159 (0.302)	-0.074 (0.623)	-0.054 (0.719)	0.042 (0.782)	0.059 (0.692)					
International experience of firm	X7	5.22	4.104	0.239 (0.110)	-0.154 (0.292)	-0.009 (0.952)	0.188 (0.195)	-0.009 (0.953)	0.646** (0.000)				
Foreign expertise of employees	X8	0.67	0.474	0.206 (0.170)	-0.076 (0.602)	0.308* (0.031)	0.428** (0.002)	0.327* (0.022)	-0.030 (0.841)	0.092 (0.529)			
Foreign market coverage	X9	2.4	1.225	-0.203 (0.342)	0.163 (0.437)	0.102 (0.627)	-0.236 (0.256)	0.242 (0.244)	0.277 (0.190)	0.161 (0.442)	0.161 (0.442)		
Export intensity	X10	25.09	29.536	0.067 (0.687)	-0.146 (0.363)	0.372* (0.017)	-0.049 (0.761)	-0.077 (0.633)	0.137 (0.404)	0.436** (0.004)	0.342* (0.029)	0.741** (0.000)	
Export growth	X11	49.65	135.9	-0.157 (0.296)	0.094 (0.519)	0.165 (0.258)	0.063 (0.667)	-0.151 (0.300)	-0.188 (0.206)	-0.088 (0.547)	0.179 (0.218)	0.260 (0.210)	0.368* (0.018)

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

**Table 9.** Correlation for All Independent Variables ( $N = 47$ ) (India).

Variables	Mean	SD	1	2	3	4	5	6	7	8	
Educational background of entrepreneur	X1	3.72	0.54								
International experience of entrepreneur	X2	0.81	0.4	-0.050 (0.741)							
Technological innovativeness of entrepreneur	X3	2.11	1.07	-0.061 (0.684)	-0.053 (0.722)						
Strategic orientation of entrepreneur	X4	2.81	1.1	-0.496*** (0.000)	0.636** (0.012)	-0.038* (0.800)					
Size of firm	X5	3.55	1.38	-0.053 (0.725)	-0.080 (0.593)	-0.041 (0.785)	0.359*** (0.013)				
Age of firm	X6	11.43	9342	-0.177 (0.233)	-0.216 (0.146)	-0.151 (0.309)	-0.131 (0.381)	0.21 (0.156)			
International experience of firm	X7	6.87	4.56	-0.279* (0.057)	-0.134 (0.371)	-0.011 (0.944)	0.191 (0.199)	0.459*** (0.000)	0.672*** (0.000)		
Foreign expertise of employees	X8	0.6	0.5	-0.102 (0.495)	0.370** (0.010)	0.165 (0.268)	0.654*** (0.000)	0.366** (0.012)	-0.148 (0.319)	0.198 (0.183)	
Foreign market coverage	X9	2.85	0.36	-0.217 (0.144)	0.100* (0.503)	-0.014 (0.923)	0.367** (0.011)	0.082 (0.584)	0.090 (0.549)	0.015 (0.922)	0.143 (0.339)

Value within paranthesis are  $p$ -values.

\*Significant better than 1.10.

\*\*Significant better than 0.05.

\*\*\*Significant better than 0.01.

gradual development is actually in line with the stage models of internationalization. At the same time, however, the firms that experience fastest international growth in relative terms are the ones that just start their international operations. This finding lends support to the born global phenomenon.

The overall picture, however, from Table 7 is that there are differences in the empirical findings for Finland and India. Educational background and technological innovativeness of the entrepreneur, and foreign expertise of employees are positive (supporting the hypotheses) and statistically significant for India.

The strategic orientation variable (our shorthand for the “glocalization” abilities of the entrepreneur) is strongest for Finland in both Tables 7 and 5. This hypothesis stated that export performance would be positively related to the entrepreneur/manager’s ability to *simultaneously* manage the sometimes contrary pulls of global standardization and local adaptation – or “global coordination” and “local focus,” – proposed in (Wills et al., 1991). This tension is faced by all international businesses – but not to the same degree. It is likely that Finnish software firms are faced with greater pressures in this respect than are Indian companies, as the demands of software written for the Finland’s indigenous market are greater, given Finland’s sophisticated domestic industries. (very little Indian software is written for locally produced hardware). The “balancing act” is tougher in Finland and hence entrepreneurs that are more capable of handling this tension appear to be the more successful export performers. This would comprise a good subject for additional research.

## CONCLUSIONS

This study has attempted to provide a holistic framework, namely, theory of accelerated international entrepreneurship to explain the export performance of international new ventures in technology-driven industries such as software industry in both a small developed country – Finland – and a big emerging market – India. Toward that end, this study analyzed both the impact of entrepreneurship and firm-level characteristics on the international performance of software firms individually and jointly. In general for international start-up firms, but particularly in rapidly evolving high technology sectors such as software industry, one would suspect that performance is as much a function of the character and background of the entrepreneur, as a characteristic of the company.

The bulk of scholarly investigation has treated larger manufacturing companies and has often found firm-specific variables such as size, age, and

international experience to be relevant factors. But there has been relatively little investigation based on the entrepreneur's characteristics and on small start-up firms. One objective of this study therefore is to see which factors – those relating to the entrepreneur, or those relating to the structure of the firm – provide stronger explanations of performance.

On the whole, entrepreneur characteristics such as educational background, technological innovativeness, and strategic orientation of the entrepreneur are somewhat more important in explaining successful export performance. Most of the firms in the software business are very young and, especially in the case of Finland, very small. Thus, they have to rely on the intrinsic traits of the founder/entrepreneur's vision and dynamism in shaping the success. Also the institutional environment is more challenging for Indian entrepreneurs as compared with Finnish counterparts.

This does not contradict the findings of the economics or international business literatures, where firm specific/ownership factors (Dunning, 1993) play a significant role in explaining the foreign growth of corporations. It simply shows that in the case of innovative startups in a service sector, more traditional explanations from manufacturing may not apply as strongly, or offer a complete explanation for performance. In fact, some of the more traditional firm-level variables turned out to have unexpected negative signs, contrary to hypotheses, although this occurred only infrequently – such as the negative sign for the firm size variable in India. At first blush this appears paradoxical, but one possible *ex post* explanation is that many smaller software start-ups in India are “international new ventures” (Oviatt & McDougall, 1994). That is to say, from the beginning, their output is aimed at foreign markets. Hence, such Finnish and Indian firms exhibit a much larger role for exports in their overall business. It was only after the very recent takeoff in the domestic computer market in India that the importance of domestic operations and local sales in India has risen somewhat. If this is true, that would explain the negative relationship between export propensity and firm size. Of course, this remains an unproven *ex post* speculation, but one of further research interest, as it is contradictory to the traditional international evolutionary path proposed by internationalization theory (Johanson & Vahlne, 1977).

## POLICY IMPLICATIONS

This study does provide some unambiguous implications for managers and policy makers. As we have observed, the background, education, and

orientation of an entrepreneur make a difference in the export performance of young start-up global software firms. Public policy conclusions are that export promotion and financial institutions should work to identify and nurture rising entrepreneurs. The one abundant resource in Finland and India is technical human capital and the impressive rate of growth in the software sector (where financial capital does not constitute a major constraint) emphasizes the returns from these nations' large tertiary education establishment. The information technology revolution, as indeed the growth of exportable services in general, is an obvious growth area for both Finnish and Indian talent. The findings of this chapter also reiterate the fact that traditional explanations of performance from manufacturing industry do not always apply to the emerging service sector, or at least that traditional theory variables provide a less than complete explanation.

## **FUTURE RESEARCH**

As stated above, further research is needed to study if and how export share is related to growth and age of software firms in India – and if indeed the domestic market accounts for a larger share over time. This is a crucial question for internationalization theories of the firm, as the software sector provides some contradictory results. However, this is not a question that can be answered from a cross-sectional analysis, but needs to be studied using longitudinal data and case studies on individual firms.

The second future research question, relevant more for Finland today, and possibly for India also later on, is the “glocalization” issue. Case studies and more research focused on this question, would reveal exactly what the tensions are, in the software business, between the demands of the sophisticated local customers (in Finland, hardware and chip makers) and global market demands.

In this study, for dependent variables, we used only two measures of export performance. We intend to deploy a few more measures such as value of exports, and export profitability to ensure robustness and consistency in our findings. It would also be useful for researchers to develop other comprehensive and dynamic indexes of export performance.

Finally, this study was conducted in two countries viz., Finland and India. The findings of this study have to be carefully generalized to other developed and developing nations attempting to build a vibrant software industry both inside and outside of their geographic boundary.

## NOTES

1. Oviatt and McDougall (1994) define an international new venture as a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries.

2. This number also includes companies for which software is not the main business.

3. 39% of Finnish entrepreneurs have a Master's degree and 9% have a Doctoral degree.

4. The value chain depicted in Fig. 3 was conceptualized based on the discussion with Indian software entrepreneurs in understanding the complexities of this business.

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# INSTITUTIONAL AND ECONOMIC INFLUENCES ON INTERNET ADOPTION AND ACCELERATED FIRM INTERNATIONALIZATION

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## INTRODUCTION

Accelerated internationalization occurs when a firm engages in international business early in its life cycle or when it builds international business experience with great speed, perhaps incorporating international activities in more parts of the firm's value chain than has occurred historically. Such acceleration seems to have been occurring since the late 1980s, and evidence indicates that it is not a temporary or abnormal phenomenon ([Organisation for Economic co-operation and development \(OECD\), 1997](#)). Many firms around the world experienced an era of accelerated internationalization in the 1990s ([OECD, 1997](#)) and many are continuing to do so.

The phenomenon has captured the attention of academics (e.g., [Shrader, Oviatt, & McDougall, 2000](#); [Zahra, Ireland, & Hitt, 2000](#)). Scholars have offered a variety of plausible explanations about why accelerated internationalization occurs. For example, the relative flexibility of young firms appears to make them more open than established firms to new learning, including learning about foreign markets, a characteristic that has been

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called the “learning advantage of newness” (Autio, Sapienza, & Almeida, 2000). The unusual alertness of entrepreneurs to new opportunities may lead some firms to venture with unusual aggressiveness into foreign markets (McDougall, Shane, & Oviatt, 1994), and such actions might be reinforced by a management team’s strong international experience (Reuber & Fischer, 1997). Some firms expand internationally to enhance technological learning (Zahra et al., 2000). In addition, complementarities among large and small multinational enterprises (MNEs) (Dunning, 1995) and the natural decay of the liability of foreignness over time (Miller & Parkhe, 2002) seem to promote early, rapid, and more comprehensive firm internationalization.

Some scholars believe that recent technological innovation has established new foundations for multinational corporations that enabled accelerated internationalization (Oviatt & McDougall, 1994, 1999). With the advent and widespread adoption of first the fax machine, and, soon after, the Internet, firms could more easily, rapidly, and efficiently obtain necessary information about foreign markets. Such technology sometimes compensated even for the relative deficiency of foreign experience among new venture founders and managers. The Internet could help firms reach a wider range of customers and maintain better connections with foreign partners. Thus, developments in information and communication technology since the late 1980s and early 1990s have made foreign market exploitation more efficient for most companies, and feasible for new ventures.

Katz, Safranski, and Khan (2003) described how the Internet can make new firms instantly global. Kotha, Rindova, and Rothaermel (2001) showed that recently started, United States-based, Internet firms were more likely to establish websites in foreign countries when their reputation, cooperative activity, domestic website traffic, new product introductions, and new feature announcements were strong. Zaheer and Manrakhan’s (2001) exploratory analysis found that the possibility of remote access increased the number of countries from which a firm obtains resources or customers and that the introduction of a business-to-business trading network increased the global market participation of firms from peripheral countries. These findings suggest that the development of Internet technology could promote firms’ involvement in international business.

We believe, however, the connection between the nearly simultaneous development of the Internet and the phenomenon of accelerated internationalization remains insufficiently explored. The few scholars interested in the relationship have focused on the impact of the development of Internet upon internationalization, and have ignored the possible reciprocal relationship between the two phenomena. That is, while Internet technology

seems likely to strengthen firms' capabilities to expand abroad, establishing international activities is itself likely to encourage the subsequent adoption of Internet technology in order to achieve greater efficiency. We do not believe such a reciprocal causal relationship has been explored. Furthermore, much of the literature about the Internet employs an economic perspective. The Internet is depicted as (1) helping both buyers and sellers reduce search costs in foreign countries, (2) offering firms a useful tool to customize products, and (3) pushing companies to enhance firm efficiency (Bakos, 2001). Missing is an analysis of the adoption of the Internet and its use in international business from an institutional perspective, which we believe may be a useful companion lens. Institutional theory provides potent explanations for why many firms imitate others in adopting innovations, without the support of (or even despite) economic reasoning.

The purpose of this chapter, therefore, is to further explore the relationship between the recent phenomenon of accelerated firm internationalization and the emergence of Internet technology. A two-force perspective – economic and institutional – serves to explain the adoption of the Internet by organizations in the process of accelerated internationalization. Economic forces, which focus on efficiency and competitive advantage, and institutional forces, which highlight isomorphism to achieve legitimacy, are believed to show different strengths during different periods in the proliferation of the Internet and in the acceleration of internationalization. In the early phases, economic forces are more likely to motivate the adoption of the Internet, which in turn leads to accelerated internationalization; later, institutional forces may lead to Internet adoption. In the later phases, internationalization leads to increased problems of legitimacy, some of which may be addressed by adoption of the Internet in imitation of industry leaders. Furthermore, internationalization may impose economic reasons for adopting the Internet. In exploring the system from an industry perspective, we do not focus on dependent variables such as performance or survival, but rather we propose an endogenous system, where each of these strategies (Internet adoption and internationalization) may induce greater involvement in the other.

We believe we make two distinct contributions in this chapter. First, in highlighting the endogeneity of Internet adoption and internationalization, we explore the shift in dynamics of these strategies over time within an industry. Second, we add to previous research on Internet adoption by supplementing economic perspectives with institutional theory insights. Our model suggests predictions of what type of firms will be entrepreneurial leaders, when and why.



In the following sections of the chapter, literature in international entrepreneurship, electronic commerce, technology adoption cycles, and institutional theory is reviewed. A model follows that is focused on the relationship between the adoption of the Internet and accelerated internationalization. We then present a detailed analysis of the book-retailing industry in the United States, showing various stages of the process of Internet adoption and accelerated internationalization in the third section. In conclusion, we highlight the contribution of the chapter, ideas for future research, and the limitations.

## **THE LIABILITY OF FOREIGNNESS AND ACCELERATED INTERNATIONALIZATION**

Hymer (1960/1976) introduced the “liability of foreignness” concept as a way of explaining the disadvantages that multinational enterprises face in foreign countries compared to a country’s domestic firms. Since his introduction, it has been widely adopted by researchers working on theories of the multinational enterprise (Zaheer & Mosakowski, 1997), and it has become the fundamental assumption driving theories in that area of inquiry (Zaheer, 1995; Kostova & Zaheer, 1999). Empirical studies show evidence that the liability of foreignness does exist (Zaheer, 1995; DeYoung & Nolle, 1996; Hasan & Hunter, 1996; Zaheer & Mosakowski, 1997; Kostova & Zaheer, 1999; Miller & Parkhe, 2002; Mezas, 2002). Not only are foreign-owned firms found to be less profitable than host-country firms (Zaheer, 1995; DeYoung & Nolle, 1996; Hasan & Hunter, 1996; Zaheer & Mosakowski, 1997; Miller & Parkhe, 2002), but also they appear to be disadvantaged with respect to labor lawsuit judgments (Mezas, 2002).

Zaheer (1995) has usefully explained the liability of foreignness as follows:

In general, the liability of foreignness can arise from at least four, not necessarily independent, sources: (1) costs directly associated with spatial distance, such as the costs of travel, transportation, and coordination over distance and across time zones; (2) firm-specific costs based on a particular company’s unfamiliarity with and lack of roots in a local environment; (3) costs resulting from the host country environment, such as the lack of legitimacy of foreign firms and economic nationalism; (4) costs from the home country environment, such as the restrictions on high-technology sales to certain countries imposed on U.S.-owned MNEs (p. 343).

The conventional explanation of how multinational organizations overcome such disadvantages is that they have unusual or unique advantages of other types, such as global economies of scale, brands, knowledge, and

technologies that indigenous firms do not possess and can not independently acquire. Three long-term trends have made such advantages even more potent: (1) worldwide liberalization of international trade and investment regulation, (2) technological advances in transportation, communication, and computation, and (3) increasing similarities among markets in many foreign countries.

First, since World War II, international tariffs and investment restrictions have continually and significantly decreased ([United Nations Conference on Trade and Development \(UNCTAD\), 2003](#)). With the conclusion in 1994 of the Uruguay Round of negotiations on the General Agreement on Tariffs and Trade, the average tariff on industrial goods in developed countries fell below 4% ([GATT, 1994](#)). Since then, many countries have taken steps to open service industries to foreign participation, and developing countries have established policies designed to attract investment by foreign-based companies ([UNCTAD, 2003](#)).

Second, technological innovations have dramatically improved passenger and freight transportation, and communications. International air travel has become faster, cheaper, and ubiquitous over time. In Europe, rail transportation has experienced a similar change. The containerization of freight has made the international transportation of goods far less expensive than in the past. Continual reductions in the cost of digital technology, its continual improvement, and its constant miniaturization have made computers available throughout the world. These same developments have also made wired and wireless communication available in many locations that previously did not have telephones.

Third, these technological advances have made information about foreign countries more readily available to all, leading to increasing similarities in market demands. Communication between people located in foreign countries is now common. Transportation between disparate locations in the world is possible and affordable by increasing numbers of people. Thus, foreign cultures and foreign markets are not only easier to understand, but also have increasing similarities ([Hedlund & Kverneland, 1985](#)).

In summary, reduced regulation, advanced technology, and improved understanding have made the liability of foreignness a less formidable obstacle to the conduct of international business ([Zaheer & Mosakowski, 1997](#)). Multinational enterprises have fewer inhibitions. Although liabilities of foreignness certainly remain, even the smallest and newest of firms may engage in international business. Thus, we observe accelerated firm internationalization and it has existed for more than a decade ([Brokaw, 1990](#); [The Economist, 1992, 1993](#); [Mamis, 1989](#); [Gupta, 1989](#)).

## THE INTERNET AND E-BUSINESS

Since its invention by the U.S. Department of Defense in the 1960s, Internet technology progressed slowly and steadily over many years. Even in the early 1980s, the Internet remained in the domain of academics and the military. All that was changed, however, by the introduction of the World Wide Web and by the subsequent development of a browser at the University of Illinois in the early 1990s, which made the Internet widely available for business purposes. Compared with earlier technologies, such as the telegraph, sound recordings, and the telephone, the Internet offers something qualitatively new to individuals and organizations (Tapscott, 2001). With the support of broadband and cable, Internet technology allows inexpensive simultaneous real-time exchange of visual, oral, numerical, and textual messages, creating a much more powerful imitation of closeness than has heretofore been possible (Leamer & Storper, 2001).

Internet technology has successfully attracted much investment from businesses in many countries, and electronic transactions have greatly expanded around the world. By the beginning of the new century, approximately 80% of the companies in North America, 90% of the companies in Europe, and 78% of the companies in Asia had recognized the importance of the Internet and had begun to plan or had already implemented electronic business strategies (CSC, 2000). Online retail sales in the United States increased from \$28.2 billion in 2000 to \$55.0 billion in 2003 and were expected to exceed \$88 billion by 2005 (emarketer.com, 2004). Despite the collapse of optimism regarding electronic business investments that began in 2000, the Internet is clearly a critical part of business in the future. Currently, the key question is not whether to deploy Internet technology, but how and when to deploy it (Porter, 2001).

## VALUE CREATION AND EFFICIENCY

Accompanying its popularity in the business world, the new technology has also attracted attention from academic researchers exploring the Internet as a source of value creation (e.g., Amit & Zott, 2001; Bakos, 2001; Devinney, Latukefu, & Midgley, 2001; Lucking-Reiley & Spulber, 2001; Leamer & Storper, 2001; Barua, Ravindran, & Whinston, 1997). For example, a study of 59 American and European E-businesses reveals four unique dimensions

of value creation potential: efficiency, complementarities, lock-in, and novelty (Amit & Zott, 2001).

Nearly all of the existing research studies view the impact of Internet technology from an economics perspective. Value creation and efficiency are proposed as the major reasons of the diffusion of the technology (see Table 1 for a summary). The contribution of the Internet has been discussed at three levels (social level, firm level, and individual level). For society, the Internet offers a new intermediary connecting suppliers and customers (Lucking-Reiley & Spulber, 2001). According to the economics perspective, lack of effective price discrimination which reflects the different utilities a product may have for different people creates a deadweight loss to social welfare. It has been argued that the increased opportunities for price discrimination enabled by the Internet can thus increase social welfare (Bakos, 2001; Devinney et al., 2001). In addition, the Internet can contribute to the society by reducing information asymmetries between customers and suppliers (Amit & Zott, 2001), and consolidating demand and supply through organized exchanges (Lucking-Reiley & Spulber, 2001).

At the firm level, Internet technology can also benefit firms in multiple business activities (Amit & Zott, 2001; Barua et al., 1997; Dewan, Jing, & Seidmann, 2000; Leamer & Storper, 2001). With the assistance of the Internet, firms are able to make faster and more informed decisions, reduce

**Table 1.** Role of the Internet from the Economic Perspective.

Social Level	Firm Level	Individual Level
<ul style="list-style-type: none"> <li>• Reduce information asymmetries between buyers and sellers</li> <li>• Reduce deadweight loss</li> <li>• Consolidate demand and supply through organized exchange</li> <li>• Speed up transaction processing and order fulfillment</li> <li>• Introduce new market intermediaries</li> </ul>	<ul style="list-style-type: none"> <li>• Enable price discrimination</li> <li>• Enable bundling of complementary products and services</li> <li>• Increase product variety and customization</li> <li>• Enable faster and more informed decision making</li> <li>• Reduce the cost of procurement before, during and after the transaction</li> <li>• Gain efficiencies from automation of transactions</li> <li>• Reduce costs of collecting buyer preference information and managing multiple prices</li> <li>• Capture the attention of potential buyers and to develop new business relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Lower search costs for buyers and sellers</li> <li>• Enable global product and price comparisons</li> <li>• Allow individuals to benefit from scale economies through demand aggregation and bulk purchasing</li> <li>• Enable customers to customize products, services, or information to individual needs</li> </ul>

transaction cost through automation, and more efficiently target potential customers. These benefits should translate to better firm performance, and thus may motivate firm investments in Internet technology.

For individuals, the Internet facilitates a more efficient way to search for the information they want (Bakos, 2001; Devinney et al., 2001). Demand aggregation and bulk purchasing permit individuals to benefit from scale economies, and customization of products, services, or information is enabled (Amit & Zott, 2001).

## ISOMORPHISM, DIFFUSION OF INNOVATION, AND THE INTERNET

Value and efficiency, however, are not the only explanations for adoption of Internet in commercial transactions. Firms may adopt an innovation for symbolic purposes that have little to do with the actual efficiency of organizational operations (Tolbert & Zucker, 1983). Some business actions primarily serve to establish legitimacy and to avoid uncertainty. For example, conformity to the norms and social expectations of the institutional environment can improve an organization's survival chances significantly (Baum & Oliver, 1992). As the legitimacy of a practice increases, firms will find it easier to overcome resistance and join the trend (Guillen, 2002). Moreover, organizations tend to model themselves on other organizations when organizational technologies are poorly understood, when goals are ambiguous, or when the environment creates symbolic uncertainty (DiMaggio & Powell, 1983).

In their classic paper, DiMaggio and Powell (1983) introduced three types of forces that institutionalize behavior: coercive, mimetic, and normative isomorphism. Each of the institutional isomorphic processes can proceed in the absence of evidence that they improve organizational effectiveness or efficiency (DiMaggio & Powell, 1983). Coercive isomorphism stems from powerful political institutions, laws, and widely held social expectations. Mimetic isomorphism is mainly the result of uncertainty. Past studies have revealed benefits of the mimetic strategies, such as overcoming the liability of foreignness by learning from the experiences of other firms (Guillen, 2002) and increasing the legitimacy of organizations from the perspective of regulators and the general public (Deephouse, 1996). Trade associations, director linkages, and other networks can have an impact upon firm

practices through normative isomorphism (DiMaggio & Powell, 1983; Deephouse, 1996).

Within the context of institutional theory, a stream of research focuses on determining which types of organizations will be the first to adopt innovations. Compared with large established firms, small firms, especially those with a stronger entrepreneurial orientation are more likely to actively explore innovative ideas. Past research has shown that new and small firms have been responsible for 55% of the innovations in 362 different industries and 95% of all radical innovations (Daft, 2000). The findings are consistent with institutional theory, which argues that such firms are more peripheral and, thus, less embedded in their institutional environments, making them more likely to develop new practices (Leblebici, Salancik, Gopay, & King, 1991; Greenwood & Hinings, 1996). While these entrepreneurial firms are important to the development of new practices, established firms, especially those most prestigious in their industries are critical for the diffusion of these innovations. In a context of a competitive pattern of commitment, radical change would not be the likely outcome, unless those in positions of privilege and power were in favor of the proposed change (Greenwood & Hinings, 1996; Sherer & Lee, 2002). As a result, only a small number of firms with prestige and power are likely to adopt innovations early, after which the new practices are legitimized and perhaps necessary for later adopters.

The above arguments of institutional theory are consistent with the theory of innovation diffusion (Rogers, 1983, 1995), which argues that firms have quite varied attitudes toward innovation. While some firms are more innovative and more likely to accept new ideas, other firms are more reluctant and suspicious of innovations. According to Rogers (1983, 1995), there are five types of adopters in the process of diffusion: innovators, early adopters, early majority, late majority, and laggards.

## **INTEGRATING INSTITUTIONAL AND ECONOMIC PERSPECTIVES**

While the institutional perspective and the economic perspective are different, they are not incompatible. Tolbert and Zucker's (1983) study of civil service reforms showed that during periods when reforms were not mandated by state governments improvements in internal effectiveness or efficiency were most often associated with change. Over time, however, as the

reforms became more widespread, normative institutional factors provided a better explanation for civil service reforms. More recently, [Sherer and Lee \(2002\)](#) did a similar study of law firms' human resource practices, and noted that the early majority of law firms that adopted innovations were more likely to be large, well-established firms that were able to use their legitimacy to effect the economically necessary changes. The late majority followed the new practices as indicated by their industry. These studies ([Tolbert & Zucker, 1983](#); [Sherer & Lee, 2002](#)) suggest that, while earlier adopters of an innovation may be motivated by pressures for effectiveness and efficiency, later adopters are driven to conform to what becomes regarded as best, or institutionalized, practice. We believe this argument also fits the diffusion of Internet technology in the business world, and in our model we seek to use Rogers' more subtle distinction between early adoption and early majority adoption. This distinction allows us to capture the role of entrepreneurial firms in creating change in industries and markets.

In the following section, a model of accelerated internationalization is proposed that considers the diffusion of Internet technology and its relationship to internationalization. We argue that there is a reciprocal relationship between the adoption of the Internet for business purposes and the process of firm internationalization; in other words, we propose an endogenous system where the initial primary causal relation from Internet adoption to internationalization over time is supplemented by a reverse causal relation from internationalization to Internet adoption. This reinforcing cycle broadens Internet adoption and accelerates internationalization. Therefore, a multi-period diffusion of Internet technology and accelerated internationalization occurs.

## **A MODEL OF INTERNET ADOPTION AND ACCELERATED INTERNATIONALIZATION**

Based on the above analysis, a model of accelerated internationalization linked with Internet adoption is proposed in this section ([Fig. 1](#)). We believe that the adoption of the Internet over the last decade by more organizations around the world greatly contributed to the recent phenomenon of accelerated firm internationalization, which is especially noticeable among new ventures. At the same time, accelerated internationalization also increased the need for organizations to more actively pursue the application of Internet technologies, which in turn further enhanced organizations' ability to

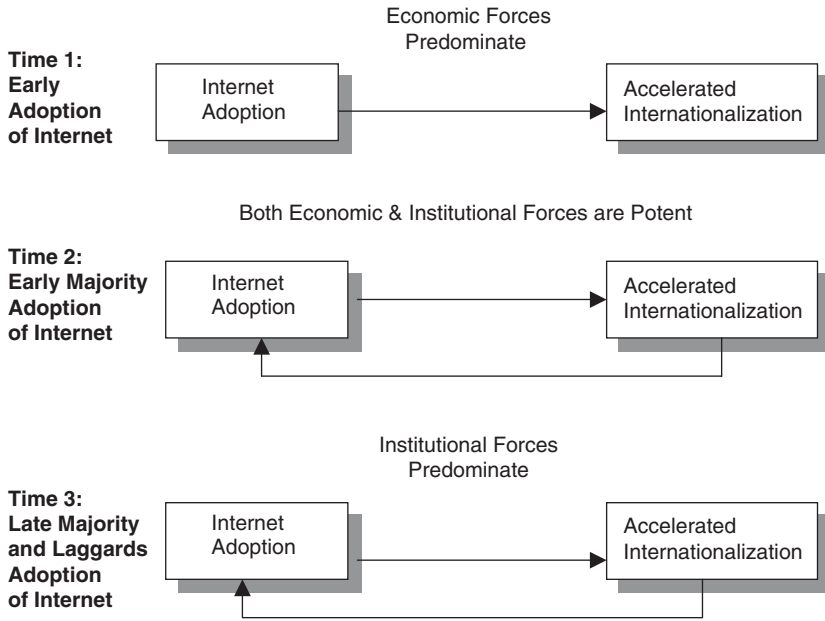


Fig. 1. Economic and Institutional Forces on Internet Adoption and Accelerated Internationalization.

explore foreign markets. As depicted below, economic forces are strongest among early adopters, which are often small entrepreneurial or new ventures, while institutional forces emerge among the early majority of adopters and predominate among the late majority and laggards. (We do not include Rogers’ (1983, 1995) category of innovators in this model, as they are primarily motivated by the love of technology, which falls outside of the scope of our theoretical argument.)

Fig. 1 and its associated theoretical reasoning imply several testable propositions that we delineate below.

### PROPOSITIONS CONCERNING EARLY INTERNET ADOPTION: ECONOMIC FORCES PREDOMINATE

It was noted earlier that adoption of the Internet for business purposes can provide increased effectiveness and efficiency and, therefore, economic



benefits (Amit & Zott, 2001; Barua et al., 1997; Devinney et al., 2001; Dewan et al., 2000; Leamer & Storper, 2001; Lucking-Reiley & Spulber, 2001). However, in the early and middle 1990s, as Internet communication slowly became available to greater numbers of people, routines for using the Internet and those economic benefits were not clear to everyone. Long institutionalized methods for distant communication (e.g., telephones) and business practices predominated and appeared satisfactory to many. The fax machine was relatively new at the time, and norms for using the Internet in business were just emerging. Thus, during that period, firms that used the Internet for business purposes were deviating from common industry practices, were therefore regarded with some skepticism, risked some loss of legitimacy, and had to be focused primarily on the economic benefits they expected (or hoped for). Such reasoning is consistent with the usual expectation that early adopters of organizational innovations are motivated primarily by efficiency reasons (DiMaggio & Powell, 1983; Sherer & Lee, 2002; Tolbert & Zucker, 1983). One example of this careful, economically oriented approach to Internet adoption can be seen in the earliest online booksellers. Powell Books, located in Portland Oregon, sold technical books through the Internet for 3 years before making the investment to put their full catalog on the web. Subsequently, sales grew 10–20% per month.

**Proposition 1.** Early adopters of the Internet for business purposes were motivated predominately by economic forces.

Clearly, not all business organizations saw advantage in the Internet. Early on, firms that were less tied to traditional methods of doing business, less comfortably established in their communities, and more vulnerable to attack by industry leaders were the ones that adopted the Internet as a commercial innovation. This is consistent with the institutional theory prediction that small and new organizations are more likely to deviate from institutional norms than large, established firms (Greenwood & Hinings, 1996; Leblebici et al., 1991). As small and new organizations, they had less to lose and they observed a possible opportunity to gain an advantage over established firms. Established organizations initially liked the status quo because they were advantaged by it. Therefore, they could afford to ignore the Internet and to maintain institutionalized routines.

It may also be observed that small and new organizations tend to benefit more from innovation adoption than large, established firms. The emergence of the Internet technology offered small and new organizations an opportunity to create new industry standards that were good for their survival and growth. Thus we observe among the American booksellers that

only small firms (e.g., Powell Books starting in 1993) and new ventures (e.g., Amazon.com starting in 1995) were major players in the earliest phases of Internet book sales.

**Proposition 2.** Early adopters of the Internet for business purposes were predominately small and new ventures.

Once they were using the Internet, these early adopters were automatically connected to an international network. It is an inescapable corollary of Internet use. Anyone on the planet with an Internet connection could contact them. Thus, even the small Clark and Stone Book Company of Spokane Washington received inquiries from multiple countries during its first day on the World Wide Web in 1994.

In a variety of ways, the Internet makes foreign market expansion and exploitation more effective and efficient, and it helps organizations overcome the liability of foreignness. Even without experience in a foreign market, a company can obtain through the Internet some information about foreign customers with very little investment. Thus, the technology helps organizations – especially those with few resources – spot foreign market opportunities and plan appropriate strategies for their exploitation. It is even possible for a new venture to be “Born Global” by having a presence on the Internet (Katz et al., 2003; Jarvenpaa & Yayavaram, 2002), as was the case with Amazon.com. Therefore, early adopters of the Internet were able to beneficially internationalize earlier in their life cycles than older firms.

**Proposition 3.** Early adopters of the Internet for business purposes were more likely to be engaged in accelerated internationalization than later adopters.

### **PROPOSITIONS CONCERNING LATER INTERNET ADOPTION: INSTITUTIONAL FORCES PREDOMINATE**

As Internet adoption spread among businesses and its benefits were demonstrated, firms that had not yet adopted the new technology came under increasing pressure to change. This institutional pressure originated from customers, partners, owners, professional organizations, governments, and the public. However, actions that were efficient for some individual organizations were not efficient for all, and some firms were reluctant to adopt the

new Internet technology. However, institutional forces, such as the desire to maintain certain business relationships, influenced them to accept what had been suggested by powerful partners. Such decisions were sometimes made without reference to efficiency. Moreover, professional associations, such as those in information technology, may influence organizations to embrace new technology standards before there is a comprehensive understanding of their effects. That is reflected in the following quotation:

Many retailers have launched Web stores only to find e-commerce operations costly relative to ROI, and thus have subcontracted to third-party solution providers... (Kellee, 2001).

One solution provided in 1999 by the American Booksellers Association invited independent stores who were association members to list and sell their inventory through booksense.com. These stores felt the pressure to develop online sales, yet the cost of building up the website would have been uneconomic if they acted on their own. In this case, institutional forces were so strong that an economic solution had to be found.

**Proposition 4.** As time passed, adopters of the Internet for business purposes were increasingly motivated by institutional forces until they predominated.

Over time, some benefits of the Internet were demonstrated among the upstarts, and increasingly customers wanted the firms they dealt with to be accessible on the Internet. So firms that were older and better established in their communities began to engage in electronic commerce. Initially, adopting the Internet would have cost these firms legitimacy in their industry and markets and may have threatened their survival. Over time, however, as Internet adoption spread, the established firms' survival was threatened if they did not adopt the Internet. The early majority adopters of the Internet waited until legitimacy costs were minimized; the late majority of adopters experienced a reversal in legitimacy costs, where adoption was necessary to retain legitimacy in the changing environment. Thus, Barnes & Noble felt considerable pressure from Amazon.com's fame and competition for sales, and created their own online store in early 1997, despite initial doubts about profitable returns. Over time, more and more booksellers adopted the Internet. Indeed, by 1997, Publisher's Weekly reported 1,000 booksellers had an online presence.

**Proposition 5.** As time passed, adopters of the Internet for business purposes were increasingly established firms.

Not only can use of the Internet accelerate the internationalization process of organizations, but the process of internationalization can accelerate the adoption of Internet technology within organizations. Timely information and communication among the various national units of a multinational enterprise are important and can clearly be aided by use of the Internet. More importantly, international customers have come to expect the convenience and timeliness of Internet-enabled transactions. Thus, there may be a reciprocal relationship between the adoption of the Internet and firm internationalization. For new ventures and small firms, we suspect that the Internet came first, but during the mid-to late 1990s, as the Internet was commercialized, some firms that were already international undoubtedly found both economic and institutional reasons for adopting the Internet. An interesting example of this trend can be seen in the antique and rare booksellers who already had international markets and who, following the example of mainstream trade booksellers, have increasingly relied on the Internet to buy and sell books.

**Proposition 6.** As time passed, more internationalized businesses adopted the Internet for business purposes.

## **INTERNET ADOPTION AND ACCELERATED INTERNATIONALIZATION IN THE BOOK-RETAILING INDUSTRY**

The processes described above are consistent with prior studies showing early adopters of innovations accept them for different reasons than later adopters (e.g., DiMaggio & Powell, 1983; Tolbert & Zucker, 1983; Sherer & Lee, 2002). Later adopters tend to be more concerned with legitimacy than with efficiency. We have extended these ideas into the arena of new ventures and internationalization.

As indicated by the examples we have provided above, the authors explored these ideas in the book-retailing industry located in the United States. The United States book-retailing industry was chosen because the Internet has had a significant impact upon the industry and it has attracted wide public attention. In addition, some high-profile online retailers, such as Amazon.com, operated in the industry. The competition between these online retailers and traditional brick-and-mortar book retailers, such as Barnes & Noble, were widely reported in the media, offering more detailed information about the impact of the Internet and its diffusion than could be

found in many other industries. Thus, it was believed sufficient public information would be available for study. Of course, many business functions are potentially aided by Internet technology, for example, contracting between book publishers and wholesalers, reaching customers, and managing storage. However, an analysis of the evolution of all the functions would obscure the theoretical focus of this chapter. Therefore, we focused on the diffusion of retail sales functions enabled by the Internet by searching the ABI/INFORM and Lexus-Nexus databases for articles on book-retailing and the Internet for the period 1992 through 2002.

In the late 1980s, the U.S. book-retailing industry experienced consolidation. Many small firms were driven out of business. However, the emergence of the Internet offered a second chance from small and new book retailers. We found evidence concerning all three time periods of Internet adoption and internationalization in our model shown by Fig. 1. Table 2 divides the institutional forces of Time 3 in the model into coercive, normative, and mimetic (DiMaggio & Powell, 1983), providing a more nuanced perspective on the institutional forces at work in the industry. The largest part of Table 2 lists key events in the book-retailing industry relevant to each period. It will be noted that evidence is least clear for the proposed reciprocal relationship between Internet adoption and internationalization.

#### *Time 1: 1993–1996*

The emergence of the Internet in the beginning of 1990s provided book retailers with a new channel to access more customers. Despite all the potential offered by the Internet, not all book retailers, especially the larger established ones, paid serious attention to the opportunities at that time. As predicted by institutional theory, small and sometimes new entrepreneurial firms were the innovators of Internet technology in the industry. For example, Book Stacks Unlimited, Inc., became available on the Internet as early as 1993. The now famous Amazon.com was launched in July 1995. Feeling the competition from Amazon, Powell's City of Books, located in Portland, Oregon, moved aggressively onto the Internet and increased monthly sales by 10–20% per month in 1996 (Mann, 1997). Our evidence indicates that reason these firms adopted the Internet was mainly for economic efficiency and value creation purposes.

Evidence shows that the online position of these stores made these organizations more easily accessible to international markets. Clarke & Stone Book Co., a small bookstore in Spokane, Washington, widened its audience

**Table 2.** Periods of Internet Adoption in the Book-Retailing Industry.

Times	Events and Reports
Time 1	<ul style="list-style-type: none"> <li>• In 1993, a man in England found a book he wanted on Powell's Technical Books' ftp site in Portland, Oregon and e-mailed an inquiry. Powell's priced the book plus shipping to England at 42% less than was quoted by the man's local bookstore for an international order. Thus, Powell's fulfilled its first foreign order originating on the Internet. By 1994, two employees manage Powell's City of Books' Internet orders (<a href="http://www.powells.com">www.powells.com</a>).</li> <li>• Book Stacks Unlimited, Inc., was accessible via the Internet in 1993 (<a href="#">Link-up</a>, 1993).</li> <li>• Clarke &amp; Stone Book Co., hooked a personal computer in their store onto the Internet in 1994. During the store's first day, it received inquiries from Internet users in Italy, Brazil, Denmark, and Portugal. (<a href="#">Ripley, Journal of Business</a>, 1994).</li> <li>• Jeffrey Bezos launched Amazon.com in July 1995, and its existence is said to be proof that the Internet really works (<a href="#">Willis, Forbes</a>, 1998).</li> <li>• About one-third of Amazon.com's sales were international (<a href="#">Essick, Computerworld</a>, 1997).</li> <li>• Powell's City of Books' complete catalog was moved online by 1996, and sales grew by 10–20% a month (<a href="#">Mann</a>, 1997).</li> </ul>
Time 2	<ul style="list-style-type: none"> <li>• In January 1997, Barnes &amp; Noble signed an exclusive book-retailing arrangement with America Online, and in May, the retail chain opened its Web storefront to the public (<a href="#">Conhaim, Link-up</a>, 1997).</li> <li>• Borders Group Inc. launched <a href="http://www.borders.com">www.borders.com</a> on May 7 and began selling books, music, and videos (<a href="#">Reece, Billboard</a>, 1998).</li> <li>• According to <i>Publishers Weekly</i>, there were over 1,000 booksellers worldwide with web sites in 1997 (<a href="#">Conhaim, Link-up</a>, 1997).</li> <li>• According to an annual survey of retail industry IT executives conducted by computer sciences corp. and retail info systems news, 20% of retail companies offered online shopping in 1997, up from 11% in 1996. The leading category in cyber-retailing was books and music, with 36% of those retailers selling online at the time (<a href="#">Wilder, Informationweek</a>, 1997).</li> </ul>
Time 3 Coercive Institutions	<ul style="list-style-type: none"> <li>• In October 1998, the United States Congress approves the Internet Tax Freedom Act as part of the 1998 Omnibus Consolidated Appropriations Bill (<a href="#">Prettie, Intermedia</a>, 2002).</li> <li>• President George W. Bush signed into law H.R. 1552, the Internet Tax Non-Discrimination Act, on November 28, 2001. The legislation extends the "Sense of the Congress" resolution that there should be no federal taxes on Internet access or electronic commerce, and that the United States should work aggressively through the European Union and the World Trade Organization to keep electronic commerce free from tariffs and discriminatory taxes (<a href="#">Computer and Internet Lawyer</a>, 2002).</li> </ul>

**Table 2.** (Continued)

Times	Events and Reports
Time 3 Normative Institutions	<ul style="list-style-type: none"> <li>• In 1995, the American Booksellers Association had created BookWeb, a consumer oriented web site devoted to book-related information, but did not sell through the site (<i>Publishers Weekly</i>, 1995). In 1999, the Association launched Booksense.com, the online selling service it developed for its independent bookstore members (<i>Gwinn, Seattle Times</i>, 1999).</li> </ul>
Stage 3 Mimetic Institutions	<ul style="list-style-type: none"> <li>• Germany's Bertelsmann launched bol.com their online retail store in 1999, and by 2000 had bought and built online subsidiaries in several countries including Sweden and Japan (Annual reports).</li> <li>• By 2000, Amazon.com was aggressively pursuing international business and claimed customers in more than 150 countries (<i>McKegey, Advertising Age</i>, 2000).</li> <li>• Japanese bookstore chain Maruzen Co. invested in online bookseller Book 1 Inc. in a move to expand its online retailing business (<i>Jiji Press English News Service</i>, 2001).</li> <li>• Australians spent more than A\$120 m in 2001 ordering books online from U.S. web sites run by Amazon and by Barnes and Noble (<i>Internet Business News</i>, 2002).</li> <li>• Amazon.com significantly gained book-retailing market share in the U.K., as it grew sales more than 60 percent in the U.S." (<i>Armstrong, Knight Ridder Tribune Business News</i>, 2002).</li> </ul>

when it ventured onto the Internet in 1994. During the store's first day on the World Wide Web, it received inquiries from customers in Italy, Brazil, Denmark, and Portugal (*Ripley, Journal of Business*, 1994). Amazon.com also counted about one-third of its sales from markets outside its headquarters in the United States.

#### *Time 2: 1997–1998*

Faced with new competition from online book retailers, established brick-and-mortar booksellers had to reevaluate the role of the Internet for their businesses and reconsider their approach to online sales. The largest two book retailers in the United States, Barnes & Noble and Borders Group Inc. opened their own online stores in May, 1997 and May 1998, respectively. Books-A-Million, the third largest book retailer in the United States started to consider online sales in 1996, but did not implement it until 1999. Besides these large booksellers, more medium and small book retailers around the world also increasingly explored Internet technology, apparently to achieve

greater efficiency. According to *Informationweek*, 36% of U.S. book and music retailers sold directly online in 1997. At the same time, over 1,000 booksellers worldwide were operating with a website (Conhaim, *Link-up*, 1997).

The adoption of the Internet by the book retailers greatly contributed to the internationalization process of the firms in the United States. Some firms, such as Amazon.com, deliberately built or bought localized websites for international markets during this period. With the help of the Internet, these firms not only entered foreign markets very early in their life cycles, but also accelerated their pace of internationalization.

