



## Informational Networks, Entrepreneurial Action and Performance

JOHN E. BUTLER

msbutler@polyu.edu.hk

*Department of Management—M950, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong SAR*

BRAD BROWN

RBB8F@virginia.edu

*McIntire School of Commerce, University of Virginia, Charlottesville, VA 22903, USA*

WAI CHAMORNMARN

wchamorn@hotmail.com

*Department of Human Resources and Organization Management, Faculty of Commerce and Accountancy, Thammasat University, Bangkok, Thailand*

**Abstract.** This paper develops a model that incorporates personal and business networks, firm action, and performance based on the existing literature. It explores the links between information and entrepreneurial-type action, and action and performance. Survey data was collected from a sample of 100 manufacturing firms in Thailand. Results show that entrepreneurs value the information they receive from their networks. However, there is little statistical support for tangible links between personal or business networks and entrepreneurial action and performance, or between action and performance.

**Keywords:** entrepreneurship, personal networks, organizational networks, information linkages, Thailand

In developing economies, international activity is often a driving force since there are normally limits to firms' ability to sustain their growth in their domestic markets. Governments tend to offer tax and other incentives to encourage exporting by entrepreneurs, and the justification for starting a business in a developing country is often related to identifying an international opportunity. In addition, firms in less industrially developed countries know that if they want to grow they will probably have to do so through international operations. This means that the link between entrepreneurial actions and international operations is much more direct in developing economies.

Governments appreciate the activities of these international entrepreneurs, but the activities themselves are not well understood. Disequilibrium approaches to entrepreneurship, where buyers and sellers have varying perceptions about market prices and supply conditions, have been developed by Kirzner (1973, 1979) based on notions developed by Austria School Economists (e.g., Bohm-Bawerk, 1884; Menger, 1871; Shackle, 1979). These approaches assume that equilibrium is a rare condition in most markets, and for most products and services, and that when it occurs the condition is of short duration. They theorize that different people have different perceptions about the prevailing price and supply of an item. The wider this range of individual perceptions, the more room for entrepreneurial behavior, which occurs when they exploits these differences by buying from those with lower

receptions of the appropriate price and selling to those with higher perceptions of the appropriate price. McGrath and MacMillan (2000) also suggest that successful entrepreneurs thrive in turbulent markets.

International opportunities can be difficult to identify because of informational collection difficulties (e.g., Powell and Bradford, 2000) that are caused by differences in language, culture and a lack of knowledge about local situations in other countries. Borders have been shown to have some negative impacts on information flows even when they can be crossed freely by those sharing the same culture and language (Brown and Butler, 1993). This difficulty with accessing information helps explain why some practitioners recommend visiting the target country or finding a local partner or firm to assist you in conducting commercial operations in another country (Arnold, 2000; Bartlett and Ghoshel, 1992; Margretta, 1998). Networks have been seen as important to entrepreneurial activity since Granovetter (1973) suggested that they, and not autonomous action, were the major driver of entrepreneurial activity. Others have also found that networks can be useful sources of information, although not specifically in an international context (Ostgaard and Birley, 1996; Dodd and Patra, 2002).

When entrepreneurship is viewed as a process, it has both an opportunity identification and an action component. Opportunity identification is a first and necessary step in the entrepreneurial process (Kirzner, 1973; Gaglio, 1997). This aspect of the entrepreneurial process could also include resource gathering, persuasion, planning and even implementation that recognizes the opportunity as ongoing. Including opportunity in entrepreneurial models involves dealing with a high level of complexity. For instance, Russell's (1999) inclusion of opportunity identification was in the context of a model with seventeen variables and numerous feedback loops. Ways of doing business with firms in other countries also require additional information, which would add to his model's complexity. Finally, after entrepreneurs notice an opportunity they need to identify the steps needed to exploit it. This action is what really constitutes entrepreneurial action.

Action is the activity that completes the process, although the time elapse between noticing and action may be very short. In the entrepreneurial context, action could include, for example opening a business (Vesper, 1980), new product development, or market extensions including international expansion (Antoncic and Hisrich, 2001). This type of international expansion could be evolutionary stage expansion (Leonidou and Katsikeas, 1996) or reflect the action of "born global" firms (Oviatt and McDougall, 1994). In terms of Kirzner's (1973) model of entrepreneurship, action on an opportunity also highlights its existence to others, which results in a convergence of perceptions about market conditions. This convergence eventually, but gradually acts to eliminate entrepreneurial returns.