To summarize the 1997–1998 period, book retailers of all sizes and ages began adopting the Internet and there is evidence that some of these firms were aggressively internationalizing. Such widespread change implies that some firms, observing the success of the early adopters, were motivated by a drive for efficiency and a desire to improve their competitive position, while other firms, motivated by institutional forces, simply copied without much analysis what many other firms in their communities and industries were doing to ensure they did not appear to be old-fashioned. The evidence we have is not clear on whether firms that had been international prior to this period adopted the Internet, in particular, to aid in the management of their foreign subsidiaries.

### *Time 3: 1999–2002*

We found plenty of evidence that during Time 3 institutional forces were strong. Table 2 demonstrates all three of the generally accepted types of isomorphic influences (DiMaggio & Powell, 1983). Coercive isomorphic influences were clear in the passage of the Internet Tax Freedom Act by the United States Congress in October 1998. The act imposed a 3-year moratorium on federal taxes levied on Internet transactions. The moratorium clearly put traditional brick-and-mortar bookstores at a significant tax disadvantage if they did not have an Internet sales channel. In 2001, Congress passed and President Bush signed an extension to the moratorium. At this writing in Spring 2004, Congress is considering an additional extension.

Normative institutional pressure was exerted by a professional association of booksellers. Although the American Booksellers Association built a website for book-related information in 1995, it did not explore online sales until 1999 with the launch of Booksense.com to facilitate online sales of independent retailers. The emergence of the online service offered by the



association pushed its members to quickly adopt online sales. In addition, the interaction of the members of the association also seemed to encourage the managers of member companies to think alike and to apply similar strategies.

Direct evidence was not found for mimetic isomorphism during Time 3. It is possible that managers are reluctant to say that they simply copy the strategies of other firms. From the growing number of adopters of the Internet highlighted in Table 2, however, we can surmise that book retailers were more likely to imitate each other than ever before. Firms no longer needed to worry about the risks of adopting of an innovation; online sales had become an established practice.

Accompanying the popularity of online sales practices in the book-retailing industry, the phenomenon of accelerated internationalization also became more evident. Amazon.com bought and built subsidiaries in five foreign markets, Canada, United Kingdom, Japan, Germany, and France. Such rapid and comprehensive international expansion was achieved within just 7 years of launching the company. As another example, Bertelsmann's bol.com AG of Germany started to sell books on the Internet in Japan in 2000, just 2 years after its birth in Germany.

In summary, the findings of our exploration generally support our arguments that both economic forces and institutional forces can influence organizations' adoption of the Internet, and that adoption accompanies the phenomenon of the accelerated internationalization. While efficiency forces were significant at the beginning of the adoption of the innovation, institutional forces seemed to have a greater impact during the later periods of Internet diffusion. Also, the international successes of earlier adopters created a context in which later adopters made their Internet adoption decisions.

## CONCLUSION

This chapter focuses on the relationship between the phenomenon of accelerated internationalization and the diffusion of Internet technology. There are three contributions of the chapter. First, the chapter explores the influence of institutional forces upon the adoption of the Internet, which has been largely neglected in past research. While economic forces do make organizations adopt the Internet, it is not the only, and sometimes not the most important force for organizational decisions. Isomorphic processes also drive the diffusion of Internet technology. We hypothesize that the

strength of the influence of the two forces changes through various periods of diffusion. While at the early stages, efficiency factors are the major force for Internet adoption; institutional forces tend to have a greater impact upon organizations at the later stages of diffusion.

Second, the chapter recognizes the reciprocal relationship between the diffusion of Internet technology and the phenomenon of accelerated internationalization. Not only does the adoption of the Internet make it easier for organizations to explore the foreign markets, but also the internationalization process puts higher demands on organizations to implement Internet technology. The forces that lead from internationalization to Internet adoption are both economic and institutional. First, in terms of the costs of organizing international transactions, the spread of the Internet around the globe has allowed firms to stop using more costly or time consuming means, such as telephone, fax, and telex. Second, in terms of legitimacy in new markets, companies are expected to use the Internet and to have a web presence. For example, some transactions with smaller firms are arranged through third-party web sites and Internet marketplaces. As knowledge of the Internet's possibilities became better known, economic and institutional forces converged, and both accelerated internationalization and Internet adoption became increasingly concurrent.

Third, the authors explored evidence for such a model of Internet diffusion in the book-retailing industry, and the findings offered some support for the arguments highlighted in the chapter. Evidence shows that there is an expected pattern in the diffusion of Internet technology in the book-retailing industry involving economic and institutional forces and that the adoption of the Internet did help book retailers explore foreign markets at an accelerated rate. We were less able to identify concrete examples of how accelerated internationalization led to increasing use of Internet technologies, except possibly in the use of multilingual web sites and in the location of Internet servers in foreign countries.

One limitation of the chapter is that only the book-retailing industry was investigated for the study. It is possible that other industries could show contradictory evidence. For example, in certain industries, some large established firms could be the pioneering innovators of Internet technology, instead of small and new entrepreneurial organizations. Such a difference, if found, might be caused by the initial institutional environment, the competitive conditions, the characteristics of the industry, or the characteristics of the organizations in the industry. In the future, studies are needed to explore the differences between industries with respect to the issues raised in this chapter.

Another limitation of the chapter is that only secondary data were gathered for this exploratory study. Such data do not necessarily reveal all the information needed to completely observe the processes and constructs described in our model. For example, few firms will frankly admit to the public media, which served as the source of our data, that they do not want to adopt the Internet but they have no choice and feel forced. Primary data gathered through field interviews and archival data should be analyzed in the future to draw a more accurate picture of the process of the diffusion.

Despite the limitations of the chapter, we suspect that our model of the accelerated firm internationalization could be generalized across at least some industries. Our findings are not inconsistent with studies of other diffusions of innovation. In the future, empirical studies may be conducted to further develop the propositions raised in the chapter and to establish empirical support for the model. An in-depth study of a single industry might be very illuminating, particularly if both retailing and business-to-business relations could be examined in the same industry throughout the value chain. The challenge for this type of study would be to identify an industry that has excellent secondary data and possible access to primary data. This requirement could be particularly challenging in studying the actions of small and privately owned firms who are less likely to have primary data available. Other studies could address cross-industry comparisons, to explore what contingencies in the industry structure or institutional environment could affect the speed of Internet adoption and internationalization, and to confirm whether these two phenomena are interdependent.

### *Implications for Practitioners*

Although as researchers we must be careful in drawing conclusions from this study, nonetheless the chapter raises some interesting questions for practitioners. First, we raise the question of when and how can decision makers balance the requirements of legitimacy and efficiency when making the decision to adopt an innovation such as the Internet. Research suggests that both are required for the survival of the firm, yet it seems the answer may be quite different for small and new firms, versus established and large firms. Consciously addressing both these issues may help mitigate the risks inherent in adopting an innovation.

Second, the relationship between an Internet presence and accelerated internationalization suggests that firms need to be prepared for unanticipated consequences – and opportunities. An Internet presence may pull a

company into developing new markets overseas, but the desire to develop an international business will necessitate an Internet strategy beyond a simple web site. In the latter case, for example, the firm should pre-emptively evaluate the Internet norms of targeted international customers so those requirements can be met in a timely and effective manner.

Third, entrepreneurial early adopters can never be complacent about their leading edge in adopting an innovation such as the Internet. As soon as the early adopters have demonstrated valuable results, they can expect large firms to follow their lead, bringing with them a level of economic resources and legitimacy that could lead to greater success than the early adopters enjoyed. This implies that small and new firms must be able to maintain an innovation edge or establish a strong brand identity in the new space (such as Amazon achieved). Keeping the firms' innovation successes quiet may give a greater window of opportunity before competitors notice. From the alternative viewpoint, larger firms are wise to watch and evaluate the innovations adopted by small and new firms in their industry. If the results are promising, they can use their established legitimacy to leverage change in the industry. Of course, an established small firm may decide that waiting until change is 'forced' by isomorphic forces may be a less risky strategy.

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# NEW VENTURE GROWTH IN INTERNATIONAL MARKETS: THE ROLE OF STRATEGIC ADAPTATION AND NETWORKING CAPABILITIES

Stephanie A. Fernhaber and Patricia P. McDougall

## INTRODUCTION

International new ventures have been argued to seek foreign markets from inception in response to the external environment and/or motivations internal to the firm. For example, a new venture that exists in an industry that is more globally integrated is more likely to have a need to internationalize in order to remain competitive (Shrader, Oviatt, & McDougall, 2000). Similarly, those new ventures that have limited domestic growth due to the size of their home country may look elsewhere in order to gain a sufficient level of sales to survive (Zahra & George, 2002). Some of the many firm-specific motivations to internationalize might include the desire to fully exploit a unique product (Burgel & Murray, 2000; Oviatt & McDougall, 1994, 1995), capitalize on the learning advantage of newness (Autio, Sapienza, & Almeida, 2000) or take advantage of networking opportunities (Reuber & Fischer, 1997).

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Regardless of the motivation to pursue international markets, a new venture must be able to develop an adequate set of firm-specific capabilities in order to survive and grow internationally. These capabilities must first address the limited resources and lack of legitimacy typically associated with new ventures. In addition, the capabilities must allow the new venture to overcome the constraints related to entering an international market. Otherwise referred to as the liability of foreignness, such constraints might include transaction costs related to spatial distance as well as the unfamiliarity and lack of legitimacy within the host country context (Zaheer, 1995). However, research to date has not addressed how the development and reliance on a key set of capabilities will indeed contribute to new venture growth in international markets (McDougall & Oviatt, *in press*; Zahra & George, 2002). Gaining additional insight into the new venture internationalization process is imperative given the suggested benefits relating to performance, technological learning, and survival (e.g. Lu & Beamish, 2001; Zahra, Ireland, & Hitt, 2000).

To identify capabilities important to new venture growth in international markets, we began with a review of the literature on capabilities and on new venture growth. We then considered the identified capabilities within the international new venture context. This resulted in the recognized criticality of both strategic adaptation and networking capabilities. First, being able to continuously maintain an alignment of the new venture's strategy with its environment is clearly important (Duncan, 1972; e.g. Nicholls-Nixon, Cooper, & Woo, 2000). As new ventures are essentially experiments with a working set of assumptions, the strategy and behaviors of the new venture need to adapt to the unexpected realities and evolving challenges confronted in the environment in order to grow (McGrath & MacMillan, 1995). Second, the ability of a new venture to develop and utilize networking capabilities is also critical to growth. Networks enable the acquisition of needed resources, exploitation of informational benefits, and the increased ability to execute their strategies (Johannisson, 2000). In addition, networks can offset the lack of proven track record and limited legitimacy associated with being new (Shane & Cable, 2002).

The research objective of this chapter is to build on the international new venture literature and explore in further detail how strategic adaptation and networking capabilities contribute specifically to new venture growth in international markets. We argue that new ventures can minimize the negative impact of the liability of foreignness through the reliance on networking and the ability to adapt to changes in the environment. The opportunities and information provided through extensive networking will

not only influence international growth directly, but can also strengthen the relationship between a new venture's strategic adaptation capabilities and growth in international markets.

This chapter is structured as follows: in the first section, we review the literature on the role of key capabilities in the determination of new venture growth. Specific attention is paid to both strategic adaptation and networking capabilities. The second section consists of the application of these capabilities to new venture growth in the international context, in which several propositions are offered. Lastly, we provide a discussion of the implications and directions for future research.

## **CAPABILITIES AND NEW VENTURE GROWTH**

It is widely acknowledged that new ventures face a higher likelihood of failure than existing firms. Otherwise referred to as the liability of newness, [Stinchcombe \(1965\)](#) offers several reasons why organizations face such challenges during their early years of existence. First, new organizations involve the creation of new roles that need to be developed and learned. Second, the process of creating new roles can result in costs to the new organization related to time, worry, conflict, and temporary inefficiencies. Third, there is a heavy reliance by new organizations on social relationships with strangers. The limited existence of new organizations and the ability or inability to develop a standard of trust both clearly play a role in the success of such interactions. Last, unlike existing organizations, new organizations do not yet have a set of stable links to a customer base that uses their organizational services.

[Hannan and Freeman \(1984\)](#) offer an alternative and complimentary reason why new ventures face such a liability of newness. Essentially, the authors argue organizations with high inertia are more favorably selected within populations of organizations. This is because organizations with high inertia exhibit higher levels of reliability and accountability, which are both argued to be key competencies for organizational survival. As the level of reliability and accountability, and thus inertia, are argued to increase with both the age and size of the firm, new ventures are more likely to be selected against.

Given the lack of legitimacy and constraints associated with the liability of newness, how then are new ventures able to develop a competitive advantage to enable growth in the marketplace? According to resource-based theory, firms are seen as a bundle of tangible and intangible resources. The

extent that these resources are inimitable, rare, valuable, and nonsubstitutable determines their competitive advantage (Barney, 1991). As research surrounding the resource-based view has evolved, it has become apparent that the theory pertained not only to a firm's resources, but also its capabilities (Hoopes, Madsen, & Walker, 2003; Makadok, 2001). Makadok argues that a resource, tangible or intangible, is observable and can be valued and traded. An example of a firm's resources that might constitute a competitive advantage could include a patent, license, or building. In contrast, a capability is not observable, thus intangible, and cannot be valued. A capability is a high-level routine embedded within an organization that enables distinct activities to be performed (Teece, Pisano, & Shuen, 1997; Winter, 2003). Some well-known examples include innovation at Microsoft or customer service at Southwest Airlines. Capabilities become advantageous to the firm only after a threshold level of practice and expertise has been reached. Owing to the level of embeddedness required, a capability is therefore likely to be firm-specific and nontransferable. This results in a greater competitive advantage for the firm:

A [business] model based on one or two strengths becomes obsolete as success begets imitation. For instance, competitors can easily knock off an entrepreneur's innovative product. But they will find it much more difficult to replicate systems that incorporate many distinct and complementary capabilities (Bhide, 1996, p. 125).

As new ventures are less able to compete with existing firms based strictly on their stock of tangible firm resources, we suggest it is beneficial to consider the role of capabilities in the growth of new ventures due to the ability of capabilities to reflect a new venture's competitive advantage being created and exploited over time.

The specific capabilities required to achieve high levels of new venture growth tend to vary by the industry and competitive environment that a new venture faces. For example, technological capabilities are more critical to growth in high-tech industries than low-tech industries (Covin, Slevin, & Covin, 1990). Similarly, production-related capabilities are more vital to manufacturing firms than service or retail firms (Boter & Homquist, 1996). However, in considering the capabilities that are likely to contribute universally to new venture growth, the development of both strategic adaptation and networking capabilities stand out as being important. This becomes evident when considering the typical types of challenges and experiences that all entrepreneurs encounter in the new venture creation process due to their newness and typically small size, regardless of their relative industry or competitive environment. In the next sections, we go on

to explain how strategic adaptation and networking capabilities not only enable new ventures to overcome the constraints associated with the liability of newness, but also achieve higher levels of growth.

### *Strategic Adaptation Capabilities*

All business ventures stem from an initial idea of a business concept and a set of related assumptions put forth by an entrepreneur (Block & MacMillan, 1985). These assumptions relate to factors both internal and external to the venture. For example, internal assumptions might include the costs it takes to build the product, the type of employees to hire, necessary resources, and the time it will take to reach certain milestones. A few of the many external assumptions are related to the projected buyer demand, the response of competitors, relationships to be developed with suppliers, or the current economic conditions. Together, these assumptions must be perceived as representing a favorable opportunity for the entrepreneur to move ahead and pursue the business concept (Shane & Venkataraman, 2000).

The problem that many entrepreneurs encounter as they begin to pursue their initial business concept is that many of their original assumptions do not equal reality. Indeed, McGrath and MacMillan (1995, p. 4) characterize new ventures as having a “high ratio of assumption to knowledge.” An entrepreneur may find out it costs significantly more than expected to build their initial prototype or that it is going to take additional resources to produce. Likewise, the set of target customers might not respond as quickly as expected, or, if they do, certain competitors that already exist in the marketplace might attempt to imitate the entrepreneur’s business idea. As noted by Nicholls-Nixon et al. (2000, p. 494), entrepreneurs need to find a way to adapt to these unexpected realities as part of the normal process to position their business concept:

...no matter how much attention to detail is involved in the preparation of the business plan, the actual formation and development of the business will involve considerable adjustment to and/or deviation from that plan. This is because the process of new business development involves iterative changes in the way the entrepreneur positions his/her firm as he/she develops an understanding about what does and does not work.

While every entrepreneur encounters a different set and quantity of unexpected realities as they evolve, the failure or success of the new venture depends on their ability to deal with these challenges in a timely and appropriate manner (Morris & Zahra, 2000). Whereas some entrepreneurs tend to stick persistently with their initial business concept, some might

decide it is not beneficial to pursue any longer. Still others might revise their business concept in an attempt to take into account their incorrect assumptions, building on the new information put before them. The ability to continuously reevaluate the assumptions critical to the business opportunity and adapt appropriately is the essence of the strategic adaptation capability (Jaeger & Baliga, 1985; Morris & Zahra, 2000).

Those new ventures that build a strategic adaptation capability are able to develop an expertise that enables them to increasingly confront new information and challenges in a more timely and opportune manner, which can both aid in increasing new venture growth. The more time it takes for a new venture to recognize and adjust to an incorrect assumption that is critical to the business concept, the more difficult and costly it will be to overcome. However, if the mistake in judgment is recognized early, a new venture still may be able to recover and utilize its existing resources to pursue that growth option.

Similarly, it is not only important that a new venture adapts to new information in the environment, but it needs to be done in the most opportune manner to enable further growth. For example, an entrepreneur may discover a different opportunity as the result of addressing unmet assumptions in their original business concept. This also equates to the entrepreneur being more proactive in the testing of assumptions, rather than waiting to be disproved. Block and MacMillan (1985) suggest a process that documents and tests assumptions at certain milestones as the new venture evolves. Informed decisions can then be made regarding what the new venture has learned and how future plans should be modified. Bhide (1996) puts forth a three-step sequence of questions that first clarifies the entrepreneurs' current goals, then evaluates their strategies for attaining those goals, and last, helps assess their capacity to execute their strategies. The sequence includes feedback loops for the readjustment of goals and the strategies pursued. Regardless of the process chosen, a new venture is much more likely to achieve higher levels of growth if it can strategically adapt to the changing environment in the most appropriate way.

As a new venture grows, it is probable that additional opportunities will continue to be explored, such as secondary products or new customer markets (Greiner, 1998). The strategic adaptation capabilities being developed by a new venture will continue to play a role in the growth and success of these opportunities. First, the new venture has a more accurate view of the environment, which will help in the development of more realistic assumptions. Second, the new venture will have a greater ability to be proactive and adjust for those unmet assumptions in a more timely and opportune manner.

The importance of strategic adaptation capabilities to new venture growth is consistent with organization theorists, who emphasize that organizations must adapt to their environment in order to remain viable and reduce levels of uncertainty (Duncan, 1972). Existing firms are typically studied to examine their realignment of existing strategy and organizational structure to changes in the environment. For example, Boeker and Goodstein (1991) found hospitals change the composition of their board of directors to adapt to changing environmental contingencies. Haveman (1993) examined the extent to which firms diversified following the deregulation of the savings and loan industry. Other scholars have examined the implications of firms responding to transitions within their industry by pursuing market expansion (Mitchell, Shaver, & Yeung, 1993) or by relying on key networks for information (Kraatz, 1998). While existing firms are thus concerned with realigning their existing strategy to changes in the environment, new ventures differ by having to develop a coherent competitive approach for the first time through their perceptions of the existing environment (Nicholls-Nixon et al., 2000). As further information and experiences are accumulated by the entrepreneur, a need to strategically realign the competitive approach arises as a more accurate or realistic view of the environment is developed. The ability of an entrepreneur to develop and exploit these strategic adaptation capabilities will ultimately result in higher levels of achieved growth.

An additional reason why strategic adaptation capabilities are an especially important competitive weapon to new ventures, as compared to existing firms, relates to structural inertia. The low level of structural inertia exhibited by new ventures is argued to be a constraint due to the related lack of accountability and reliability that can increase the likelihood of organization failure (Hannan & Freeman, 1984). However, strategic adaptation capabilities enable new ventures to turn this weakness into a strength through exploiting their lower levels of structural inertia and responding quicker to the environment than more mature firms are able to.

### *Networking Capabilities*

Due to the lack of operating history and experience, new ventures typically face a low level of legitimacy in their industry starting out. Likewise, most new ventures tend to have a limited set of resources to work with due to their small size. As the level of legitimacy and resources have both been demonstrated to be positively associated with new venture growth (Lee, Lee,

& Pennings, 2001; e.g. Zimmerman & Zeitz, 2002), it is essential that growth-oriented new ventures enhance their legitimacy and creatively access the necessary resources in a fast and efficient manner. One of the ways new ventures can address these shortcomings and facilitate new venture growth is through the building and exploitation of a networking capability. While networks have been defined as a set of nodes (individuals, organizations) linked by a set of social relationships (Cooper, 2002; Johannisson, 2000), a networking capability refers to the ability of a firm to tap external resources through the building and maintenance of these relationships (Jarillo, 1989).

Network relationships have been suggested to influence almost every aspect of new venture creation, including the generation of the initial idea, investigation and development of the idea, assembly of resources, implementation and early development, and last, the ongoing performance of the new venture (Cooper, 2002). For this reason, Dubani and Aldrich (1991, p. 306) conclude “entrepreneurship is thus inherently a networking activity.” Networks offer a series of intermingled benefits to new ventures through the provision of information, credibility, and the creation of exchange relationships (Johannisson, 2000). It is through these advantages that the development of a networking capability can contribute significantly to new venture growth.

First, networks can lead to increased levels of growth by providing entrepreneurs with informational benefits (Johannisson, 2000). This might include business intelligence or information on new business opportunities. For example, stronger ties with major customers can provide invaluable feedback regarding necessary product changes. Birley (1985) illustrates how networks can aid an entrepreneur with such issues as employees, location, possible sources for financing, and other needed resources. This might include information on institutions or the quality of select buyers and suppliers.

The second benefit provided by networks is increased credibility or legitimacy of a new venture. As the liability of newness suggests new ventures can be constrained due to their reliance on developing social relationships with strangers (Stinchcombe, 1965), increased legitimacy can help overcome this challenge. For example, a new venture that belongs to a local business group or is a member of an industry trade association is likely to receive more credibility among its potential buyers. Referrals often result from these relationships as well, which in turn lead to higher levels of sales growth. New ventures can also utilize their networks to establish credibility with investors (Shane & Cable, 2002) or potential alliance partners (Gulati, 1999). Stuart, Hoang, and Hybels (1999) specifically demonstrate how interorganizational

endorsements enable more rapid growth and higher performance outcomes in their sample of young, biotech firms.

Third, exchange relationships can develop as a result of networking. While a new venture may identify a potential opportunity that appears very advantageous, it may be difficult for them to pursue it alone based on the risks and costs involved. Likewise, new ventures tend to have a difficult time obtaining certain resources necessary to grow. An option is to form some type of exchange relationship, such as an alliance. Alliances are advantageous to new venture growth as they provide access to additional resources and the pursuit of opportunities that are beyond their immediate means (Larson, 1991). In other words, these new ventures are able to do more with less. However, given the lack of experience and an existing track record, many companies can be hesitant to develop alliances with new ventures. Having networks can be very beneficial here in establishing a level of trust necessary to proceed (Eisenhardt & Schoonhoven, 1996).

### *Strategic Adaptation and Networking Capabilities*

An additional way in which networks contribute to new venture growth is through the enhancement of a new venture's strategic adaptation capability. A recent study by Kraatz (1998) found organizations can mitigate uncertainty and promote adaptation to the environment through the increased communication and information sharing of strong ties within their network. This suggests that new ventures are able to utilize the information gathered from their networks in order to assess their current assumptions regarding their business idea and adjust accordingly. In essence, the networks of a new venture determine how it will "perceive the environment, as well as the set of choices that can be practically considered and implemented in their attempts to adapt" (Kraatz, 1998, p. 638).

In examining some of the constraints associated with the liability of newness, the value of the interactive relationship between a new venture's networking and strategic adaptation capabilities again becomes evident. Networking can provide a new venture with information regarding a more efficient way to set up the roles within the organizational structure. Similarly, networking can not only provide a new venture with more stable links to a potential customer base, but also potentially uncover unexplored customers that may show more opportunity. Through the reliance on a new venture's networking capability, the new venture is likely to more effectively adapt to the environment and encourage growth.



## THE INTERNATIONAL CONTEXT

Prior to the 1990s, research on new ventures focused almost exclusively within the domestic marketplace of the venture. With the recognition that new ventures were competing in the international arena (McDougall, 1989), many new venture scholars began to focus their attention on the international context. An international new venture is defined as “a business organization that, from inception seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries” (Oviatt & McDougall, 1994, p. 49). As the objective of this chapter is to explore how new ventures achieve growth in international markets, we now consider the role of strategic adaptation and networking capabilities specifically in the international context.

In order to pursue international markets, a firm must be able to overcome the negative implications associated with the liability of foreignness (Dunning, 1988; Hymer, 1976). The liability of foreignness concept was introduced by Hymer in his seminal dissertation on foreign direct investment in 1960 (published in 1976) and suggests local firms are likely to have an advantage over foreign firms. This is based on the assumption, now widely accepted by international business scholars, that firms operating abroad incur additional costs that a local firm does not necessarily incur. Zaheer (1995) offers a grouping of four potential sources to which the liability of foreignness can be attributed. First, costs associated with spatial distance can arise when conducting business internationally. These may be related to travel, transportation, coordination over distance, and across time zones. A second type of constraint can develop due to the firm’s unfamiliarity with and lack of roots in the local environment. When the Walt Disney Company expanded into Europe, for example, many of the business plan assumptions regarding the typical hotel stay, pricing, and value of word-of-mouth advertising were incorrect because they were based on parks in other countries. While Euro Disney was still able to hit its admissions target by 1993, this required the firm to adjust many of their strategies as they became more familiar with the local environment (McGrath & MacMillan, 1995). Third, the lack of legitimacy of foreign firms or economic nationalism within the host-country environment can act as a barrier to international entry. Within the United States, the Harley-Davidson Motor Company continues to hold a major share in certain segments of the motorcycle market largely due to the national reputation it has worked hard to create. This has made it difficult for competitors to compete in those market segments. Last, firms can experience constraints from their home-country

environment, such as sales restrictions to certain countries or consumer backlash due to political conflict between nations. For example, trade restrictions imposed by U.S. government with Cuba limits the ability for firms within these countries to do business with each other. Empirical evidence for the existence of a liability of foreignness has been demonstrated by several scholars among existing firms in foreign trading rooms (Zaheer, 1995) and global banking (Miller & Parkhe, 2002) as well as among small and medium sized firms pursuing internationalization (Lu & Beamish, 2001).

While the liability of foreignness thus characterizes the constraints faced by firms initially entering an international market, we suggest there are many similarities to those new venture constraints described by the liability of newness (Lu & Beamish, 2001). First, they both deal with a lack of legitimacy. This is evident among new ventures due to their lack of operating history and new existence (Stinchcombe, 1965). Similarly, in the international context, little is typically known about the previous experience or background of new foreign firms. There is a suggested need in both scenarios for finding a way to facilitate growth by becoming more accepted as a legitimate organization. Second, both the liability of newness and liability of foreignness deal with resource constraints. While new ventures need resources to grow, the founding entrepreneurial team typically only has a given pool from which to tap (Brush, Greene, & Hart, 2001). Unlike existing firms, there are no resources to fall back upon. Instead, new ventures need to work with different players and organizations in their environment to facilitate the acquisition of necessary resources. Resource constraints are also implied by the liability of foreignness due to the additional transaction costs associated with internationalizing, such as transportation, coordination, or the financing of physical assets both domestically and abroad (Zaheer, 1995). Third, the importance of developing firm-specific competitive advantages is recognized in overcoming the legitimacy and resource constraints related to both the liability of newness and liability of foreignness. This is not only supported by resource-based theory, but also widely acknowledged by international business scholars (e.g. Dunning, 1988). Last, while the negative implications associated with the liability of newness are suggested to diminish as the new venture ages and becomes more established (Stinchcombe, 1965), the same is true of the liability of foreignness. This is supported by Zaheer and Mosakowski (1997) who found the effects of foreignness on the survival rate of foreign trading rooms diminished as their tenure in a given location increased.

Although Barringer and Greening (1998) examined the geographic expansion of several small businesses within the same country, as opposed to

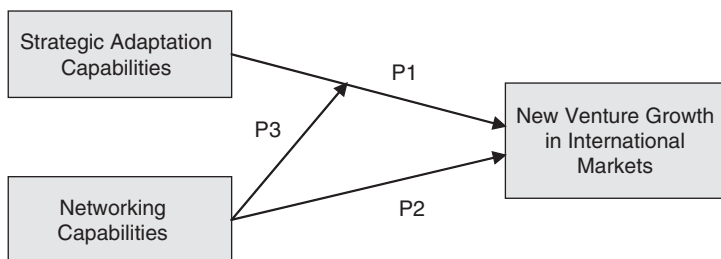


Fig. 1. New Venture Growth in the International Context.

international expansion, it is interesting to note their observation that some of the same constraints characterized by the liability of newness were experienced in this process. For example, in expanding into the new geographic market, the firms faced problems related to a lack of legitimacy and incorrect assumptions due to unfamiliarity. This suggests that while the liability of newness is traditionally associated only with the tenure of the firm (i.e. new ventures), it is also relevant in some respects to the tenure of the firm within a given location.

As strategic adaptation and networking capabilities are important to new venture growth, the similarities drawn between the liabilities of foreignness and newness would suggest the potential applicability of these capabilities also to the growth of new ventures internationally. We next consider the relevancy of these capabilities in more detail, utilizing a model of new venture growth in the international context (see Fig. 1).

Specifically, we consider the direct effects of strategic adaptation and networking capabilities on new venture growth in international markets. In addition, we consider the potential interaction of these capabilities and resulting influence on international growth.

### *Strategic Adaptation Capabilities*

Strategic adaptation capabilities refer to the ability to continuously reevaluate the assumptions critical to the business opportunity and adapt appropriately (Jaeger & Baliga, 1985; Morris & Zahra, 2000). By developing and maintaining such a capability, firms are more apt to achieve growth internationally due to the reduction in the constraints associated with the liability of foreignness as well as the ability to take advantage of opportunities in a

more efficient manner. For example, one of the constraints identified with the liability of foreignness relates to the firm's unfamiliarity with and lack of roots in the local environment (Zaheer, 1995). This poses a challenge for firms in the pursuit of international markets due to the level of uncertainty created and the likelihood of having to operate with a high number of assumptions. Petersen and Pedersen (2002) found that firms with a higher level of learning engagement will familiarize with foreign markets more rapidly. A firm's learning engagement refers to the effort and ability to learn how to conduct business in a foreign environment and includes such managerial discretion as the willingness to undertake local adaptation. A firm that develops a strategic adaptation capability is more likely to exhibit such willingness and exert a more concentrated effort to learn and adjust to the international market. This should result in a reduction of the liability of foreignness, thereby facilitating future growth.

The importance of engaging in learning and adaptation is further illustrated through the need for a firm to align their strategy to the needs and requirements of the international environment. Building on contingency theory, which advocates the necessary alignment of the firm with its environment, Roth and Morrison (1992) found that different strategic positioning is required in the international versus the domestic context. When a firm solely operates domestically, it confronts relatively homogeneous technological, social, political, and economic pressures. However, these pressures are likely to differ internationally depending on the relative country being entered. Thus, a firm that is pursuing international markets will have to be able to recognize these differences and align the appropriate strategy to achieve growth. Similar to the initial business opportunity being pursued by a new venture, it is likely that a lot of the initial assumptions being made by an internationalizing firm might be incorrect. For example, the international customers may not respond to the initial marketing strategy exactly as expected. However, a firm that is better able to recognize flaws in the strategy related assumptions in a timely manner (i.e. through its strategic adaptation capabilities) is more apt to be able to change them and still achieve growth internationally.

If a firm has developed a strategic adaptation capability, it will also be able to operate more efficiently with less wasted resources. This is due to the ability of the firm to recognize incorrect assumptions quicker and find ways to adapt to opportunities and challenges with their given resources. Resource efficiency is important in the international context due to the resource constraints implied by the liability of foreignness. As firms need to be able to develop some sort of firm-specific advantage in order to compete

internationally (Dunning, 1988), being able to utilize resources more efficiently will contribute to this effort. Thus, the ability to proactively test their assumptions and adapt in the most opportune manner will help firms increase their likelihood of growth internationally.

While strategic adaptation capabilities by and large appear to be influential in achieving international growth, we suggest strategic adaptation capabilities are especially important among new ventures competing internationally. More established and older firms have often been characterized by their inability to react quickly to changes in the environment. As noted by Hannan and Freeman (1984), this is largely due to the existence of structural inertia forces. In contrast, new firms are suggested to exhibit more flexibility and be able to adapt more readily to changes. Consequently, new ventures are more apt to be able to develop and rely on strategic adaptation capabilities in the international context. Based on these observations, Autio et al. (2000) hypothesize and find support for a negative relationship between the age of a high-technology firm at international entry and subsequent growth in international sales. Their rationale for this “learning advantage of newness” illustrates the key role of a new venture’s adaptability in internationalization:

We proposed that as firms get older, they develop learning impediments that hamper their ability to successfully grow in new environments and that the relative flexibility of newer firms allows them to rapidly learn the competencies necessary to pursue continued growth in foreign markets (Autio et al., 2000, p. 919).

Thus, a new venture that is able to develop and maintain a greater ability to strategically adapt is going to be more apt to compete in the international context and thus, achieve higher levels of growth.

Moreover, the operating efficiencies in foreign markets resulting from a firm’s strategic adaptation capabilities are not only going to help a new venture grow internationally through a reduction in the constraints associated with the liability of foreignness, but also the liability of newness. Hannan and Freeman (1984) assert “small organizations have small margins for error because they cannot easily reduce the scope of their operations much in response to temporary setbacks.” Thus, being able to operate more efficiently is crucial to international growth for new ventures as they have little operating slack to work with in this capacity. Existing firms would likely also benefit from increased operating efficiencies in the international context due to strategic adaptation capabilities, but such benefits will not necessary be as tightly linked to international growth due to their ability to rely on a more established resource base and excess operating slack.

The benefit of being able to draw on strategic adaptation capabilities also becomes apparent when new ventures expand into multiple countries, which has been a demonstrated route to achieving new venture growth internationally (Zahra et al., 2000). Having experienced and learned from previous mistakes, a new venture can better address potential opportunities and related assumptions in subsequent market entry decisions. The Uppsala model of internationalization assumes that knowledge about foreign markets is a major obstacle to internationalization and, in response, firms internationalize incrementally as learning and knowledge is built up (Johanson & Vahlne, 1977). While international new venture has been found to enter multiple countries simultaneously and/or at a more rapid pace, which differs from the stage model of internationalization presented in the Uppsala model (McDougall, Shane, & Oviatt, 1994; Moen & Servais, 2002), we suggest that the organizational learning implied in the Uppsala model is still important. A new venture that develops a strategic adaptation capability will first be able to internationalize more rapidly with limited knowledge as they are able to more efficiently adjust to new information and knowledge. In essence, the perceived uncertainty in the international environment is somewhat lower for the new venture due to the confidence in their ability to adapt (Forsgren, 2002). At the same time, the knowledge being gained is constantly building up their strategic adaptation capability for future usage, which supports the notion of organizational learning and contributes to new venture growth.

Last, the value of an alignment between strategy and environment specific to new venture growth in the international context is supported by several empirical studies. McDougall and Oviatt (1996) found changes in strategies over a 3- year time period were associated with international growth by new ventures, which suggests the importance of adaptation. While focusing exclusively on export ventures, Cavusgil and Zou (1994) supported the notion that the fit between the environment and marketing strategy resulted in higher levels of new venture performance and growth. Fit was conceptualized and measured through promotion adaptation, product adaptation, and price competitiveness, which is consistent with our interpretation of strategic adaptation capabilities. In another study of small and medium sized firms, Knight (2000) found that responding to globalization pressures and preparing in advance to enter foreign markets (i.e. conducting market research, committing resources, adapting products) contributed favorably to firm performance and growth. This again implies the importance of strategic adaptation capabilities to new ventures through the need to be responsive to local needs as well as the proactiveness required in testing of assumptions through some form of market research.

**Proposition 1.** For those new ventures competing internationally, there will be a positive relationship between their strategic adaptation capabilities and growth in international markets.

### *Networking Capabilities*

The ability to tap external resources through the building and maintenance of social relationships is referred to as an organization's networking capability (Jarillo, 1989). While entrepreneurship has been inherently referred to as a networking activity (Dubani & Aldrich, 1991), the escalating importance of networking in the international context has also been acknowledged in response to the increasing interdependencies between firms, countries, and markets (Dunning, 1995). Ghoshal and Bartlett (1990, p. 603) suggest the multinational corporation "can be conceptualized as an interorganizational network that is embedded in an external network consisting of all other organizations such as customers, suppliers, regulators, and so on, with which the different units of the multinational must interact." In terms of international new ventures, a number of studies have consequently begun to explore the role of networks (e.g. Coviello & Munro, 1997; Hara & Kanai, 1994; Sharma & Blomstermo, 2003). Madsen and Servais (1997) stress the importance of considering the networks developed by the entrepreneur prior to start-up as well as the networks subsequently formed in explaining the international behavior of a new venture, which reinforces the value of taking into account the resulting networking capability that develops over time. Drawing on these literature streams, we propose new venture growth in international markets is likely to be positively influenced by the extent of a new venture's networking capability.

Networks can motivate the decision of a new venture to pursue international markets, as it is through these connections that many entrepreneurs recognize the international opportunities that exist (Coviello & Munro, 1995, 1997; Johanson & Vahlne, 2003). In a survey of small, entrepreneurial firms, Coviello and Munro (1995) reported that 64% of the firms indicated their initial foreign market entered and entry mode used were triggered by opportunities presented by network contacts, rather than by their own proactive identification process. One of the examples provided in their research is how an entrepreneurial firm with no international experience expanded into Australia due to an opportunity provided by a local distributor. This local distributor had gotten to know the entrepreneurial firm via a common customer in the United States. Once the entrepreneurial firm had entered

Australia, networks were then formed and exploited in order to enter portions of Asia. The end result of this network contact was not only the international expansion opportunity for the entrepreneurial firm, but due to the enhanced legitimacy and market access provided by the local distributor, growth was likely achieved much faster than if the entrepreneurial firm would have entered Australia on its own. In essence, the reliance on networks can enhance new venture growth in international markets by providing opportunities and, in doing so, help offset costs or risks related to market unfamiliarity and a lack of legitimacy. [Chen and Chen \(1998\)](#) consistently argue networks drive and facilitate foreign direct investment and further observe that smaller firms tend to rely more heavily on networks than larger firms when internationalizing. This is likely because smaller firms have less options and information to make decisions with than larger firms.

Networks also lead to the formation of exchange relationships, which have been suggested to be a vital component to new venture internationalization as they can provide both resources and legitimacy ([Oviatt & McDougall, 1994](#)). New venture pursuing internationalization have been noted to rely on an aggressive or large scale strategy in entering foreign markets ([McDougall, 1989](#); [McDougall, Oviatt, & Shrader, 2003](#)), which implies the necessity of resources. Some of the many resources needed by new ventures in international markets might be related to marketing or distribution channels, the creation of overseas production facilities, or financing. Through the use of networks and associated credibility, new ventures can more easily enter into exchange relationships to obtain these resources, which can subsequently lead to higher levels of growth and performance internationally. The positive relationship between alliances, which are one common type of exchange relationship, and new venture growth in international markets has been reported in several studies ([Kotha, Rindova, & Rothaermel, 2001](#); [Lu & Beamish, 2001](#)). Other scholars have frequently noted the increased reliance on such hybrid structures to preserve scarce resources ([Madsen & Servais, 1997](#); [Oviatt & McDougall, 1994](#)).

Last, networks can provide new ventures with key information about international markets ([Sharma & Blomstermo, 2003](#)), leading to subsequent growth. Examples include information regarding the quality of potential suppliers or country-specific data regarding customer preferences or demands. Increased knowledge about the host-country environment can reduce the level of uncertainty perceived by a new venture as well as help validate some of the assumptions being used. These informational benefits are important as they can enable the new venture to compete both with local



firms, who do not have to overcome the liabilities of foreignness, as well as larger multinationals.

**Proposition 2.** For those new ventures competing internationally, there will be a positive relationship between their networking capabilities and growth in international markets.

### *Strategic Adaptation and Networking Capabilities*

The existing literature suggests that networking can help develop and enhance a new venture's strategic adaptation capabilities. This is largely due to the informational benefits provided by the network in testing assumptions related to key business decisions (Kraatz, 1998). In considering the international context, it is also likely that the networking capability of a new venture will enhance the relationship between the adaptability of the new venture and international growth. Networking will provide the new venture with more information to make sound foreign entry decisions and also adjust to those unmet assumptions. Sharma and Blomstermo (2003) observe that new ventures do not tend to conduct formal market research regarding the international environment, but instead rely on their networks for gathering information. For example, through communication and networking with prospective customers abroad, new ventures can gain a better understanding of country-specific preferences and product demands. This information provided by a new venture's set of networks evolves into a continuous feedback process in which the new venture is able to revise its strategy appropriately.

In addition to enabling a new venture to better test their assumptions about international opportunities, networking can enhance the relationship between the new venture's strategic adaptation capability and international growth by providing opportunities to execute revised strategies. For example, networks might identify potential partners for exchange relationships to access necessary resources to pursue a new strategic direction. This suggests the following relationship:

**Proposition 3.** For those new ventures competing internationally, the relationship between strategic adaptation capabilities and growth in international markets will be more positive for new ventures with high networking capabilities than with low networking capabilities.

## DISCUSSION

In this chapter, we have explored how strategic adaptation and networking capabilities lead to new venture growth in international markets. In doing so, we acknowledged some of the similarities in constraints suggested by the liability of foreignness and liability of newness in terms of a lack of legitimacy and limited resources. The ability to strategically adapt to the environment is important to new ventures in the international context as it helps reduce the level of uncertainty encountered. Other benefits in the international context for new venture growth are related to the alignment of strategy to the characteristics of the host country, supporting growth via multiple countries, less wasted resources, and being able to better compete with existing firms based on more flexibility. The networking capabilities developed by a new venture are also important in minimizing the liabilities of foreignness and enabling growth. New ventures can exploit newly developed contacts in order to increase their legitimacy in unfamiliar territory. In addition, networks aid in providing credible information and potential exchange relationships, which both contribute to international growth.

Due to the path-dependence nature of capabilities as they are developed (Helfat & Peteraf, 2003), it is important to recognize the role of the initial conditions and actions of a new venture in developing these strategic adaptation and networking capabilities. While the liability of newness suggests new ventures have a higher risk of failure than existing firms, new ventures can rely on their stock of initial resources to temporarily avoid or put off some of the constraints associated with the liability of newness. In fact, Bruderl and Schussler (1990) demonstrated that mortality peaks between one and fifteen years after founding, depending on the initial resource endowments of a firm. Thus, a new venture that has a greater stock of initial resources will likely have more time to develop firm-specific routines leading to strategic adaptation and networking capabilities. In addition, the initial resources and actions of the new venture during this time period will play a key role in the development of such capabilities. For example, a new venture's founding team that does not have any personal networks to draw on is less likely to be able to develop networking capabilities than those with more expansive personal networks (Kogut, Shan, & Walker, 1992). Additionally, if the founding team of a new venture does not set out explicitly to develop a networking capability by maintaining and nurturing potential relationships, they are going to be less successful. This is supported by Hara and Kanai (1994), who emphasize the importance of networks to internationalization and suggest having a key person(s) dedicated to creating a global network of

local networks for this purpose. Thus, the implication for those new ventures desiring growth in international markets is to build up their initial stock of resource and be focused on developing and maintaining both strategic adaptation and networking capabilities at the earliest time possible.

As a recognized need exists for a better understanding of how capabilities indeed contribute to new venture internationalization (Zahra & George, 2002), a significant contribution could be made in future research by empirically testing the proposed model. This requires the operationalization of key variables, namely, strategic adaptation capabilities and networking capabilities. In general, there are two approaches to measuring capabilities (Moorman & Slotegraaf, 1999). The first approach directly measures the underlying knowledge and skills that are likely to comprise a given capability. For example, Deeds, DeCarolis, and Coombs (2000) operationalized R&D management capabilities through assessing the number of top management team members with a Ph.D. or M.D. and whether the CEO had prior R&D work experience. In terms of measuring strategic adaptation capabilities, Morris and Zahra (2000) suggest relevant factors include the top management team's tolerance with ambiguity, internal locus of control, and risk-taking propensity. Additional factors to consider might include any prior start-up experience of the top management team or diversity of members. Regarding the measurement of networking capabilities, relevant knowledge and skills leading to such a capability are likely to consist of the diversity and quantity of the personal network of the new venture's top management team or membership in industry related groups.

The second approach is to measure the observable outcomes or goals associated with a capability. For instance, a firm's technological capability has been derived from outputs such as the number of new product developments or the ability to manufacture leading edge products (Eisenhardt & Schoonhoven, 1996; Leiblein & Reuer, 2004). Likewise, Knight, and Cavusgil (2004) measured the global technological competence suggested to result from a firm having strong technological capabilities. Accordingly, to measure a new venture's strategic adaptation capabilities, it may be possible to assess the new venture's response to environmental changes in comparison to its peers. Similar to Morris and Zahra (2000), another option would be to assess the adjustments made by the new venture from its original business plan. The networking capability of a new venture could be measured by the resulting number of alliances formed or information gathered through the networks regarding new opportunities.

We suggest that a third approach to measuring capabilities would be to assess the specific actions or behaviors taken by a firm to build a given

capability. For example, one could assess the extent to which a new venture has incorporated processes to reevaluate business assumptions or specific positions within the venture dedicated to develop social relationships. This is consistent with Helfat and Peteraf (2003) who explain how capabilities develop over time, in which the specific actions dedicated to developing a capability are emphasized. While strategic adaptation and networking capabilities could thus be operationalized by assessing the factors leading to the capability, the processes associated with a capability or the resulting outcomes of a capability, it would also be beneficial to utilize multiple measures to offer some triangulation and improve the overall construct validity of the measures.

The criticality of strategic adaptation and networking capabilities to new venture internationalization highlighted in this chapter offer several additional areas for future research. While networks and new venture internationalization have been receiving increased attention in recent years, there is still a need to focus on the building and maintenance of the networking capability. The measurement of networks tends to examine the given relationships of a new venture at a set place in time. However, these relationships are the current outcome of the new venture's networking capability. By examining the process of how the networking capability was built and continues to be maintained, much can be learned about the implications on new venture growth in international markets over time.

In contrast to networks, fewer studies have examined the link between strategic adaptation capabilities and new venture growth in international markets. Thus, it is a very fruitful area for future research. For example, do new ventures tend to respond more proactively or reactively to their initial assumptions regarding foreign market entry? As suggested by institutional theory, do new ventures tend to revise their strategy and behaviors based on the actions of others? What managerial attributes and organizational structure enable new ventures to learn quicker in foreign markets?

Lastly, future research is needed in obtaining a better understanding of the linkage between the strategic adaptation and networking capabilities of a new venture and their joint role in international growth. What types of networks are most influential for the development of adaptation skills appropriate to the international context? How does this relationship evolve over time?

## CONCLUSIONS

While a significant amount of research has focused historically on the motivation behind the internationalization of new ventures, the objective of this

chapter was to focus on the process of internationalization and how key capabilities lead to new venture growth in international markets. Strategic adaptation and networking capabilities are clearly not only important, but critical, to this process. It is our hope that this chapter has offered some new insights and motivation for obtaining an increased understanding of how international new ventures grow.

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# NETWORK ANALYSIS IN AN INTERNATIONAL ENTREPRENEURIAL ENVIRONMENT

Joy Godesiabo

## INTRODUCTION

Most of us have experienced the “small world” phenomenon; you meet a stranger while traveling or waiting in a queue, for example, and begin to discuss where you are from, what type of work you do, or why you are at this certain location. Surprisingly, you and the stranger discover you both know the same person, possibly from your hometown, academic department, or children’s school. You both remark “what a small world” and then go on your way. Small worlds are just one example of social networks, or how individuals know one another. Social scientists have been interested in this phenomenon since the 1930s and have developed network analysis tools to gain an understanding of how social networks are formed and evolve. These methods have improved significantly over the past 15 years and may provide an informative lens through which to investigate international entrepreneurship (IE).

IE has been defined as “...a combination of innovative, proactive and risk-seeking behavior that crosses national borders and is intended to create

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value in organizations” (McDougall & Oviatt, 2000). Extensive empirical research on IE has utilized a variety of analytical methods, including regression, M/ANOVA, general descriptive statistics, correlation analysis, *t* tests, factor analysis, structural equation modeling, cluster analysis and discriminate analysis (Coviello & Jones, 2004). Scholars have called for future IE research to include definitional rigor in order to create a common vocabulary so that comparisons of research can be made (Coviello & Jones, 2004; McDougall & Oviatt, 2000). Further, Coviello and Jones (2004, p. 499) note “Phenomenological research on behavioral process in international networks is rare – this is a weakness in the field.” Additionally, the use of longitudinal data has the possibility of strengthening IE, as the temporal aspect is identified in research as a key factor (Autio, Sapienza, & Almeida, 2000; Buckley & Chapman, 1996). Network analysis provides a method to address these concerns.

The study of cooperative alliances, new ventures, and initial public offerings (IPOs) and venture financing are three of the eight areas identified of interest in IE (McDougall & Oviatt, 2000). Both international and entrepreneurship research in these three areas has found social capital and networks to be the key factors. Social capital is defined as “those assets created and leveraged through relationships” (Nahapiet & Ghoshal, 1998). Social capital scholars have studied how the social networks of individuals provide information and advice into the decision-making process (Burt, 1992, 2000; Granovetter, 1973). Social capital has been positively associated at a firm level with advancing nascent entrepreneurs through the start-up process (Davidsson & Honig, 2003), obtaining firm funding (Florin, Lubatkin, & Schulze, 2003; Uzzi, 1999; Uzzi & Gillespie, 2002), selecting an industry-appropriate strategy (Geletkanycz & Hambrick, 1997), new product development (Yli-Renko, Autio, & Sapienza, 2001), and early entry into international operations (Autio et al., 2000). Research has found that biotechnology start-ups with more alliances were more likely to create new network relationships, than those firms with fewer alliance relationships (Walker & Kogut, 1997). Using network analysis, one study of multinational management teams of multinational enterprises (MNEs) found that national and cultural differences between pairs of managers were positively related to the strength of business-related ties (instrumental ties), but negatively related to the strength of personal or expressive ties (Manev & Stevenson, 2001). Although not identified as social capital research, another study found that teams with high or low national heterogeneity performed better than teams with a medium level of national heterogeneity (Earley & Mosakowski, 2000). The measures in this study of group norms and rules, as

well as team identity, are frequently identified as measures of social capital (Nahapiet & Ghoshal, 1998). Further, social capital and network theories have been recently introduced into IE, but the majority of this research uses methods other than network analysis (Coviello & Munro, 1997; Davidsson & Honig, 2003; Yli-Renko et al., 2001).

The previous discussion documents that research has found social capital and networks to be a useful lens through which to study both international and entrepreneurial phenomenon. McDougall and Oviatt (2000, p. 906) state that “the most influential research in international entrepreneurship is likely to be a significant collaborative challenge.” They believe the collaboration efforts will come from those scholars versed in international business and those researchers of entrepreneurship. We propose further collaboration with network analysis scholars will add a new dimension to IE.

Network analysis methods have advanced to a point where a common vocabulary of research terms exists. Terms such as density, structural holes and centrality are well established measures in network research from sociology to corporate organizations. Further, these research methods have been tested sufficiently to ensure rigor in the research. Network analysis has been utilized effectively in studies of cooperative alliances, new ventures, and IPOs and venture financing, three areas of interest to IE research. And finally, longitudinal data has been used in network research of alliances (Walker & Kogut, 1997), nascent entrepreneurs (Davidsson & Honig, 2003), and project management (Gargiulo & Benassi, 2000). As such, network analysis may introduce new methods and measures that could expand the horizons of IE research.

Our intention is to introduce network analysis concepts in this chapter, not to provide in-depth, mathematical network analysis methods. Network analysis texts, from introductory, such as *Introducing Social Networks* (Degenne & Forse, 1999) or *Social Network Analysis: A Handbook* (Scott, 2000) to the comprehensive *Social Network Analysis* (Wasserman & Faust, 1994) exist for this purpose. This chapter will provide an overview of network analysis so that researchers interested in these procedures will understand the opportunities these methods impart. We will further explicate specific opportunities where network analysis may further the IE research stream.

The chapter proceeds as follows. We first provide a definition of network analysis, explaining what it is, how it is different from other empirical methods, as well as how it is used. Second, we provide an overview of network analysis terminology, measures and processes. Specific individual and network measures are explained and demonstrated using a small

network example. Next we set forth specific areas where network analysis can inform IE research, specifically the study of cooperative alliances, new ventures, and IPOs and venture financing. We then discuss issues of data collection and some limitations of network analysis. We close the chapter with summary remarks.

## DEFINITION OF NETWORK ANALYSIS

Network analysis began in the 1930s when researchers became interested in group dynamics and how information flowed within groups. In 1933, Jacob Moreno's creation of the "sociogram" to formally represent network relationships was the first step toward formal network analysis. Network research continued, primarily at Harvard and Manchester University. In 1967, Stanley Milgram developed a process to collect network data. He and Jeffery Travers devised a study to examine to what degree people within a group knew one another. The following discussion describes the results of their study (Travers & Milgram, 1969).

An arbitrary 'target' person and a group of 'starting persons' were selected, and an attempt was made to generate an acquaintance chain from each starter to the target. Each starter was provided with a document and asked to begin moving it by mail toward the target. The document described the study, named the target and asked the recipient to become a participant by sending the document on. It was stipulated that the document could be sent only to a first-name acquaintance of the sender. The sender was urged to choose the recipient in such a way as to advance the progress of the document toward the target; several items of information about the target were provided to guide each new sender in his (sic) choice of recipient. Thus, each document made its way along a chain of acquaintances of indefinite length, a chain which would end only when it reached the target or when someone along the way declined to participate. Certain basic information such as age, sex and occupation, was collected for each participant.

The starters consisted of three populations, a random sample of residents of Boston ( $n = 100$ ), a random sample of residents of Nebraska ( $n = 96$ ) and a sample of stockholders in Nebraska ( $n = 100$ ). Each starter was told that the target was a stockbroker in Boston. Each starter was instructed to mail the letter to the target only if that person was known on a first name basis to the starter. If the starter did not know the target, he was asked to mail the letter to someone he did know on a first name basis that would be more likely to know the target. The target ultimately received 64 letters. Of these 64, the average chain length was 5.2. In other words, it took just over 5 people to get the letter to the stockbroker in Boston, who was the sixth person in an average chain. Surprisingly, only 26 people delivered the letter to the

stockbroker. His neighbor provided 16 of the 64 and 15 were provided by two work colleagues.

This study was considered a breakthrough in small world research. The average distance between two people was found to be six people or six “degrees” and this finding has been replicated in later studies. This study is also believed to be responsible for the prevalent concept of six degrees of separation, which was the basis for numerous books, as well as both a popular play and movie. Small world research methods are used for such varied purposes as epidemiology (Klovdahl et al., 2001) to food chains (Ray, Ulanowicz, Majee, & Roy, 2000). We believe these, as well as other forms of network analysis methods may be used effectively in IE.

## OVERVIEW OF NETWORK ANALYSIS

Network analysis examines the *relationships* among individuals in a group. A network is defined by the research question, so sampling is typically not used. An in-depth discussion of how a researcher defines a network follows later in this chapter. Further, network data is not independent; rather it is, by definition, dependent and therefore the error terms are dependent, biased and homoscedastic. Given these issues, traditional data analysis methods of regression, structural equation modeling and ANOVA are inappropriate for network data. In other words, analysis of network data requires the use of network analysis methods. Additionally, network analysis uses terminology unique to these methods. Terms specific to individual analysis are included in Table 1. Terms used to describe the lines among actors in a network, or ties, are included in Table 2. Table 3 sets forth measures used to describe entire social networks. These terminologies, as well as network analysis methods, are described in more detail in the following sections.

### *Research Methods and Considerations*

Network data lends itself to the use of graphs, or sociograms, to depict the network. A sociogram is a graphical depiction of a network. Fig. 1, generated using NetDraw (Borgatti, 2002), is a sociogram of the influential families in 15th century Florence, Italy. We have chosen to use this network as an example in this chapter for a number of reasons. First, this network is small, with only 16 families. Second, the network provides good examples of individual and network measures which are core concepts in network

**Table 1.** Typical Social Network Measures Assigned to Individual Actors (Brass, 1995).

Measure	Definition
Degree	Number of direct links with other actors
Indegree	Number of directional links to the actor from other actors (incoming links)
Outdegree	Number of directional links from the actor to other actors (outgoing links)
Range (diversity)	Number of links to different others (others are defined as different to the extent that they are not themselves linked to each other, or represent different groups or statuses)
Closeness	Extent to which an actor is close to, or can easily reach all the other actors in the network. Usually measured by averaging the path distances (direct and indirect links) to all others. A direct link is counted as 1, indirect links receive proportionately less weight
Betweenness	Extent to which an actor mediates, or falls between any other two actors on the shortest path between those two actors. Usually averaged across all possible pairs in the network
Centrality	Extent to which an actor is central to a network. Various measures (including degree, closeness and betweenness) have been used as indicators of centrality. Some measures of centrality weight an actor's links to others by the centrality of those others
Prestige	Based on asymmetric relationships, prestigious actors are the object rather than the source of relations. Measures similar to centrality are calculated by accounting for the direction of the relationship (i.e., indegree)
<i>Roles</i>	
Star	An actor who is highly central to the network
Liaison	An actor who has links to two or more groups that would otherwise not be linked, but is not a member of either group
Bridge	An actor who is a member of two or more groups
Gatekeeper	An actor who mediates or controls the flow (is the single link) between one part of the network and another
Isolate	An actor who has no links, or relatively few links to others

analysis. Finally, the network provides comparisons of network measures that will clearly demarcate the differences between certain network measures.

By examining the sociogram of the Florentine families, a number of questions come to mind. Which family has the most power and influence? How is information communicated within this network? Who controls this

**Table 2.** Typical Social Network Measures of Ties (Brass, 1995).

Measure	Definition	Example
Indirect links	Path between two actors is mediated by one or more others	A is linked to B, B is linked to C, thus A is indirectly linked to C through B
Frequency	How many times, or how often the link occurs	A talks to B 10 times per week
Stability	Existence of link over time	A has been friends with B for 5 years
Multiplexity	Extent to which two actors are linked together by more than one relationship	A and B are friends, they seek out each other for advice and work together
Strength	Amount of time, emotional intensity, intimacy or reciprocal services (frequency and multiplexity often used as measure of tie, strength of tie)	A and B are close friends or spend much time together
Direction	Extent to which link is from one actor to another	Work flows from A to B, but not from B to A
Symmetry (reciprocity)	Extent to which relationship is bidirectional	A asks B for advice, and B asks A for advice

information flow? Do some ties provide better access to information? Network analysis methods provide potential answers to these questions.

Each node or circle in the network represents a family and each tie or degree represents a marriage between the families (Padgett & Ansell, 1993). Marriages were used by these families to advance business relationships and cement power. Padgett and Ansell (1993) have used these data to research the rise of the Medici family in the early 15th century. These data are also used extensively in network analysis texts (Monge & Contractor, 2003; Wasserman & Faust, 1994) as well as UCINET6 (Borgatti, Everett, & Freeman, 2002), a software package commonly used for network analysis. We will use this data throughout the chapter to demonstrate network concepts and measures.

Networks are analyzed on multiple levels. Wasserman and Faust (1994) defined five specific levels of analysis: (1) individual, (2) dyad or a pair of nodes, (3) triad, a group of three nodes, (4) subgroup, a group of multiple nodes, and (5) global, all the nodes in the defined network. We will limit our discussion to individual and global levels in this chapter. While the other three levels are useful, the majority of global measures also apply to dyads,



**Table 3.** Typical Social Network Measures Used to Describe Entire Network (Brass, 1995).

Measure	Definition
Size	Number of actors in the network
Inclusiveness	Total number of actors in a network minus the number of isolated actors (not connected to any other actors). Also measured as the ratio of connected actors to the total number of actors
Component	Largest connected subset of network nodes and links. All nodes in the component are connected (either direct or indirect links) and no nodes have links to nodes outside the component
Connectivity (reachability)	Extent to which actors in the network are linked to one another by direct or indirect ties. Sometimes measured by the maximum, or average, path distance between any two actors in the network
Connectedness	Ratio of pairs of nodes that are mutually reachable to total number of pairs of nodes
Density	Ratio of the number of actual links to the number of possible links in the network
Centralization	Difference between the centrality scores of the most central actor and those of all other actors in a network is calculated, and used to form ratio of the actual sum of the differences to the maximum sum of the differences
Symmetry	Ratio of number of symmetric to asymmetric links (or to total number of links) in a network
Transitivity	Three actors (A,B, C) are transitive if whenever A is linked to B and B is linked to C, then C is linked to A. Transitivity is the number of transitive triples divided by the number of potential transitive triples (number of paths of length 2)

triads and groups. The following sections discuss individual measures, including ties, as well as network level measures.

### *Measures*

*Individual Measures.* A point on a network is a node. A node, or actor, can represent an individual, a group or team, a firm or country, for example. The nodes in Fig. 1 represent 15th century Florentine families. The Pucci family is an isolate, because it has no ties to any other nodes in the network. The Albizzi family is the gatekeeper for the Ginori family, as is the Guadagni family for the Lamberteschi family. Although they only have six out of 16 possible ties, the Medici family could be considered a star in this network because they have the highest number of ties, as well as the highest betweenness and closeness measures, as discussed next.

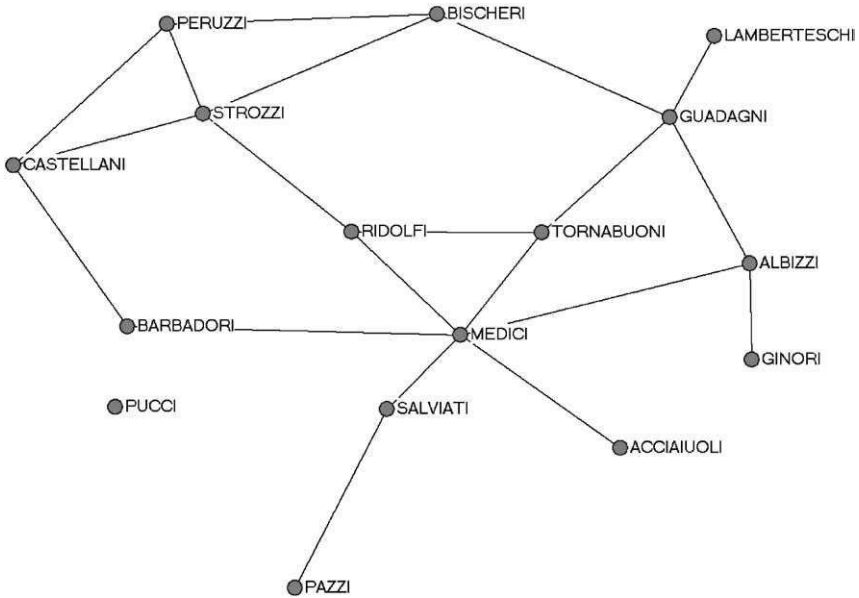


Fig. 1. Influential 15th Century Florentine Families Marriage Network.

Degree centrality is a function of how connected an actor is to the other actors within the network. Degree centrality is calculated as

$$d(n_i)/g - 1$$

where  $d(n_i)$  is the number of degrees for actor  $i$  and  $g$  the total number of actors in the network. If an actor has ties to every other actor in the network, his or her centrality measure would be 1. If the actor does not have ties to any other actor in the network, his or her centrality measure would be 0.

“Betweenness measures the extent to which a node is directly connected only to those other nodes that are not directly connected to each other. That is, it measures the extent to which a node serves as an intermediary ‘between’ other nodes in the network” (Monge & Contractor, 2003). Another term for betweenness is “structural holes” (Burt, 1992). An actor with a high betweenness measure has the capability to control the flow of information from one part of the network to another. At the same time, this actor has

access to information not available to other actors in the network. If a node with a high betweenness measure was removed from a network, the communication link between groups would be eliminated. Such nodes are also known as liaisons or bridges. The calculation of betweenness is one of the most complicated calculations in network analysis. A researcher may be better served by gaining a solid understanding of the concept, and allowing UCINET (Borgatti et al., 2002), or another network analysis software package, to perform the calculations. The Guadagni family provides a bridge to the structural holes between the Lamberteschi, Bischeri, Albizzi and Tornabuoni families.

Closeness is a measure of a node's indirect network, or how connected, either directly or indirectly, a node is to all other actors in the network. A high closeness score may indicate an actor's ability to efficiently access information in the network through their link to a node with high degrees. A node can have a high closeness score, even if it has few direct links in the network. Although the Acciaiuoli family has only one link in the network, it has a relatively high closeness score, because that one link is to the most connected family in the network. Closeness is calculated as

$$g - 1 \left/ \sum_{j=1}^g d(n_i, n_j) \right.$$

where  $g$  is the number of nodes in the network,  $d(n_i, n_j)$  the number of lines in the path linking actor  $i$  and  $j$ , so that the total distance from actor  $i$  to all the other actors in the network is  $\sum_{j=1}^g d(n_i, n_j)$  (Wasserman & Faust, 1994). Closeness is simply the measure of all the nodes in the network minus the focal actor, divided by the sum of the distances from that actor to all the other nodes. If an actor is directly linked to others that have high numbers of degrees, that actor will have a higher closeness measure when compared to an actor that is directly linked to others with low numbers of degrees.

High levels of closeness, centrality and betweenness are valuable to an actor playing a brokerage role. Access to unique information, as well as the ability to combine this information enables entrepreneurship as defined by Schumpeter. Isolates, or those with low levels of closeness, centrality or betweenness, may receive information long after a better-connected actor has received, and possibly acted, on the information.

Table 4 includes the calculation of betweenness, centrality and closeness for the Florentine families. The Medici family has the highest scores in all the measures. It is interesting to note, however, that while the Guadagni and Strozzi families have identical centrality, the Guadagni family's betweenness

**Table 4.** Individual Network Measures of the Florentine Families.

Family	Degrees	Centrality	Betweenness	Closeness
Medici	6	0.150	0.4524	0.3659
Guadagni	4	0.100	0.2206	0.3261
Strozzi	4	0.100	0.0889	0.3125
Albizzi	3	0.075	0.1841	0.3333
Bischeri	3	0.075	0.0905	0.2941
Tornabuoni	3	0.075	0.0794	0.3333
Castellani	3	0.075	0.0476	0.2885
Ridolfi	3	0.075	0.0984	0.3409
Peruzzi	3	0.075	0.0191	0.2778
Salviati	2	0.050	0.1238	0.2885
Barbadori	2	0.050	0.0810	0.3125
Pazzi	1	0.025	0.0000	0.2308
Lamberteschi	1	0.025	0.0000	0.2542
Ginori	1	0.025	0.0000	0.2586
Acciaiuoli	1	0.025	0.0000	0.2778
Pucci	0	0.000	0.0000	0.0000

measure is significantly higher than that of the Strozzi family. It would seem that although both families have marriage ties to an equal number of other families, the Guadagni family married into families that do not marry into one another, and, as noted earlier, is a bridge for these families. Similarly, although the Ridolfi family has the same centrality and betweenness measures as the Bischeri family, the Ridolfi family has a much higher closeness measure. This is because the Ridolfi family is more connected, indirectly, to the rest of the network than the Bischeri family. This is primarily due to the connection to the Medici family, which provides the Ridolfi family with a high number of indirect ties to the rest of the network.

*Ties.* The line connecting two nodes is known as a tie. Ties are also called links, degree, arcs or paths. Ties are defined in terms of direction and value. If the relationship between two nodes is directional, such that A likes B, but B does not like A, the tie is directional. A tie is nondirected when the relationship is symmetrical. France and Switzerland sharing a border is an example of a nondirected tie. Ties can also represent valued, such as frequency of interaction or level of liking. Further, ties can be directional and valued. For example, A defines her liking of B as 2, while B describes his liking of A as 4. Ties can also be multiplex. For example, [Padgett and Ansell](#)

(1993) study of the Florentine families examined both marriage and business ties.

Tie strength has been measured as frequency and intensity of the relationship (Granovetter, 1973), level of communication (Gargiulo & Benassi, 2000), and length of the relationship (Marsden & Campbell, 1984; Uzzi, 1999). In network analysis, the tie strength is denoted by the value of the tie.

The number of directed ties from a node is the outdegree of that node. The number of directed ties coming into a node is the indegree measure. For nondirected graphs, a node's indegree equals its outdegree. The degree of a node is the sum of its indegree and outdegree. The calculation of degrees for the Florentine families is shown in Table 4. This network does not have directional ties, because a marriage between two families results in a bidirectional tie between those families. The measure of a family's indegree, outdegree and degree are therefore the same.

Ties to and from an actor are used to measure his or her position in or relationship to the network. Descriptions and examples of common network tie measures are included in Table 2.

*Networks.* A number of measures have been used to evaluate the structure of a social network. The size of the network is usually defined by the number of nodes. In order to compare network measures, in Fig. 2 we have included a sociogram of the business ties among the 15th century influential Florentine families.

Inclusiveness is a measure of the isolates in a network and is typically measured as the ratio of connected nodes to the total number of nodes. The inclusiveness measure for the marriage network is greater than that of the business network (Table 5). This is because only one family is an isolate in the marriage network, whereas five families are isolates in the business network.

Density is a measure of the number of ties between the actors in a network. Density is measured as the ratio of the number of ties in a network to the total possible ties (Wasserman & Faust, 1994). For example, if each individual in the network knew every other actor, that network would have a density measure of 1. In contrast, if network members have ties to very few actors within the network, the density measure would approach 0. Network closure posits that a dense network provides coordination and cooperation (Coleman, 1998). In contrast, structural hole theory finds that a dense network precludes the cooperation needed for complex tasks (Burt, 1992). In other words, the value of a dense or sparse network will depend upon the role of the actor. The density measure for the marriage network is

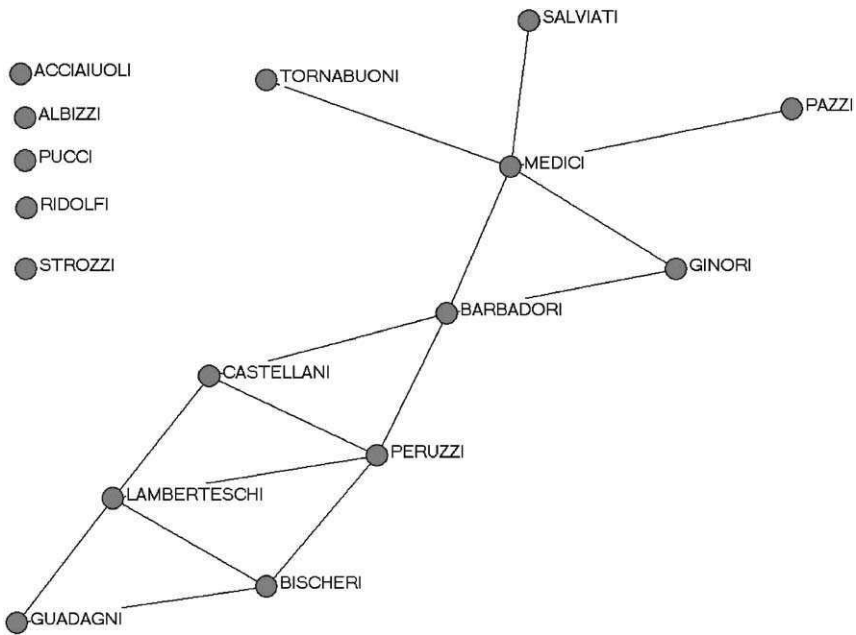


Fig. 2. Influential 15th Century Florentine Families Business Network.

Table 5. Entire Network Measures of the Florentine Families.

Measure	Marriage Score	Business Score
Inclusiveness	0.9375	0.6875
Density	0.1667	0.125
Centralization	0.2667	0.2381

33% greater than the density measure of the business network. This implies that the marriage network is more beneficial for cooperative efforts than the business network. Further, the business network provides brokerage opportunities, particularly for the Medici and Barbadori families.

Centralization is a measure of how tightly the network is formed around its most central node. If one node is directly connected to all other nodes, and none of the other nodes are connected to one another, the centralization measure would be 1. If all the nodes are connected to one another, the

centralization measure would be 0. While this may seem to be the inverse of a network density measure, centralization is a measure of the network's most connected node, rather than just the network. The centralization scores of the business and marriage networks are quite similar. Both networks are tightly formed around the Medici family, so this similarity is to be expected.

## RESEARCH OPPORTUNITIES

As noted earlier, we believe network analysis methods will be particularly effective in cooperative alliances, new ventures, and IPOs and venture financing research. We propose integrating top management team (TMT) research and network analysis to examine both venture funding and IPOs for IE. We believe network analysis methods are well suited to analyze the intersection of these four research streams; international business, entrepreneurship, fund-raising and TMTs. Further, the methods described in this section for venture funding and IPOs are the same, so, for the remainder of this chapter, we will combine the two research areas of new ventures, and IPOs and venture financing into one category entitled venture funding. In the remainder of this section, we discuss opportunities for the use of network analysis first in IE venture funding and then in IE alliances.

### *Venture Funding*

In this section, we first review current research in TMTs and venture funding, TMT social networks and venture funding, and TMT social networks and international business. We then explore the research opportunities created by the integration of these three research streams and network analysis.

#### *TMTs and Venture Funding*

There is a significant body of entrepreneurship research regarding venture funding. Much of this research has studied the relationship between TMT and venture funding (De Clercq & Sapienza, 2001; Florin et al., 2003; Shane & Cable, 2002; Uzzi, 1999). In fact, research has found that investors often consider the quality of the team the most important factor when deciding to fund a new company (Timmons, 1995). Given the strength of these findings, we find it surprising that the relationship between TMTs and venture funding has received little focus in IE research. We believe the study of venture

funding using a TMT lens may provide an informative extension to IE research. Further, the use of network analysis methods will afford insights into this research not available with the use of other data analysis methods.

#### *TMT Social Networks and New Venture Funding Research*

In their examination of new venture funding, [Shane and Cable \(2002\)](#) found that direct and indirect ties individually were positively related to the probability of a venture capital investment. When both direct and indirect ties were included in the model, the effect of direct ties was no longer significant ([Shane & Cable, 2002](#)). In other words, information from a trusted associate regarding an unknown entrepreneur was positively associated with the decisions to invest. Additionally, the social networks of TMTs were found to be positively related to pre-IPO funding and post-IPO firm performance ([Florin et al., 2003](#)). This study used both business ties, as well as personal network ties of TMT members as measures of social capital. Firms with higher levels of network ties had higher levels of venture funding prior to going public, in addition to higher firm performance in the 2 years after going public.

These studies clearly demonstrate the positive relationship between an entrepreneurial firm's social network and obtaining firm funding. Interestingly though, the social network measures were based upon the social networks of the TMT members. The measures were aggregated at a firm level, but in reality, the studies showed that TMT social networks are positively related to new venture funding. These studies, however, utilized U.S.-based entrepreneurial firms as their data set and did not consider IE. An interesting extension of this research would be to examine the relationships found by [Shane and Cable \(2002\)](#) and [Florin et al. \(2003\)](#) in an IE environment. For example, research investigating how firm funding is impacted by the social capital of a multinational TMT compared to a national TMT, or if business ties are more effective than personal ties when raising funds for an international entrepreneurial firm would provide interesting extensions of both IE and TMT literature.

#### *TMT Social Networks and International Research*

International business research has recently introduced network measures into its empirical analysis. Using network analysis methods, cultural distance, as well as differences in nationality and expatriate status were found to be positively related to the strength of instrumental or business ties and negatively related to expressive or personal ties ([Manev & Stevenson, 2001](#)). This study by Manev and Stevenson examined interactions between the



manager dyads of a MNE. In this study, expressive ties were measured by the personal acquaintance of the two managers, and if they discussed non-work-related topics. Instrumental ties were a function of the exchange of work-related resources and perception of the importance of the relationship for work. The nationality, culture and expatriate status of each manager were the dependent variables tested in this study. The authors found that managers formed expressive ties with others of similar backgrounds and formed instrumental ties with others of different backgrounds. These findings for expressive ties support the theory of homophily, or that individuals are more attracted to others that are more like themselves than those that are different.

International TMT research has also begun to use network analysis methods. The density of TMT advice networks has been positively related to a firm's level of internationalization and inter-country interdependence (Athanasidou & Nigh, 1999). These studies, however, utilize MNEs as their data set, not entrepreneurial firms. One might expect different outcomes if entrepreneurial firms were studied, given the likelihood of smaller TMTs and a more dynamic environment. An extension of this research might be to investigate the effect of the density of entrepreneurial TMT's network and the firm's level or speed of internationalization. Further extensions might include examining the success of international entrepreneurial firms to obtain funding relative to the TMT's network density.

#### *Team Social Networks, New Venture Funding and International Research*

We believe the intersection of these research streams allows for an informative expansion of IE. Network analysis methods may be informative when investigating the sources or types of funding for international entrepreneurial firms. For example, does the social capital of the TMT influence the type of funding raised by the firm, such as equity, debt or government backed funding? Does the TMT social network affect where the funds are raised, domestically or internationally? How is fund raising by an international entrepreneurial firm affected by any previous fund-raising experience of the TMT? How does the TMT utilize its social network when searching for funding or during the funding process? How do social networks impact the valuation of an entrepreneurial firm during an IPO? Answers to these questions would provide new extensions to IE research, examine differences between domestic and IT and fund-raising, as well as potentially provide practitioners with means to improve the funding of international entrepreneurial ventures. These are just a few examples of how network analysis could inform IE research into firm funding. Next, I will address how

network analysis methods could be used in international entrepreneurial alliance research.

### *Alliances*

Network analysis of alliances has primarily focused on three reasons for forming alliances: reducing risk, providing legitimacy and learning (Borgatti & Foster, 2003). Alliances and joint ventures between or among firms have been positively associated with innovation (Powell, Koput, & Smith-Doerr, 1996), firm valuations (Das, Sen, & Sengupta, 1998) and learning (Cross & Cummings, 2004). Next, I provide a brief discussion of alliance research in entrepreneurship and international business, followed by opportunities to integrate the three research disciplines.

#### *Alliances and Entrepreneurship Research*

Strategic alliances have been linked to improved performance in entrepreneurial firms. Higher numbers of alliance partners have been positively associated with increased numbers of patents (Shan & Walker, 1994; Stuart, 1998), new product development (Deeds & Hill, 1996), sales growth (Stuart, 1998) and decreased time to complete an IPO (Chang, 2004).

#### *Alliances and International Research*

An extensive stream of research has consistently found alliances to be positively related to international growth (Sarkar, Echambadi, & Harrison, 2001). Specifically, a strong international alliance network has been found to provide options in dynamic environments (Kogut, 1991; Larson, 1991), resources (Hara & Kanai, 1994) and tacit knowledge specific to a country, partner or task (Hamel, 1991; Khanna, Gulati, & Nohria, 1998), as well as assist in foreign sales growth (Leiblein & Reuer, 2004) and strategy development (Harrigan, 1988).

#### *Alliances and International Entrepreneurship*

Firms form alliances when entering new markets or implementing risky strategies (Eisenhardt & Schoonhoven, 1996), in other words, international entrepreneurial environments. Network analysis methods provide different means to investigate alliance relationships when compared to more traditional data analysis methods. Specifically, longitudinal alliance data analysis may extend current IE research. For example, an extension of Walker, Kogut and Shan's (1997) study might examine if early alliance formation by

international entrepreneurial firms leads to more alliances in multiple countries? An opportunity to extend Steier and Greenwood's (2000) research might include questioning if long-term alliance relationships affect firm performance differently than new alliances for international entrepreneurs? Further, new research questions might include: Is there a relationship between the order of alliance formation and order of entry into new international markets? Do alliance formation differences by industry or country affect firm performance? Investigation of these questions may lead to other areas to inform IE research. The use of network analysis methods to investigate IE alliances is only limited by the imagination of the researcher.

## DATA COLLECTION

The following section addresses data collection for network analysis. We begin by discussing the process of defining the network. We then follow with examples of network data sources and collection methods. We conclude by describing issues specific to network data collection that the researcher should address when gathering network data.

### *Defining The Network*

The majority of network analysis research consists of either egocentric networks or whole networks. Egocentric networks consist of an actor (ego) and others to whom the actor is linked. Whole networks are a group of inter-related actors, such as the countries within the European Union or ASEAN. Network boundaries are frequently determined by the researcher, as Padgett did when defining the "influential Florentine families." For example, a researcher interested in international alliances might define the network as all international alliance partners of U.S. companies in a particular industry. The network would not include U.S. alliance partners or wholly owned international subsidiaries of the firms. In other words, determining network boundaries can be very similar to defining the study sample. The relationships among the actors may also determine network boundaries. To investigate if strong ties to investors influence a firm's ability to complete an IPO, the researcher would define the network by all relationships with strong ties, and ignore all other types of links, such as weak ties. At a minimum, a network consists of a set of objects linked by relationships. The data set is displayed in a matrix form known as a sociomatrix or a "who to whom" or "one-mode"

matrix (Wasserman & Faust, 1994). Table 6 displays the sociomatrix for the 15th century Florentine families. More frequently, researchers use “two-mode” (Wasserman & Faust, 1994) data, where multiple relationships or multiple occasions are measured. For example, nascent entrepreneurs were contacted every 6 months as long as they were active (Davidsson & Honig, 2003). In this study, the authors compared nascent entrepreneurs with a control group during an 18-month period. Strong ties were found to be associated with the probability of starting a new venture, and weak ties were associated with having a first sale and profitability. As the process of starting a new venture progressed, the importance of weak ties increased compared to strong ties. In another study, the different aspects of relationships of entrepreneurial high-technology firms with their primary customer (Yli-Renko et al., 2001) were examined. The authors found that as social interaction, relationship quality and customer network ties increased, new product development and technological distinctiveness increased and sales costs decreased. In both of these studies, the network boundaries were defined by the researchers and data was gathered through the use of questionnaires and phone calls.

### *Network Data Sources*

Once the network is defined, the researcher will begin to collect the appropriate data. Three methods are used to collect network data: surveys or questionnaires, archival searches and observation. In the following section, we discuss each of these data sources and collection methods, as well as the issues related to each method.

#### *Surveys and Questionnaires*

Surveys and questionnaires are the most frequently used forms to gather network data for both egocentric and whole network research.

#### *Whole Networks*

In a whole network study, the researcher will identify the network members when defining the research plan. For example, Krackhardt (1987) studied a high-tech company with 21 managers. Each manager was supplied with a list of the other 20 managers and asked to respond to two questions: “Who would you go to for advice?” and “Who are your friends?” (Krackhardt, 1987). These binary responses are easier for respondents when compared to requests to rank all members of the network (Marsden, 2005). The list of

**Table 6.** Sociomatrix of the Florentine Families.

	Acciaiuoli	Albizzi	Barbardori	Bischeri	Castellani	Ginori	Guadagni	Lamberteschi	Medici	Pazzi	Peruzzi	Pucci	Ridolfi	Salviati	Strozzi	Tornabuoni
Acciaiuoli	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Albizzi	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0
Barbardori	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Bischeri	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
Castellani	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
Ginori	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guadagni	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1
Lamberteschi	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Medici	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1
Pazzi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Peruzzi	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0
Pucci	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ridolfi	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Salviati	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Strozzi	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0
Tornabuoni	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0

actors for a whole network study is prepared in advance and included in the survey instrument. Individuals in the study then provide information on their relationships with each actor in the network.

*Egocentric Networks*

Data gathering for egocentric networks usually depends upon the memory and recollection of the actor (ego). Multiple methods are used to generate this data, such as name generators or position generators. The following section describes these methods.

*Name Generators.* A typical survey method is a “name generator” (Marsden, 2005). Instruments requesting respondents to list “who you go to for advice” or “who are your most important customers” are examples of name generators. These surveys are frequently administered in person because of their complexity. Studies have found that respondents frequently forget individuals in their network, but this forgetting is inversely related to tie strength (Brewer, 2000). In other words, networks created using name generators may reflect higher levels of density than networks developed using other methods. Using multiple name generators, such as “who do you go to for advice” and “who have you met with during the past week” is one method to decrease forgetting. Further, memories may be organized by social relationships or social clusters, so that a focus such as a professional association or previous work environment may also improve an actor’s ability to recall network members.

*Name Interpreters.* Most name generators are followed by name interpreters. Name interpreters consist of additional questions on the survey to solicit information about the individuals listed in the name generator process. This may include relationship data both between the subject and named others, and among the named others. Analysis of egocentric networks generally utilized the data from name interpreter. This data might include items such as frequency of interaction, form of contractual relationship, level of trust, etc.

*Position Generators.* “Position generators” ask respondents to identify network members on the basis of social positions, such as occupation. This survey method has proved effective in generating networks with both strong and weak ties, and can take less of the respondent’s time than a name generator. The network will be limited to only those positions listed, however, and may be biased by the respondents who wish to appear in a favorable light, or “ego bias.”

### *Archival Data*

Archival data is another source of social network data. This data may be gathered quickly and inexpensively using the Internet. Further, archival data may provide longitudinal information. Specific issues of validity must be considered for archival data, the first being whether the relationship examined is truly reflected in the data (Marsden, 2005). Network analysis methods have been used to analyze corporate alliances (Gulati, 1998; Stuart, 1998; Walker & Kogut, 1997). It is possible, however, that a firm may enter into an alliance agreement with one partner for a development project and create another alliance arrangement for joint marketing efforts with a different partner. Second, the researcher needs to clearly understand how the archives are produced (Marsden, 2005). For example, network analysis methods have been used in a recent study analyzing citations in academic research (McFadyen & Cannella, 2004). When gathering their data, the authors took steps to ensure the citation records were complete, yet only included those publications being studied. Citations in non-academic publications or conference presentations may not be appropriate. Finally, one must understand what determines which items are included in the data (Marsden, 2005). A study may use international sales data from Securities and Exchange Commission (SEC) filings of U.S.-based companies. The research will need to be familiar with the disclosure rules for such information. Currently, firms are required to disclose this data only if such sales exceed 5% of total sales.

These three validity issues were addressed when Florin et al. (2003) used SEC filings for 275 high-growth ventures to test the effect of social capital on a firm's ability to obtain funding before its IPO, as well as its performance post IPO. Social capital, as measured by the authors, as well as pre-IPO funding and post-IPO profitability are disclosures required by the SEC. Further, the officers and directors of companies are required to attest to the accuracy of the data in the filings and the financial statements are prepared according to specific guidelines. A similar source of international data would be financial data from statutory financial statements filed by European firms, for example.

### *Observation Data*

Early network research used observation methods, but the vast majority of network research in the past 15 years has used survey or archival data. This is primarily due to the tremendous difficulties associated with gathering observation data. For example, in order to observe a large meeting of the management of an international start-up, multiple observers may be

required to capture all of the interaction of the participants. A researcher may consider using observational data to compliment survey data.

*Issues with Data Collection*

Issues relative to self-reported data and retrospective bias are the same for data collected for network analysis as with other forms of data analysis, so they will not be discussed here. However, there are issues unique to network data collection. As discussed earlier in this section, data gathering for network analysis is fraught with obstacles, including setting network boundaries and relying on the accuracy of respondents (Marsden, 2005). Setting network boundaries often relies on the recollection of the respondent. Also, when self-reported data on interactions was compared to observed data, there were significant differences between the two (Bernard, Killworth, & Sailer, 1981). Additionally, criteria, such as “friend” or “respect their opinion” used in a survey may hold different meanings for each respondent. This concern may be even more applicable to IE research, where cultural issues may further exacerbate the ambiguity of a measure. Individuals may also be affected by ego bias, such that their reported network is centered on them. Respondents may also use balance heuristics when asked to report relationships among other actors in their network. Researchers should consider the impact of these concerns when designing their data collection processes. Table 7 includes the more common data issues as well as methods to address the concerns.

*Network Analysis Software*

Once the network data have been collected, it must be entered into a sociomatrix, (similar to the one shown in Table 6) in a spreadsheet software

**Table 7.** Data Collection Issues.

Data Collection Issue	Methods to Address Issue
Respondent’s Recall	Multiple generator list Recognition rather than recall List of network, if available
Ambiguous Criteria	Temporal rather than relationship criteria
Ego Bias	Use of informants to triangulate data
Balance Heuristic	Use of informants to triangulate data



package, such as EXCEL. The sociomatrix can be downloaded into a network analysis software package. The two most popular analytical programs are UCINET and Pajek. UCINET may be purchased and downloaded on the internet at [www.analytictech.com](http://www.analytictech.com). Pajek may be downloaded from <http://vlado.fmf.uni-lj.si/pub/networks/pajek/> at no charge. Either program may be used to calculate all of the network measures we have discussed, as well as generate the sociograms of network. These extremely complex programs are able to analyze large networks, calculating a wide array of network measures and graphical representations. Because of this complexity, a researcher would be well served to study the system documentation so that his or her analysis efforts are efficient.

## LIMITATIONS

We have shown throughout this chapter that network analysis provides new methods to extend IE research. As useful as these tools are, they are not appropriate for all IE research question. Network analysis methods are used to examine relationships among groups of actors and are therefore only appropriate for research questions relative to relationships. For example, IE research areas of interest noted by [McDougall and Oviatt \(2000\)](#) of entrepreneur characteristics and motivations, transitioning economies, economic development initiatives and corporate entrepreneurship may not easily lend themselves to network analysis methods.

Further, limited access to network data may require a researcher to use other forms of data analysis to address his or her question. Respondents may be hesitant to respond to questionnaires asking for relationship data. As noted earlier in this chapter, gathering network data holds challenges not found when collecting data for other analysis methods. We recommend that the researcher consider data collection issues as early as possible when designing their research agenda.

## CONCLUSION

The purpose of this chapter is to provide an overview of network analysis methods as well as how these methods could be used to inform and extend IE research. Network analysis methods are relatively new to empirical research, but over the past 20 years these methods have become rigorous and well defined. These methods are well suited to examine three areas of

research interest in IE: IPOs, firm funding and alliance formation. I believe the introduction of network analysis methods into IE research will create new insights and research questions in this important stream of research. Further, network analysis methods may provide a new lens through which to evaluate current IE research questions.

I would encourage IE researchers interested in gaining a greater understanding of network analysis to review introductory texts by Scott (2000) or Degenne and Forse (1999). The Monge and Contractor (2003) text provides an introduction to multi-theoretical, multi-level analysis using network analysis methods. Additionally, Wasserman and Faust (1994) have written a thorough text of network analysis methods. Finally, journals such as the *Annual Review of Sociology*, *Social Networks*, *American Review of Sociology* and *American Sociological Review* provide current trends in network analysis research methods.

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# A CROSS-NATIONAL COMPARISON OF INCUBATED ORGANIZATIONS: AN INSTITUTIONAL PERSPECTIVE<sup>☆</sup>

Tomas Karlsson, Benson Honig, Friederike Welter,  
Leora Shakked and Arie Sadaovski

## INTRODUCTION

In the process of starting new ventures, entrepreneurs typically reallocate existing resources to new uses. These resource reallocations challenge the status quo, and are therefore often viewed with suspicion by others (Aldrich & Fiol, 1994). Thus, entrepreneurs need to convince others that the actions required of their new venture are desirable, proper and/or appropriate – they need to gain legitimacy. Institutional theory holds that new ventures have to conform to institutional pressures in order to gain legitimacy. Legitimacy is essential for the new ventures' chances of survival (cf. Aldrich & Auster, 1986; Aldrich, 1999; Stinchcombe, 1965; Singh, Tucker, & House, 1986). For example, a new venture's reputation facilitates its entry into business networks, which enhances growth (Larson, 1992) and an individual's associations with government agencies and community organizations

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have positive effects on business founding and survival (Baum & Oliver, 1996). Consequently, institutional theory may lead us to expect that those new ventures that adapt most to institutional pressures would have the greatest chances of success.

At the same time, entrepreneurship research suggests that new ventures are more prone than established firms to break away from established patterns of behavior. New ventures have become a major source of innovation and the creation of new technologies (Acs & Audretsch, 1990). These creative organizations and new technologies are difficult for established companies to imitate, leading some new ventures toward industry leadership positions (Utterback, 1994), as well as creating wealth for the owners and the society (Birch, 1987; Dahlqvist, 1998; Davidsson, Lindmark, & Olofsson, 1996; Storey, 1994).

Thus, there is an unresolved paradox between the findings of entrepreneurship research that new ventures tend to break established patterns; and institutional theory's focus on the need for conformity to rules and legitimacy. However, recent conceptual developments in institutional theory potentially provide us with tools to resolve this paradox. It has been suggested by many institutional theorists that a more diverse image of organizational responses to institutional pressures must be offered (Beckert, 1999; Judge & Zeithaml, 1992; Oliver, 1991). In this chapter, we utilize such an approach.

Organizational responses are influenced by the nature of institutional pressures, the congruence between different institutional pressures facing an organization, the coherence between the institutional pressures and the goals and strategies of the organization, and the extent to which different institutional pressures are enforced; as well as by the overall environment the organization is performing in. A repertoire of organizational responses to institutional pressures is thus conceivable (Oliver, 1991). While recent additions to institutional theory may provide insights into how new ventures deal with institutional pressures, little, if any, empirical research has been done that examines how different institutional fields influence strategic options and outcomes.

Recent literature has begun to focus on the various aspects of internationalization of new and small businesses (Oviatt & McDougall, 1994; Wright & Ricks, 1994; Westhead, Wright, & Ucbasaran, 2001). Despite some recent efforts for systematic comparisons between countries (Reynolds, Bygrave, Autio, Cox, & Hay, 2002), most entrepreneurship research analyzes new venture creation and entrepreneurship from a micro-level perspective, taking the local or national institutional environment as given.

In this study, we argue for a cross-national comparative framework to better understand how responses to institutional pressures influence young organizations in different institutional fields.

## **PURPOSE**

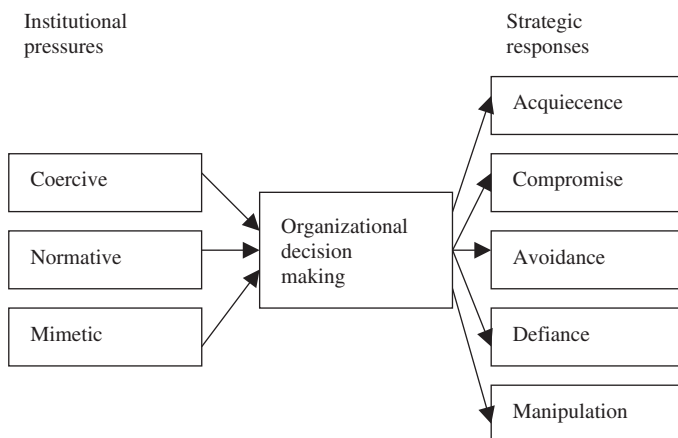
This study analyzes how new organizations in two different organizational fields respond to institutional pressures. Our objective is to develop an understanding of how different organizational fields influence new organizations' responses to institutional pressures, and offer potential context-dependent resolution of the conformity/nonconformity paradox of new organizations. By organizational fields we mean those organizations, which, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products (DiMaggio & Powell, 1983).

## **STRATEGIC RESPONSES TO INSTITUTIONAL PRESSURES**

Not all organizations respond in the same way to pressures, and not all organizational actors share the same goals and objectives. Broadening the possibility for agency within institutional theory, researchers have begun to address the strategic options available to organizations subjected to institutional pressures beyond the conformity–nonconformity dichotomy (Ang & Cummings, 1997; Beckert, 1999; Judge & Zeithaml, 1992; Bigelow & Stone, 1995; Montgomery & Oliver, 1996; Scott, 2001; Oliver, 1991). This stream of research suggests that organizations have the discretion to respond to institutional pressures in several different ways. In other words, they have other options than to conform to the institutional pressure, although the availability of the repertoire might depend on their age and size.

Oliver (1991) has developed an elaborate typology of organizational responses. This typology is summarized in Fig. 1. She also argues that nonconformity to institutional pressures may sometimes be beneficial, as it improves flexibility and gives the organization more options for action. The typology is based on the argument that a particular institutional pressure may be internally inconsistent, insufficient and conflicting with other institutional pressures. Further, the pressure may be more or less in congruence





*Fig. 1.* Institutional Pressures and Strategic Responses.

with internal organizational characteristics. Based on this, several different organizational responses are possible, depicted in Fig. 1.

#### *Acquiescence*

In its most basic form, institutional theory predicts that organizations will accede to institutional pressures. Oliver (1991) suggests that organizations may accede in several different ways; by habit, imitation, or compliance. Habit refers to the unconscious adherence to taken-for-granted norms. Imitation is related to mimicry or institutional models expressed by successful organizations, which might be of particular importance in the case of new organizations, as one might expect them to gain legitimacy faster when imitating successful organizational models. Compliance is the conscious obedience to or incorporation of values, norms or institutional requirements.

#### *Compromise*

Under circumstances of conflicting institutional demands or inconsistencies between institutional and intraorganizational demands, organizations may try to balance, pacify or bargain with the institutional pressures or the

actors exerting pressures. Balancing refers to playing institutional actors against each other. Organizations may thereby balance the expectations of multiple constituents, although this is a strategy to be less expected from new or small organizations having not yet gained legitimacy and/or the size needed to exert any power over institutional actors. Pacifying refers to partial conformity to one or more constituents, hoping that this would be sufficient to pacify any threatening action. Bargaining refers to placating and accommodating parts of the institutional elements, while trying to re-negotiate with the institutional actors.

### *Avoidance*

Avoidance is defined as the organizational attempt to preclude the necessity of conformity. Organizations achieve this by concealing their nonconformity, buffering themselves from institutional pressures, or escaping from the context in which the institutional rules and expectations are expressed. This kind of behavior can be frequently observed in transition countries, which are on the move from a centrally planned toward a market-based economy, and where newly installed institutions in combination with weak enforcement foster widespread avoidance behavior of entrepreneurs.

### *Defiance*

Well defiance is an active form of resistance. Oliver (1991) suggests three tactics of defiance. These are dismissal, challenge, and attack. One option is to totally ignore the institutional pressure. This option is available if the organization's survival is not at threat because of nonconformity, or the risk of nonconformity being discovered is low. It could also be a possible strategy if institutional enforcement is weak. Challenge is an active departure from rules, norms, and expectations. If the organization feels that its structure and behaviors are more efficient than those advocated by the institutional system, and the punishment for deviations is limited, the organization may choose to challenge the institutional system. Attack involves active resistance. An organization may attempt to change the institutional rules by actively belittling, or denouncing them. Again, this might not be an option for young and new organizations, which are in the need of establishing legitimacy within the organizational field.

### *Manipulation*

Manipulation is the most active organizational response. Organizations may try to use tactics that influence or control the institutionalized norms and values. Influence tactics are directed toward changing the institutionalized criteria of acceptable practices through various tactics such as lobbying. Controlling tactics involve trying to establish power and dominance over the external constituents that are applying pressure on the organization, thereby forcing them to change.

Oliver's (1991) identification of different response strategies to institutional pressures is a major contribution to the literature. She argues that new organizations will respond to institutional pressures according to their *willingness* to respond and their *ability* to conform to the institutional rules and expectations. However, she does not discuss how these different responses are related to different organizational fields or to different stages of enterprise development. In this study, we try to develop insight into both these issues. The willingness to conform to institutional pressures depends upon the organization's perceived benefits in terms of efficiency and legitimacy gains. Ability to conform depends on what awareness the organization has toward the institutional pressure and the knowledge the organization has about the institutional field in which the pressure is exerted. New organizations, due to their resource scarcity and lack of legitimacy, have much to gain from conforming to institutional standards. Research has shown that conforming to institutional pressures to write business plans increases survival for certain types of nascent organizations (Delmar & Shane, 2004), although conformity is not necessarily associated with success (Honig & Karlsson, 2004). It is likely that new organizations, in general, are willing to conform to institutional pressures. However, their ability to do so may differ.

In this study, we studied one environment in which the knowledge about the institutional requirements is extensive and one environment where the ability to adapt to institutional requirements is less extensive. In this way we are able to illustrate how strategic choices are made in two different organizational fields and which factors might influence the strategies used. For this study, we assert three propositions which are discussed later in this chapter.

## **METHOD**

Knight (1997, p. 696) pointed out that "we cannot assess the rationality of individual action without taking account of the institutional and cultural

context in which everyday decisions are made.” Similarly, organizational behavior with respect to institutional pressures is locally specific and differs with respect to experiences and backgrounds of entrepreneurs, nationality, industry, and culture (DiMaggio & Powell, 1983). This takes on special importance in the case of institutional pressures in new organizations. When comparing entrepreneurial behavior in different contexts, one ought to take local institutional factors into account.

In this study, we focus on two different organizational fields for new organizations, namely, new organizations incubated in a Swedish incubator, and new organizations incubated in the Israeli incubator system. By organizational fields we mean those organizations, that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products (DiMaggio & Powell, 1983). We acknowledge that organizations in the same incubator environment do not fully match all requirements of an institutional field. However, it satisfies most of the requirements. New organizations in the same type of incubators are geographically proximate, and are influenced by a similar intensity of pressures from regulatory agencies that are often state controlled. They share several types of suppliers for office space and funding. It is not uncommon that companies in the same incubator also share similar suppliers and customers. Thus, they are both *connected* and *structurally equivalent* to other firms from the same incubator environment (DiMaggio & Powell, 1983). Firms started in another incubator environment, however, could be said to act in a different institutional field, even though some aspects are probably generic to all incubators. To study incubated firms also provides a methodological advantage. Very young organizations are very difficult to find, since they are too young to have made their mark on the world (Katz & Gartner, 1988; Kalleberg, Marsden, Aldrich, & Cassell, 1990). Incubators provide one of the few arenas where very young organizations can be found.

Incubators, consisting of supportive micro-environments for the nurturing and development of entrepreneurial businesses, have existed for quite some time. The first incubators were founded in the U.S. in the 1950s and the model spread slowly through the 1960s and 1970s, reaching Europe in the early 1970s. The study of incubation is a reasonably young field, beginning in the mid 1980s, spurred by the growing prevalence of incubators worldwide during that era. Business incubators have traditionally been investigated from a public policy perspective, examining questions such as “How can business incubation be improved?” or “What are the best support structures for firms in incubators?” Business incubation is seen as the

remedy for a great variety of problems, including lack of capital, and market knowledge, as well as job creation. Despite considerable study of the public outcomes of incubator activity, little is known regarding the internal micro-processes occurring inside these organizations. In a recent literature review of the field of incubator studies, [Hackett and Dilts \(2004\)](#) bemoan the dearth of research investigating incubated organizations. The study of business incubation is lacking in two significant aspects.

First, the majority of research investigates the incubators themselves, and not the incubated organizations. This clearly poses both a theoretical and a practical problem. If we want to improve organizational activities, e.g. the job creating effect of an incubator, the key focus should be the incubated organizations, not the incubators. Understanding of incubated firms is central to understanding problems of technology innovation and job creation. Incubator managers as such do not produce many innovations, although they may play an important role in supporting innovation in the incubated firms.

Second, [Hackett and Dilts \(2004\)](#) argue that for the theoretical development of business incubation studies, we must turn our attention toward the contextual factors where incubated firms act. Attention to contextual factors calls for additional qualitative work, as well as comparisons of incubated organizations in different organizational contexts. We are aware of no study comparing incubators in different national contexts, i.e. cross-national comparisons, an important research gap we hope to help fill with this study. By focusing on incubated organizations in two different countries, we hope to address some of the shortcomings as highlighted by [Hackett and Dilts \(2004\)](#).

## SAMPLE

The analysis in this chapter is based upon two different samples, a Swedish and an Israeli sample. The Swedish group consisted of six incubated firms in a Science Park in a mid-sized Swedish town. In this group, the incubatees were interviewed at several points in time over a 2 year period from 2001 to 2003. The incubatees were not selected according to any specific criteria, but could be considered as representative for the type of incubatees in a Science Park in Sweden at that point in time. The entrepreneurs in the incubator are a rather homogeneous group, they are all Swedish by origin, they are predominantly around 25–30 years of age, they have a university or university college education, and four of them have at least one member on their

management board with a university education in business administration. As they are all localized in the same Science Park, they all know each other by name, none of them have business relations, and they are all rather small, with 1–3 employees. Actors in the task environment of the incubatees were also interviewed, using a snowball sample through references by the interviewed managers. The data from the Swedish sample focused specifically on issues of organizational responses to institutional pressures as set by the incubator and other institutional actors.

In total, 27 companies were interviewed in the Israeli study, but only 13 of these companies were randomly selected for this analysis. The selection criterion was done alphabetically on their first names. First names beginning with A to first names beginning with L were included. The Israeli data set was more diverse in some aspects. Respondents differed with respect to age and geographical location in Israel. They are, as a group, similar to the Swedish companies with respect to size and the relative youth of their firms. Israeli and Swedish managers differed with respect to what type of business ideas they pursued, however, this is mainly due to the different professional backgrounds of the entrepreneurs and the different objectives of the overall incubator programs in both countries. The Swedish firms were predominantly starting their firms in the service sector, and the Israeli firms were predominantly product-innovation-based companies. The Israeli managers, as a group, were different from the Swedish managers with respect to their relative newness to norms and values in a market economy. While the Swedish managers had all been raised in Sweden, and were infused with the workings and values of a market economy, the Israeli managers were recent immigrants from the Former Soviet Union (FSU, nowadays mainly Russia and Ukraine).

The main source of data collection consisted of in-depth interviews of about 1–1.5 hours in length. The Swedish entrepreneurs were interviewed several times over a 2 year period of time. Interviews were conducted in a semi-structured manner, aimed at understanding certain aspects, such as the sources of institutional pressures, and what type of responses they created. The Israeli entrepreneurs were interviewed once, for a different purpose, and the interviews were reanalyzed for this study. Thus, the Israeli interviews were not as rich in describing the phenomenon of strategic responses to institutional pressures. In some cases, it was not possible to code a certain aspect. In these cases, we disclose and acknowledge this limitation. While such omissions of codeable data are unfortunate, we believe it is not crucial for the analysis. The data from the Israeli interviews are sufficient for making an interesting and fruitful comparison and analysis as well as for

pointing out avenues for further research. All interviews were transcribed verbatim and translated into English.

Table 1 provides a descriptive summary of the samples. We have a summary of the year of establishment, industry, demographics, and amount of interviews conducted at each firm in the study, both Israeli and Swedish. All names are fictitious, as the companies have been granted anonymity.

The transcriptions were imported into the text analysis program NUD\*ist 6. Analysis of the material was conducted in a structured way, drawing from the theoretical framework of Oliver (1991), and blocks of texts were coded accordingly, recorded by NUD\*ist 6.

In Table 2, we have summarized how we coded different blocks of texts into the categories of Oliver's strategies. For each of the strategies: acquiescence, compromise, avoidance, defiance, and manipulation, we define the concepts closely to the definitions of Oliver. Next, we operationalized these definitions in coding principles reflecting more practically what had been categorized into a certain strategy. In order to make the whole process more transparent, we added specific examples of quotes that would be coded in a specific category. These quotes are drawn as closely as possible from translations of the actual interviews in the present study.

## CHARACTERISTICS OF THE TWO INCUBATOR ENVIRONMENTS

The Swedish incubator environment is localized and diverse. Most incubators are connected to universities and university colleges. Some are owned by their universities, and some are independent of their universities. Swedish incubators focus mainly on university teachers and students. The central idea of most Swedish incubators is to make use of research and development generated in universities, and commercialize it. Funding for incubators commonly comes from universities, governmental institutions, and funds from associations and companies, and helps to finance the space in which the incubator is housed and the salary for incubator managers and staff. The Swedish incubators often offer subsidized rents. The incubator has no equity stake in the incubated businesses, and the incubator offers no funding to the incubated firm. Instead, they offer infrastructure such as telephone services, shared equipment such as faxes, copying machines, as well as all common coffee and meeting rooms. Moreover, they provide contacts with banks, venture capital firms, angel investors, insurance agencies, and governmental

**Table 1.** Summary of Interviews and Organizational Characteristics of the Sample.

Name	Year Founded	Industry	CEO Demographics	Interviews
Ett (Sweden)	2000	Web design	Swedish male	4
Två (Sweden)	2001	Media	Swedish male	6
Tre (Sweden)	2000	IT-consultant	Swedish male	4
Fyra (Sweden)	1999	Stock broker	Swedish male	4
Fem (Sweden)	1999	PR-consultant	Swedish female	4
Sex (Sweden)	2000	Light-consultant	Swedish male	3
One (Israel)	1992	Acoustics	FSU male	1
Two (Israel)	1992	Materials	FSU male	1
Three (Israel)	1999	Chemical engineering	FSU male	1
Four (Israel)	1993	Mechanical engineering	FSU male	1
Five (Israel)	1993	Mechanical engineering	FSU male	1
Six (Israel)	1995	Medical equipment	FSU male	1
Seven (Israel)	1995	Mechanical engineering	FSU male	1
Eight (Israel)	1990	Mechanical engineering	FSU male	1
Nine (Israel)	1993	Pharmaceutical	FSU male	1
Ten (Israel)	1993	Pharmaceutical	FSU female	1
Eleven (Israel)	2000	Medical equipment	FSU female	1
Twelve (Israel)	2003	Materials	FSU male	1
Thirteen (Israel)	1998	Materials	FSU male	1



**Table 2.** Strategic Responses Coding Table.

Name of Code	Definition	Coding Principle	Quote
Acquiescence	Acquiescence is the action taken by a firm to conform to institutional pressures	Behaviors, plans, and talks taken to conform to the institutional pressures will be coded here. Indications of imitating role models, adopting behaviors according to literature and compliance because of rules	It feels like it is a tool really. We feel that it can really be used. We want to revise it, such that it really is solid and change. It feels like it has been the goal and how we have gotten there in some way
Compromise	A compromising strategy indicates that the firm tries to reduce the extent to which conformity is necessary	Attempts to renegotiate, reduce and balance the extent to which conformity is necessary among the firm and its external constituents is coded here	We don't really want to do what the incubator tells us to do, but what choice do we have? So we write something to them and hope it makes them happy
Avoidance	Avoidance is the attempt to preclude the necessity to conform to institutional pressures	Concealing nonconformity by copying existing methods or tools, avoiding resource providers demanding other tools and speaking about institutional pressures in the future	That type of strategy that the incubator suggests is ok if you are in another line of business than the one I am in. I am not going to use it, because it is not suitable for my type of business
Defiance	Defiance is an active response to an institutional pressure where nonconformity is openly admitted. But active initiatives for change beyond	Expressed alienation to the institutional pressure in interviews, meetings with stakeholders and colleagues. Arguments questioning the	And all the companies went bankrupt because they did what the incubator managers said they should do, except for developing a service whose need existed at the

**Table 2.** (Continued)

Name of Code	Definition	Coding Principle	Quote
	derogatory speech is precluded	legitimacy of the incubator	market. Instead they applied for venture capital, and then when they got it and it was withdrawn, they went bankrupt
Manipulation	Manipulation is an active response to an institutional pressure where change of the institution itself is the goal	Behaviors, plans, and talks taken to influence different stakeholders not to conform to the institutional pressure to write business plans will be coded here	We wrote a commentary in the newspaper about the incompetence of the incubator leadership and what they suggest that we should do

support agencies. Their proximity, and close cooperation with the university also provides a pool of skilled labor for incubated firms.

The typical inhabitant of a Swedish incubator is a student in the university, who, due to his/her relative youth, may be less risk averse than older individuals. In addition, there may be structural advantages for younger people. The most important is that their opportunity costs are small, as few have jobs with an alternative stable income. Many Swedish students have student loans that are set out on beneficial pay-off terms relative to their future income. If the student does not have an income after graduation, he/she does not have to repay anything on the loan. Many student entrepreneurs succeed in gathering a sufficient amount of credits to be eligible for new loans the following term, which means that they can efficiently run the new business on the loan they get from the government for studying.

The Swedish incubated companies share the same background as most of the incubator coordinators. They have the same education, they are of the same age, and they have the same nationality. Their businesses are typically started as a professional service firm. In Table 3, some general characteristics of the Swedish sample are presented.

The initial aim of the Israeli incubator program was to assist with the employment and assimilation of an influx of immigrants from countries from the FSU that occurred in the early to mid-1990s.

**Table 3.** Industrial Sector and Founding Year of the Swedish Firms.

Industry	Year of Foundation	Number of Companies
IT, media, engineering	1999–2001	6
Materials, chemicals, medicine and acoustics	1992–2003	12

A project wishing to join an incubator must have a new and innovative idea (judged by the incubator's board and by the Ministry of Industry and Trade's representatives) in the field of technology, whose objective is to develop a product with a potential for export. Each project consists of 3–6 developers, while 50% of the project members must consist of new immigrants. Projects operate in the incubator for a 2-year period. Each project has a budget of up to \$172,000 a year (i.e. up to \$344,000 for the 2-year period). Of this budget, 85% is a government grant. The program is also supported by other organizations, such as the Jewish Agency, local authorities, veteran industry companies, research institutions, and some private investors.

The incubator assists with examining the feasibility of an idea of the project, helps to hire personnel, offers professional and managerial guidance, provides secretarial, purchasing, bookkeeping and maintenance services, as well as assists with legal advice, securing funds, and aiding preparation for marketing. During his/her time in the incubator, the entrepreneur must have developed a specific product of technological and marketing value, a prototype or working model of the product, as well as a business plan. Part of the profits, 3% annually until the investment is returned, go toward paying back the government for its investment in the form of royalties.

The Israeli company managers represented in this study are quite different from their Swedish counterparts. They do not speak Hebrew well, they do not share the same education as the incubator manager, they come from an engineering background, and from an entirely different economic system. As some of them immigrated to Israel in the 1980s; they left the Soviet Union during a time when perestroika and glasnost had not gained much impetus, as entrepreneurship development did not begin until 1988 with the law on cooperatives (Smallbone & Welter, 2001). This means that most respondents were raised and gained their professional experience in a system which did not allow and tolerate private entrepreneurship in an official sense.

The Israeli incubated projects are typically highly technical, based on technology and knowledge brought from former Soviet states to Israel. In Table 4, some general characteristics of the Israeli sample are presented.

**Table 4.** Industrial Sector and Founding Year of the Israeli Firms.

Industry	Founding Years	Total Number of Companies
IT, media, engineering	1999–2001	6
Materials, chemicals, medicine and acoustics	1992–2003	12

## ANALYSIS

In Table 5, we summarize the results of our analysis. Swedish incubatees are labeled with Swedish numbers. Israeli companies are labeled with English numbers. The table contains four columns summarizing our coding with respect to: strategic response, ability to conform, desire to conform, and outcome. The categorization into different labels were analyzed and agreed upon by at least two of the authors.

In many cases, both Swedish and Israeli incubator firms tried to adapt to institutional forces, but failed to accomplish their goals. Examples include an Israeli entrepreneur who explained the difficulties he experienced when writing his business plan:

I wrote the report as a physicist and it did not work. They said to me: ‘well, we don’t understand physics...’. So I wrote part of the report about physics and the other part about economy. That did not work either. The third time I wrote three pages, only about economy.

Proposition 1 asserted that “new organizations will act so as to appear to follow institutional demands, while simultaneously subverting or avoiding direct thorough compliance”. We found that new organizations did, by and large, attempt to conform to institutional forces, but only to a limited degree. In support of Proposition 1, we found that the most common reason for young organizations to conform to institutional pressures was to gain access to external capital. Of note was that wanting external capital, and acquiescence to institutional rules did not always result in obtaining external capital, as illustrated by the quote above. On the other hand, not conforming to institutional pressures did not necessarily have adverse consequences. From a theoretical perspective, we might anticipate negative consequences for organizations failing to submit to institutional forces. This study suggests that under certain conditions, such simple predictions based on institutional theory may not hold with regard to new organizations.

**Table 5.** Coding with respect to: Strategic Response, Ability to Conform, Desire to Conform and Outcome.

Name	Strategic Response	Ability to Conform	Desire to Conform	Outcome
Ett (Sweden)	Compromise	Yes	External ownership capital	Granted external capital and award for best incubator company
Tva (Sweden)	Acquiescence	Yes	Equipment loan	Granted
Tre (Sweden)	Compromise	Yes	External ownership capital	Not granted
Fyra (Sweden)	Compromise	Yes	External ownership capital	Granted
Fem (Sweden)	Defiance	Unknown	No (earn money without external capital)	Award for best incubator company
Sju (Sweden)	Avoidance	No	No (earn money without external capital)	Award for best incubator company
One (Israel)	Acquiescence	No	Unclear	Granted external capital
Two (Israel)	Acquiescence	No	External ownership capital	Granted
Three (Israel)	Acquiescence	Yes	External ownership capital	Not granted
Four (Israel)	Acquiescence	No	External ownership capital	Some funding
Five (Israel)	Unclear	Unclear	External ownership capital	5000 USD
Six (Israel)	Acquiescence	No	No	Corporate funding
Seven (Israel)	Unclear	No	No	Failure
Eight (Israel)	Unclear	Unclear	External ownership capital	Some funding
Nine (Israel)	Unclear	Yes	External ownership capital	Some funding
Ten (Israel)	Acquiescence	No	External ownership capital	Marginal funding
Eleven (Israel)	Acquiescence	Yes	External ownership capital	Problems with funding
Twelve (Israel)	Avoidance	No	External ownership capital	Failure
Thirteen (Israel)	Acquiescence	Yes	Unclear	Corporate funding

**Table 5. (Continued)**

Name	Strategic Response	Ability to Conform	Desire to Conform	Outcome
Total				
Sweden	3 Compromise	4 Yes		
	1 Acquiescence	1 No		
	1 Defiance	1 Unknown		
	1 Avoidance			
Israel	8 Acquiescence	4 Yes		
	4 Unclear	7 No		
	1 Avoidance	2 Unclear		

Proposition 2 stated that ‘in organizational fields marked by a good knowledge of institutional demands, attempts to acquiesce will lead to successful outcomes’. The Swedish firms were in an environment marked by knowledge of institutional norms and rules. While they have the ability to conform, they appear to use it only to a limited degree. Swedish firms use their conformity to obtain their financing, but they do not use other institutionally promoted aspects. In this sense, we observed organizations in the incubators using a compromising strategy. By conforming to the institutional pressure in form, and not in action, they hoped to gain the benefits of conformity to institutional pressures without paying the price of implementation on the organization. In this way, the Swedish firms managed to gain legitimacy through conforming to institutional pressures on one side, and to carry on with their business as usual on the other. This strategy provided new Swedish organizations time to create and develop unique technological and organizational structures, as well as to gain legitimacy and resources from the environment.

Proposition 3 stated that ‘In organizational fields marked by poor knowledge of institutional demands, attempts to acquiesce will not result in successful outcomes’. Poor knowledge about the institutional demands led to marginal success in the Israeli firm’s acquiescence strategy. That is, they tried to conform to the institutional standards, but fell short, unable to produce what the external financiers wanted. Some of the new immigrants indicated that they were lacking legitimacy just because they were immigrants, stemming from not being similar to what is expected from a “normal” Israeli. They also lacked legitimacy with respect to their work and expertise, while some also reported they observed or received skeptical treatment on the part of institutional actors when they tried to act as

entrepreneurs. This is illustrated best by quotes from the Israeli entrepreneurs. One entrepreneur complained about his loss of reputation and the difficulties connected to building up an entrepreneurial identity in an unknown environment:

[In Russia] I had a very good reputation... But I'm not a suitable entrepreneur in this project [in Israel]. I can't speak with them, I can't explain to them. It is not Russia. By immigrating I lost my reputation. It's very difficult to reconstruct.

Included here is a reference to the way things were done in the former Soviet Union, where knowing people ('blat', cf. [Ledeneva, 1998](#)) played an important role in coping with shortages in daily life, as well as at the workplace. This parallels the reliance on social capital at start-up for ethnic minorities and/or immigrant communities (cf. [Ram & Jones, 1998](#) for review). Another entrepreneur stated that

Everything you say is being 'examined'. They don't believe in you. Neither in you nor in your inventions. There was an attitude that whatever was done in the USSR is no good.

Thus, incubatees in the Israeli environment conformed to institutional pressures, but still failed to achieve legitimacy from their conformity.

## CONCLUSIONS

This chapter examines how new ventures are influenced by institutional pressures in two different institutional contexts, subject to similar constraints due to their size and relative newness.

We found some similarities between entrepreneurs in two different countries. Both groups wanted seed or venture capital, and entrepreneurs in both countries seemed willing to endure considerable sacrifices to obtain it. Both groups conformed to institutional pressures they associated with applying for venture capital.

However, we found that Israeli incubatees failed to gain legitimacy from their conformity, even if they had the intention to conform, while the Swedish incubatees were highly successful in gaining legitimacy even though their intentions to conform to institutional pressures were limited. The Israeli entrepreneurs suffered with respect to legitimacy as they were lacking knowledge in the language and homogeneity to the general socio-cultural environment they were operating in.

More specifically with respect to Proposition 1, we found that Swedish entrepreneurs consciously conformed to the institutional pressures formally,

while keeping the operational aspects of the company intact, uninfluenced by the formal changes. In the case of the Israeli entrepreneurs, they intended to conform to the institutional pressures, but knowledge about the institutional requirements made their conformity incomplete.

In line with Propositions 2 and 3, we found that conformity to institutional pressures was rewarded in the Swedish case, even though they were not conforming to the institutional pressure in their operations. In Israel, even though conformity was intended, there was no direct relationship between increasing legitimacy and conformity in the Israeli companies. It might be that the Israeli entrepreneurs did not gain legitimacy through their conformist attempts because they did not reach the threshold level of homogeneity to the Israeli norms.

There are several limitations to consider in this study. Since the environments we studied are different and in many ways unique, there may be unobserved heterogeneity. However, our results are illustrated by exact quotes from entrepreneurs, and we hope that the methodology we utilized in this study created a rigid system for interpretation, one that can be compared and examined in light of future cross-national comparison.

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# TUNING UP THE GLOBAL VALUE CREATION ENGINE: THE ROAD TO EXCELLENCE IN INTERNATIONAL ENTREPRENEURSHIP EDUCATION

Ronald K. Mitchell

## 1. INTRODUCTION

Most of us believe that entrepreneurs are special. We do this because both scholars and practitioners tell us so.

Scholars may disagree on the nature of entrepreneurship itself; but they do agree that the results of entrepreneurship are unique and important to economic well-being worldwide. Practitioners likewise. Whether they be policy makers seeking job creation, the popular press which needs an endless supply of biographies and “how-done-it” stories, the beneficiaries of entrepreneurs’ generosity that are constantly wooing these potential sources of large endowments, the celebrity-seeking public who – as with sports and entertainment stars – seeks to venerate entrepreneurs as heroic objects, or entrepreneurs themselves, most of whom do not mind a little veneration; it is also well accepted by each category of practitioners that entrepreneurs are special.

However, here the agreement seems to stop, at least when it comes to one fundamental issue: how entrepreneurs are created. Scholars continue to

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argue whether entrepreneurs are born or made (Katz & Shepherd, 2003; Mitchell et al., 2002b), with those of the “born” persuasion pointing to traits (Berlew, 1975; Ibrahaim & Soufani, 2002) such as high locus of control (Rotter, 1966) and need for achievement (McClelland, 1965) as reasons that people become entrepreneurs; and those of the “made” persuasion noting that the psychology of the entrepreneur (Brockhaus, 1982; Brockhaus & Horowitz, 1986) or of new venture creation (Shaver & Scott, 1991) involves much more than traits: such things as person, process and choice (p. 23). Practitioners offer up an almost infinite variety of explanations for entrepreneurial success, the prevailing presumption being that because entrepreneurs are special, then the process of becoming one is also special.

Fortunately, mounting evidence is beginning to suggest a new hypothesis ... that while the results of entrepreneurship are indeed important (special, in this parlance), the path to becoming an entrepreneur is not itself special, as previously thought, but is in fact general – rooted in the simple processes of deliberate practice that have been universally associated with creation of the cognitive systems that give rise to excellence in other areas of human endeavor such as sports, games, and the arts (Charness, Krampe, & Mayer, 1996; Ericsson, 1996). And fortunately, the learning models of the deliberate practice school meaningfully situate both trait-statics and process-dynamics within a comprehensive explanation for performance excellence that is rooted in the development (through deliberate practice) of most individuals’ cognitive systems.

Confirmation of this new hypothesis may have far-reaching implications for entrepreneurship internationally. If the creation of entrepreneurs in reality, depends in a nontrivial manner, upon a process that is generally accessible to any individual who is willing to undertake the deliberate practice, necessary to create in themselves the required entrepreneurial cognitions, then we may ultimately discover that the activities based in the “specialness” paradigm that we have intended should stimulate entrepreneurship (such as entrepreneur of the year, the listing of curiosities such as youth v. wealth, etc.), have in fact discouraged it by inadvertently persuading all but the most bold or foolish (in short, all reasonable persons) that entrepreneurship is not for them. Thus, in the same way that monopolies are harmful to the public good because they limit something that is more or less unlimited, so do our beliefs about entrepreneurs effectively limit the amount of entrepreneurship available to us; because they limit a way of thinking that may otherwise be virtually unlimited when viewed in the light of the emerging deliberate practice paradigm. New approaches to the creation of global entrepreneurs are therefore needed, because entrepreneurship as the global value creation

engine, while still running, may in fact be in need of a tune-up, or perhaps even a refit.

Where global entrepreneurship is defined as *the capability to create new and valuable transactions anywhere on the globe* (Mitchell, 2003), then in this chapter we may define global entrepreneurs to be: *those individuals whose capability for creating valuable new transactions crosses geographical, cultural, and economic borders*; and then consider how we might go about a much more systematic process of creating entrepreneurial expertise. In this two-section chapter I therefore attempt to demonstrate that as a global society we have, in certain ways, been wrong in our approach to entrepreneurship education (both informal and formal), and that a course correction (pun intended) is needed. After presenting some brief background, I outline in Section 3 the relationship between education and high-performance to support the argument that entrepreneurs are special, but are not created in the way that is commonly believed: that there is, in actuality, a general process for creating them. In the fourth section of the chapter, I present and discuss the international implications of the emerging “practice school” of entrepreneurship education for reforming the creation of global entrepreneurs.

## 2. BACKGROUND

High-performance in a variety of forms is an important outcome of business school education (Porter, 1997; Porter & McKibbin, 1988). In this chapter, I define high-performance results (using a comparative approach) to mean: *present results compared to past results, results of Approach A compared to the results of Approach B, and a given set of results compared to relevant goals* (Chrisman, 2001). The achievement of high-performance results as so defined is generally thought to be directly related to education and thinking (Ericsson & Charness, 1994; Glaser, 1984). The nature of the education and thinking involved in producing high-performance entrepreneurial results both domestically and internationally is the focus of analysis in this chapter.

However, by accepting the premise that education and thinking are directly related to the achievement of high-performance entrepreneurial results, we implicitly reject two prevalent notions that bear upon the philosophy of entrepreneurship education adopted herein. The first incompatible notion is the idea that personal attributes (e.g. achievement motivation, high locus of control, and risk taking propensity) fully determine the extent of economic achievement – especially in the entrepreneurial arena

(e.g. Ibrahim & Soufani, 2002). Proponents of this idea assert some type of exclusivity: that there exists some group of individuals with the so-called “entrepreneurial traits” or “entrepreneurial personalities,” and that as a result, either much of entrepreneurship cannot be taught, and therefore the stock of entrepreneurial talent is limited to a rare minority in any society (leading to the notion that the entrepreneur-creation process should focus on methods of sifting through the population to identify these rare individuals); or that the entrepreneur-creation process should focus on somehow understanding and magnifying entrepreneurial traits and idiosyncrasies.

In this chapter, using recent research on expert performance, I shall instead make the more inclusive argument that high-performance results in global entrepreneurship are more directly related to the cognitive systems of individuals, which are in turn created through deliberate practice behaviors. In the model presented, the influence of personal attributes (such as traits or personality) is suggested to be moderate (affecting some aspects of the propensity to practice) v. being determinative. Thus, the assumption I make in this chapter is that it is deliberate practice as shaped by personal attributes, and the consequent cognitive system of a person, rather than a person’s personal attributes alone that more directly influence the extent of higher-performance entrepreneurial results.

The second incompatible notion is the idea that use of the scientific method to discover, explain, and teach a set of systematic economic high-performance principles and skills is not practical. As a result, there exists a belief that the creation of or the accurate assessment of new economic opportunity (Venkataraman, 1997; Shane & Venkataraman, 2000) is an arcane process that is difficult to understand, and one that only few master. However, as has now been well chronicled e.g. Bernstein (1998), there has been throughout history, a line of demarcation between the phenomena that may acceptably be explained by science, and those which are the province of fate, luck, the gods, etc. For example, prior to the introduction of probability theory, many risks were thought to be unmanageable, which today are simple matters for the actuary and for insurance (life, accident, fire, etc.) (Bernstein, 1998, p. 3). Correspondingly, prior to the occurrence of unacceptable economic shocks (e.g. the stock market crash of 1929, or the automobile quality crisis of the late 1970s and early 1980s) the development and application of systematic standards of auditing (the Accounting Principles Board (APB) and the Financial Accounting Standards Board (FASB)), or quality (e.g. ISO 9000) were thought to be unworkable, if not impossible. In this chapter, I shall demonstrate that recent theory and

empirical results make it possible to further push the line of demarcation from the inexplicable in economic performance, toward the scientifically explicable, thereby enabling a vastly larger proportion of interested individuals to perform at higher economic levels: to become entrepreneurs with global possibilities for creating new value.

Thus, by asserting the possibility of creating effective educational models for the acquisition and enhancement of the high-performance economic expertise that constitutes entrepreneurship, we are explicitly rejecting the prevailing notions and the resulting conclusion that only a minority can achieve high-performance results. For too long, these notions seem to have constituted a tacit morality for our tolerating the exclusion of the majority of the world's population from the high-performance economic result possibility set. However, if, as I hope to demonstrate, the exclusion of the majority of the world's population from first-tier economic opportunity rests primarily on the absence of the requisite cognitive system, which system is very likely to be widely transferable if based upon the application of a new branch of entrepreneurship research centered on transaction cognition theory (e.g. Mitchell, 2003), then the educational enterprise that I hope to outline within this chapter, is of monumental import to our collective economic future.

Accordingly, within Section 3 the elements of a conceptual model that relates high-performance entrepreneurial results to education are summarized. Within Section 4 the implications of the model for creating global entrepreneurs are developed: (1) in first-tier economies, (2) in transition and developing economies, (3) using a theoretically justifiable pedagogy, and (4) exploring some of the technological support that is helpful in sustaining and assisting in the effective use of this approach.

### 3. EDUCATION AND HIGH-PERFORMANCE RESULTS

A key turning point in my own research program as it relates to the education of entrepreneurs occurred on the day that I read Glaser (1984): *Education and thinking*. This new direction was further refined when I added to Glaser's foundation, the concepts of Ericsson and Charness (1994): *Expert performance: Its structure and acquisition*, and those of Charness et al. (1996): *The role of practice and coaching in entrepreneurial skill domains: An international comparison of life-span chess skill acquisition*. In this first

section of the chapter, in accordance with the use of the integrative approach as the guarantor of knowledge (Mitroff & Turoff, 1973), I shall summarize a conceptual model of the approach used by the deliberate practice school, which I believe can then relate the high-performance economic results of entrepreneurship, to education.

Beginning with the end, so to speak, I should like then to present first the deliberate practice model (Charness et al., 1996), and to explain its component parts, especially noting how both trait-based elements and process dynamics combine to influence entrepreneurial achievement (Section 3.1). Second, I explain how it is possible to combine principles from cognitive psychology and transaction cost economics to identify three essential elements in individuals' entrepreneurial cognitive systems that, through practice, can influence the level of performance in generating entrepreneurial results (Section 3.2). A discussion of the relationship among the parts in the "educational transaction" is the next logical step (Ericsson & Charness, 1994) (Section 3.3). Finally, I conclude the section by discussing the application of the model to education and thinking (Glaser, 1984), and to the pedagogy recommended (Section 3.4).

### *3.1. The Deliberate Practice Model*

Charness et al. (1996) provide a taxonomy that summarizes the factors (and their relationships), which research presently suggests are related to expert performance (Charness et al., 1996, p. 53). Fig. 1 is a reproduction of this summary.<sup>1</sup>

Charness et al. constructed and published the taxonomy illustrated in Fig. 1 in Anders Ericsson's (1996) book *The road to excellence: The acquisition of expert performance in the arts and sciences, sports and games*. Accordingly, based upon the context from which it was derived, a strict interpretation of the model might constrain one to conclude that this model may not apply to a more general setting, such as its use in pedagogies that lead to the achievement of high-performance entrepreneurial results. However, as reported later in this chapter, there exist both empirical evidence and evidence from educational practice, which suggest that this model may in fact, be generalizable to the education of global entrepreneurs. The argument supporting this assertion follows.

Essentially, the model illustrated<sup>2</sup> in Fig. 1 suggests that high-performance results are an outcome of an individual's cognitive system. Further, the model illustrates one of the most robust findings in the literature (Ericsson,

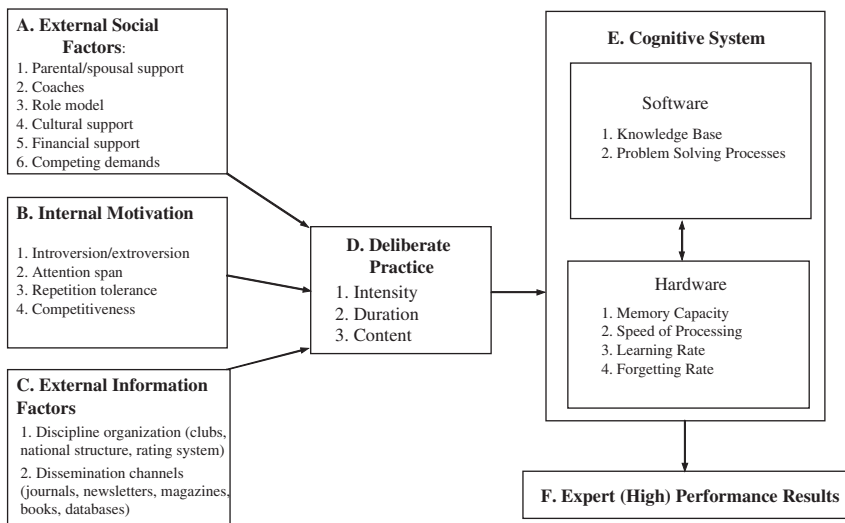


Fig. 1. General Model of Expertise/Skill Acquisition. Source: Adapted from Charness et al. (1996).

Krampe, & Tesch-Romer, 1993): that deliberate practice is the fulcrum upon which the leverage of an expert-level cognitive system depends. Deliberate practice, in turn, is suggested to result from both external and internal (personal attribute) factors, including: external social, internal motivation, and external information factors, each of which is thought to arise from the corresponding sets of sub factors illustrated. Deliberate practice, therefore, is thought to be the key to the attainment in individuals of *both* elements of a person’s cognitive system: the software (knowledge bases and problem-solving processes), and the hardware (memory capacity, speed of processing, learning rate, and forgetting rate). Importantly, the findings summarized in this model suggest that the acquisition of the requisite cognitive system in a domain is limited primarily by the lack of effective deliberate practice. The challenge for educators is to construct a pedagogy that fosters such practice; and accordingly, the “action” (in an educational sense) focuses on boxes A–D, Fig. 1, action that combines both traits (as they affect internal motivation) and the process-dynamics of learning through deliberate practice.

Interestingly, one of the findings related to the preeminence of deliberate practice as the key to high-performance, suggests that the role of coaches is critical (Ericsson & Charness, 1994). As my colleagues and I worked



together to operationalize this model in the University of Victoria (UVic) Entrepreneurship Program, we discovered that of the three necessary elements of deliberate practice: intensity, duration, and content (Fig. 1, box D), the coaches (we as professors) *only* had primary responsibility for the content; and that students must take primary responsibility for the level of intensity and for the actual duration of their individual practice experiences.

The finding that both student and coach contributions are required, appears to be consistent with suggestions in the literature: that neither fully experiential (Newell & Simon, 1972), nor fully individualized (Gardner, 1983, 1993) training can alone explain optimal performance (Ericsson & Charness, 1994, pp. 726, 727). To bring about intensity, duration, and content requires a combination of learner and coach contributions. Thus, before proceeding with a discussion of this combination-based educational process, it will first be useful to more explicitly specify the nature of the content to be provided by teacher/coaches, because this is the element that is most controllable by educators as coaches. In the case of deliberate-practice-based entrepreneurship education, a clear specification of the content consists of using cognition theory adapted explicitly for entrepreneurship education, to identify the essential cognitive systems that, through practice, can influence the extent of high-performance entrepreneurial results.

Entrepreneurial cognition theory has led a resurgence in scholarly examination of the “people side” of entrepreneurship (Mitchell et al., 2002a), and reaches across disciplines using a boundaries-and-exchange approach to enable a jointly distinctive and inclusive domain of entrepreneurial cognition research (Mitchell et al., 2004). Of particular usefulness in the specification of the essential cognitive content of deliberate-practice-based pedagogies that might be applicable in a global setting, is the newly emerging transaction cognition entrepreneurship theory, because, by deriving the core cognitions necessary for economic activity, it identifies the three sets of entrepreneurial cognitions that cross borders. The essential concepts of this theory – as cognitive content suitable for use in deliberate-practice-based entrepreneurship education, are summarized in Section 3.2.

### 3.2. *Cognitive Content*

In this section, I introduce Transaction Cognition Theory as the basis for the border-crossing cognitive content in deliberate-practice-based entrepreneurial education, and summarize it in three subsections. Transaction cognition theory has only recently been introduced to explain how to identify

the cognitions in transacting systems that lead to high-performance entrepreneurial results, i.e. produce new transactions/units of value (Mitchell, 2001, 2003; Mitchell, Morse, & Sharma, 2003); although some of its component concepts began appearing in the literature during the latter part of the past decade (Mitchell, 1992; Mitchell & Chesteen, 1995; Mitchell & O’Neil, 1998; Mitchell & Seawright, 1995; Mitchell, Smith, Seawright, & Morse, 2000; Morse, Mitchell, Smith, & Seawright, 1999). In the first subsection, I define transaction cognitions as the basis for identifying the necessary deliberate practice content using principles from transaction cost economic theory and cognitive psychology. In the second, I define the basic model of the transaction. In the third subsection, I illustrate how the concepts from transaction cognition theory are applied to our better understanding the deliberately practisable content of entrepreneurship education.

### *3.2.1. Transaction Cognitions*

Transaction cognition theory (Mitchell, 2001, 2003, 2004; Mitchell et al., 2003) proposes that three sets of cognitions working together are sufficient for an individual to create a transaction as a new unit of economic value, regardless of geographic location:

- Planning cognitions
- Promise cognitions
- Competition cognitions.

Transaction cognitions themselves consist of specialized mental models or scripts (Arthur, 1994; Neisser, 1967; Read, 1987) that guide individuals’ responses to three principal sources of market imperfection: bounded rationality (BR), opportunism (O), and specificity (S) (Williamson, 1985). Transaction cost economic theorist Williamson (1985, p. 31) argues that contracting processes in the transacting world include: (1) planning, (2) promise, (3) competition, and (4) governance/hierarchy, depending (respectively, in each instance) upon the presence/absence combination of the foregoing market attributes (BR, O, and S) (Williamson, 1985), as shown in Table 1.

This framework suggests three sets of attribute–process relationships that form the foundation for linking the realities of real-world markets to decision-making cognitions. These three relationships are: (1) between bounded rationality and planning, (2) between opportunism and promise, and (3) between specificity and competition (the relationships in the diagram relating to governance not being germane to this summary).

**Table 1.** Adapted from Williamson (1985, p. 31): Some Attributes of the Contracting Process.

Behavioral Assumption			Implied Contracting Process
Bounded rationality	Opportunism	Asset specificity	
0	+	+	Planning
+	0	+	Promise
+	+	0	Competition
+	+	+	Governance

Note: 0, absence; +, presence.

Interestingly, although these relationships are by nature bidirectional, Williamson utilizes only one direction in his analysis of hierarchies v. markets. That is, he suggests (for example) that the “absence” of bounded rationality in the “presence” of asset specificity and opportunism implies planning; but leaves underutilized the reverse idea that planning should also reduce bounded rationality in situations characterized by those same two conditions (Simon, 1979) (because better or worse planning affects the level of transaction costs that arise from bounded rationality). The same conclusion follows for market imperfections created by opportunism and asset specificity. Opportunism should be affected by promise processes (e.g. trust creation (Barney & Hansen, 1994) among stakeholders (Agle, Mitchell, & Sonnenfeld, 1999; Mitchell, Agle, & Wood, 1997)), and specificity by competition processes (e.g. adopting a low-cost generic strategy (Porter, 1985)). Thus, it follows logically that the cognitions that individuals possess about planning – defined as *the mental models that assist in developing analytical structure to solve previously unstructured market problems*; promise – defined as *mental models that help in promoting trustworthiness in economic relationships* with, for example, stakeholders (Agle et al., 1999; Mitchell et al., 1997); and competition – defined as *mental models that can create sustainable competitive advantage*, are expected to impact transaction costs in the manner illustrated in Table 1, and therefore the likelihood that a transaction – as the basic value-bearing unit in economic activity – will be created.

### 3.2.2. The Transaction

By definition, a transaction occurs when an individual, the most customary creating entity, creates a “work” (some product or service) and then enters into an exchange relationship with other persons for the sale or acceptance

of that work (Gardner, 1993). Transaction cognition theory suggests that, in fact, transaction creators introduce bounded rationality, other persons introduce opportunism, and the work introduces specificity into the transaction (Mitchell, 2001), and these transacting attributes are the sources of transaction costs. Transaction costs are the costs of running the economic system, that to economic systems are what friction is to physical systems (Arrow, 1969, p. 48; Williamson, 1985, p. 19). Like friction, transaction costs and social frictions can either help or hinder transacting. The probability of a transaction's occurrence is thought to depend upon the level of effective transaction cognitions present in the transaction as illustrated in Fig. 2.

Entrepreneurship then, can be defined to occur when: *transaction cognitions (mental models and scripts about planning, promise, and competition) are used to organize exchange relationships (among the individual, the work, and other persons) such that transaction costs caused by the sources of market imperfection (bounded rationality, opportunism, and specificity) are minimized, thus yielding a new unit of value.* Transactions are therefore forthcoming from entrepreneurs within a socioeconomic setting when the social frictions and transaction costs that prevent transactions are minimized. To restate this colloquially: entrepreneurs make transactions happen that would not occur unless someone shows up to reduce the transaction costs that prevent them.

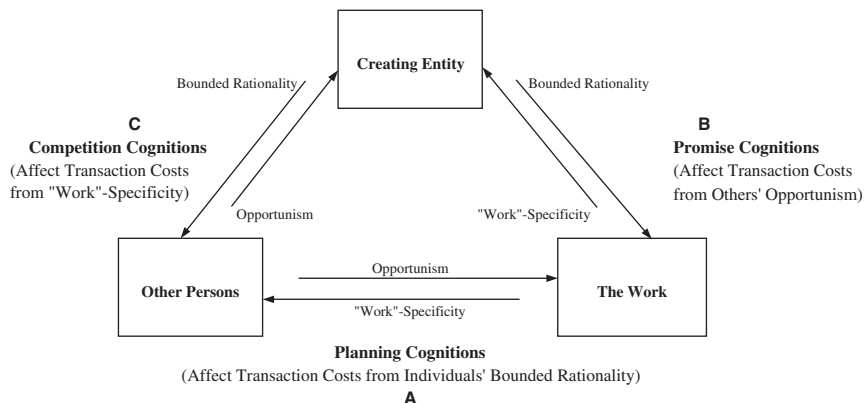


Fig. 2. The Effect of the Specialized Mental Models: Planning, Promise, and Competition Cognitions, on Transaction Costs. Source: Based on Gardner (1993) and Williamson (1985).

As used in a previous publication to illustrate the point (Mitchell, 2003, pp. 189, 190) the Microsoft–IBM transaction provides an example that illustrates the relationships diagrammed in Fig. 2. As suggested in the definition presented above, the requirement for a completed transaction between Microsoft and IBM should be the use of *all three necessary cognitions* (Fig. 2). A review of the actual circumstances illustrates the role of each cognition set.<sup>3</sup>

First, for the product envisioned by Microsoft to be competitive, it was necessary that Gates & Co. be permitted to use the early DOS source code – not then owned by Microsoft – that would form the foundation of the product (Fig. 2C: the creating entity – others link). Through the use of bargaining and competitive techniques, this key element of the product was acquired (transaction costs due to specificity were reduced).

Also necessary was the development of a relationship of trust between the IBM executives and Microsoft, which assured IBM that they could rely on the Microsoft team (Fig. 2B: the creating entity – work link). Through the use of references and in-person meetings, the promise of reliable production and delivery was communicated such that the possibility of transaction costs from opportunism could be diminished to an acceptable point in the Microsoft–IBM deal, while remaining relatively higher for alternative transactions – once again an action that made transaction completion more likely.

Finally, before the transaction could occur, Bill Gates and associates had to overcome their limited knowledge of the market for their services (Fig. 2A: the work – others link). Gates and Co. reduced these knowledge limits through a series of events that we can label the planning process, while the limits remained high for potential rivals. This permitted the fledgling Microsoft to minimize transaction costs – an action that made a completed transaction more likely, thus creating sufficient conditions for the Microsoft–IBM transaction to occur – one of the signal high-performance economic events in computing history.

The key point to note in this example is that without the requisite planning, promise, and competition cognitions/scripts, the transaction would likely have failed due to the transaction cost-based social frictions. With a sufficient level of these cognitions/scripts present, a completed transaction – despite, or perhaps because of the effective use of transaction costs/social friction<sup>4</sup> – was the result.

### 3.2.3. *A Theory of Practisable Content*

At this point in the summary an important parallel can be introduced. In developing this parallel, I intend to create conceptual linkage in

entrepreneurship among the social frictions, transaction costs, transaction cognitions, and the productive use of friction, to identify the content necessary to support deliberate practice in global entrepreneurship education. Accordingly, a further analysis of social frictions is called for.

Since social friction and transaction costs can be either relatively higher or lower, and since friction can either help or hinder (Britannica.com, 2001), four general states of transacting can be conceptualized, as illustrated in Fig. 3.

Because the level of friction between two surfaces depends upon the degree of irregularity (Britannica.com, 2001), if we can somehow change the degree of irregularity by altering the nature of the surface, we can effect – or in some cases effectuate (e.g. Sarasvathy, 2001) the proper application of frictions, including social frictions. Transaction cognition theory suggests that increasing the level of effective transaction cognitions, by adding requisite information to transactions (which can be accomplished by increasing the deliberate practice of key cognitive content), ought to increase the expertise needed to effectively alter the nature of the “social surface” to expedite the success of a given transaction (Mitchell, 2001), as illustrated by arrows [1–4] in Fig. 3. The logic for this proposed relationship is therefore as

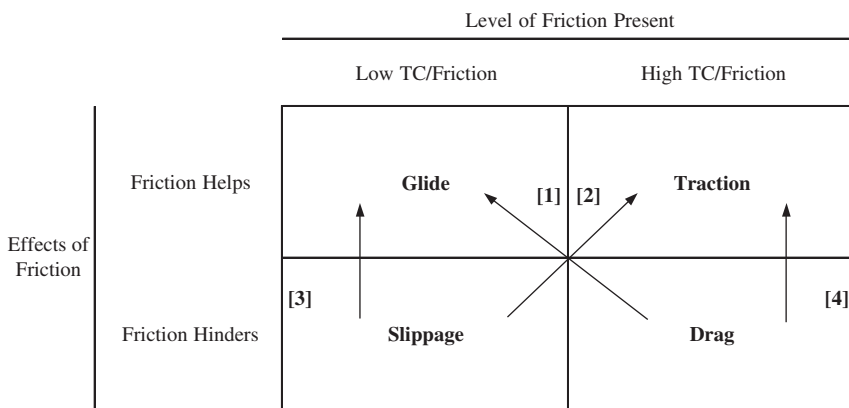


Figure 1 KEY:

Fig. 3. Possible Information-Based Approaches to the Utilization of Transaction Costs/Social Friction in Affecting Transacting. *More Comprehensive Transacting Tasks*: 1. Glide from Drag; 2. Traction from Slippage. *More Specialized Transacting Tasks*: 3. Slippage to Glide; 4. Drag to Traction.

follows:

Transaction cognitions ( $P, P, C$ ) → Information conditions  
 → TC/Social friction → Results

Of course, alterations to information conditions (and thus to the social surface) that make transacting more difficult (where social frictions and transaction costs *increase*) also occur in the real world. Whereas in the foregoing case, which was recounted in a simplified form (where only the presence or absence of bounded rationality, opportunism, and specificity was allowed as a condition in the analysis); in the real world, these conditions are variables, and are rarely categorical. Thus, a specification of the general case (to deduce the full scope of the practice content in entrepreneurship) requires that such categorical assumptions be relaxed, which suggests that two additional parameters must be included in the model represented in Table 1.

First, continuous variability should be introduced. Thus, rather than showing only “0” or “+,” the table should provide for *levels* of bounded rationality, opportunism, and specificity that theoretically could range from 0 to +1 (although for operationalization purposes, researchers have nevertheless chosen to set threshold values – subject to internal validity standards – somewhere within the 0 to +1 range to simplify the solution set, and to aid interpretability, e.g. Mitchell & Agle, 1997).

Second, once continuous variability has been introduced, the impact of the new logic must also be taken into account and represented in the model accordingly. For example, in the special case shown in Table 1, the absence of bounded rationality (shown as 0), in the presence of opportunism and specificity (shown as +, +), appears to have led Williamson to the conclusion that planning is the implied contracting process in this special case. Herein, Williamson’s logic has now been extended to comprehend the reciprocity of the relationship between showing a “0” for bounded rationality, and the existence of planning as the implied social contracting process. And accordingly planning cognition levels are expected to be inversely related to bounded rationality levels, which means that planning cognitions are thought to reduce bounded rationality. But this extension causes problems in the categorical set up (where the only values possible are 0 or 1) due to the lack of range – as previously noted – and also, due to the failure to comprehend in the model the social factors that might *increase* bounded rationality as well as reduce it (or simply not reduce it through their absence e.g. planning cognitions = 0; BR = 1). By extension in the argument, the

failure to comprehend in the model the social factors that might *increase* as well as reduce or not reduce opportunism or specificity in their function in the analysis would also cause problems in the categorical set up and in the subsequent arguments regarding social surface compatibility as the most likely case for transaction units to occur.

The idea of countervailing cognitions – those that operate to cancel some or possibly all of the effects of planning, promise, and competition cognitions – has recently been suggested (Gurnell, 2000). In analyzing the reasons why some aboriginal peoples in Canada fail to attain economic independence, even while potentially possessing the requisite transaction cognitions, Gurnell suggests the possibility of canceling cognitions as follows:

But what if the level of requisite cognitions does not actually lie at the zero end of the respective planning, promise, and competition continua; but rather, what if the requisite cognitions have been supplanted in some degree by three debilitating – or (countervailing) – cognitions that are artifacts of the repressive years, which in fact inhibit and constrain the development of the appropriate socio-economic scripts that would allow individuals within aboriginal society to attain a material wealth that is commensurate with their spiritual wealth? (Gurnell, 2000, p. 3).

Gurnell goes on to propose and present three substitute cognitions corresponding to planning, promise, and competition cognitions.

More specifically, planning assists in developing analytical structures and courses of action necessary to solve previously unstructured problems. Promise helps in building mutual trust in economic relationships; and competition can create bargaining positions – small or large. Each cognition (set) has an effect upon the transaction costs created by market imperfections, in particular, planning acts on bounded rationality (BR); promise acts on opportunism (O); and competition acts on specificity (S).

*Fatalism v. planning.* Prospective (transactors) may choose to plan a little, or to plan a lot. To completely disregard the validity of planning implies fatalism. Fatalism is the belief that events in life are preordained or that human intervention is powerless to effect change.

*Refusal<sup>5</sup> v. promise.* One might be involved in high promise transactions or low promise transactions; but to avoid transacting entirely within a group implies that something has happened to that group's capacity for trust (and results in the refusal to transact). That something is typically betrayal or continued exposure to disappointment.

*Dependency v. Competition.* Presently native society shows an unwillingness to compete (Mitchell, 2001). This unwillingness has likely evolved from prolonged forced dependency upon Indian and Northern Affairs Canada (the federal government), and is manifested in a lack of self-reliance. To further complicate things, societal norms have developed to prevent competition within native society (Gurnell, 2000, p. 4).

Gurnell's insights help to solve the problem of an arbitrarily constrained model, by suggesting the dynamic elements needed. These include fatalism, refusal, and dependency cognitions, which as an initial formulation, move



**Table 2.** Some Attributes of The Transaction Cognition Process.

Behavioral Assumption			Implied Transaction Cognitive Process
Bounded rationality	Opportunism	Specificity	
0	1	1	Fatalism ↔ Planning
1	0	1	Refusal ↔ Promise
1	1	0	Dependency ↔ Competition
1	1	1	Governance <sup>a</sup>

*Note:* Values 0–1, absence to level of presence.

<sup>a</sup>By definition already includes a range.

the development of transaction cognition theory forward. One potential problem with the Gurnell formulation – the conceptualization as categorical variables – needs attention as well. Thus, while Gurnell’s insights assist us in better formulating the general model, their presentation as “either/or” appears to be theoretically unfortunate. As I have considered this parameter of the general model, it seems more logical to me to further suggest that the so-called “substitute” or “canceling” cognitions serve as anchor points on a cognitive continuum.

The implications of this second parameter relaxation are therefore far-reaching, because the resulting model, though parsimonious, is intended to apply to a wide range of socioeconomic phenomena. The general case might then be represented as shown in Table 2, a version of Table 1 revised to represent the relaxed assumptions just introduced into the analysis. As indicated in the table, bounded rationality, opportunism, and specificity are shown to vary along a continuum from zero to one. Further, this variation is shown to effect a continuous range in the implied cognitive process, anchored at one end by the cognitions that counter those at the other. As produced through the foregoing analysis, the focus of deliberate practice to better enable high-performance entrepreneurial results should therefore generate learning pedagogies that both develop the planning, promise, and competition cognitions that reduce barriers to transacting (transaction costs and social frictions), while attenuating the fatalism, refusal, and dependency cognitions that increase such barriers.

*3.2.4. Summary*

In summary, then, transaction cognition theory uses the three-element structure of transactions (“works” are generated for “others” by transaction “creators”) as a way to sort and to group the thinking skills (cognitions)

required in all economic exchanges. Each element of a transaction introduces a source of value-adding opportunity, which it requires thinking skills/cognitions (a specific knowledge base and problem solving processes) to utilize. In a transaction, “works” must be *competitive*, “others” must pay as *promised*, and transaction “creators” must effectively and efficiently make *plans* to connect works with customers. Thus, transaction cognition theory suggests that there are three fundamental sets of “transaction cognitions” (counterbalanced by their countervailing counterpart cognitions: dependency, refusal, and fatalism, respectively) that are used to sort and group the thinking skills (deliberate practice content) required in economic exchange are: competition cognitions, promise cognitions, and planning cognitions, respectively. The result of using transaction cognition theory, is that the essential content element in the deliberate practice model has been explicitly specified, thereby enabling me to use this specification to support one of the primary objectives in this chapter: to demonstrate how, with a conceptualization of entrepreneurial content that crosses borders, we can identify a common-content basis for including the majority of the world’s population in entrepreneurship as a reasonable long-term educational and social goal.

As an important aside, because it is directly applicable to the educational enterprise, it is useful to note how the generalizability of transaction cognition theory assists in a new conceptualization of the educational transaction. Because the general transaction cognition theory model is expected to apply in any socioeconomic setting (Mitchell, 2001), the educational transaction in the university setting can also be conceptualized in its general form. An example of this combination (the production of an educational work of value to others, in the form of the UVic Entrepreneurship Program) is developed in the next section. Because the educational transaction is no different in its form than that of any other transaction, an interpretation of this example in terms of transaction cognition theory – to discern the necessary cognitions<sup>6</sup> for an effective educational experience – is possible.

### 3.3. The Educational Transaction

In the educational transaction that normally occurs under present university-level pedagogical assumptions, instructors create pedagogies for students, as illustrated in Fig. 4.

Fig. 5 then illustrates how the transacting sequence in education parallels the general transacting sequence developed and published in volume 6 of this series (Mitchell, 2003, p. 205). After signaling learning intentions – say

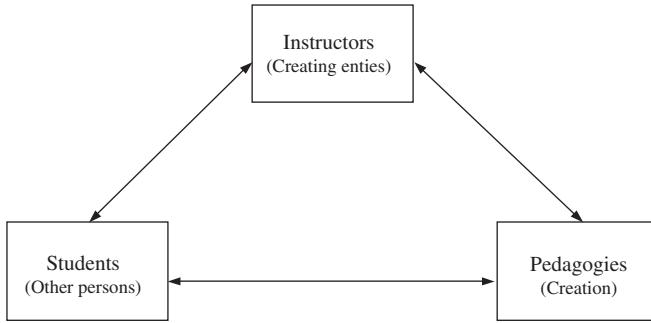
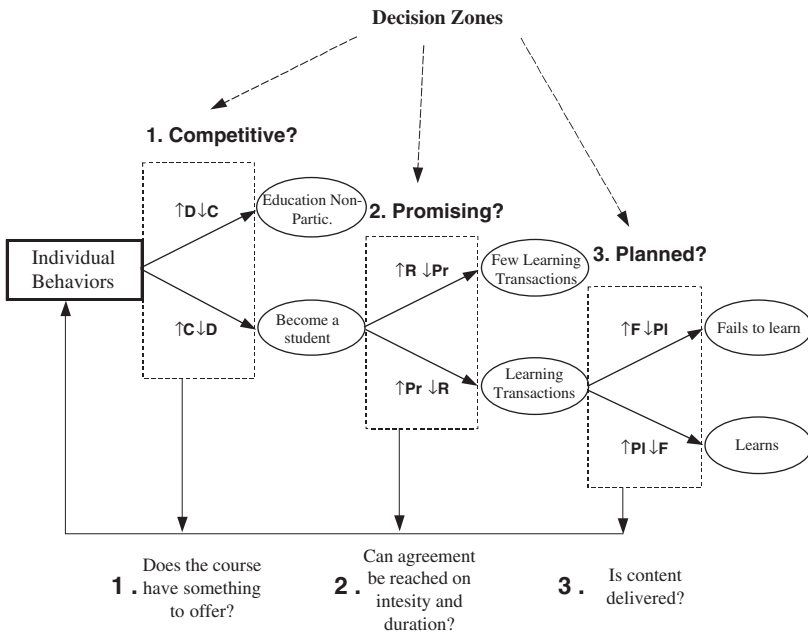


Fig. 4. The Educational Transaction. *Source:* Based on Csikszentmihalyi (1988) and Gardner (1993).



*Cognitions:*

- 1. Dependency ↔ Competition
- 2. Refusal ↔ Promise
- 3. Fatalism ↔ Planning

Fig. 5. A Transaction Cognition Theory Model of The Educational Transaction.

by registering in the UVic Entrepreneurship Program (which of course requires a certain level of competition cognition-based evaluation that this is the set knowledge deliverables desired) – the next question encountered by the transacting student has to do with the crafting of an agreement between teacher and student. The second decision step in transaction cognition theory as represented in Fig. 5 duly suggests that the probability of such an agreement depends primarily on the effects of a student’s promise cognitions level, less the effects of the “refusal cognitions.” The importance of this decision step leads me to briefly amplify this point. Since promise cognitions create trust, and refusal cognitions create an affect-based objection-type mentality (Mitchell, 2001), then in the UVic example, a student may decide to register in the five-course (all-or-nothing) entrepreneurship program because the trust-creating effects of a strong positive experiences recounted by satisfied former students exceed that student’s worry over having to take the “tough” courses. (Incidentally, in the case of entrepreneurship education, we have observed that even after registration, the level of observed student practice intensity and duration – the student’s responsibility – appears to be directly related to the level of a student’s refusal cognitions.<sup>7</sup>)

We conceptualize the promise v. refusal phenomenon as a kind of “elasticity” in a student’s practice curve. Somewhat like economic elasticity, the shape of this practice curve dramatically affects the level of refusal behaviors as a function of level of coaching input, and as a result, affects the expected level of intensity and duration of student practice. Thus in the inelastic case, a hypothetical “unit” of coaching input results in fewer units of refusal (low-refusal behaviors); while in the elastic case, that same unit of coaching input produces many more units of refusal.<sup>8</sup> Clearly, the propensity to practice hard and long is much higher where there is an inelastic practice curve.

As a result of these observations, and to assist students with effective self-selection decisions (e.g. whether to register for our Entrepreneurship Program or not), we have introduced as a self-help mechanism, a Student Preparation Guide, that requires students to prepare a portfolio (Gaglio & Mitchell, 1999; Gaglio, Mitchell, & Vesper, 1998), which develops the promise cognitions necessary for the student and teachers to be able to agree on an exchange with respect to the work (coaching input from the Entrepreneurship teaching team). This agreement is more probable where the likelihood of realizing promised payoffs (e.g. learning for the student, and study diligence for the professor), is signaled by the promise effects of the portfolio project.<sup>9</sup>

Then next, according to step 3 in the transacting sequence illustrated in Fig. 5, once an agreement has been reached, students and teachers are then

able to execute the course syllabus (a learning plan, hopefully consistent with transaction cognition theory). The learning plan, in turn, focuses upon the “content” sub factor in the deliberate practice model (Fig. 1, D 3). It is intuitively obvious that highly intense, long-duration practice of the irrelevant will be likely to have little effect on the production of high-performance behaviors in a field. Thus, transaction cognition-based content is key, is the responsibility of the teacher, and can be deliberately practiced when focused on the transfer of transaction cognitions. But how does the learning plan create this content in the mind of the student? As explained in Volume 6 of this series (Mitchell, 2003), the content necessary to support the transfer of a high-performance cognitive system in an individual involves the creation of a high-performance script or knowledge structure. To explain how an entrepreneurial script is created, key elements in the transfer process, specifically the nature and characteristics of high-performance scripts (also known as knowledge structures), must be more deeply examined.

Knowledge structures are thought to be a subset of the larger “schema” notion, and have been termed a “schemata.” Glaser writes:

A schema is conceived of as a modifiable information structure that represents generic concepts stored in memory. Schemata represent ... interrelationships between objects, situations, events, and sequences of events that normally occur (Glaser, 1984, p. 100).

The content of schemata is therefore the key element, and Glaser as do others e.g. Read (1987) intimates that this content has two parts: “sequences” and “norms.” Development of the individual entrepreneurial cognitive sequence has also been described in much more detail elsewhere and includes: searching, screening, planning/financing, setup, startup, and ongoing operations/growth (Morse & Mitchell, 2005; Vesper, 1996). However, the process required for the development of the practice content of script norms still requires further attention, and accordingly is addressed next.

### *3.4. Practice Content Norms*

Script norms are the compliance standards that are understood by experts to be necessary to the proper performance of tasks within a domain (Read, 1987); and since sequence within a domain is relatively standard, it is the depth and quality of the norms that distinguishes experts from novices. It follows logically that understanding and properly selecting the attributes of the practice content employed when using the deliberate practice model of expertise improvement, is therefore of critical importance in effectively

implementing the model, especially since, as educators, the content of our teaching is often its most controllable element. The deliberate practice model (Fig. 1) suggests that intense, durable practice of relevant content can create or enhance a person's cognitive system: the schemata that individuals draw upon to effectuate expert performance. What are these norms?

Schemata theory assumes that there exists structured knowledge for recurrent situations, and that one of its major functions is to permit the interpretation of such situations (Glaser, 1984, p. 100). Situational interpretation can be thought of as a learning process through which individuals acquire knowledge through an iterative process that consists of interrogation (in-depth examination), instantiation (repetition of same), and falsification (sorting which ideas to keep and which to discard) (p. 101). Glaser suggests that these thinking skills are best invoked through the development of general intellectual capabilities that he refers to as the "self-regulatory or metacognitive capabilities present in mature learners ... such as knowing what one knows and does not know, predicting the outcome of one's performance, planning ahead, efficiently apportioning time and cognitive resources, and monitoring and editing one's efforts to solve a problem or to learn" (p. 102). Where is such information content to be found? And, how can a metacognition-based teaching help a person to acquire it?

In a 1995 study, Susan Chesteen and I developed a pedagogy for entrepreneurship education, based upon the foregoing theory supplemented with concepts from the experiential learning literature, and tested it in practice. In the paragraphs that follow, I summarize key ideas from the study, and in Appendix A, provide more detail on the pedagogy (Table A1), and on the tests performed to validate the underlying assertions. The content of the UVic Entrepreneurship Program is based upon the results of this study.

In this study we explored the idea that, since entrepreneurial expertise is an important factor in successful new venture founding (Mitchell, 1994), and since expertise consists of expert scripts (Leddo & Abelson, 1986; Lord & Kernan, 1987), there ought to be a link between enhancing entrepreneurial scripts and increasing entrepreneurial expertise. The educational intervention (quasi-experimental treatment) in this study was an instructional pedagogy that was expected to improve students' entrepreneurial expertise by applying the recommendations of expert information theorists for improving script acquisition. Since expert information theory suggests contact with expert scripts as a primary means for acquiring expertise (Glaser, 1984) we used concepts from the simulation and gaming literature (e.g. Petranek, Corey, & Black, 1992) to design an experiential pedagogy that featured contact with practicing entrepreneurs, and metacognitive interpretation of

this contact (in this case flow-charting student and mentor, script sequences and norms) as its primary areas of emphasis.<sup>10</sup>

The effectiveness of this pedagogy was examined using a model derived from expert information theory (Leddo & Abelson, 1986) and tested using multiple discriminant analysis (MDA). As described more fully in Appendix A, and most comprehensively in the chapter itself, the experiential pedagogy was shown to enhance novices' propensity to *enter* the new venture script, beyond that of either non-enhanced novices or experts, while providing a significant improvement in novices' ability to do the things the new venture script requires. This study leads to my noting herein at least three "general" implications of the findings, and then noting three further implications of the findings, which are "specific" to entrepreneurial education.

#### *3.4.1. General Implications of the Study*

The first general implication of the findings in this study is to establish links among deliberate practice, script enhancement, and transaction cognition theory. The link between deliberate practice and script or expertise enhancement is established through confirmation of the relationship between certain deliberate practice activities – in this case direct contact with individuals who are more expert, which students analyzed metacognitively (by being required to "think about their thinking") – and changes in the subjects' cognitive scripts. The link to transaction-cognition theory came in later studies (e.g. Mitchell et al., 2000; Mitchell et al., 2002) where it was demonstrated that the existence of the arrangement, willingness and opportunity–ability scripts of entrepreneurs in a variety of countries is consistent with the cognitive sets predicted by of transaction cognition theory (respectively): planning, promise, and competition cognitions (Mitchell, 2003). We can thereby see another reason why transaction cognition theory is appropriate to the task of more clearly specifying the nature of the practice content norms that make up entrepreneurial expertise. The enhancement of planning, promise, and competition cognitions appears to be at the core of improving individuals' entrepreneurial scripts and thereby their expertise.

The second general implication of the findings in this study relates to the pattern based upon the Glaser (1984) approach that is evident in Appendix A (Fig. A1). Generally, in the enhancement of expertise, we can expect to see the formation of a new and significantly different cognitive group that is neither expert nor novice. Relative to experts, this group is likely to be underprepared for "doing" and overly eager to "enter" into venturing activity; and as further discussed under specific educational implications that follow, raises the possibility that entrepreneurial education can, in fact,

create an overconfidence bias (Busenitz & Barney, 1997; Kruger & Dunning, 1999; Simon, Houghton, & Aquino, 2000) in entrepreneurship students.

Thirdly, this study was the first to demonstrate that the “entry” and “doing” dimensions as suggested by Leddo and Abelson (1986) provide a primary basis for distinguishing among four major categories of cognitive engagement in the field of entrepreneurship (although – similar to other findings in the expert information processing literature – there is no reason to suppose that this phenomenon would be limited to the entrepreneurial domain). Thus, if we were to take the results plotted in Fig. A1 as archetypal, we could – by simply matching the dividing lines with the findings, delineate three of the four possibilities suggested by entry/doing-based theoretical framing. The result is illustrated in Fig. 6. As noted, the sample upon which Fig. 6 is based rests in the Western U.S.A. However, given the broad geographic dispersal of subsequent findings in multiple countries that include in addition to the U.S.A., Australia, Canada, Chile, China, France, Italy, Japan, Mexico, Russia, and the UK (Mitchell & Seawright, 1995; Mitchell, Smith, Seawright, & Morse, 1998; Mitchell et al., 2000; Mitchell,

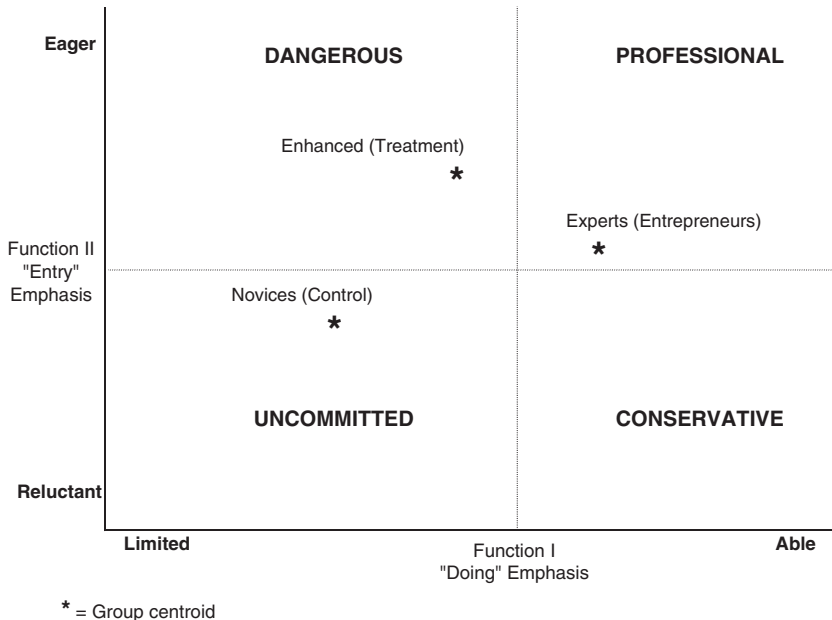


Fig. 6. Cognitive Archetypes Derived from Mitchell and Chesteen (1995).



Smith, Seawright, Morse, & Peredo, 2002b) it appears to be likely that these archetypes should be useful in mapping the types of entrepreneurial approaches globally.

What are the implications of these findings for deliberate-practice-based entrepreneurship education?

#### *3.4.2. Implications of the Study for Education*

The first specific implication for education is that credible evidence suggests that entrepreneurial expertise can be created and/or enhanced. As described more fully elsewhere (McKenzie, Mitchell, Morse, & Smith, 2001) the UVic model of entrepreneurship education is based upon this theoretical foundation, and has been recognized in peer-reviewed forums for its successful application at the University of Victoria.<sup>11</sup>

The second specific educational implication may also be derived from the results illustrated in Appendix A (Fig. A1). While the experiential and expert enhancement-based pedagogy is successful in the creation of a new group of “enhanced novices,” it certainly does not produce experts in a few months. As a result of this finding, I suggest, and have done so in our entrepreneurship program at the University of Victoria, that the objectives of cognition-based entrepreneurship education be adjusted to portray what is realistic given the empirical data.<sup>12</sup> Of course improvements in the pedagogy are still possible, which suggests as a result, ongoing engagement in a process of continuous improvement.

A third educational implication, to which we have already alerted the scholarly community (Mitchell & Chesteen, 1995, p. 302; Mitchell et al., 2000, p. 979) is the possibility that entry scripts without doing scripts “may result in venture creation decisions, but these ventures are not likely to last very long (a “rockets to oblivion” phenomenon).” Furthermore, there is a developing literature that considers the effects of overconfidence bias on entrepreneurship (e.g. Busenitz & Barney, 1997; Simon et al., 2000). It appears from the foregoing study, that the experiential pedagogy alone is insufficient for accomplishing the entire task of creating entrepreneurial experts,<sup>7</sup> and that the effects of overconfidence bias as it might act to create a mismatch between skill and awareness (e.g. Kruger & Dunning, 1999) should be therefore considered. So, instructors are cautioned to beware of the power of the pedagogy to create eagerness, which can precede preparation by such a wide margin that the danger of “low-performance entrepreneurial results,” is higher, to the extent that expertise remains underdeveloped.

### 3.5. Summary

In this section, the objective has been to present, evaluate, and explain the component parts of a conceptual model of expertise acquisition (Charness et al., 1996) that has been adapted as a prototype for use in entrepreneurship education. The relationship among the component parts of the model was next explored. Finally, the section has concluded with a discussion of the application of the model to education and thinking, and to the deliberate-practice-based pedagogy.

The primary idea that drives the construction of the pedagogy described in this section has been that deliberate practice is directly and effectively associated with the development of the cognitive systems (software and hardware) (Fig. 1F) that lead to high-performance entrepreneurial results. It has seemed to me to be only logical that something as general as intense, durable, proper-content-based practice, which has been documented to contribute to excellence in other fields of achievement such as sports, games, and the arts (Ericsson, 1996), would likely work in the field of entrepreneurship. In this section, I have described one application and its testing to illustrate the practicality of the construction and implementation of a pedagogy based in the deliberate practice model for the education of new entrepreneurs. And it has been my hope by documenting this, to begin to demonstrate that through the wide transferability of transaction-cognition-based entrepreneurial expertise that is made possible by a deliberate practice model of entrepreneurship education (rooted for its content in border-crossing entrepreneurship theory), that the exclusion of the majority of the world's population from the high-performance entrepreneurial results possibility set, is not necessarily a permanent condition.

What does this therefore mean for teaching?

In the next section, the implications of this model for the educational content that can enhance the achievement of high-performance entrepreneurial results in both market and transition economies, and for harnessing information technology to support and further enhance these results is discussed.

## **4. IMPLICATIONS OF THE EDUCATIONAL MODEL FOR INTERNATIONAL ENTREPRENEURSHIP**

In this section of the chapter and within its three subsections, I address the implications of a deliberate practice-based educational model of teaching for

the achievement of high-performance entrepreneurial results in the global setting. I begin (Section 4.1) with a discussion of the present challenges that confront educators within the mainstream business schools in North America, and consider the refinements that are still necessary, in my opinion, for a more optimal path toward high-performance entrepreneurial results within Tier 1 economies.

In Section 4.2, I turn to an analysis of the application of the deliberate practice cognitive model within economies that are still in the process of developing toward first-tier economies. In Section 4.2 I introduce the idea of a fundamental level of economic literacy, which using transaction cognition theory I define as: *adequate economic thought based upon the three universal subsets of transacting knowledge – the planning, promise, and competition cognitions necessary for transacting regardless of culture or political system.*

In Section 4.3, I describe some of the progress that has been made in the construction of expert assistance technology that supports the cognition-based deliberate practice approach to education for high-performance results.<sup>13</sup> The section concludes with observations on the future implied by this educational model.

#### *4.1. Educational Models in Tier 1 Economies*

Business schools in the USA have been criticized for insufficient attention to the education of entrepreneurs (Porter & McKibbin, 1988, p. 66). However, there is little research that differentiates better from worse ways of teaching entrepreneurial skills (Katz, 1991) and little integration of the contributing disciplines to a business school education (Porter, 1997). The transaction cognition model suggests solutions to each of these three problems.

First, for reasons previously identified, it suggests that the substance of an entrepreneurship education should be the development of the planning, promise, and competition cognitive scripts of individuals (Mitchell, 2003). Second, it suggests that these cognitive scripts – i.e. expertise in the field of entrepreneurship – can be developed using the deliberate practice-based expertise enhancement methods identified in the elaboration of expert information processing theory as it applies to the acquisition of expert performance within a given domain (Ericsson & Charness, 1994; Glaser, 1984; Mitchell & Chesteen, 1995). Third, transaction cognition theory suggests a likely means for integration across disciplines.

The core idea for value creation that transaction cognition theory proposes, is that new value comes from quantity v. price-related dynamics.

Whereas price theory in neoclassical economics suggests that prices tend to decrease when quantities increase (an equilibrium-based approach), the disequilibrium-based approach of the Austrian School of economics (e.g. [Jacobsen, 1992](#)) suggests that the presence of market imperfections is relatively constant, and that in such circumstances, quantity may increase without downward pressure on prices: thus identifying the source of new value.

Transaction cognition entrepreneurship theory simply identifies the entrepreneurial thinking needed to identify such opportunities and to then recognize, discover, or create ([Saravathy, Dew, Velamuri, & Venkataraman, 2003](#)) the works for other persons within a marketplace ... to increase quantity without decreasing prices. This quantity- or unit-based approach is often referred to as “first-order” economizing (e.g. [Williamson, 1991, p. 75](#)) in recognition that second-order or price-based decision-making is irrelevant where no units – the first-order of business – exist.

Thus, for example, a focus group comprised of MBA students selected the following courses taught in a well-recognized MBA program as *primarily* helping to recognize and develop first-order thinking using the three cognitive models as follows:

- **Planning:** to identify and apply the first-order planning skills supported by financial and management accounting, managerial economics, applied research, and consulting methods, organization design, international business, finance, operations management, and cross-national management.
- **Promise:** to identify and apply the first-order promise skills included with the domains of law, human resource management, marketing, and statistics (another course – if offered – would be business and society).
- **Competition:** to identify and apply the first-order competition skills that are described within the strategy and information technology domains.

Transaction cognition entrepreneurship theory thereby suggests a workable and practical foundation for effective entrepreneurship education: to highlight and integrate the first-order portion of skills taught in the various business disciplines that enable new value creation. This is the essence of the necessary “content” for deliberate practice as suggested by transaction cognition theory.

An explanation of the high degree of success of many of the “pracademic” models of entrepreneurship education (e.g. the Swinburne Model, [Vesper & McMullan, 1998](#)) can trace their success to the intuitive application of the foregoing transaction cognition principles to enhance the expert information

processing of students. The creation of planning (business plan-based, e.g. Stevenson, Roberts, & Grousbeck, 1994), promise (stakeholder- and trust-based, e.g. Barney & Hansen, 1994; Mitchell & Agle, 1997), and competition (entrepreneurial strategy-based, e.g. Rumelt, 1987) courses, which combine with experiential (practice e.g. Ericsson et al., 1993) and conceptual (script interrogation, instantiation, and falsification, e.g. Glaser, 1984) courses taught in an integrated semester-length module along with as much real-world contact with practicing entrepreneurs as possible, is therefore suggested.<sup>14</sup>

It appears likely that if the use of the transaction cognition model as the basis for entrepreneurship education within Tier 1 economies creates increases in the success of individual transactions (whether in jobs or ventures) and of transaction sets (the ventures themselves), then the productivity of an economy must unavoidably be impacted. A populace that is “educated” in the solution of transacting problems that have heretofore resulted in transaction failure due to lack of or misunderstanding of first-order (unit-based) new value creation, could have a material impact upon the wealth creation capacity of an economy. The result in Tier 1 situations would be a high-performance economy (Williamson, 1996, p. 332) where the friction of transaction costs that impedes transactions would be minimized.

#### *4.2. Educational Models in Transition Economies*

Very early in the presentation of my arguments in this chapter, I suggested that the deliberate practice model of entrepreneurial education that I intended to articulate herein, might provide a means to address the unfortunate and unnecessary exclusion of the majority of the world’s population from the high-performance entrepreneurial results possibility set. Throughout the preceding section, I have been building this argument in support of the idea that, if this exclusion rests primarily on the absence of the requisite cognitive system, and if the requisite system is very likely to be widely transferable when based upon the application of the deliberate practice model, then the educational enterprise implied can be of monumental import to our collective economic future, because while it is counterintuitive, it may ultimately and actually be doable.

This subsection specifically addresses the development of pedagogical content in less-developed economies. Due to the large disparity with Tier 1 economies, we can logically expect that details concerning the application of the deliberate-practice-based model to transition and less-developed

economies will be most extensive. Therefore, these details – if only to be discussed once – should rightly be addressed within transition economies as the exemplar case in the “most extensive” context, even though application of certain elements to Tier 1 economies, where relevant, is also intended.

Since 1996, the term “transition economy” has been applied to those economies that have been undergoing a change from a dependency upon central planning to more reliance upon market mechanisms (World Bank, 1996). Included as transition economies have been those in Central and Eastern Europe (CEE), the (relatively) newly independent states (NIS) of the former Soviet Union, and economies in East Asia, notably that of the Peoples Republic of China (Peng, 2001, p. 95). Transition economies are characterized by an economic no-man’s-land that is no longer fully subject to the protections of planning, but is not yet fully responsive to the motivations of the marketplace. For example, according to policy-makers who are close to the situation, the fledgling venture capital industry in China faces: an absence of market-based laws and regulations, the lack of effective exit mechanisms, few qualified investors, underdeveloped support institutions (e.g. law firms, management consultants, financial and accounting advisors, market analysts, project evaluators, etc.), a lack of talented managers, and no clear property rights (Fensterstock & Li, 2001). Thus, while the economies within CEE, NIS, and China may be considered to be transition economies, it is also possible that many other less-developed economies would also qualify as “transition” as described herein, and should therefore also be included in the discussion that follows.

Education is likely to play a significant role in the development of solutions to the problems faced by transition economies. But what education? And for whom?

There exists some degree of skepticism that general concepts have a place in such a discussion due to the problem that “every transition economy is different” (Peng, 2001, p. 106). But as noted earlier in this chapter, there also exists evidence in support of the assertion that there are also regularities – especially cognitive regularities – that *do* cross borders and can be reliably transferred (Charness et al., 1996; Mitchell et al., 2000) and suggest that the possibility of creating educational models applicable more generally to transition economies is indeed possible. So, while I readily acknowledge that vast differences exist among transition economies in such areas as culture, size, former economic traditions, level of preparation for the market – and the list could perhaps go on endlessly – I am also constrained to argue based on both experience and study, that a balanced approach must also allow for the identification and utilization of similarities as well. In actuality, it

appears likely that each economy will include manifestations of differences (Mitchell et al., 2002b) within the systematic structure suggested by transaction cognition theory (Mitchell, 2003; Mitchell et al., 2000). Accordingly, the suggestion of educational models that are, or can be, applicable to transition economies is rooted in the models and ideas previously developed within this chapter.

As one might expect, given the argument presented in Section 3, the models that I am suggesting elaborate the deliberate practice model of expertise acquisition, with the content focal point being the enhancement of planning, promise, and competition cognitions, and the corresponding diminishment of fatalism, refusal, and dependency cognitions at multiple levels of analysis (e.g. individuals, firms, economies, and societies). I believe that it is unrealistic to expect that such complex problems as those presented within the transition economic context will not require a matching level of depth in theory to respond effectively. In the paragraphs that follow, I hope to further demonstrate how the outlines of the model can be reliably drawn using the previously developed concepts from transaction cognition theory as employed within the deliberate practice model, which, in a measure, provide the practical path toward creating global entrepreneurs: (as defined earlier herein) those whose capability for adding new valuable transactions crosses geographical, cultural, and economic borders. Consistent with these principles, then, the development of the educational pedagogy for a given economy can be divided into the process (sequence) and the content (norms), but beginning first with content.

#### *4.2.1. Content*

As educators, we control or at least strongly influence educational content. As earlier illustrated in Fig. 1, the fulcrum of the pedagogy is deliberate practice, which depends upon the quality of practice content for its effectiveness. And as also intimated earlier in the chapter, it is critical to have correct content for deliberate practice to actually produce the increased expertise desired. As the argument has developed herein, it is hopefully becoming clear, that the reason to use transaction cognition theory, deliberate practice, and the script-enhancement educational process suggested, is that through this use we expect to be able to change or improve the incidence of high-performance entrepreneurial results. Transaction cognition theory describes the necessary content, because it provides a comprehensive model that suggests how the border-spanning individual cognition sets can be identified to be planning, promise, and competition cognitions, and then can be related to expertise enhancement and thereby to high-performance

entrepreneurial results. This theory → practice → enhancement chain thus supports an effective educational pedagogy for creating global entrepreneurs.

The ultimate objective of such an educational pedagogy in the case of transition economies appears to be no different than it is for first-tier economies, and put in the border-crossing terminology of transaction cognition theory, it is to enable transaction creators to: (step 1) apply effective levels of transaction cognitions (planning, promise, and competition), (step 2) organize exchange relationships (among transaction creators, other persons, and the work), and (step 3) minimize the transaction costs created by the sources of market imperfection (BR, opportunism, and specificity), to create new transactions: new units of value. Each element of this objective must be addressed for the content of a transition economy educational model to be complete. In the following paragraphs, the identification and specification of each of these elements in turn (speaking prospectively) amplifies the steps needed to accurately identify educational content for a given economy.

*4.2.1.1. Step 1: Establish Effective Levels of Transaction Cognitions.* As reported elsewhere (Mitchell, 2001), transaction cognition theory suggests that within each economy/culture/setting there is likely to exist sets of planning, promise, and competition cognitions, and fatalism, refusal, and dependency cognitions. As far as I know, an exact catalogue of these cognitions – by economy – has not yet been compiled, and is a subject for extensive future research. Further, within transition economies – despite the observed regularities between groups of transaction creators across countries (Mitchell et al., 2000) – there are likely, for each country or culture, to be highly specific, erroneous, and missing cognitions, each of which bears upon a determination of the necessary content (Mitchell et al., 2002b). Thus, both a within-groups and a between-groups analysis appears to be necessary.

Accordingly, this first part of step 1 in the development of pedagogy for transition economies would be to identify common specific cognitions within an economy group at a given level of analysis – to establish effective levels of transaction cognitions. The methods for this descriptive research are well known, and have been published for both market and transition economies at the individual (Mitchell, 1994) and community levels of analysis (Mitchell & Morse, 2002; Peredo, 2000). Briefly summarized, they include the following subparts: (1) conduct in-depth interviews with a representative group of transaction creators within an economy, who have – as in the case of the individual/firm cross-level analysis – started at least one business (transaction stream) that is an ongoing entity, (2) conduct textual analysis of the interviews to identify the common elements, (3) construct script cues and



test them using a sample<sup>15</sup> of individuals within the economy. This process should identify the planning, promise, and competition cognitions that are crucial to that economy at the relevant level(s) of analysis. The foregoing steps should be repeated using a representative sample from the non-transaction creators to identify the common fatalism, refusal, and dependency cognitions. On the basis of this research, the cognitive scripts to be enhanced, and those to be lessened through coaching may be identified.

The next part of step 1 is the establishment of the effective cognition content for transition economy pedagogy would be to conduct a comparative analysis to identify common specific cognitions at a given level of analysis between economy groups and thereby surface erroneous and missing cognitions. Although research in this area is in its infancy, there does exist some empirical evidence upon which to base such an analysis (Mitchell, 2001; Morse et al., 1999). In this analysis, a careful evaluation of specific within-country common cognitions in comparison to those that are generally found to be efficacious across economies should be conducted. Where certain specific cognitions are found to be missing, they should be considered for addition to pedagogy content. Where specific cognitions are found to be contradictory or erroneous, then further research and analysis should be undertaken to resolve the differences, and to suggest the appropriate additions/deletions to/from pedagogy content.

*4.2.1.2. Step 2: Organizing Exchange Relationships (Using the Value Helix).* As noted elsewhere (Mitchell, 2003, p. 205), the process of organizing exchange relationships follows a standard pattern, beginning first with the use of competition cognitions, proceeding then to utilize promise cognitions, and then utilizing planning cognitions; after which the whole process can repeat itself in several iterations, which we can term the “value helix.” Thus, at the individual level of analysis the cross-level venture creation process (actions at the individual level produce outcomes at the firm level of analysis) involves two iterations of the value helix as illustrated in Fig. 7.<sup>16</sup>

Accordingly, the second step in the pedagogy is to organize the teaching/delivery of the concepts identified in Step 1 using the value helix approach. As previously described in Section 3, there exist proven experiential expert script-based teaching/learning processes that can assist with the knowledge transfer necessary (e.g. Morse & Mitchell, 2005).

*4.2.1.3. Step 3: Utilizing Market Imperfections to Create Value.* Elsewhere (Mitchell, 2001, p. 37, 2003, p. 185), I have presented a highly detailed discussion of how the addition of adequate information to transactions

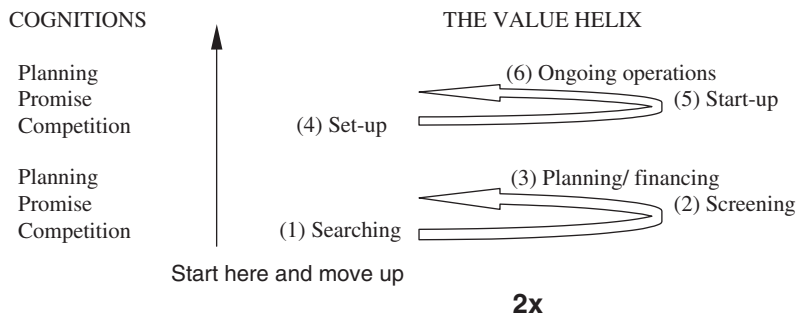


Fig. 7. Sample Exchange Relationship Organization Process.

could minimize the social frictions/transaction costs within a transacting environment to create new units of value. Two of the methods (Fig. 3) (drag to glide [1], and slippage to traction [2]) require the use of both promise and planning cognitions. The other two methods illustrated in Fig. 3 (slippage to glide [3], and drag to traction [4]) require only the employment of planning cognitions. Examples were cited to illustrate these processes at the individual and firm levels of analysis (*ibid.*).

To support an effective pedagogy for deliberate-practice-based entrepreneurial teaching in transition economies, a third step in the creation of this pedagogy appears to be required because of the uniqueness in institutional development to be expected. Depending upon the levels of analysis that are the point of focus (e.g. cross-level individual/firm: the creation of new business – individual creates a firm) illustrative case studies from the economy in question that clearly and unambiguously illustrate the four value-adding processes (Fig. 3) should be identified and made available to learners. These cases should illustrate how, for example, using transaction cognitions can transform drag into glide<sup>17</sup> within the economy under study, using (in the order suggested in Mitchell, 2001, p. 102–108) competition, promise, and planning cognitions. Once learners master the case details, then transaction cognition theory suggests that the experiential teaching method as described in Section 3 may productively be utilized to create this portion of the expert knowledge structure (a script for using market imperfections to create value) in the learners.

It should not be lost on the reader that I have deliberately structured this pedagogy creation discussion to encompass use at multiple levels of analysis. The reason for this as it applies to transition economies is that it is often the case that in order to solve the transition problems, the pedagogy may need to be applied simultaneously at multiple levels of analysis. So while the

approach to application at the entrepreneurial levels of analysis (individual, firm) might now be evident, I believe that it is worthwhile to explain how I envision that this approach could also be applied at other levels of analysis (e.g. the society level).

Application at the society level of analysis is important to education within transition economies, because many of the obstacles to the creation of wealth exist at that level. Thus, as an example in China's present case, the obstacles to the creation of venture capital markets include: the need for market-based laws and regulations and effective exit mechanisms, few qualified investors, underdeveloped support institutions (e.g. law firms, management consultants, financial and accounting advisors, market analysts, project evaluators, etc.), a lack of trained managers, and no clear property rights (Fensterstock & Li, 2001). In an analysis of transaction cognitions at multiple levels of analysis, I illustrate (Mitchell, 2001, p. 143) that some of the missing elements on Fensterstock and Li's list involve planning cognitions relating to the productivity levels of the economy (e.g. the lack of trained managers and underdeveloped support institutions), some require promise cognitions relating to the establishment of the institutions of trust within the economy (e.g. laws and regulations and property rights), and others relate to competition cognitions concerning the realization of value (lack of effective exit mechanisms).

Although quite a massive undertaking, it is nevertheless conceivable that the leaders of transition economies or other development agencies might wish to consider the identification and communication of effective societal level transaction cognitions as a necessary prerequisite for the eventual success of a market system tailored to their particular needs. With the advent of mass media, and with the dramatic reduction of telecommunications costs globally, it seems that now is the time to undertake such far-reaching initiatives. I believe that it is now practical to consider that relevant case studies, founded in transaction cognition theory, could be disseminated using appropriate media. The result – as suggested in the discussion of the components of compositional transaction cognition theory models (Mitchell, 2001, p. 140) – is that each of the less-aggregated levels of transaction analysis could benefit and be supported by the additions to the quality of planning, promise, and competition cognitions at the society level of analysis. The idea of a global human economic literacy project is explored in more detail elsewhere (Mitchell, 2001), and further supports the notion that the deliberate practice model of entrepreneurial education might provide a means to address the needless exclusion of the majority of the world's population from the high-performance entrepreneurial results possibility set.

The essential conceptual framework for such initiatives, however, rests upon the foundation illustrated in the general model of expertise/skill acquisition (Fig. 1) presented in Section 3. This leads us next to a discussion of educational process.

#### 4.2.2. *Process*

The research summarized (Charness et al., 1996), and represented in the deliberate practice model (Fig. 1), suggests each necessary element of the entrepreneurial education process to be derived from it. Because it is the fulcrum of the model, a discussion of deliberate practice, specifically focusing on the “content” element has been featured prominently and first in our discussion. However, in Fig. 1, on either side of (i.e. preceding and following) deliberate practice are shown the factors in the literature (Charness et al., 1996) that are (respectively) the antecedents and consequences of deliberate practice. These antecedents are a key part of the process.

The reader is invited to recall from Fig. 1 that there are three sets of preconditions that support deliberate practice: external social factors, internal motivation, and external information factors. It therefore seems logical to focus on these three areas as the starting point for suggestions about a more general educational process that applies to transition economies, and also can be useful to further dimensionalize necessary processes of entrepreneurial education in more developed settings. During my previous discussion of this model (Fig. 1) in Section 3, I attempted to differentiate within the three components of deliberate practice that are illustrated within box D of the diagram (intensity, duration, and content), those components for which the learner is primarily responsible, and those for which the coaches or teachers are responsible: content being suggested as the primary responsibility of the teacher, and the intensity and duration of practice being the primary responsibility of the learner. Thus, as I now discuss the practice elements of the model in Fig. 1, as they relate to educational process within transition economies, I seek to relate the influence of the preconditions suggested in the model (boxes, A–C) to the propensity for stimulating intensity and duration in a learner’s practice process.

And, as presaged in the introduction to this chapter, my philosophy of education has considerable bearing on the implications that I suggest for educational process. Thus, while the relationships illustrated in the model might be utilized – perhaps intentionally – only descriptively within more mature Tier 1 economies (to explain why high-performance results do occur), I take the position that the relationships illustrated in the model are also prescriptive: suggestive of, and pointing to, the steps that are needed to

remove the impediments to an effective transition from a planning/command economy to a market one. So in the following paragraphs, I take the liberty to expand description to suggest instrumental and normative (Donaldson & Preston, 1995) implications as well.

*4.2.2.1. External Social Factors.* The deliberate practice general model suggests that “how long and how hard an individual will deliberately practice” is related to the influence of a relevant social community. Significant others (parents/spouses), coaches, other role models, and the support of an individual’s underlying culture, along with financial support and relief from competing time demands, are all thought to influence practice intensity and practice duration. Thus, community-based economic development initiatives appear to be crucial to stimulating the learner-motivated aspects of deliberate practice.

But unfortunately, many such initiatives focus on “outside-in” approaches,<sup>18</sup> and as a result miss the opportunities suggested by transaction cognition theory to also build from the inside: mind by mind, transaction by transaction. But to take advantage of these opportunities requires that the social system – e.g. the external social factors in the model – be addressed in a participatory and holistic way, as called for in some of the community economic development initiatives with which I am familiar, e.g. SFU (2001). For almost a decade, it has been thought that formulating a social system with the proper channels and support structure for the processes that can lead to more effective entrepreneurial behaviors is essential for newly emerging capitalist countries and for interventionist ones as well, as they seek to revitalize stagnation within their economies (Herbner, 1992). But how is this to be done? What process should be utilized?

Elsewhere (e.g. Mitchell, 2001, 2003) I have developed the ideas: (1) that the creation of a transaction as the primary value bearing unit, is the basic building block for the achievement of high-performance entrepreneurial results, (2) that successful transacting results from the set of decisions that follow a general cognitive sequence that answers the following questions. Do I (as a potential transaction creator) have something economic to offer to other persons in the marketplace? Can I agree on an exchange with another person? Can I deliver on that promise?”, and (3) that the major barriers hindering people who live in under-performing economies from acquiring an effective level of the competition, promise, and planning cognitions they need to achieve economic independence is (a) the absence of the opportunity to encounter and deliberately practice these cognitions, and (b) the presence in those same people of dependency, refusal and fatalism

cognitions. Recent research in economically struggling regions in British Columbia, Canada suggests that these communities are missing crucial cognitions that allow individuals within them to participate in transactions and, hence, contribute to the economic development of the community (Gurnell, 2000; Nyce, 2003). Thus, from the perspective of public policy-makers, the question should be: What cognitions are missing from these communities and why? Then community economic development initiatives should focus on building effective levels of the competition, promise, and planning cognitions that are necessary for the successful completion of transactions.

Descriptively, then, we can expect to see within transition economies, that weakness in the community transaction cognition foundation will have a dramatic influence on the external social factors that ought to be supporting the intensity and duration of economic learning experiences. As a result, it should be expected that a variety of misinterpretations of the actual situation due to the “unskilled and unaware” phenomenon (Kruger & Dunning, 1999, p. 1121) will impede the development of high-performance results in these economies. Is there a remedy?

Prescriptively, it is clear that leaders in transition economies must sponsor initiatives that result in the development of effective levels of transaction cognitions. Accordingly, I view the human economic literacy initiative (Mitchell, 2001; [www.ronaldmitchell.org](http://www.ronaldmitchell.org)) to be an essential element in the economic development of transition economies. I therefore expect, for example, that mass communication of the ideas that lead toward increases in the general levels of planning, promise, and competition cognitions, and away from the prevailing influence of fatalism, refusal, and dependency cognitions will have a signal impact upon the practice levels of entrepreneurship (as defined herein), and upon the resulting community cognitive and level of high-performance entrepreneurial results. Our taking such actions bears upon my expectations for the factors identified in Fig. 1 (box A). Parents/spouses will be more supportive because they have a deeper understanding; coaches will be able to call for and get greater intensity and duration; role models will be more easily identifiable, and their actions more easily interpretable; and general cultural and financial support should increase, while the impact of competing demands for time and attention should diminish.

Idealistic? Yes.

Perfect? No.

Better than many present processes? Perhaps.

Worth trying? I believe so.

But social factors alone do not fully shape the propensity to deliberately practice. The process model also suggests that internal motivation factors will also have an effect.

*4.2.2.2. Internal Motivation.* Earlier in this chapter while setting forth my educational philosophy, I explicitly rejected the idea that personal attributes are determinative in the likely achievement of high-performance entrepreneurial results. However, within that discussion, I noted an important exception: that the propensity to practice (alluding to the intensity and duration of practice) is nevertheless shaped to some extent by elements of internal motivation. It is clear from the literature that the personal attributes: attention span, repetition tolerance, and competitiveness are thought to be positively related to the intensity and duration of deliberate practice (Charness et al., 1996). And, depending upon the nature of the task, introversion and extroversion (also shown in the diagram) either help or hinder; and in the case of entrepreneurship have been shown to make little difference (Ginn & Sexton, 1990).

It is within the realm of internal motivation that I believe we will find the source of high or low practice refusal behaviors. At present, I am not aware of successful interventions that can assist an individual to change the slope (elasticity) of practice refusal behavior. In the UVic Entrepreneurship Program, we accommodated ourselves to this reality by implementing student preparation activities that are announced as a prerequisite for success in the program. It has been our experience that students with high-refusal behaviors tend to self-select, and remove themselves from the educational pool. Perhaps in future, methodologies will emerge that make this rather Darwinian approach to dealing with internal motivation obsolete. However, until that time, I am persuaded that providing pre-educational self-screening hurdles for learners is a humane process for ensuring that scarce teaching resources are better allocated – especially in transition economies where such resources are scarce.

Thus, transaction cognition theory allows – through the inclusion of internal motivation factors in the model – for the influence of personal attributes in explanations of high-performance results. The key distinction, however, is that we should be looking for “practice personalities,” not entrepreneurial personalities – as alluded to in an earlier footnote 7: looking for those who want “flight training,” and avoiding the “bird watchers.”

*4.2.2.3. External Information Factors.* As might be expected in a social cognitive explanation of “persons in a situation” (Fiske & Taylor, 1984, p. 4),

external information factors are thought to have a strong bearing on a person's cognitions, mediated in the case of the model under discussion by the propensity to deliberately practice. I have come to believe that within the set of external information factors we can find the greatest opportunities for the enhancement of high-performance economic behaviors. Further, it is my impression that even within the so-called developed Tier 1 economies, the support of external information factors for the deliberate practice of relevant content is, in fact, underdeveloped. In my conversations with colleagues who work within transition economies, it has been their conclusion that the utilization of up-to-date external information will accelerate their capabilities to catch up and perhaps even surpass the performance of some present leaders in the achievement of high-performance entrepreneurial results. Their reasoning goes as follows.<sup>19</sup>

In the West, the reported failure rate of new ventures is between 50% and 80% depending upon measures (Kirchhoff & Greene, 1995; Kirchhoff & Phillips, 1989). Contacts with venture capitalists in North America suggest that of the approximately three surviving ventures out of ten, one is a spectacular success, one is moderately successful, and a third is at or near break-even. The remaining seven produce some level of economic loss – even disaster at times. Policy-makers within transition economies view this record of results with alarm. They cannot envision nor can they accept that capital formation at the early stages of economic enterprise should be so perilous. Frankly, I agree with them.

Certainly, there are voices within the venture community, which argue philosophically for the status quo: nothing can be done; it is just the way things are, etc. However, as noted earlier in this chapter, the steady progress of scientific inquiry has been to systematically subdue risk (Bernstein, 1998). Science continues to penetrate the domain of philosophy. Addressing problems as diverse as infant mortality, or quality problems in production, the scientific method has contributed systematic analysis for superstition, fatalism, and mediocrity. Thus, it is not surprising to me that policy-makers within transition economies are asking: Why should we accept the capital formation failure rates of the West? Can we not do better than this?

Thus, as new policies are considered within transition economies, the goal is to identify and implement a much higher standard. The essential conceptual framework for such initiatives, however, rests upon the foundation illustrated in the model (Fig. 1). Organization of a discipline, and the establishment of effective dissemination channels are suggested to have a direct and positive effect upon deliberate practice, and through such practice upon people's cognitive system and high-performance results.



Returning, then, to Fig. 1, the focus can now turn to the cognitive system itself: the knowledge base and problem solving processes that together make up the cognitive system upon which a person relies for level of expertise in their performance within a domain. Hopefully it is now clear to the reader that in the case of entrepreneurial performance, this cognitive system is expected to consist of expertise scripts (sequences and norms) that contain the knowledge and problem solving that comes from possession of some level of planning, promise, and competition cognitions. However, a discussion of the cognitive system available to entrepreneurs seems to be somewhat incomplete without a discussion of the possibilities for computer-based tools that might be utilized to further assist entrepreneurs by enhancing the effectiveness of their cognitive system. Here is why.

The foregoing discussion has provided a specification of the content which, when part of a person's cognitive system, acts like software in the human mind. To round out this "software," it only seems sensible for us to attempt to specify, in a discussion of what we might term "entrepreneurial technology," the expertise assistance systems possible that can extend with *computer* software, the *human cognition software* that exists at a given time: to more fully utilize mind-based knowledge and problem solving, by conceptualizing and developing technology-based problem solving processes. The next section presents this extension and discussion.

#### 4.3. *Technology Implications for Teaching Global Entrepreneurship*

To begin a discussion of technology that we shall term expert-assistance software, we must first develop the necessary definitions and an analytical context within which such a discussion might make sense. Accordingly, I first define some of the necessary terminology, and then proceed in the following two subsections to develop both a conceptual framework and an analytical framework.

Entrepreneurship technology is defined as the application of entrepreneurial science to commercial objectives. One of the means whereby the "entrepreneurial science" of transaction cognition theory – rooted in information processing theory – can be applied to commercial objectives, is through the use of information technology. Expert-assistance computer software offers one such opportunity. As differentiated from artificial intelligence systems (Chi, Glaser, & Rees, 1982; Granger, 1980; Marr, 1977), expert assistance systems perform for an individual only the operations that

– if performed by that individual – would *lessen* their level of performance (e.g. long computations, complex comparisons, etc.).

#### *4.3.1. The Conceptual Framework*

Based in the functional relationship,  $Y = f(x)$ , expert assistance entrepreneurial technology relates key planning, promise, and competition independent variables to likely outcomes expressed as a multivariate dependent variable. By minimizing the computational burden, specialized information technology that serves as an expert assistance system can assist in the representation of complex problems in a manner that can enhance expert performance. The analytical framework that forms the foundation of this approach is explained in the first subsection and then this framework is further explained in a second subsection in which the conceptual content is explored in more depth. In this third subsection of Section 4, the analytical framework is linked to transaction cognition theory – specifically to the value helix.

#### *4.3.2. The Analytical Framework*

The analytical framework that forms the structure upon which the technology is based mirrors the functional relationship in the following paragraphs as follows: (1) the establishment of likely outcomes, (2) the identification of representative independent variables, and (3) the application of an example functional relationship.

*4.3.2.1. Establishment of Likely Outcomes.* Experts can recognize “positions” e.g. 50,000–100,000 board positions in chess (Chase & Simon, 1972). This recognition invokes use of a schema (VanLehn, 1989), schemata (Glaser, 1984), or expert script (Leddo & Abelson, 1986; Read, 1987). However, if data are not in a recognizable position, experts use of schema is as limited as that of novices (Ericsson & Charness, 1994). Decision-making by experts is thus limited by the existence and extent of an expert schema in a domain. Thus, the first key to the creation of useful expert assistance technology is to establish for business enterprises the equivalent of “board positions,” which can then be related by a decision-maker to any actual set of circumstances that may be encountered. A set of 14 case studies with assigned coordinates on the independent variables serve as these points of comparison.

*4.3.2.2. The Identification of Representative Independent Variables.* Like the forensic evaluation of a partial strand of human DNA that supports, for example, a legal judgment, the assessment of a partial set of venture

characteristics such as the following list – as a sample of something akin to a venture’s genetic material – can provide entrepreneurs with the capability to make the business judgments that distinguish viable from less-viable ventures. This set-based approach is known in venturing circles as the “known attributes” approach (Mainprize, Hindle, Smith, & Mitchell, 2003, pp. 16–17). These variables include: new combination, product–market match, net buyer benefit, margins, volume, repetitive purchase, long-term need, resource availability, nonimitability, non-substitutability, holdup, slack, uncertainty, ambiguity, and core competence (Mitchell, 1998). All in all, our capability to identify at least 15 sample attributes of viable ventures suggests the possibility of utilizing *venture viability templates* to identify and observe necessary venture characteristics as independent variables in a functional relationship.

*4.3.2.3. Application to the Functional Relationship.* The idea that enables the construction of expert assistance technology for the assessment of economic opportunity relates the decision-making process to the standard functional relationship. Decision-making for the most part, appears to be essentially a binary exercise (e.g. makes sense/does not; will do it/would not; etc.). Binary exercises use base 2 to delimit the consequences of that decision, depending upon the number of independent variables influencing (which have yes–no conditions) that decision. Hence, the number of consequences (conditions on the dependent variable) in a multiple-variable decision situation is an exponential function of the number of independent variables ( $n$ ) on a base of 2 (e.g.  $2^n$ ). Thus, for two independent variables the number of conditions is  $2^2 = 4$ ; for three independent variables the number of conditions is  $2^3 = 8$ ; and for four independent variables the number of conditions is  $2^4 = 16$ ; etc.

Thus, for example, where promise expertise requires that stakeholders be identified and prioritized according to the absence or presence of the independent variables: power, legitimacy, and urgency to yield eight possible outcomes ( $2^3$ ), e.g. Mitchell et al. (1997), the functional relationship  $Y = X_1 + X_2 + X_3 + e$  can be more easily and expertly assessed using software that transforms levels on the independent variables into categorical form using an expert assistance algorithm (Agle & Mitchell, 1998). Or where planning expertise is enhanced by the relation of the multiple independent variables of venture performance to multiple venture outcomes e.g. Mitchell (1998), or where competition expertise is improved by the capability to assess individual competition scripts (Mitchell, 1994), the expert assessment of the respective functional relationships  $Y_m = X_n + e$ ; and  $Y = X_1 + X_2 + X_3 + X_4 + e$  can be enhanced through the use of algorithms created to speed

the task, embedded within self-contained software that trains the individual to use it, and contains input and output mechanisms that permit the individual to concentrate on the elements of the problem that are better assessed using the human mind<sup>20</sup> (VanLehn, 1989).

The consequences of decisions based upon multiple independent variables in particular domains are known to experts – and appear to be analogous to “board positions.” As such, these “consequences sets” form part of an expert’s *knowledge structure* or *expert script*. If decision-making comparisons utilizing a mental template such as the one proposed herein (15 variables in a binary decision situation yielding  $2^{15} = 32,768$  possible combination conditions) are attempted without the use of known points of reference (board positions) then analysis is effectively disabled, and an individual is relegated to functioning as a novice. Accordingly, a set of case prototypes, based upon actual ventures, is required for comparison purposes. This results in the following functional relationship using the known attributes approach:<sup>21</sup>

$$Y_{1-14} = f(\text{attributes})_{1-15}$$

Comparison of results from the known attributes approach (theory-driven system) with results from espoused criteria (practitioner rule-of-thumb) approaches show promise, for example, in the tripling of certain new venture hit rates (Mainprize, Hindle, Smith, & Mitchell, 2002; Mainprize et al., 2003).

## 5. CONCLUDING REMARKS

In this chapter I have attempted to demonstrate that as a global society we have, in certain ways, been wrong in our approach to entrepreneurship education; and to identify our mistakes, surface possible solutions, and to some extent assess some practical courses of action accordingly. The objective of this chapter has therefore been to use newly emerging entrepreneurship theory, specifically transaction cognition theory as set within the domain of entrepreneurial cognition research, as a foundation with which to explore the relationship between education and the achievement of high-performance results in international entrepreneurship, with the intention of improving it – or at least opening to the mind of the reader some previously un- or under-considered avenues for possible new directions for tuning up entrepreneurship education as an engine of global value creation.

In Section 3, through the introduction of a cognitively based general model of expertise/skill acquisition (Fig. 1), expert performance in entrepreneurship was suggested to come from a highly accessible practice-based learning approach that is general and systematic in nature, rather than from the previously assumed highly exclusive process of entrepreneur-creation that is based in “special” and unsystematic processes. This argument was offered in service of the idea that the exclusion of the majority of the world’s population from the high-performance entrepreneurial results possibility set is unnecessarily wasteful of human talent and potential. In Section 3 I intended to demonstrate that the exclusion of the majority of the world’s population from first-tier economic opportunity rests primarily on the absence of the requisite cognitive systems, that such systems are very likely to be widely transferable if based upon the application of the transaction cognition theory-based deliberate practice model of entrepreneurship education. It is my hope that in this demonstration that the reader has at least become open to the possibility that our collective economic future has the possibility to include a majority v. a minority as entrepreneurs: that while we have been in some respects mistaken, that doable solutions are available.

In Section 4 the educational model introduced in Section 3 was addressed for both content and process practicality, in both first-tier and transitional or developing teaching situations, and further, led to the a discussion of the nature and to some extent the role of expert assistance technology in optimizing the effectiveness of individuals’ cognitive systems as they impact high-performance entrepreneurial results. My intention in Section 4 was to demonstrate to the reader in practical terms, some possible avenues that can be taken whereby we might construct workable action plans to correct our mistakes in the creation of global entrepreneurs. In this task, I hope to have also been at least moderately successful.

As an educational philosophy, I have thus argued: (1) that the cognitive systems of individuals are more directly related to the achievement of high-performance entrepreneurial results than are their personal attributes, and (2) that recent theory and empirical results make it possible to further push the line of demarcation from the inexplicable in economic performance, toward the scientifically explicable, and therefore from the impossible to the possibly doable. One earlier-suggested line of inquiry, however, remains to be assessed in light of the foregoing arguments.

Earlier in this chapter, I suggested that there are activities (based in the “specialness” paradigm) that we have intended should stimulate entrepreneurship, which may in fact have discouraged it. I believe that, in conclusion, it might be useful for us to briefly examine a few examples of such

activities with an eye towards: (1) recognition that the things we are doing that we think are “helping” may actually be “hurting,” and (2) launching a movement that results in the course corrections needed for entrepreneurship education to fulfill its full potential.

Examples of some activities that continue to backfire on us include:

- (Certain kinds of) veneration or castigation of entrepreneurs: because some types of recognition confirm a self-censoring belief in specialness that is exclusionary.
- The creation of (certain kinds of) entrepreneurship centers: because they prevent the early identification of ill-conceived projects, and the subjection of these projects to market discipline, and fail to enact a bridging and catalytic vision for “entrepreneurial transfer.”
- Teaching entrepreneurship as a (certain kind of) “specialty” program: because it focuses attention away from critical skills and toward less-relevant ones.

### *5.1. (Certain kinds of) Veneration or Castigation of Entrepreneurs*

In a celebrity-driven culture, it is easy to see how certain kinds of veneration (or castigation) of, for example, the super-rich or super-successful entrepreneur can backfire. Celebrity by its very nature is exclusive. Veneration-based activities send the subtextual signal that very few individuals can attain this status. It seems to me that only where the recognition operates to reinforce inclusivity, does celebrity-creating veneration serve the cause of increasing overall global value creation. Otherwise, we incur the vast opportunity cost of lost entrepreneurial value due to erroneous self “selection out” of the realm of entrepreneurial possibility: either because we think we cannot attain the heights (veneration), or because we think that we cannot bear to experience the depths (castigation).

Empirical questions, worthy of exploration, are raised by the assertion that exclusivity-creating veneration of entrepreneurs can backfire. For example, it would be useful to know the proportion of individuals who are motivated toward higher levels of results in entrepreneurial performance by assurance of a fair and reasonable chance of success (the deliberate-practice paradigm message), and how many are motivated to higher levels of results in entrepreneurial performance by the message that very few, if any, of those who attempt to can actually reach their goals. It seems logical to expect that

accessibility will be shown to be more motivational in the general setting; and I suggest that were such an approach to replace the presently somewhat misguided veneration-based approach, we would see more individuals attempting global entrepreneurial value creation, and more of them succeeding in meeting their entrepreneurial performance goals.

In making the foregoing suggestions, I am not unaware of the potential upset that such a change might invoke in the short term. For example, within the philanthropic community, it is well known that “recognition” is the lubricant that plies money from purses and wallets. Yet, the damage from a course correction does not need to be great. Veneration of deliberate practice that has led to the entrepreneurial success of an “ordinary” person, for example, could go some distance toward aligning learning incentives, while preserving philanthropic sentiment.

### *5.2. The Creation of (Certain Kinds of) Entrepreneurship Centers*

The creation of an entrepreneurship center is not in itself negative in its impact on the number of individuals or teams of individuals who attempt entrepreneurship. However, certain kinds of entrepreneurship centers, especially those that foster low-accountability incubation or funding programs, can backfire, because their fundamental premise is based upon a “hothouse” mentality.

What is meant by a hothouse mentality? This metaphor alludes to the practice of creating an artificial environment in the case of certain delicate flowers (e.g. orchids) that do not grow well in temperate or cooler climates. An extension of the hothouse mentality is the growing of bedding plants in an artificially munificent environment while conditions in the outside environment are inclement, with the objective of setting them out into the regular environment once its prospect for supporting these plants is sufficiently benign.

Where entrepreneurship centers are created to incubate or finance, and shield prospective entrepreneurs and their works from the “others” (the marketplace) in future transactions, it seems to follow logically that the number of transactions (the attainment of value creation through the creation of first-order economizing advantages) will be slowed. The marketplace, by its very nature, is rarely munificent to that business which is poorly conceived and ineptly implemented. The treatment of individuals or projects as though, by the very declaration of entrepreneurial intention, these are

“special,” sets up and inevitable waste of resources ... in at least two respects. First, resources are wasted in the support of that which the ecology of the market would almost immediately select out. Second, resources are wasted once the full brunt of market force comes to bear upon a congenitally flawed venture, and failure results due to its inability to effectively utilize (what turn out to be) erroneously committed and possibly escalated resources. Thus, another empirical question, that would help to assess the foregoing assertions, might be to track and to determine (at varying levels of protectionism) the longevity of new ventures that are incubated as compared to those that are not.

I suggest that there exists a broader vision for entrepreneurship centers. Earlier in my career, one of my mentors was the late Wayne Brown, who was one of the leaders in the U.S. in suggesting and acting on the idea of “technology transfer” from (in his case) the engineering schools of universities (and later the national labs) into the business sector. In the 1980s, he created a unique kind of entrepreneurship center, one he referred to as an “innovation center,” which tried to enact the entrepreneurship center idea without the above noted disabilities, and *with* technology transfer as an anchor concept. However, given the relative underdevelopment of entrepreneurship research at the time (at least when compared to the development within a university of technology to be transferred) it is little wonder that the “complement” of technology transfer: what I think of as “entrepreneurial transfer,” has not been included within the vision of an optimal entrepreneurship center.

Entrepreneurial transfer as I define it, focuses on the facilitation (through use of the deliberate practice model) of economic literacy; it focuses on the transfer of the special part of entrepreneurship as articulated by transaction cognition theory – the creation of new units of value in a marketplace. A center that includes such a focus could then be extended to serve multiple-bottom-line value creators: artists, engineers, graphics specialties, musicians, playwrights, and other writers, etc.; and if coupled with a public policy mandate, could take emerging insights in the creation of value from imperfections beyond the economic (e.g. environmental, social, etc.) (e.g. [Cohen & Winn, 2003](#); [Dean & McMullen, 2002](#)). Thus, there appears to be an under-enacted vision of the entrepreneurship center as a bridge to the disciplines that depend upon business schools for certain parts of the practical enactment and dissemination of “works.” The idea of entrepreneurial transfer is at the core of such bridging ideas. The idea of entrepreneurial transfer is, in this respect, catalytic, and supportive of broadening ownership of entrepreneurial cognitions.



### 5.3. *Teaching Entrepreneurship as a (Certain Kind of) “Specialty” Program*

At the point in time when an educator accepts the veracity of the deliberate practice paradigm, that person may actually be adopting a stance toward entrepreneurship education pedagogy that leads away from the treatment of entrepreneurship as a specialty program. I suggest this outcome because the deliberate practice paradigm is rooted in notions of students contributing intensity and duration of practice, and of instructors contributing content: specifically content that is based in transaction cognitions, value creation that is focused on unit increases, and the utilization of the first-order economizing aspects of all the business disciplines. Thus, two potential “backfires” must be considered: (1) the need in a specialty program to repeat much of the content within the general business school curriculum, and (2) the isolation of entrepreneurship, which should – under the deliberate practice paradigm – not be isolated, but instead be a part of general business education, but which perversely is bottled up in a specialty program that only few can access.

Thus, the deliberate practice paradigm of entrepreneurship education suggests that entrepreneurship education should be a general part of all B-school education, and that this can be accomplished: (1) with courses that teach students opportunity thinking: how to identify the first-order, unit-based, new value through quantity increases-creating elements in all the business disciplines, (2) by specializations that are open to the self-selection of *all* interested students from disciplines both within and beyond the B-school, (3) by implementing cross-disciplinary assignment based credit systems, where entrepreneurial learning is recognized wherever it occurs, and (4) by enacting the complement of the technology transfer that (as discussed in the previous subsection) is termed “entrepreneurship-transfer,” where instead of engineers, etc. transferring technology to business people; the B-school transfers effective entrepreneurial cognitions to transaction creators (thus solving the perennial “mug with no beer problem”).<sup>22</sup>

Of course the business plan creation courses, as the practice of a skill set to effectively meet institutional expectations in the financing process, would have a necessary place in such curricula; but the “business plan course as integrator” should be properly viewed as a limited-scope version<sup>23</sup> (i.e. planning cognitions only) of a more comprehensive model that is rooted in the deliberate practice of all three necessary entrepreneurial cognition sets: planning, promise, *and* competition cognitions. What administrators think of, as “the entrepreneurship course,” could thus become the coaching,

bookmarking, attention-focusing course(s) that could lead any individual who wishes to think entrepreneurially and to feel empowered, to add value locally or globally.

#### 5.4. *Creating Global Entrepreneurs*

As the reader, you may have noticed the two ways in which I have treated the notion of creating global entrepreneurs: the first, being that individuals can be empowered to act globally, and the second, being that the creation of global entrepreneurs can occur globally. It seems to me that the road to excellence in international entrepreneurship education has room for both travelers. Hopefully in this chapter I have been somewhat persuasive that the process of creation of entrepreneurs who act globally, which is based in transaction cognition theory – a notion of entrepreneurial expertise that crosses geographical, cultural, and economic borders – is a doable one. I hope also that I have been persuasive in conveying the notion that there are many more possible entrepreneurs than we had ever supposed: that globally, through the transmission of effective transaction cognitions, and with the right practice, the majority of individuals in our global economy can be entrepreneurial in the [Schumpeterian sense \(1934\)](#) that they create new combinations/new transactions/new units of value. I believe that tuning-up, or perhaps even refitting entrepreneurship education as an important engine of global value creation, can better enable us to reach new milestones on the road to excellence in international entrepreneurship education.

### NOTES

1. The figure is slightly adapted from the original figure to: (1) replace item B.3. “compulsivity” with its more accurate and less pejorative substitute “repetition tolerance,” (2) align the original title D. “practice” with the literature, thus using the term “deliberate practice,” (3) link the original outcome variable “expert performance” to the entrepreneurial outcome variable utilized in this chapter “high-performance results,” and (4) to designate the subheadings with capital letters A, B, ..., etc. instead of with numbers to avoid later confusion in referencing the figure.

2. The reader is referred to the original text of the article and the related literature referenced therein for the original definitions of the elements of [Fig. 1](#). Within this chapter, the definitions offered are intended to be applied versions that are especially suited for the education of individuals who desire to accomplish the high-performance economic results of global entrepreneurship.

3. Interestingly, most events in the transaction creation sequence seem to follow the steps that answer successively the questions: (1) What do I have to offer? (2) Can I make a deal? and (3) Can I produce it? This suggests that the order of cognition use may not, in practice, be planning, promise, and competition; but rather competition, promise, and planning. As such, then, it appears that BR is not the first transaction attribute to be addressed by transaction creators. Instead, it appears to be first specificity, followed by opportunism, and then bounded rationality. Planning is thus made practical because BR has itself been “bounded” in the enactment of the transacting sequence.

4. Please see the more detailed discussion and application of social frictions later in this chapter, and a thorough development in [Mitchell \(2001\)](#).

5. Gurnell originally proposed “betrayal” cognitions. It has later been suggested ([Mitchell, 2001](#)) that the label “betrayal” might be too narrow to serve the counterpoint role in the case of promise cognitions (in addition to having a pejorative tone that might compromise its use in a general model). Nevertheless, in searching for a more fitting label, it seems that Gurnell, in his description cited above, has provided the needed conceptual foundation, if not an adequate label. The suggestion, therefore, has been that the cognitions that lead a person to “avoid transacting entirely,” are, in fact, simply refusal cognitions; and I shall refer to them using this label henceforth.

6. The idea here is that certain enabling cognitions make it possible to acquire further enabling cognitions.

7. Since it was noted as a point of educational philosophy at the beginning of this chapter, it should not be lost on the reader that this approach to the education of fledgling entrepreneurs contradicts most of the characteristics-based assumptions about entrepreneurs (i.e. that they have a high locus of control ([Berlew, 1975](#)) and high risk taking propensity ([Coulton & Udell, 1976](#)), for example). Critics might assert that the encouragement/self-selecting of individuals who are willing to engage in high intensity and duration of practice behaviors, through the identification and teaching of those individuals who are likely to exhibit low refusal behaviors, will eliminate those with the so-called “entrepreneurial potential.” We are not convinced. Our experience with the very few overly willful and noncompliant (high refusal behavior) students that we have encountered since our program began, is that a higher proportion of our coaching input appears to be wasted; and that, in addition, as high-refusal individuals act out their objections in class it simply detracts from the learning environment for the majority. Whether such individuals are more likely to succeed or not as entrepreneurs is an empirical question, which has been quite thoroughly addressed by scholars who find little explanatory power in the locus of control or risk taking propensity approach to the understanding of individual entrepreneurship ([Brockhaus, 1980](#); [Hull, Bosley, & Udell, 1982](#); [Sexton & Bowman-Upton, 1983](#)). Based upon our understanding of the research record as it presently stands, we see potential in transaction cognition theory to be used as a foundation to educate the majority of individuals in the thinking patterns that are related to high-performance results, and see little merit in the search for the personality traits of ideal entrepreneurs. We agree with those who propose the model shown in [Fig. 1](#), that there are likely to be aspects of the personality that shape the propensity of an individual to engage in deliberate practice ([Charness et al., 1996](#); [Ericsson &](#)

Charness, 1994). And it should be obvious that the self-selection processes and low-refusal emphasis that we propose (and have found to be effective) do not violate these standards. In short, our internally gathered data show that the implementation of the pedagogy depends less on personality characteristics, and more upon students' intent. Metaphorically speaking: to the extent we are teaching those who want "flight training" v. "bird watching" (i.e. those who want to personally be able to think entrepreneurially v. those who simply want to observe entrepreneurship as a phenomenon), the deliberate practice model is effective in building/enhancing students' planning, promise and competition cognitions.

8. This is a re-specification to correct an error that appeared in Mitchell, 2001.

9. The full *Student Preparation Guide*, which follows the format suggested in Fig. 1A–D, is included as an operationalization example in the appendix in Mitchell (2001), [www.ronaldmitchell.org/publications.htm](http://www.ronaldmitchell.org/publications.htm). Illustrated in Fig. 1 and discussed more fully in Section 4, boxes A–C are twelve items: A(6), B(4), and C(2), which, when combined, are thought to influence positively the intensity, duration, and content of deliberate practice (box D). As students gather into their portfolio, for example, letters of support from significant others (e.g. A1), a description of their training regimen for a sport or artistic pursuit of choice (e.g. B3 and 4), or documentation of their pre-program preparation readings (e.g. C2), they increase trust in themselves, and increased trust is created in the professor, and, in turn, these promise cognition effects make registration in the Entrepreneurship Program more probable.

10. See Morse and Mitchell (2005) (forthcoming) for a more recent elaboration of this process-based pedagogy where case-based teaching has been added to the script-transfer process.

11. The UVic Entrepreneurship Program won the USASBE Model Undergraduate Entrepreneurship Program Award, presented at the US Association for Small Business and Entrepreneurship Annual Meeting, San Antonio, TX, February 19, 2000. Further, the program also won the 1999 Academy of Management Entrepreneurship Division "Innovation in Entrepreneurship Pedagogy Award," presented on August 9th, at the 1999 annual meeting held in Chicago.

12. Thus, for example, the UVic program objective is to prepare individual students so that they can acquire the knowledge and critical thinking skills necessary to enable them to become venturing experts within 5 years of graduation (this being half the time that the conventional wisdom suggests is necessary to acquire an expert knowledge structure (VanLehn, 1989)).

13. This software has been cited as a worldwide best practice in distance consulting in: *Potentials and Pitfalls in Using the Internet to Deliver Business Development Services to SMEs*, A report to the Donor Committee on small enterprise development, commissioned by the Open Society Institute, October 27, 1998, and presented by Jerome A. Katz, Ph.D., Mary Louise Murray, Endowed Professor of Management, Saint Louis University, St. Louis, MO USA.) (New Venture Template™ Expert assistance software© Ron K. Mitchell, 1995, cited along with: Multimodal Consulting Services – Ernst & Young's ERNIE, Email consulting for everyone – SCORE's Email Service, Multimodal Training for SMEs in Finland – University of Oulu's LearnNet.

14. At this point the University of Victoria undergraduate program, Victoria, BC, Canada, is the only one known to have been explicitly based upon this suggested

model. This 16-month program utilizes two 4-month academic semesters at the beginning and end of the program, coupled with two back-to-back work-term semesters (8 months) to provide experience in the middle of the program. Since its implementation began in May 1997, since an operational understanding of relevant constructs is still under development (e.g. this chapter), and since the objective of this particular program is to create the capability to achieve high-performance results beginning 5 years after graduation (assuming work life v. graduate education begins immediately), undertaking a realistic assessment of the impacts of this approach is only beginning to become practical. The program has, however, been highly rated by student participants, and anecdotal evidence of program effectiveness abounds.

15. In transition economies, and with entrepreneurs in general it has often proven difficult to accomplish strictly random sampling. However, the use of purposeful sampling that is designed to minimize sampling error has been found to be effective (Mitchell et al., 2000).

16. In the subsection following, which discusses the application of transaction cognition theory to the creation of expert assistance technology, three iterations of the value helix can be seen to provide the underlying order for the assessment of opportunity at the venture/firm level of analysis.

17. Mitchell (2001) devotes extensive attention to the development of both the theoretical and practical application of the concepts behind the four value-adding processes: [1] drag to glide, [2] slippage to traction, [3] slippage to glide, and [4] drag to traction.

18. "Governments have concluded that the symptom – the "shortage" of capital – and the cause are one and the same. The solution that follows from the government's perspective is to jump in and provide billions of dollars in subsidies, "strategic investment," research and development funding, and seed capital through dozens of programs that target everyone from micro-enterprises to huge multinationals ... (but) there is scant evidence that any of these programs work (Vanagas, 2001).

19. Referring to discussions with the individuals who are, for example, writing the new venture capital policies for the Central Government in the Peoples Republic of China.

20. Presently, software that assists with the utilization of planning scripts (Mitchell, 1995) has been utilized by hundreds of venturers, by the rating panels in several venture capital conferences sponsored by the Wayne Brown Institute, Salt Lake City, Utah, and by new venture teams in two Fortune 500 companies, with a reported positive impact in the \$10 million range. Testing of the promise cognition expert assistance system has followed the more traditional research trajectory (Agle et al., 1999). Also, the competition cognition expert assistance system has been in use at several universities in North America (Canada, Mexico, U.S.A) for several years, with excellent results (Mitchell et al., 1998).

21. A sample algorithm has been created and tested in a variety of settings, and it appears later in the discussion; but since this is not the only one possible, since improvements are continual, and since a digression into a discussion of the merits of such mathematical representations is not germane to the topic at hand, I shall simply refer the reader to other literature on this topic (Mitchell, 1995; Mitchell, 1998; Wang, Tang, & Mitchell, 2001; Wang, Mitchell, & Tang, 2003).

22. The “mug with no beer problem” is a term coined to evoke the notion that while B-school graduates can practice management, they often do not have the training to create the actual technology or special-training-based products (e.g. art, graphics, music, software, writing, etc.) that can be more easily or excellently created by those whose expertise is in such work-creation specialties.

23. The present focus on business plan preparation and competition has recently been called into question by a *Burn Your Business Plan* (Gumpert, 2003) approach to entrepreneurial education that suggests “synopsis-based” planning: still an insufficient (in my view) but necessary part of comprehensive entrepreneurial thinking skill. This is especially important since the discussion/debate stems, I believe, from the increasing realization that business plan preparation for *planning* purposes is quite distinct from business plan preparation for *financing* purposes. The B your B-plan approach deals primarily with the financing aspect.

24. Subsequent theoretical development has resulted in the observation that such scales are formative indicators, v. reflective indicators of the constructs being measured. As a result, the tests of internal validity were not, strictly speaking necessary. Because the individual items are independent pieces of evidence of the scripts they are formative indicators (Pedhazur & Schmelkin, 1991, p. 54), and are added together to create interval scaled variables (Nunnally, 1978). Formative indicators define, or give rise to, the construct, but are not a reflection of it. Since each item in a formative scale helps to define the meaning of a construct, affirmative responses to all items are not required from an individual respondent to capture construct meaning. For example, an increase in the pool of people and assets that a respondent controls e.g. Mitchell et al. (2000, p. 992; appendix item 20), is one indication of mastery of a script relating to arrangements. However, a respondent may have an arrangements script that is based on the masterful use of other resources without reference to changes in their available pool of people and assets. Also, since formative indicators are independent components of a construct, they may not be highly correlated. Consequently, it is inappropriate to expect unidimensionality at the construct level, and it is inappropriate to assess reliability at the item level with Cronbach’s alpha, which is based on inter-item correlation (Howell, 1987, p. 121).

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## APPENDIX A. SUMMARY OF RELEVANT CONCEPTS AND FINDINGS (MITCHELL & CHESTEEN, 1995)

### *A.1. Theory and Hypothesis*

In this chapter, it has been argued that the achievement of high-performance results is related to the content of individual knowledge structures/expert scripts (e.g. level of transaction cognitions), and that entrepreneurial expertise is an important factor in successful new venture founding (e.g. Mitchell et al., 2000). In this study we applied an instructional pedagogy based on Glaser (1984) to evaluate its efficacy for enhancing entrepreneurial expertise. Thus, the focus is on an instructional pedagogy that improves students' entrepreneurial expertise through the application of the recommendations of expert information theorists regarding script acquisition. Glaser, and other information processing theory scholars suggest that contact with expert scripts is a primary means for acquiring expertise (Glaser, 1984; Norman, Gentner, & Stevens, 1976; Read, 1987). Concepts from the simulation and gaming literature (Petranek et al., 1992) were employed to design the pedagogy that features such contact as its primary emphasis. Table A1 reproduces the summary table from the published article (Mitchell & Chesteen, 1995, p. 294), which details the experiential enhancement activities that we utilized as our pedagogy.

Information processing theory proposes that an expert may be distinguished from a novice by observing an individual's ability to recognize cues related to an expert "script" (Leddo & Abelson, 1986; Lord & Maher, 1990; Read, 1987). Striking differences between novices and experts have been identified, particularly in the way they store and retrieve information (Fiske, Kinder, & Lartner, 1983; Lurigio & Carroll, 1985). For example, a novice tends to respond to surface features of problems while an expert uses a more fully developed schema, organized around context-relevant scripts (Chi, Glaser, & Rees, 1982). The proposed experiential pedagogy was intended to enhance the expertise of novices such that their expertise levels would become distinct from those of other novices, and approach those of experts. If the experiential pedagogy were to have a significant effect, a distinct level of expertise to be termed "enhanced novice," that is a level between expert and novice, should result. Thus, we expected:

**Hypothesis.** Differences exist on the expertise levels of experts, novices, and enhanced novices.

## A.2. Methods

The methods used in our study may be described under the three headings: data gathering, measurement, and data analysis.

### A.2.1. Data Gathering

The subjects in the experimental study were 174 residents of a large Western U.S. metropolitan area. The data included responses from: (1) a novice group (control), where subjects either had no contact with venturing concepts, or had not personally created new enterprise, (2) an enhanced novice group (treatment), where subjects who have not personally created new enterprise received expertise enhancement course materials and experiences according to the previously described pedagogy, and (3) an expert group of entrepreneurs who qualified under the following definition of “expert.” Experts in this study were individuals who had either (1) started a business that has been in existence over 2 years, or (2) started three or more businesses, at least one of which was a profitable, ongoing entity.

The experiential treatment centered on the *participating* portion of the experiential series described earlier in Table A1. For two, quarter-long business school courses designed to optimize students’ capability to apply the principles and practices of entrepreneurship, we formulated an instructional strategy that incorporated new venture expert scripts. In each class approximately one half of the students were randomly assigned to an “expertise enhancement” group. For these students, the script-based instructional strategy was implemented by utilizing “participating, writing, and debriefing” activities to enhance expertise consistent with the script comparison method suggested by Glaser (1984), and Lord and Kernan (1987). Those students not assigned to the “treatment” group were encouraged to complete a “control” project the preparation of a business plan or feasibility study. All students participated in a “base” pedagogy consisting of exposure to materials in generally accepted entrepreneurship texts. The undergraduate course was a senior strategy class taught with an entrepreneurial emphasis. The masters’ course was a strategy elective focusing on innovation and entrepreneurship. Students in both courses were primarily business majors.

### A.2.2. Measurement

Measurement of the effectiveness of the script-based experiential activity was accomplished using two expert script cue-based scales that were new at the time, but have subsequently been refined e.g. Mitchell et al. (2000,

**Table A1.** Experiential Enhancement Activities.

		Glaser (1984)		
		Interrogation	Instantiation	Falsification
Petranek, Corey, and Black (1992)	Participating	Depth interview with entrepreneur mentor	Hearing the results of other depth interviews	Comparing and contrasting within-group views after mentor interview
	Writing	Written description of entrepreneur mentor script: part II of assigned report	Written description of student novice script based upon individual prior experiences, case studies and lectures from classes: part I of assigned report	Written comparison analyzing similarities and differences between student novice and entrepreneur mentor scripts
	Debriefing	Responding to class questions following group report on depth interviews	Listening to other groups debrief their depth interviews in class	Verbally evaluating the information experienced in class debriefing session

Source: From Mitchell and Chesteen (1995, p. 294).

2002b): (1) the entry scale containing 15 items, and (2) the doing scale containing 18 items.<sup>24</sup>

The items that were created for the entry scale embody factors strongly associated with willingness to embark upon a new venture (Glade, 1967; Kihlstrom & Laffont, 1979; McClelland, 1968; Sexton & Bowman-Upton, 1985). It is commonly accepted that propensity to take action, moderate risk taking to capture an opportunity, and a continual search for opportunities (v. non-venture application of resources) indicate that an individual is more willing to venture. The items that were created for the doing scale embody the elements strongly associated with the actual creation of a new venture (Low & MacMillan, 1988; Smilor & Gill, 1986; Stuart & Abetti, 1990; Vesper, 1980). Entrepreneurial experiences such as previous ventures (successes and failures)

and the building and utilization of networks, improve an entrepreneur's ability to start a venture.

The randomized Solomon four-group experimental design employed in this study provided a high level of control over threats to internal validity (Fraenkel & Wallen, 1990). In the study approximately half of the individuals in the classes where the enhancement exercises were conducted were randomly selected to receive both a pre- and a post-test. A *t*-test was performed using the entry and doing scale scores of novices who had no exposure to enhancement activities, and showed no pretest bias.

#### *A.2.3. Data analysis*

In this study it was desirable to analyze the three expertise groups (expert, novice, and enhanced novice) as a dependent variable, using scores drawn from the doing and entry scales as independent variables to ascertain whether such discrimination is possible. Thus, Hypothesis was tested using multiple discriminant analysis.

#### *A.2.4. Results*

A MDA of the three groups using the two independent variable scales entry and doing was conducted. A test of equality of group mean vectors (based on Wilks' lambda) resulted in a multivariate  $F = 20.06$  ( $df_1 = 4$ ,  $df_2 = 340$ , and  $p < 0.0000$ ). Thus the three groups evidence significantly different levels of expertise. The entry and doing scales were also found to be significant predictors of group membership  $p < 0.0000$ .

The centroids (means) of the three groups are plotted in Fig. A1 as ordered pairs (coordinates) shown near each centroid, so that the separation of groups can be visualized. Isodensity ellipses (circles) that are expected to contain 20% of the subjects in each group were plotted with a diameter of each circle computed to be 1.34 units (Watson, 1982). The isodensity circles in Fig. A1 depict the overlaps among the groups. Furthermore, the total correct classification was found to be 84.2% for the novice (control) group, 20.0% for the enhanced novices (treatment) group, and 54.7% for the expert (entrepreneur) group.

The two discriminant functions substantially increase classification capability since, based on the proportion of each group in the sample, it would be expected that 54.6, 14.4, and 31.0% of the subjects (respectively) – only 41.5% of subjects – would be classified correctly. The model improves our capability to distinguish group membership by approximately 160% (65.9/41.5) and permits us to improve classification capability over the prior probability by 154%, 139%, and 176% for the novices, enhanced novices,



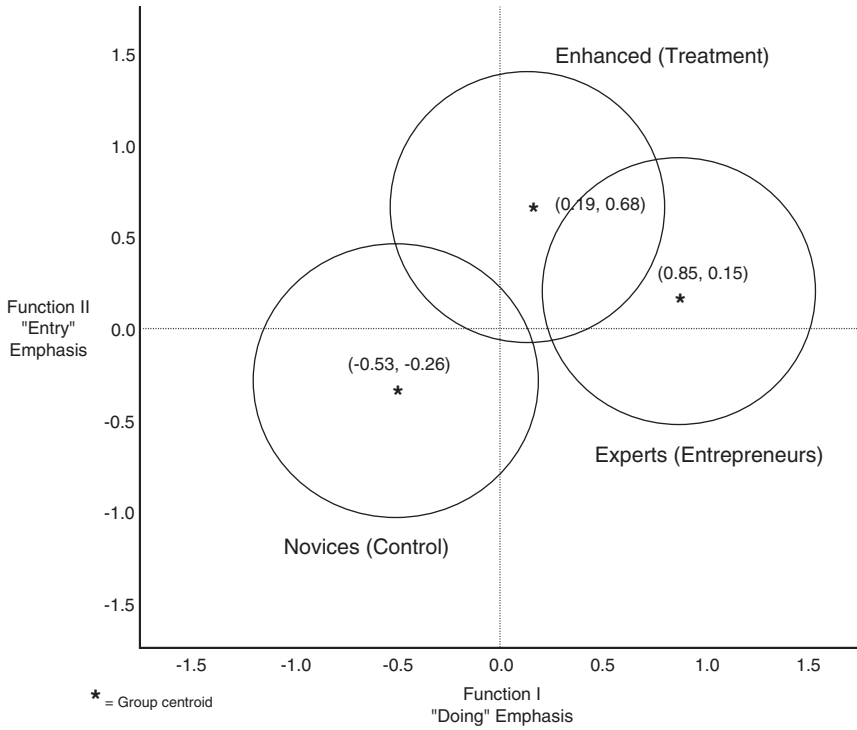


Fig. A1. Discriminant Function All Group Scatter Plot: 20% Isodensity Circles.

and experts, respectively. And, as anticipated, the lower “enhanced novice” classification percentage (20.0%) indicated that the enhanced novices’ scale scores fall somewhere between “expert” and “novice,” demonstrating that members of the treatment group were no longer strictly novices, but were not yet experts. Those subjects who did not receive the experiential pedagogy treatment, and who, instead, prepared a business plan or shorter-version business feasibility study showed no significant change in their levels of expertise.

# WHEN DO VENTURE CAPITALISTS MAKE A DIFFERENCE? THE EXPORT INTENSITY OF VENTURE CAPITAL BACKED COMPANIES

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Louise Scholes and Dave Paton

## INTRODUCTION

There has been considerable debate concerning the contribution of venture capitalists (VCs) to their investee companies (Sapienza, Manigart, & Vermeir, 1996). This research has shown that VCs can add value and impact the strategic direction of their investee firms through their skills and knowledge. These skills lie in two distinct areas: financial (monitoring) and non-financial (strategic and operational involvement) skills (Pruthi, Wright, & Lockett, 2003). The monitoring and involvement of VC firms in their investees have been shown to vary according to their needs (Lerner, 1995). On balance, the evidence suggests greater involvement during the more uncertain earlier stages than during the later stages when the firm is more established (Sapienza, Amason, & Manigart, 1994; Elango, Fried, Hisrich, & Polonchek, 1995). This suggests that the VC's ability to bring about change will be mediated by the impact of the history of the firm via path dependency (Teece, Pisano, & Shuen, 1997).

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A neglected aspect of the literature relating to the added value role of VC firms concerns their contribution to the internationalization of investees. While there is now an extensive literature concerning the internationalization of small- and medium-sized firms (Westhead, Wright, & Ucbasaran, 2001), little attention has been paid to the contribution of VC firms. These are potentially important omissions. There has been growing recognition of the importance of international entrepreneurship (McDougall & Oviatt, 1996, 2000). Early stage firms that are born global may have the flexibility and scope to grow fast (Autio, Sapienza, & Almeida, 2000). More established firms that undergo a reinvigoration of entrepreneurship and a release from parental constraints, as in a management buy-out (MBO) (Wright, Hoskisson, Busenitz, & Dial, 2000), may also turn to international markets as a means to achieve growth. In both these cases, VC firms may have an important role in enabling internationalization to be developed.

This chapter seeks to address this gap in the internationalization and VC literatures by examining the export intensity of the investee firm as a key strategic outcome and analyzing how a VC may affect the investee's export intensity. To investigate the constraining effect of path dependency we examine how the VCs' contribution will differ according to the investment stage of the investee. We also seek to overcome a critique of the internationalization literature relating to small- and medium-sized firms that it has frequently been based on small, non-random samples of manufacturing firms in limited country contexts (Westhead et al., 2001). We use a novel representative dataset of 442 venture-backed firms covering a wide range of industrial sectors and spread across some 20 countries in Europe.

The next section outlines the conceptual background to the chapter and derives hypotheses. We review the salient work relating to the issues of export intensity of firms, from a resource-based perspective, the nature of a VCs' contribution, in terms of the financial and non-financial contribution the VC may make, and how the different VC investment stages differ. The section 'Data' outlines the data and sample we employ, while the section 'Statistical method and model specification' presents our model specification and the Heckman statistical method employed in the analysis. The penultimate section presents the results of the study. The final section discusses the results and implications of the research.

## CONCEPTUAL FRAMEWORK AND HYPOTHESES

The decision to export is a strategy choice that is influenced by a firm's resources and capabilities (McDougall & Oviatt, 1996; Autio et al., 2000;

Westhead et al., 2001). The intensity of export activity is a strategic outcome. Export intensity may be contingent on management's strategic decisions, influenced by the resources available to the firm, the role of financiers and path dependency (Filatotchev, Dyomina, Wright, & Buck, 2001). It requires that the organization has accumulated resources and selected strategies to enter new markets and represents a fundamental departure from existing domestic practices (Lu & Beamish, 2001). Strategies focusing upon identifying and exploiting opportunities in foreign markets are thus more risky than those focusing upon domestic markets and improving internal efficiency. Entrepreneurs' risk attitudes and changes in corporate ownership and governance can shape the resources accumulated by organizations, and the strategies adopted to identify and exploit foreign market opportunities. The resources and capabilities available to the organization, as well as the ownership and governance structure, will be a function of its development.

Resource-based theorists suggest that owners and managers of organizations can create competitive advantages for their firms when they accumulate and manage resources that are rare, valuable, and hard to duplicate (Barney, 1991). A central tenet of the resource-based view (RBV) is that each firm's opportunity set is unique, a product of the resources acquired as a result of its past experience. The past experience of the firm can constrain as well as enable the firm's development (Henderson & Clark, 1990). Over time, the firm's resource base will develop. However, the more developed the firm the greater may be the problems associated with path dependency hindering strategic change in the firm.

Key resources of the firm may not necessarily be under the direct control/ownership of the firm. Rather, a firm may seek to access the resources in its environment for its own benefit. In the case of VC-backed firms, the VC may have an important impact in terms of providing access to resources such as finance, expertise, and networks of contacts. These resources can be accessed by the investee company to augment its own resources.

VC firms provide resources in terms of both equity finance and involvement in entrepreneurial firms. VC-backed firms are characterized by concentrated ownership between the entrepreneur and the VC firm. The introduction of the VC investor changes agency and governance relationships in the firm. In early stage and expansion deals the stake of the entrepreneur is diluted through VC investment. However, in management buy-outs/buy-ins (MBO/Is) managers take a stake in the business that they previously did not have.

With their specialist skills and significant equity blockholding, VCs have both the skills and incentives to adopt an active governance role (Wright & Robbie, 1998) which includes exerting costly effort to improve outcomes. Specifying contractually all potential contingencies is highly problematical so that VC firms typically play an active role in their investees. This involvement helps to protect the interest of the VC firm, ameliorate the problems of information asymmetry and increases the likelihood of higher returns on investment (Sahlman, 1990).

### *VC Involvement and Export Intensity*

The resources that a VC brings through its involvement may relate to both financial and non-financial issues (Pruthi et al., 2003). As VC firms extend funds to entrepreneurs in an environment of asymmetric information and incomplete contracts, there is generally considered to be a need for financial monitoring (VC's financial, VCF) of investees (Mitchell, Reid, & Terry, 1997). VCF mechanisms may include requirements for the provision of detailed and regular budget information as well as the monitoring of performance through board representation and regular meetings between the VC and the entrepreneur. Non-financial involvement (VC's non-financial, VCNF) is also important. Non-financial involvement, which is generally at a more strategic level, primarily concerns developing new strategies, acting as a sounding board, interfacing with the investor group, etc. (Gorman & Sahlman, 1989).

A VC's emphasis on financial issues may be negatively related to the export intensity of the investee firm because of the focus on controlling costs and the short-term financial position of the firm. In contrast, a VC's contribution that emphasizes the non-financial issues for the firm will be positively related to export intensity because the VC is looking to generate returns through growing the business. Hence,

**H1a.** There is a negative relationship between VCF and export intensity.

**H1b.** There is a positive relationship between VCNF and export intensity.

### *Stage of Financial Investment*

VCs may invest across a number of stages in the development of a venture. These stages are typically characterized as early, expansion, and MBO/I stage investments. The stage of investment will have an impact on the

resource base and the path dependency of the company. We expect that the more established the company, the greater will be the resource base. At the same time the greater will be the constraining effect of path dependency and hence the more difficult it will be for the VC to instigate change. The nature of VC involvement and its implications for export intensity may vary considerably according to the stage of investment. We expand on these arguments below.

### *Early Stage*

At the early stages of investment the investee firm is commonly resource deficient. The resources that it has been able to acquire are relatively limited in comparison to more developed companies. A key role, therefore, for the VC firm is to provide equity capital to finance development as well as assistance in terms of financial and non-financial aspects of the business. The resources of the VC can thus be used to augment those of the early stage firm.

The limited resource base also means that the firm is likely to have limited path dependence, that is the firm has not yet had time to develop a strong history to constrain strategic change. The VC investment will lead to a dilution of the entrepreneur's equity holding and will provide a governance role for the VC. However, the entrepreneur will remain a key element of both the ownership and management of the company.

### *Expansion Stage*

Firms at the expansion phase have typically developed a product and established a market presence. At this point, VC may be sought to take advantage of growth opportunities that cannot be met with existing resources. Essentially, the entrepreneurs remain in place but cede some of their equity stake to the VC, or cede additional equity if the venture already had VC investment.

Firms at this stage will likely have developed a much greater resource base than early stage firms. Hence, the firm has a lesser need to access the non-financial resources of the VC. This is not to say, however, that the role of the VC is unimportant but that the difference that the VC will make, especially in terms of VCNF, will be less than at the early stage.

### *MBO/I Stage*

Managers in an organization can purchase its equity to create a newly independent firm in which they are significant equity owners. Where incumbent managers become equity owners, the term MBO is used. When external managers, not previously employed in the organization purchase a

business, a management buy-in (MBI) is created. VC or private equity firms typically play an important role in these situations (Wright & Robbie, 1998).

Organizations can gain a new lease of life after an ownership transition such as an MBO/I. This shift may cut across path-dependent behavior. First, firms subject to MBO/Is have been characterized as suffering from major agency cost problems prior to the ownership transfer. These agency cost problems may have led to suboptimal internationalization behavior. Incumbent management in divisions may have the skills to identify international market opportunities and consider strategies to exploit these opportunities. However, corporate management or former owners may face problems in monitoring this activity and hence refuse to sanction it. For example, these initiatives may not be central to corporate strategy or the subjective nature of the information relating to the identified opportunity may not fit into corporate decision-making processes. Sanders and Carpenter (1998) suggest that internationalization exacerbates agency problems as the increased specialist knowledge that senior management derive from these activities makes monitoring of executives more difficult. Alternatively, with a lack of incentives and monitoring, management may have opted for the easier option of home markets even though these may not necessarily be the most profitable ones. The enhanced governance mechanisms introduced on buy-out, notably the active involvement of VC firms, may help to change this behavior.

The above arguments suggest a number of path dependency-related hypotheses relating to export intensity. The development of resources over a company's life cycle brings with it the potential problem of path dependency. Early stage companies may be less constrained by their path dependency. Hence, relative to later stage firms, there is likely to be a greater impact on export intensity. Companies at the expansion stage are likely to be more constrained by path dependency than early stage companies. This discussion leads to the following hypotheses:

**H2a.** The impact of VCs on export intensity will be significantly greater for early stage companies relative to MBO/Is.

**H2b.** The impact of VCs on export intensity will be significantly greater for expansion stage companies relative to MBO/Is.

The impact of the different types of VCs' contribution will depend on the investee company's stage of development. In particular, investee companies at the early stage will have limited non-financial resource bases and so the

VCNF contribution will have the greatest effect in terms of augmenting the firm's resource base. This relationship is likely to be less strong for companies at the expansion stage of investment and least for MBO/Is. In particular, the developed nature of an MBO/I's resource base will limit the impact of the VCNF. This discussion leads to the following proposition:

**H3a.** The positive relationship between VCNF and export intensity will be greatest at the early stage and least at the MBO/I stage.

The effect of VCF may also be moderated by the stage of the investment. We anticipate that the negative relationship between VCF and export intensity will hold for early and expansion stage investments for the arguments outlined above. In contrast, the nature of the governance change that occurs in an MBO/I leads to increased equity holding by managers that may give them greater discretion and incentive than under the previous ownership regime to take and implement strategic decisions. This change in governance may have the impact of breaking the path dependence of the company. As the MBO/I has a developed resource base, and therefore management do not need VCNF involvement, it may be that the VCF has the effect of forcing the management to seek out new opportunities to take the business forward (Wright et al., 2000). VCF mechanisms place management under scrutiny to perform. Management may thus work harder to improve performance through searching for new markets, notably overseas ones. This discussion leads to the following hypothesis:

**H3b.** There will be a positive relationship between VCF and export intensity for MBO/Is.

## DATA

### *The Sample*

This study draws on two proprietary Pan-European datasets of VC-backed firms covering early, expansion and MBO/I investment stages that cover the entire period and one publicly available dataset covering more recent years. First, the early and expansion stage firms in the sample are derived from the European Venture Capital Association (EVCA) and the Europe Unlimited database which effectively comprise the population of venture-backed firms in these stages. Data are captured through the provision of information by member firms. Second, the venture-backed MBOs and MBIs in the sample



were drawn from the database compiled by the authors. Data in this database, which effectively comprises the population of MBOs and MBIs across Europe, are captured from a twice yearly survey of private equity and VC firms, intermediaries, and banks which obtain a full response rate.

Based on the existing literature and discussions with practitioners, a questionnaire was designed to capture the variables of interest in this study. The questionnaires were translated into French, German, Italian and Spanish, and translated back into English. The questionnaires were also slightly differentiated to take account of differences between early and expansion stage, and MBO/I stage investments. To check for face validity in the different countries covered by the study, the questionnaire was piloted with 20 venture-backed firms in the U.K., the Netherlands, Spain, France, Italy, Denmark, Germany, and Sweden. The survey was mailed to venture-backed investments completed from 1992 and was conducted between mid-2000 and early 2002 to a total of 5,267 venture-backed firms. After administering one mail reminder and telephone follow-up calls, a total of 664 responses were obtained, providing an overall response rate of 12.6%. Owing to missing data on certain items, the usable sample for the analysis presented here was 442 firms. The stage and geographical distributions of the populations, initial responses, and responses used in the analysis presented here are summarized in [Table 1](#).

**Table 1.** Investment Stage and Geographic Breakdown.

	Population		Initial Response		Study Sample	
	No.	%	No.	%	No.	%
<b>Stage</b>						
Early	2,908	55.3	245	36.9	138	31.22
Expansion			119	17.9	78	17.65
MBO/I	2,359	44.7	300	45.2	226	51.13
Total	5,267	100.0	664	100.0	442	100.0
<b>Region</b>						
U.K.	2,063	39.2	283	42.6	202	45.70
North Europe	2,098	39.8	253	38.1	153	34.62
Mediterranean	499	9.5	46	6.9	28	6.33
Nordic	526	10.0	67	10.1	48	10.86
East Europe	81	1.5	15	2.3	11	2.49
Total	5,267	100.0	664	100.0	442	100.0

The stage distribution of the initial responses is broadly in line with the population distribution. However, there is a noticeable reduction in the share of early stage investments and a corresponding increase in MBO/I investments in the sample used in the study. This shift reflects the lower penetration of internationalization activity among early stage firms. With respect to the geographical distribution, the U.K. is somewhat over-represented and the Mediterranean region is somewhat under-represented in the initial responses. This reflects well-known differences in response rates to survey instruments across Europe (Bygrave, Hay, & Peeters, 1994). In the final sample used, the over-representation of the U.K. is increased, while North Europe becomes somewhat under-represented.

### *Variables*

The variables employed in the study are outlined below and their definitions are summarized in [Table 2](#).

#### *Dependent Variables*

The dependent variable is the export intensity of the firm (EXPINTENSITY) at the end period of the survey or the year of exit if different. In addition, we also created a dummy variable of whether or not the firm was an exporter (0 = not an exporter and 1 = exporter) in order to construct our selection model for the Heckman procedure (see below).

#### *Independent Variables*

*Stage Variables.* The investee firms were classified according to the stage of investment. We employed three different stage dummy variables. Early stage – including seed and start-up – (0 = not early stage and 1 = early stage); expansion stage (0 = not expansion stage and 1 = expansion stage); MBO/I stage (0 = not MBO/I and 1 = MBO/I).

*VC Contribution Variables.* Eleven statements were identified covering a variety of contributions VC can make to enhance the development of supported firms. The 11 VC contribution statements were data reduced by an R-mode principal components analysis (PCA), see [Table 3](#) or the results. All the assumptions of the PCA model were satisfied (i.e. Bartlett's test of sphericity; Kaiser–Meyer–Olkin measure of sampling adequacy (0.84); the anti-image correlation matrix; and tests for communality). Two VC contribution statements failed to survive the R-mode PCA, and they are

**Table 2.** Variable Definitions.

Variable	Description
Export EXPINTENSITY	Exporter = 1, non-exporter = 0 Export intensity in last period of survey
Stage variables	
EARLY	Early stage = 1, not early stage = 0
EXPAN	Expansion = 1, not expansion = 0
MBOI	MBOI = 1, Not MBOI = 0
VC contribution variables	
VCF	VCs focus on financial issues
VCNF	VCs focus on non-financial issues
Interaction variables	
VCF × EARLY	Interaction of VCF and early stage
VCF × EXPAN	Interaction of VCF and expansion
VCF × MBOI	Interaction of VCF and MBO/I
VCNF × EARLY	Interaction of VCNF and early stage
VCNF × EXPAN	Interaction of VCNF and expansion
VCNF × MBOI	Interaction of VCNF and MBO/I
Control variables	
SERVICE	Service = 1, Non service = 0
TECH	High tech = 1, Non high tech = 0
EMPSIZE	Natural log of number of employees
TIME	Time window for the firm in months
EXPERIENCE	Export intensity at time of VC equity investment
NORDIC	NORDIC = 1, not NORDIC = 0
MEDIT	MEDIT = 1, not MEDIT = 0
EAST	EAST = 1, not EAST = 0
NORTH	NORTH = 1, not NORTH = 0
U.K.	U.K. = 1, not U.K. = 0

reported at the bottom of Table 3. Two components with eigenvalues greater than unity were identified by the varimax rotated PCA, and they accounted for 68% of the total variance. Each of the VC contribution variables had component loadings greater than 0.66 on either of the two components. With reference to the component loadings, the two components were given the following descriptive labels. Component 1 was termed VCs mostly focusing upon financial issues (VCF). Component 2 was termed VCs mostly focusing upon non-financial issues (VCNF).

Reliability tests were conducted with regard to each component/composite VC contribution scale. The components had a Cronbach's alpha coefficient of

**Table 3.** VC Participation Variables: Varimax Rotated Principal Component Analysis.

VC Participation Variables <sup>a,b</sup>	Varimax Rotated Components		
	1	2	Communality ( $h^2$ )
V1 Formulating corporate strategy/direction	0.81	0.27	0.73
V2 Sounding board for management ideas	0.79	0.21	0.66
V3 Management recruitment/development	0.71	0.19	0.54
V4 Formulating, testing or evaluating marketing plans	0.66	0.30	0.53
V5 More regular budget reporting	0.25	0.85	0.79
V6 Monitoring financial performance	0.28	0.82	0.75
V7 Monitoring operational performance	0.25	0.79	0.69
Sums of squares of the component loadings	2.42	2.26	
Percent of variance	34.74	33.29	
Cumulative percent of variance	34.74	68.04	
Cronbach's $\alpha$	0.79	0.83	

Note: Data gathered from a postal questionnaire administered in 1999 and 2001.

<sup>a</sup>Respondents were asked to rate the inputs of VCs since the investment with regard to the following firm activities. The following scale was used: (1) no VC participation to (5) all by the VC.

<sup>b</sup>Two statements failed to survive the R-mode PCA: communicating with/motivating employees and financial advice.

0.79 and 0.82, respectively. These standardized and orthogonal new composite VC contribution scales were utilized as independent variables in the presented regression models.

*Interaction Variables.* To assess the impact of stage as a moderating effect on the nature of the VC's contribution to the investee firm (VCF and VCNF), we created a range of interaction terms. The interaction terms were calculated by multiplying the VCF and VCNF contributions by the different stage dummies (early, expansion and MBO/I). This resulted in the creation of six interaction terms VCF  $\times$  EARLY, VCF  $\times$  EXPAN, VCF  $\times$  MBO, VCNF  $\times$  EARLY, VCNF  $\times$  EXPAN and VCNF  $\times$  MBO.

*Control Variables*

A number of control variables were introduced: the industry the firm operates in, size, geography, the time period involved between the VC investment and

the end period of the study, and internationalization experience. We expand them below.

The main industrial activity of a firm has been found to influence the propensity to export (Miesenböck, 1988). Studies have generally noted that services firms are markedly less likely than manufacturing firms to be exporters (Westhead et al., 2001). A distinction was made between firms principally engaged in services activities and those not principally engaged in services activities (0 = non-services and 1 = services) (SERVICE).

The focus of the firm in terms of its technology, either being high technology focused or non-high technology focused is considered to impact on a venture's export behavior. Due to the research intensive nature of high technology firms, and the fact that they have very long lead times to get products to market, we expect that high technology firms will be less likely to export than non-high tech firms. A distinction was made between firms principally high tech activities and those not principally engaged in services activities (0 = non-high tech and 1 = high tech) (TECH).

The RBV suggests that firms with larger resource endowments may be able to address the constraints to business development and obstacles to exporting. Empirical evidence on the effect of size on exporting is rather mixed (e.g. Bloodgood, Sapienza, & Almeida, 1996). Data relating to the total employment size of the business in final year of the survey (or the year of exit if before the end of the survey period) were collected and included as a control variable, after being (naturally) log-transformed (EMPSIZE).

The time period covered by the sample of firms was not the same across all firms; therefore, it was necessary to control for the time window covered by each firm. In order to do this we constructed the variable (TIME) as the number of months covered between the firm first receiving an equity investment and the end of the period or the time of exit if before.

In order to examine the impact of the VC's contribution on the export behavior of the investee firm we needed to control the level of export intensity prior to the VC investment. To do so we constructed the variable EXPINTENSITY (1) that measured the export intensity in the year prior to the VC investment. This approach has been employed by Filatotchev et al. (2001).

As there may also be important geographical effects present, we developed a classification of the different countries into regions and constructed dummy variables accordingly. The regions we employed were U.K. (U.K. and Ireland), NORTH (France, Germany, Austria, Belgium, Switzerland, Lichenstien, and the Netherlands), MEDIT (Italy, Spain, Portugal, and Greece), NORDIC (Sweden, Denmark, Finland, Norway), EAST (Poland,

Romania, Hungary, Bulgaria, and Slovenia). We created a dummy variable for each region (0 = not in the region and 1 = in the region).

## STATISTICAL METHOD AND MODEL SPECIFICATION

### *Statistical Method*

In order to model the effects of stage and VC contribution on investees' export intensity we must first address the selection problem. This problem arises because export intensity for non-exporting firms is zero. It is well known that simply omitting such observations from the analysis can lead to biased estimates. One approach would be to estimate both decisions (i.e. the decision as to whether to export and then the intensity of exporting) together using a Tobit model. This approach, however, involves the restrictive assumption that variables that explain the propensity decision are exactly the same as those that affect export intensity. In our view, there is little a priori evidence that this should be the case. Hence, we employ the Heckman two-stage selection model (see, e.g., Greene, 2000, pp. 926–937). In the first stage, the selection decision is estimated using a probit model, as outlined above. In the second stage, the intensity decision is estimated with the coefficients adjusted according to the results of the first stage.

The underlying model of export intensity is

$$\text{EXPINTENSITY}_i = \gamma' w_i + u_i$$

where  $\mathbf{w}$  is another vector of firm and market/industry variables and  $u_i \sim N(0, \sigma)$ . In the sample,  $\text{EXPINTENSITY}_i$  is only observed if the firm actually exports. In other words,

$$p(\text{EXPINTENSITY}_i > 0) = (\varphi' z_i + v_i) > 0$$

where  $\mathbf{z}$  is a vector of variables that affect whether the firms exports or not and  $v_i \sim N(0, 1)$ . The Heckman model is appropriate (and will produce consistent and efficient estimates) if the correlation between  $u_i$  and  $v_i$  (defined as  $\rho$ ) is different to zero.

Estimation of the Heckman model is undertaken in two stages. In the first stage, probit estimates of the following selection equation are obtained

$$p(\text{EXPINTENSITY}_i > 0 | z_i) = \Phi(\varphi' z_i)$$

From these, estimates of the “hazard” of non-selection (the inverse Mills ratio) are obtained for each observation,  $m_i$ , where

$$m_i = \frac{\phi(\varphi'z_i)}{\Phi(\varphi'z_i)}$$

and  $\phi$  is the normal density. In the second stage, consistent estimates of the coefficient vector,  $\gamma$ , are obtained by regressing  $\text{EXPINTENSITY}_i$  on both  $w_i$  and  $m_i$ .

In total, we run two different models. The first model does not contain any interaction terms, which allows us to focus on Hypotheses 1 and 2. The second model is the full model, including interaction terms. This model enables us to address Hypotheses 3a and 3b. In the second model we omitted the VCF and VCNF terms and included the interaction terms only in order to avoid any problems associated with multicollinearity. We expand on the specification of these models below. In each case, we run a Wald test that the two equations are independent, in other words of the null hypothesis that  $\rho = 0$ .

### *Model Specification*

As outlined above, in order to perform the Heckman two-stage selection model we specify both a selection equation and a full equation for each of our models. In order for the model to be identified, we need to identify at least one factor that affects the propensity to export and not the export intensity. Such an obvious factor is whether or not the firm has previous experience of exporting. Thus, in our selection equation we include a binary variable (EXPERIENCE) taking a value of one for firms that exported at all prior to the VC investment, with the expectation that the coefficient on this variable will attract a positive coefficient. Further, it is likely that regional factors may affect the propensity to export. For example, firms located in former Eastern European countries may have a particularly low propensity to export compared to other countries. For firms that do export, however, there seems little reason to expect a regional difference in export intensity. For this reason, we include the four regional dummies only in the selection equation.<sup>1</sup> Our expectation is that the coefficient on EAST will be negative, but we have no prior expectations about the signs of the other coefficients. We also include in the selection equation, the following variables (anticipated direction of relationship in parentheses): VCF (–), VCNF (+), SERVICE (–), TECH (–), EMPSIZE (+), TIME (+).<sup>2</sup>

The second stage involved the specification of the full Heckman models. Model 1 excludes all interaction terms and Model 2 excludes VCF and VCNF but includes the interaction terms.

The full Model 1 (anticipated direction of relationship in parentheses) was specified as export intensity being a function of: EARLY (+), EXPAN (+), VCF (-), VCNF (+).

The full Model 2 differs from Model 1 in that the terms for VCF and VCNF were interacted with the different investment stages. As a result, the model specification differs as we removed the VCF and VCNF terms and replaced them with a series of interaction terms. The full model (anticipated direction of relationship in parentheses), excluding control variables, was specified as export intensity being a function of: EARLY (+), EXPAN (+), VCF  $\times$  EARLY (-), VCF  $\times$  EXPAN (-), VCF  $\times$  MBOI (+), VCNF  $\times$  EARLY (+), VCNF  $\times$  EXPAN (+), VCNF  $\times$  MBOI (+).

## RESULTS

Table 4 presents the correlation matrix for the variables employed in the analysis.

The results of the two models are presented below. Note that the coefficients in the full model need careful interpretation. Each coefficient represents the overall estimated marginal impact of the variable on export intensity. We also present in the tables of results, the conditional effects. These are the marginal impact of each variable on export intensity *conditional on the firm being an exporter*. For variables that are only in the full equation, the conditional effect will be equal to the coefficient. However, if the variable enters into both selection and full equations, the two effects will be different. As, in our case, the two effects are very similar, we restrict our discussion below to the unconditional marginal effect (i.e. the coefficients).

### *Model 1*

The results of Model 1 are presented in Table 5. The Wald test of independent equations is strongly significant and confirms the value of the Heckman procedure.

The results of the selection model indicate that a firm's propensity to export is: positively related to a firm's export experience ( $p < 0.001$ ), negatively related to a firm's involvement in service sectors ( $p < 0.10$ ), positively



*Table 4.* Correlation Matrix.

	Mean	S.D.	EARLY	EXPAN	VCF	VCNF	SERVICE	TECH	EMPSIZE	TIME	EXPERIENCE	NORDIC	MEDIT	EAST	NORTH
EARLY	0.312	0.464	1.000												
EXPANSION	0.176	0.382	-0.312	1.000											
VCF	-0.005	0.992	0.236	0.083	1.000										
VCNF	-0.033	0.983	0.160	0.123	0.087	1.000									
SERVICE	0.387	0.488	-0.014	0.059	-0.027	-0.078	1.000								
TECH	0.339	0.474	0.414	0.195	0.164	0.104	0.000	1.000							
EMPSIZE	326.3	940.6	-0.177	-0.103	0.020	0.009	0.096	-0.062	1.000						
TIME	43.66	22.24	-0.461	-0.231	-0.223	-0.158	0.039	-0.392	0.142	1.000					
EXPERIENCE	23.20	32.65	-0.121	0.049	-0.054	0.082	-0.077	-0.017	0.000	0.011	1.000				
NORDIC	0.109	0.311	0.063	0.106	-0.006	0.292	0.036	0.011	0.057	-0.132	0.095	1.000			
MEDIT	0.063	0.244	0.045	0.050	0.037	-0.035	0.060	-0.049	-0.041	-0.041	0.032	-0.091	1.000		
EAST	0.025	0.156	0.049	0.155	0.125	0.110	0.052	-0.053	-0.021	0.014	0.003	-0.056	-0.042	1.000	
NORTH	0.344	0.476	0.232	0.052	0.244	-0.002	-0.076	0.246	0.040	-0.200	0.000	-0.253	-0.188	-0.116	1.000

**Table 5.** Heckman Selection Estimates of Export Intensity.

	Model 1			Model 2		
	Selection	Regression	Conditional Effect	Selection	Regression	Conditional Effect
Stage						
EARLY		16.99*** (4.79)	16.99*** (4.79)		16.47** (5.22)	16.47** (5.22)
EXPANSION		7.969* (3.630)	7.969* (3.630)		7.523* (3.391)	7.523* (3.391)
VC contribution						
VCF	0.078 (0.086)	-0.218 (1.354)	-0.537 (1.350)	0.068 (0.091)		
VCNF	0.091 (0.101)	4.498*** (1.267)	4.126*** (1.234)	0.102 (0.100)		
Interaction terms						
VCF × EARLY					-3.387 (3.864)	-3.387 (3.864)
VCF × EXPAN					-3.161 (3.798)	-3.161 (3.798)
VCF × MBOI					2.548* (1.203)	2.548* (1.203)
VCNF × EARLY					10.19** (3.384)	10.19** (3.384)
VCNF × EXPAN					5.682# (3.409)	5.682# (3.409)
VCNF × MBOI					1.226 (1.091)	1.226 (1.091)
Controls						
SERVICE	-0.317# (0.171)	-2.321 (2.531)	-2.321 (2.531)	-0.316# (0.170)	-3.048 (2.581)	-1.615 (2.495)
TECH	-0.200 (0.190)	2.366 (3.595)	2.366 (3.595)	-0.205 (0.189)	2.751 (3.633)	3.81 (3.469)

Table 5. (Continued)

	Model 1			Model 2		
	Selection	Regression	Conditional Effect	Selection	Regression	Conditional Effect
EMPSIZE	-1.11e-4# (6.27e-5)	-0.001 (8.60e-4)	-0.001 (8.60e-4)	-1.15e-4 (6.28e-5)	-0.001 (8.04e-4)	-6.79e-4 (8.30e-4)
TIME	0.019*** (0.004)	0.127* (0.061)	0.127* (0.061)	0.019*** (0.004)	0.140* (0.060)	0.055 (0.062)
EXPINTENSITY (-1)		0.797*** (0.031)	0.797*** (0.031)		0.813*** (0.033)	0.813*** (0.033)
EXPERIENCE	2.19*** (0.191)			2.186*** (0.194)		
NORDIC	0.909** (0.349)			0.966** (0.356)		
MEDIT	-0.149 (0.271)			-0.162 (0.2269)		
EAST	-0.782* (0.367)			-0.773* (0.367)		
NORTH	0.098 (0.194)			0.081 (0.192)		
Constant	-1.022*** (0.264)	3.601 (3.983)		-1.015*** (0.263)	2.609 (3.942)	
N		442			442	
Chi square $\chi^2$		1107.88***			1107.82***	
Log likelihood		-1530.72			-1523.15	
Wald test of independence		21.49***			20.74***	

Notes: (i) Robust standard errors in parentheses.

(ii) # $p < 0.1$ .

\* $p < 0.05$ .

\*\* $p < 0.01$ .

\*\*\* $p < 0.001$ .

(iii) Conditional effects are the marginal change in export intensity conditional on the firm being an exporter.

associated with time ( $p < 0.001$ ), negatively related to being located in Eastern Europe ( $p < 0.10$ ) and positively related to being located in a Nordic country ( $p < 0.01$ ).

Our results lead us to reject H1a, that (on average) there is a negative relationship between a VCF contribution and export intensity. However, the results of the regression equation provide evidence to support hypothesis H1b, that is there is a positive relationship between a VCNF contribution and the change in export intensity ( $p < 0.001$ ). In particular, if the NF contribution increases in absolute terms by 0.1, we estimate that export intensity will be increased by 0.4498 (standard error, 0.1267) of a percentage point.<sup>3</sup> Also the results provide evidence to support Hypotheses H2a, that the VC involvement will have a greater effect for early stage investee companies than for MBO/Is ( $p < 0.001$ ), and H2b, that the VC involvement will have a greater effect for expansion stage investee companies than for MBO/Is ( $p < 0.05$ ). Comparing the coefficients on the EARLY and EXPAN terms, the results indicate that the greatest effect here will be at the early stage.

### *Model 2*

The results of Model 2 are presented in Table 5. As with Model 1, the Wald test, that the selection and regression equations are independent is strongly significant, confirming our decision to use the Heckman two-step procedure.

The results of the second selection model mirror those above, however, some of the significance levels increased. The results indicate that a firm's propensity to export is: positively related to a firm's export experience ( $p < 0.001$ ), negatively related to firms' involvement in service sectors ( $p < 0.10$ ), positively associated with time ( $p < 0.001$ ), negatively related to being located in Eastern Europe ( $p < 0.05$ ) and positively related to being located in a Nordic country ( $p < 0.01$ ).

The results of the second regression equation provide evidence to support Hypothesis H3a, that the positive relationship between a VCNF contribution and the change in a firm's export intensity is moderated by the financing stage of the investee firm. In particular, the results indicate that the VCNF has a significant effect only in the first two stages. Further, the magnitude of the effect is largest in the early stage and smallest in the MBO/I stage. To illustrate this, if the NF contribution increases in absolute terms by 0.1, we estimate that export intensity will be increased by about 1.019 (standard error, 0.3384) of a percentage point if the firm is in the early stage, by 0.5682 (standard error, 0.3409) if the firm is in the expansion

stage, and by just 0.1226 (standard error, 0.1091) if the firm is in the MBO/I stage.<sup>4</sup>

The results of the second regression equation also show a negative but insignificant relationship between VCF and the moderating effect of early and expansion stage financing on the change in a firm's export intensity. In contrast, there is a significant positive interaction in respect of MBO/I stage investments. This provides support for Hypothesis H3b that there is a positive relationship between VCF and export intensity but that the relationship only holds at the MBO/I stage.

## DISCUSSION AND CONCLUSIONS

This paper has provided the results of the first systematic study of the relationship between internationalization activity and VC involvement in firms. Specifically, using a unique Pan-European dataset, we have examined the relationship between export intensity, investment stage of the investee company, and the nature of the VC's contribution. A novel feature of our analysis is to consider the impact of VC involvement on firms at different investment stages in the context of a resource-based governance and path dependency perspective.

While in general a VCNF involvement is positively related to export intensity, we find evidence to support a path dependence perspective with respect to export intensity. That is, involvement of the VC firm has a greater impact on export intensity, the earlier the stage of the venture. In addition, VC firms' NF involvement has a significant influence only at the earlier investment stages when there is expected to be a relative absence within the firm of resources and capabilities to enable high export intensity. We have also shown that changes in ownership and corporate governance may cut across path dependencies.

Our findings have implications for both researchers and practitioners. For researchers, our analysis provides interesting insights into an area of VC activity that has hitherto been neglected. This omission is an important one given the increasing internationalization of markets. This study has focused on a cross-sectional analysis of different investment stages. Further longitudinal research might usefully trace the changes in VC involvement in promoting export intensity over time in particular ventures. This chapter has also focused on the behavior of investee companies. As internationalization

by VCs increases, an interesting area for further research concerns the nature of the skills they are able to bring to foreign markets that can enable them to differentiate themselves from the domestic competition. An important aspect of this may be to offer assistance to foreign investees along with internationalization. While there is some evidence concerning the adaptation by VCs when they enter foreign markets in terms of their information, valuation, and monitoring behavior (Pruthi et al., 2003), there is an absence of evidence regarding the relative success of foreign VCs in aiding firms to internationalize. For practitioners, our analysis emphasizes the importance for early stage investors of having the ability to provide valuable NF involvement that can help investees to intensify their internationalization activities. VCs themselves are increasingly engaging in internationalization activity. The ability of VCs to provide domestic investees with the ability to increase their internationalization intensity may also contribute to enhancing the internationalization of VCs.

## NOTES

1. There is statistical support for this hypothesis in that, when we included the regional dummies in the main regression equation they are jointly insignificant. Reassuringly, our key results are robust to the exclusion of different subsets of control variables from the selection and main regression equations.

2. VCF and VCNF are included as these variables may play a role in removing or imposing constraints that affect the decision over whether or not to export. We exclude EARLY and EXPAN from the selection model on the grounds that the decision over whether or not to export (as opposed to how much to export) is affected primarily by the nature of the firm and industry than by the stage of the firm. Again there is empirical support for this proposition in that these variables attract insignificant coefficients when included in the selection equation without materially changing the other results.

3. The marginal effects are reported here using 0.1 as the degree of change as this is a more realistic figure than a full unit. If a 1 unit change was to occur, e.g. if the VCNF contribution was to increase in absolute terms by 1 unit then the marginal effect and standard error would need to be multiplied by 10 as reported here. In this instance a 1 unit change in the VCNF would result in an increase in export intensity of 5.804 (standard error, 1.357) of a percentage point.

4. As highlighted in footnote 3, the marginal effects are reported here using 0.1 as the degree of change as this is a more realistic figure than a full unit. Hence, in order to calculate the marginal effect of a full unit change in the VCNF the marginal effects and standard errors reported here would need to be multiplied by 10.

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# CAPABILITY DEVELOPMENT, LEARNING AND GROWTH IN INTERNATIONAL ENTREPRENEURIAL FIRMS: EVIDENCE FROM CHINA <sup>☆</sup>

Congcong Zheng and Susanna Khavul

## INTRODUCTION

In recent years, there has been an upsurge in firms entering the international market at increasingly early age. The Organization for Economic Cooperation and Development (OECD) estimates that more than a quarter of the world's small manufacturing firms enter international markets within 10 years of their founding and derive a substantial percentage of their revenue from foreign sources (OECD, 1997). In addition, between 1 and 2% of small manufacturing firms are estimated to be international at inception – that is, within 2 years of their founding (OECD, 1997). Being new and proactively international at the same time, international entrepreneurial firms seem to contradict prevailing theories that see internationalization as a gradual process (McDougall, Shane, & Oviatt, 1994).

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One aspect of international entrepreneurial firms that continues to spark interest in academic research is that they manage many demands at the same time. Being new and actively international, they have to face “liability of newness” (Stinchcombe, 1965) in the home country and “liability of foreignness” (Zaheer, 1995; Zaheer & Mosakowski, 1997) in the international market (Lu & Beamish, 2001); they have to develop routines in the home country and at the same time acculturate themselves to new business environments in the host country (Autio, Sapienza, & Almeida, 2000; Barkema, Bell, & Pennings, 1996); they have to balance the domestic and international learning simultaneously (Sapienza, De Clercq, & Sandberg, 2005).

Prior research has highlighted the different strategies of international entrepreneurial firms and domestic entrepreneurial firms (McDougall, 1989); examined how international firms trade off the risks they face in the international market to achieve growth (Shrader, Oviatt, & McDougall, 2000); and how knowledge about international markets and operations affects growth for entrepreneurial firms (Autio et al., 2000). Recently, Sapienza et al. (2005) have investigated the determinants of international and domestic learning effort. They explored the factors that lead to learning effort both domestically and internationally and found that early entry into foreign markets helps the firm to develop an international “identity”, fosters a learning culture and leads to greater learning effort in both domestic and international market. Most interesting to us, however, is the finding that the degree of internationalization is negatively related to domestic learning effort. Sapienza and colleagues observe that this is because entrepreneurial firms might have difficulty in attending to expanding overseas and learning domestically simultaneously. Thus, there exists a trade-off in a firm’s devotion of effort to foreign and domestic learning activities.

Although such trade-off seems to be common in international entrepreneurial firms (Chen & Martin, 2001; Lu & Beamish, 2001, 2004), researchers have not focused much attention on investigating what firms do when they face different or sometimes, conflicting learning demands from domestic and international markets and how they manage the trade-off between the two. Instead, researchers appear to assume that managerial attention is limited in international entrepreneurial firms and investigated their behavior under this assumption. For example, Burgel and Murray (2000) investigated the entry mode choice for resource-constrained U.K. entrepreneurial firms and found that entry choice is necessarily a trade-off between resource availability and technological requirement of the firm’s overseas customers. Yli-*Renko*, Sapienza, and Mani (2004) also recognizes the resource constraints of entrepreneurial firms and investigates social capital’s role in improving

the likelihood of survival in international entrepreneurial firms. Thus, with the exception of Sapienza et al. (2005), researchers have not directly examined the trade-off of managerial attention to learning in the domestic market and learning in the international market.

To address this gap in the literature, we propose that international entrepreneurial firms that improve core capabilities and quickly gain broad knowledge of the international market will achieve better growth in the international market. More importantly, those international entrepreneurial firms that use knowledge gathered in the international market to help core capability development internally would achieve higher level of growth than those that emphasize international expansion over core capability development.

We develop three lines of arguments. First, we focus on technological innovation as the major dimension of core capability. We suggest that firms with higher technological innovation levels could more easily diffuse their advantage in the international market. Second, geographical market diversity and use of intermediaries during internationalization can facilitate entrepreneurial expansion in international markets. Market diversity can facilitate organizational learning in the entrepreneurial firms by exposing firms to diverse knowledge bases and different opportunities (Hedberg, 1981; March, 1991). The use of intermediaries can give entrepreneurial firms instant access to market knowledge in international markets, and facilitate market entry (Root, 1994). However, market diversity and use of intermediaries could potentially have negative implications for technological innovation in the firm, so that it is difficult for a firm to achieve innovation improvement and international market learning at the same time. Under those situations, those firms that use international exposure to help improve innovation capabilities can achieve higher rates of international growth. Conversely, firms that emphasize international expansion to the detriment of developing innovation capability suffer in their growth.

We test our hypotheses in a sample of 145 Chinese technology-based firms. We tested the main effect of capability development and international expansion on growth and the interaction effect of capability development and international expansion. Our hypotheses received strong support.

## **THEORY AND HYPOTHESES**

### *Internationalization and Learning Demands*

International entrepreneurial firms create value and derive competitive advantage from their international markets rather than replicating their

domestic advantage internationally (McDougall et al., 1994). The conventional view in the international business was that firms create knowledge in the home country in the form of superior technology, products and processes, which they can then diffuse in international markets (Buckley & Casson, 1976; Hymer, 1960). The comparison between entrepreneurial firms and established firms shows that entrepreneurial firms are without established market power and therefore must develop their core capability alongside internationalization (McDougall et al., 1994). Thus, internationalization is not a process of simply exploiting the firm's domestic advantage, but a process of simultaneously developing new routines, practices and capabilities. In the internationalization process, the learning demands that the firm has to face come primarily from two fronts: core capability development inside the firm and knowledge development in international markets. These two learning demands parallel the essential elements of sustainable advantage in international entrepreneurial firms (Oviatt & McDougall, 1994). In a theoretical framework that describes the necessary and sufficient elements for international new ventures, Oviatt and McDougall (1994) posit that for any international entrepreneurial firms to achieve sustainable growth, they must be able to achieve a unique, inimitable capability position internally while deriving a competitive advantage from being in a foreign location. An international firm without strong core capability cannot achieve growth in foreign markets. Firms that enter foreign markets face "liability of foreignness", which adds to their cost of operation in the focal market. "Liability of foreignness" arises from the firm's unfamiliarity with the local environment and its lack of legitimacy in the host market (Zaheer, 1995). Foreign companies can overcome the liability of foreignness by leveraging their core capability in the foreign market. One such dynamic capability is "technological innovation capability" (Henderson & Cockburn, 1994; Teece, Pisano, & Shuen, 1997). Technological innovation is "a reflection of a firm's commitment to developing and marketing products that are new to the firm and/or to the market" (Li & Atuahene-Gima, 2001). Different types of technological innovation allow firms to specialize their offering to customers based on either innovative products, price or services. The innovative position can influence the international entrepreneurial firms' various operations, from product shipment speed (Schoonhoven, Eisenhardt, & Lyman, 1990), to sourcing of R&D (Zahra, 1996) and to firm overall growth (Eisenhardt & Schoonhoven, 1990). Thus, an innovation capability can positively influence the firm's international growth. Innovation capability also allows firm to specialize its product offering, commercialize the new product development efforts in an international

market, and differentiate themselves from the incumbents in the local markets (Lee, Lee, & Pennings, 2001). In an environment characterized by rapid technological development, shorter product life cycle and more integrated market, products that enjoy a technological advantage in one country usually have a lead in another country as well (Vernon, 1979). Firms with a strong technological innovation capability can enter international markets faster and reap the product advantage in the broader international market (Leiblein & Reuer, 2004). Hence,

**Hypothesis 1.** Technological innovation positively influences a firm's international growth.

To grow in the international market, a firm must learn from the international market. Here, geographical diversity and mode of entry influence a firm's international growth. Geographical market diversity refers to the scope of a firm's international operation (Tallman & Li, 1996; Zahra, Ireland, & Hitt, 2000). Market diversity can give firms the opportunity to realize economy of scope and scale (Caves, 1982). By selling products to multiple countries, a firm can guarantee the size and stability of its outlet market (Hirsch & Baruch, 1971). With a larger market size, firms can benefit from stronger bargaining position against suppliers and customers and might be able to reduce costs and increase revenue (Kogut, 1985). These advantages help the firm achieve growth in its international markets. However, the greatest benefit that an entrepreneurial firm can get is from organizational learning. First, operating in different host countries exposes international entrepreneurial firms to ideas and innovation systems that can enhance a firm's knowledge base and its capabilities (Barkema & Vermeulen, 1998; Delios & Henisz, 2000; Zahra et al., 2000). The new environment will not only inform the firms about the requirements, demands of their customers but also will provide firms with the opportunity to test product ideas in foreign markets. Such learning can trigger new solutions and improve a firm's technological capabilities (Argyres, 1996). Second, a broader vision enables firms to spot either technological or market growth opportunities faster. Firms can process new information and learn best when they have previously engaged in learning similar knowledge (Cohen & Levinthal, 1990). Firms with broader previous experience will be more likely to recognize value of new information and formulate action to take advantage of that information. Firms operating in environments of familiar opportunities, threats and routines may perform well in the short run. In the long run, however, they are likely to become constrained by the familiar environment and ignore new opportunities and threats introduced by

changes in their competitive environment (Miller & Chen, 1994, 1996). As a result, their long-term performance will suffer. Similarly for international entrepreneurial firms engaged in international markets, those who have diverse experience will recognize opportunities that might be overlooked by their rivals with less experience and narrower vision. Thus, we propose:

**Hypothesis 2.** Geographical market diversity will lead to higher growth for international entrepreneurial firms.

The entry mode that an entrepreneurial firm uses in the international market also has implications for international growth. A firm's entry mode into a foreign market is usually described as a continuum from less capital-intensive mode to more capital-intensive from exporting, use of intermediaries, licensing, alliances and acquisitions to new starts (Andersen, 1993). Because of the resource-constrained nature of entrepreneurial firms, they normally use less capital-intensive entry modes such as direct export and intermediaries such as agents or distributors (Burgel & Murray, 2000; Zacharakis, 1997). Traditionally, international business researchers saw these two modes of entry as being different with respect to control and cost (Root, 1994). Direct export is theorized to give firm the advantage of full marketing control so that the firm can develop a channel that meets its specification, provide tailor-made customer support and capture the learning effect in the international market to the greatest extent (Root, 1994). Direct export might involve a higher cost. The fixed cost of administrative and marketing overheads and managerial attention involved in direct export are likely to be more substantial than the variable costs paid to agents or distributors (Root, 1994). Although there is always a trade-off between control and cost, in the entrepreneurial context, the resource-constrained nature of the firm makes the use of an intermediary a better choice for the firm. An entrepreneurial firm using distributors to enter a foreign market can gain access to knowledge of the target market with a relatively low up-front cost, thus achieving a higher performance.

**Hypothesis 3.** Use of intermediaries in the international market will lead to higher growth of entrepreneurial firms.

However, market diversity and use of intermediaries can have negative implications for the technological innovation of the firm. It might be difficult for firms to improve technological innovation and achieve international expansion through diversity and intermediary at the same time. Below we argue that technological innovation moderates the relationship between market diversity, the use of intermediaries and growth.

*Geographic Market Diversity and Technological Innovation*

A geographically diversified market offers greater market potential (Cooper & Kleinschmidt, 1985), sales stability (Hirsch & Baruch, 1971) and more learning opportunities (Barkema et al., 1996). However, not every firm can take advantage of those opportunities. We argue that because of the constrained nature of managerial attention in entrepreneurial firms (Cooper & Dunkelberg, 1986; Stevenson & Gumpert, 1985), too much market diversity might result in overspreading of managerial attention, insufficient attention to the core capability development in the firm and thus lower performance. A diversified market will be detrimental for capability development in an entrepreneurial firm with high innovation. Products in those firms are usually immature and require more customer education and support, which will thwart standardization (Cavusgil, Zou, & Naidu, 1993). To internationalize their operations, firms usually have to adapt products to the local markets. A more diversified orientation in this case will lead to increases in coordination cost and managerial information-processing needs, spread of managerial resources, less effective marketing and technical support to each target customer. This often results in low export performance (Aulakh, Kotabe, & Teegen, 2000; Hitt, Hoskisson, & Kim, 1997; Madsen, 1989).

In the case of firms with lower levels of technological innovation, the learning involved in product development is less. The product adaptation requirement across different international markets would be less problematic (Hill & Still, 1984; Levitt, 1988). The standardized nature of their products will position those firms to exploit the economies of scale that come with a diversified orientation without exponential drain of managerial attention (Samiee & Roth, 1992; Yip, 1992). The geographical diversification will lead to replication of competitive advantage in a larger market.

**Hypothesis 4.** As firm's technological innovation level increases, the positive effect of geographic diversity on growth decreases.

*Choice of Entry Mode and Technological Innovation*

Choice of entry mode is of paramount importance for the resource-constrained entrepreneurial firms embarking on international sales as it concerns bargaining with distributors (Zacharakis, 1997), risk (Shrader et al., 2000) and managerial commitment (Lindqvist, 1991). Research has shown that almost all sales transactions in young entrepreneurial firms are carried out by either direct exporting or via distributors (Burgel & Murray,



2000; McKinsey & Company, 1993). Use of intermediaries (agent/distributor) has been argued to lead to higher international performance in the entrepreneurial context (Rabino, 1980; Zacharakis, 1997). Intermediaries provide a linkage between domestic manufacturers/producers and foreign buyers and allow for immediate sales network access with an affordable cost (Peng & Ilinitch, 1998).

We argue that although instant access to a sales network may be beneficial for entrepreneurial firms, such access can be less effective or even detrimental to the learning needs of highly innovative firms in the long term. Two serious drawbacks for innovative firms can be foreseen. First, intermediaries are less likely to develop specialized knowledge to serve the exporter's customers. To be effective, the intermediary firm has to develop knowledge and skills that might be specific to the transaction between the producer firm and its buyer. For example, those transactions require intermediaries to make investments in unique assets for serving the end customers, such as specialized sales force training and post-sales service requirements (Williamson, 1985). The more innovative a firm's product, the more differentiated its product will be from its competitors and the more likely that it will require specialized asset investment from the intermediary side. When the producer firms cannot offer incentives for the intermediaries to develop those specific skills, the intermediary service will decrease in value (Anderson & Coughlan, 1987; Peng & Ilinitch, 1998). A second but more important reason for the limited value for intermediaries is that it hinders the information exchange and feedback between the final buyer and the manufacturer firm, which will impede the technological development in the manufacturer firms. One major characteristic of highly innovative technology is that there is high likelihood that the product design is subject to changes before a dominant design emerges (Tushman & Anderson, 1986). To keep up with the latest technological trends, a highly innovative firm must stay close to its major competitors, sources of technology and consumers to maximize information flow and likelihood of innovation success (Maidique & Patch, 1982). Ideas from customers are crucial in new product development (von Hippel, 1986). If the high innovation firm chooses to use an intermediary, the crucial linkage between the firm and its customers maybe disconnected. Information from the customers may not be relayed to the target producer firm efficiently. Consequently, the technological capability of the firm might be impaired and thus can have a negative impact on performance.

Products from a less innovative firm, however, are more likely to be mature and accepted in general. The pressure for technological innovation improvement is less. The producer firms need less feedback from the

customers. The benefit a less innovative firm gets from distributor will be greater than in the case of higher innovation firms.

**Hypothesis 5.** As firm's technological innovation level increases, the positive effect of intermediary will decrease and might reverse to negative.

In the next section, we discuss the research methodology and construct operationalization.

## METHODOLOGY AND CONSTRUCT OPERATIONALIZATION

We selected the Chinese technology sector as our research setting to test the hypotheses proposed above. China, with its 1.2 billion people has the second largest economy in terms of gross domestic product (GDP) at purchasing power parity (PPP) (World Bank, 2000). After the Chinese government began economic reform in 1978, its economy has enjoyed enormous growth. Its average GDP during 1999–2003 is 8.0% per year (Economist Intelligence Unit Country Data). With the increasing market orientation of its economic system, it is considered one of the most successful transitional economies and is sometimes characterized as “network capitalism” (Boisot & Child, 1996). Its private sector has flourished in recent years (Peng, 2000). Many of these private businesses are in technology-oriented businesses such as computer hardware and software and other technical services (Zhao & Aram, 1995).

China is a rising force in global market, not only in traditional product markets, such as low cost goods or labor-intensive manufacturing, but also in “non-traditional” high technology industries (The Economist, 2001). Its competitive force has grown to a stage where entrepreneurs in developed countries cannot ignore their Chinese counterparts who, despite being latecomers in the global high technology market, are gaining international presence in several sectors such as semiconductors, software services and computer component and assemblies (McKinsey & Company, 2002; CIEC, 2001). Chinese firms are growing fast, achieving larger market share against foreign players in domestic markets and gaining foothold in overseas market. According to Access Asia, a marketing research firm based in Canada, domestic produced software accounts for increasing local market share, from around 20% (estimated) in 1990s to 32.4% in the year 2000. China's Custom House statistics show that the total value of exports in personal

computer industry from domestic firms (domestic vs. foreign producers: 13.67% vs. 86.33%), amount to 8.66 billion USD in 2004. Foreign companies, especially those from newly industrialized countries and developing countries see Chinese firms as potentially serious competitors (McKinsey & Company, 2002; Scope Marketing, 2001).

China is particularly suitable for testing our hypotheses for the following two reasons. First, China provides an ideal place for investigation of comparison between low-innovation and high-innovation firms, especially within technology-based industries. Although the country is not in a leadership status in terms of its technology, it has enjoyed a leapfrog benefit in many areas with introduction of the latest technology from the other countries. The result is the coexistence of both cutting edge and less developed technology. The contrast provides a natural setting for investigating the effect of innovation, as there is large variance in the variable. Second, there are very few empirical studies carried out in China despite its increasing importance in the world economy (Zou & Stan, 1998). Studies on Chinese international firms are even fewer. We hope to fill the gap in the empirical literature.

The data were collected during a 3-month period from September 2003 to December 2003 in two major cities in China: Beijing and Shanghai. We focused on the following industries: information computer & technology (ICT) hardware, software products, biotech, pharmaceutical and advanced chemical industry, machinery and equipment manufacturing and information technology services (IT services). To qualify into our sample, a firm had to satisfy the following two criteria in addition to the industry criteria mentioned above. First, it had to be less than 10 years old in order to qualify as an entrepreneurial firm (cf. Chandler & Hanks, 1994). Second, the firm had to have international sales for the past 2 years (this is to ensure that we are focusing on firms which have internationalized). There was no one single, public, and comprehensive list in China that contains all the firms in the technology-based industries that have international sales, let alone those firms under a certain age.

We had to compile our sampling frame from different sources. In Beijing, we used the following sources: Beijing Foreign Economic Trade Commission, Beijing Software Association and database from China Commodity Net organized by the Ministry of Commerce of China. In Shanghai, we used lists from Shanghai Custom Office besides the list from Ministry of Commerce Shanghai office. Since we could not get accurate information on firm age or international sales otherwise, we did a telephone screening. According to the contact details from our database, we called the managers and entrepreneurs or their assistants regarding the basic information about the

firms (i.e. firm age and whether the firm is engaged in international sales in the last two years). If a firm satisfied those basic screening criteria, then a telephone interviewer sets up a time for a company visit for the face-to-face survey.

Out of 1,798 firms that we contacted in Beijing and Shanghai, a total of 610 firms satisfy our screening criteria and 146 of them agreed to participate in the survey during our data-collection period. 145 of the surveys were usable, giving us an effective response rate of 23.8%. The response rate was higher than mail surveys carried out in China in former studies (Shan, 1990). This was not surprising as our data were collected through face-to-face surveys, encouraging respondents to finish the survey (Dillman, 1978). We followed the total design method from Dillman (1978) during the interview process. Next, we list the measures we used in the paper.

### *Dependent Variable*

#### *International Growth*

Following the literature (Madsen, 1987; Shoham, 1998), we used a firm's international sales growth in the most recent operating year (2002–2003) as our performance measure. The internationalization literature is filled with diverse performance measures (Shoham, 1998; Sullivan, 1994). Different measures such as sales, profitability and growth captures different conceptualization of internationalization performance. We see internationalization as a venue for firm growth (Aaby & Slater, 1989). Our main conceptual model also emphasizes the effect of learning on firm growth, so we chose firm's international growth as the dependent variable. Consistent with our conceptualization that international growth is an integral part of firm development, our dependent variable was highly correlated with firm's overall sales growth. The correlation coefficient is 0.69 and significant at  $p = 0.001$  level.

### *Independent Variables*

#### *Technology Innovation*

Technology innovation is defined as the degree of technical innovation within the core technology of the firm (Eisenhardt & Schoonhoven, 1990; Maidique & Patch, 1982). It is measured in this article using a scale from the literature (Li & Atuahene-Gima, 2001). The scale asked the respondents to

rate the firm's commitment to innovation strategy in comparison to its major competitors on the following four dimensions: product development through allocation of financial resources, rate of new product introduction, the variety of product line and the firm's overall commitment to product development. The Cronbach's  $\alpha$  for that scale is 0.80.

### *Geographical Diversity*

We use the revenue dispersion across nine geographic regions (Zahra et al., 2000) as our diversity measure. This involves two steps: first we divide the world into nine regions, then we ask respondents the following question: how much revenue do you derive from each of nine homogeneous regions around the globe (Hitt et al., 1997; Zahra et al., 2000). Global market is divided into the following eight regions include: Asia (including India), Australia/New Zealand, United States/Canada, Western Europe, Eastern Europe and Russia, South America, Central America and Mexico, Africa/Middle East and the home market (China). The reason for the preference to regions over countries is twofold. First, detailed revenue data per country usually are not available from international companies (Hitt et al., 1997). Second, regional economies become increasingly important in the current converging market (Ohmae, 1985, 1995), companies view competition as more regional than global and devote more attention/commitment to succeed in those markets. After getting data on sales revenue from each regions, we calculate market diversity by the following formula:  $1 - \sum p^2 i$ , where  $p$  is the percentage of revenue from a specific region  $i$  (one of the nine regions in the world) and  $i$  is a dichotomous variable (1/0) to signify the firm's presence (or absence) in a specific region. Calculated this way, a firm that derives 50% of its revenue from United States and 50% from South America has greater market diversity than a firm that derives 90% of its revenue from United States and 10% from South America.

### *Entry Mode*

Entry mode was measured by a categorical variable. We asked whether the firm initial sales into the most important country were through direct exporting or intermediary (domestic or foreign intermediaries) and others (including licensing). The choice between direct exporting and use of intermediary was the focus of our discussion since most of entrepreneurial firms enter international market using those two methods (Burgel, 1999). Entry mode was included in our analysis as a dummy, where 0 signified direct exporting and 1 indicated the use of intermediaries.

### *Control Variables*

Industry characteristics, size and competition have important implications for firm internationalization process, speed and performance (Boter & Holmquist, 1996). Market condition control variables include the number of products that the firm has in domestic and international markets, the degree of competition that the firm experienced in domestic and international markets (as measured by the number of direct competitors) and market size.

Apart from industry conditions, the firm's age at entry in the international market is theorized to relate to development of learning mentality in entrepreneurial firms and affects their growth rate (Autio et al., 2000). Early entry in foreign market was positively related to a culture that fosters learning effort in the international market (Sapienza et al., 2005). The earlier a firm enters international market after its establishment, the more willing the firm will learn from international market. Therefore, we include the age at entry of international market as a control variable. We also include industry dummies as controls. We have one dummy variable for industries knowledge intensive and less knowledge-intensive industries. Following Autio et al. (2000), we define knowledge-intensive industries as those industries "where firms depend on the knowledge inherent in their activities and outputs as a source of competitive advantage" (Autio et al., 2000, p. 913). In knowledge-intensive industries, value created by the firm mainly comes from intellectual property, patents and information in the firm whereas in less knowledge-intensive industries value mostly comes from tangible assets and properties owned by the firm. In our sample, knowledge-intensive industries include ICT hardware, software products, biotech and IT services, while less knowledge-intensive industry mainly comprises machinery and equipment manufacturing firms. 57% of firms in our sample ( $n = 83$ ) were knowledge-intensive firms and 43% ( $n = 62$ ) of the firms are manufacturing firms.

## **ANALYSIS, RESULTS AND DISCUSSION**

We used ordinary least square (OLS) to test our hypotheses. Table 1 shows the mean values, standard deviations and correlations for the study's variables for all the companies. The magnitude of the correlations and the results of the regression diagnostics suggested that multicollinearity between the focal variables is not a serious problem.

**Table 1.** Descriptive Statistics: Means, Standard Deviations and Correlations of Variables.

	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
International growth	1.411	3.784	1													
Firm age	6.152	3.211	-0.085	1												
No. of domestic products	26.326	34.094	-0.079	0.005	1											
No. of international products	21.096	32.553	-0.130***	-0.012	0.813**	1										
Domestic market size	1.667	0.788	0.284**	-0.094	0.075	-0.20	1									
International market size	1.860	0.869	0.223*	-0.158	0.091	0.067	0.799**	1								
No. of domestic competitors	24.585	36.488	-0.106	-0.003	-0.009	0.031	-0.114	-0.018	1							
No. of international competitors	34.633	41.082	-0.024	-0.088	0.018	0.056	-0.201*	-0.003	0.608**	1						
Industry dummy <sup>1</sup>	0.580	0.495	0.056	-0.211*	-0.105	-0.096	0.153	0.247**	-0.098	-0.137	1					
Governance characteristics <sup>2</sup>	0.448	0.499	-0.270**	0.269**	0.202*	0.230**	-0.222*	-0.287**	0.018	0.007	-0.337**	1				
Innovation	3.697	0.914	0.258**	-0.063	-0.062	-0.055	0.103	0.074	0.090	-0.059	0.033	-0.070	1			
Age at entry	1.853	2.385	0.186*	0.353**	-0.188*	-0.187*	0.053	0.019	-0.111	-0.287**	0.021	-0.187*	0.017	1		
Market diversity	0.374	0.260	-0.096†	0.003	0.027	0.112	-0.142	-0.081	0.137	0.124	-0.026	0.035	0.015	-0.026	1	
Entry mode	0.371	0.485	0.083	0.065	-0.062	-0.023	0.148	0.064	-0.045	-0.084	0.082	0.014	-0.080	0.050	-0.170*	1

<sup>1</sup>For the industry dummy variable, 1 refers to knowledge-intensive industries, while 0 refers to less knowledge-intensive industries.

<sup>2</sup>Governance characteristics refer to the private or limited liability company vs. collectively owned or state-owned companies. 0 refers to private company or limited liability companies, while 1 refers to collectively owned or state-owned companies.

†  $p \leq 0.10$ .

\*  $p \leq 0.05$ .

\*\*  $p \leq 0.01$ .

\*\*\*  $p \leq 0.001$ .

Table 2 presents the regression results. To ensure accurate results, we mean-centered the continuous variables (technology innovation and geographical diversity) and the interaction terms when testing the interactions effects (in the interaction model), as Aiken and West (1991) have suggested. We interpret all hypotheses testing results from the fully specified interaction model.

**Table 2.** Results of Regression Analysis.

Variables	Control Model		Base Model		Interaction Model	
(Constant)	1.006	(1.345)	0.099	(1.343)	0.318	(1.312)
Firm age	0.039	(0.112)	-0.093	(0.120)	-0.052	(0.119)
No. of domestic products	-0.007	(0.018)	0.006	(0.017)	0.008	(0.017)
No. of international products	-0.008	(0.019)	-0.009	(0.018)	-0.011	(0.018)
Domestic market size	1.345 <sup>†</sup>	(0.792)	1.305 <sup>†</sup>	(0.777)	1.383 <sup>†</sup>	(0.761)
International market size	-0.258	(0.729)	-0.322	(0.702)	-0.341	(0.684)
No. of domestic competitors	-0.014	(0.012)	-0.022 <sup>†</sup>	(0.012)	-0.017	(0.011)
No. of international competitors	0.009	(0.011)	0.021 <sup>†</sup>	(0.011)	0.015	(0.011)
Industry dummy <sup>1</sup>	-0.473	(0.772)	-0.373	(0.746)	-0.047	(0.734)
Governance characteristics <sup>2</sup>	-1.559*	(0.079)	-1.221	(0.791)	-1.345 <sup>†</sup>	(0.770)
Age at international entry	0.320 <sup>†</sup>	(0.161)	0.320 <sup>†</sup>	(0.165)	0.328*	(0.161)
Innovation			1.058**	(0.372)	1.772***	(0.480)
Diversity			-0.540	(1.324)	0.430	(1.335)
Intermediary			0.582	(0.715)	6.842*	(2.923)
Diversity × innovation					-3.923*	(1.778)
Intermediary × innovation					-1.727*	(0.785)
R <sup>2</sup>	0.141		0.245		0.314	
Adjusted R <sup>2</sup>	0.065		0.145		0.199	
df, n	9, 103		13, 99		16, 96	
F	1.872 <sup>†</sup>		2.465**		2.741***	
Change in R <sup>2</sup>			4.353*		4.126*	

<sup>1</sup>For the industry dummy variable, 1 refers to knowledge-intensive industries, while 0 refers to less knowledge-intensive industries.

<sup>2</sup>Governance characteristics refer to the private or limited liability company vs. collectively owned or state-owned companies. 0 refers to private company or limited liability companies, while 1 refers to collectively owned or state-owned companies.

All two-tailed tests.

<sup>†</sup> $p \leq 0.10$ .

\* $p \leq 0.05$ .

\*\* $p \leq 0.01$ .

\*\*\* $p \leq 0.001$ .



Hypothesis 1 posits that technological innovation will have a positive effect on international growth. Hypothesis 1 is supported at a 0.001 level, as the results show that higher levels of technological innovation are correlated with greater growth in the international market.

Hypothesis 2 focuses on the effect of geographical diversity on international growth. It states that geographical diversity has a positive effect on growth. As we see from the full model in Table 2, the main effect is positive but not significant. Thus, Hypothesis 2 is not supported. We argued before that geographical diversity offers international entrepreneurial firms the opportunity to learn from different, diverse business environments, practices and norms. However, the regression results reported in Table 2 seem to show that the simple fact that engaging in diverse markets does not significantly help firms to grow. Here, knowledge integration might play a role. As Zahra et al. (2000) have argued, “for learning to yield an advantage, it must be captured, interpreted and deployed effectively” (Grant, 1996a, b). Knowledge integration practice such as communicating, sharing, interpreting, synthesizing and incorporating will facilitate firms use the knowledge from international operation (Zahra et al., 2000). Without such effort from the firm’s management team, the learning benefit from market diversity would not reap benefits in terms of growth. Another reason for non-support of Hypothesis 2 might be because that geographical diversification might take up too much of the managerial attention of entrepreneurial firms and impede their technological innovation capability development. This relates to our Hypothesis 4, where technology innovation interacts with geographical market diversity. The sign of the coefficients of market diversity changes from negative in the base model to positive in the interaction model. This is due to the misspecification of the base model – it does not included the interaction terms. The omitted variable, i.e. interaction term of market diversity and innovation introduces a bias in the original coefficient of market diversity (Wooldridge, 2003).

Hypothesis 3 is about the relationship between entry mode and growth. It states that use of intermediaries in overseas market has a positive effect on international growth. The data reported in Table 2 show that this hypothesis is supported at 0.05 level.

Hypothesis 4 concerns the interaction effect of market diversity and technological innovation on growth. It states that the higher an entrepreneurial firm’s technological innovation, the less benefit it will get from market diversity. In particular, when innovation is high, diversity might have a negative effect on international growth. The hypothesis is strongly supported. As we can see from Table 2, the negative coefficient of the

interaction term (market diversity  $\times$  technological innovation) is much higher than the positive coefficient term of the main effect (market diversity). This shows that the interaction effect of our Hypothesis 4 might reverse direction of the main effect of Hypothesis 2. To better understand the form of interaction here, we plotted the interaction effects in the graphs shown in Figs. 1 and 2, using one standard deviation above and below the mean to capture high and low technology innovation. From Fig. 1, we can see that the effect of diversity is distinctively different for high-innovation and low-innovation firms. As hypothesized, for low-innovation firms, the more diverse a firm's market is, the higher its international growth. In contrast, for high-innovation firms, the more diverse a firm's market is, the lower its international growth.

Hypothesis 5 states that technological innovation negatively moderates the effect that the use of intermediaries has on growth, i.e. the more innovation a firm is, the less likely that it is going to benefit from intermediaries. When technological innovation is high, using intermediaries might even lead to less internal capability development and lead to lower international growth. We can see from Table 2 that the hypothesis is strongly supported. The interaction term is significant at 0.05 level. It should be noted that the baseline model is direct exporting and the mode variable refers to use of intermediaries. The interaction term is negative, showing that the higher a firm's

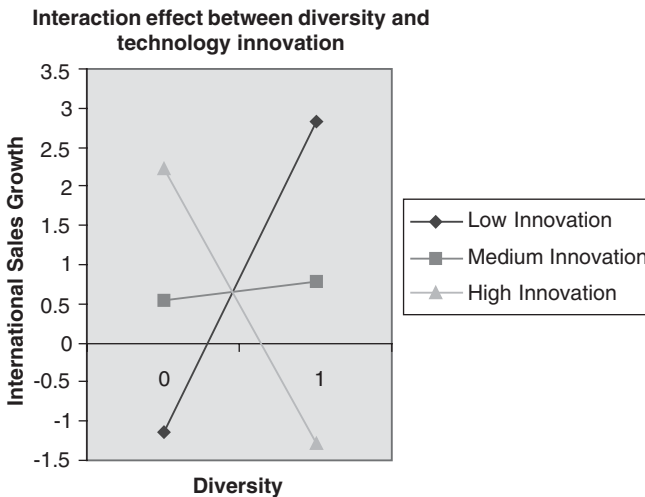
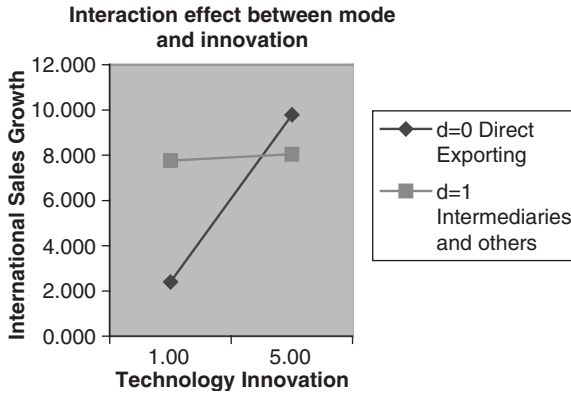


Fig. 1. Interaction Effect between Diversity and Innovation.



*Fig. 2.* Interaction Effect between Mode and Innovation.

technological innovation level, the lower the beneficial effect of intermediary for those firms. We also plot the results in Fig. 2. We can see from here that for firms with low to moderate innovation, those ones that use intermediaries outperform firms that use direct self-exporting firms. However, for firms with high technology innovation, we see the performance effect of the two modes reversed, i.e. those that use direct exporting mode outperform those who use intermediary.

## CONCLUSIONS AND CONTRIBUTIONS

Overall, the findings of this study support the idea that to achieve growth, entrepreneurial firms need to develop core capabilities internally and also learn from international markets. Firms that excel on both tasks will achieve faster international growth. Firms with higher technological innovation capability will be able to achieve higher growth since they can reap their competitive advantage across national borders. Firms that operate in more diverse markets will have greater opportunity to learn from different business practices and customers in international markets, improving their growth prospect. Use of intermediaries in international markets helps the firm gain access to foreign knowledge faster with a low start-up cost, which enhances international growth.

However, sometimes internal core capability development and international market expansion exert competing demands on managerial attention

in resource-constrained entrepreneurial firms. It might be difficult for firms to excel on both fronts (Sapienza et al., 2005). In those situations, firms that use their international expansion to help core capability development gain higher rates of international growth. In other words, firms that overemphasize international expansion to the detriment of technological innovation development will suffer in their international growth. We develop two hypotheses (Hypothesis 4 and 5) to this effect. The first concerns the interplay between market diversity and technological innovation. The higher a firm's technological innovation, the more likely it will need to customize its products/services when expanding internationally, the more attention that international expansion will exert on its managers. This will divert managers' attention from internal technological innovation capability development, possibly leading to lower international growth. The second concerns the interaction between the use of intermediaries and technological innovation. The higher a firm's technological innovation, the more likely the firm will need timely customer inputs into its product/service development processes in order to develop its technological capability. Thus, the use of intermediaries might disconnect the customer/producer linkage, cause delays in customer feedback, and impede the technological innovation. This will be detrimental to international growth as well.

This chapter is one of the first efforts that address the question: What do firms do when facing the competing demands of international expansion and firm capability development? Based on the interaction between expansion and capability development, the results show that firms need to integrate both. In particular, firms that integrate their international expansion process with their technological capability development will achieve faster growth. Data analysis on 145 Chinese international entrepreneurial firms offers strong support for our interaction argument.

The study's focus on one country (China) may raise the question of generalizability of the results to other countries. However, the theoretical foundation of our argument applies to Chinese firms as well as others. In the process of internationalizing, firms from diverse countries need to coordinate their core capability development with their international expansion effort. The international market creates a level playing field for firms. International customers have many choices of products, services and technology. If firms from a particular country do not measure up to the international standard, others may take their place. In that sense, Chinese international firms are similar to those from other countries in that they face similar internal constraints and comparable international environment. Thus, we believe that our results are not only applicable to Chinese

international firms but also could be generalized to international entrepreneurial firms from other countries.

Our study contributes to the growth literature by recognizing, stating and specifying the dual task of growth in international entrepreneurial firms: international expansion and capability development and the interplay between the two. Further, based on the learning perspective of international entrepreneurship, it develops and tests the hypotheses that international expansion would not help firm growth unless it can positively help capability development. This interaction argument emphasizes the integral nature of a firm's international operations, clarifies the relationship between firm internal capability and international activities and highlights that international activities should work for and around firm core capability for it to achieve higher performance. The empirical results based a sample of Chinese international entrepreneurial firms in the high technology industries offer strong support for our argument.

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