This research attempts to examine how entrepreneurs' information sources and networks impact on their entrepreneurial efforts and performance, including their international performance. Entrepreneurs' personal networks are examined, to determine their usefulness in starting their business. Business focused networks are examined in terms of their ability to provide useful information after their firm is started. An examination of the links between information, noticing opportunities and action tries to uncover if and how these networks are useful in terms of having a positive impact on firm performance.

This paper begins by discussing personal and business networks. While the term social network has been used to describe individuals' non-work related networks, Johannisson's (2000) logic that all networks are social has been adopted here. Thus, personal networks, in this research, are viewed as those that "reflect the personality of the entrepreneur" and which carry "the generic sense-making process that guide the entrepreneur . . . as a private person" (Johannisson, 2000:371). The key factor is that personal networks exist independent of the business, although they may be essential to its founding and success. They are a key entrepreneurial ingredient and are efficient channels for ideas, which can also provide information about what others have done to successfully exploit an opportunity. They can also serve this purpose as the firm grows. For instance, Beckman and Haunschild (2002) found that network partners could provide information that enhances acquisition success. Many entrepreneurs become more directed and narrowly focused in their network use and construction after the founding of the business.

The linkages between personal networks and entrepreneurship, and the relationship between personal networks that are more useful at the founding stage and networks more related to the needs of an ongoing business and entrepreneurial success are discussed. A model of entrepreneurial behavior combines these concepts and relates them to entrepreneurial action and performance. Several research hypotheses are presented, which reflect the model's links. The issue here is the degree to which networks are important, and the degree to which they may impact on the ability of entrepreneurs to notice and successfully exploit opportunities. The hypotheses are tested using questionnaire data from a sample of entrepreneurial manufacturing firms in Thailand. The paper concludes with a discussion of results, implications for practicing managers, and issues for future research.

## 1. Networks and entrepreneurship

### 1.1. Personal networks and entrepreneurship

Network researchers were initially very interested in communication patterns, network density and the centrality of various actors because they saw these factors as affecting actors' power or access to important information (e.g., Boissevain, 1974; Burt, 1992; Granovetter, 1973). However, our understanding of entrepreneurial behavior has been more influenced by the content of network flows, especially those related to identifying entrepreneurial opportunities. Networks provided a way to link information to entrepreneurial performance, as a critical explanatory variable (e.g., Aldrich and Zimmer, 1986). In this way, issues related to the distinction between managerial versus entrepreneurial competence, the reasons why certain ethnic groups engaged in similar businesses, and contradiction of common trait profiles leading to different outcomes could be better explained (Brockhaus and Horwitz, 1986; Gartner, 1988).

Personal networks have been found to play an important role in business startup and success (e.g., Birley, 1985; Jarillo, 1989; Lincoln, Gerlach and Ahmadjian, 1996; Reynolds, 1991). However, the original focus of personal networks concentrated on how entrepreneurs used their personal networks to find out about opportunities, test ideas, gain access to specialized expertise, and obtain financial resources (e.g., Aldrich and Zimmer, 1986; Aldrich

nd Wadinger, 1990a). Early research also focused on how entrepreneurs used their personal resources effectively (Starr and MacMillan, 1990), and found that family and friends were important elements in entrepreneurs' networks (Staber and Aldrich, 1995).

Individuals with broad, non-reinforcing networks, especially those with lots of weak ties, are more likely to be exposed to new ways of thinking and numerous business ideas than are those who receive most of their information from close friends with similar views and shared perspectives (Granovetter, 1973). In other cases, as has been seen in immigrant groups, networks provide information about which types of businesses have been most successful and advise on how to enter these businesses (e.g., Aldrich and Waldinger, 1990b; Hansen, 1995). Network theory suggests this is why certain ethnic groups tended to be associated with certain kinds of businesses. For instance, Korean immigrants in the U.S. are heavily involved in the grocery business (e.g., Aldrich and Waldinger, 1990a; Bonacich and Light, 1988; Light, 1972), Chinese immigrants in Thailand were heavily involved in rice milling (Butler and Chamornmarn, 1995), and refugees from Pakistan dominated the bicycle manufacturing industry in India (Misra and Kumar, 2000). Many of these immigrant groups arrived in their new countries with little technical business expertise in these areas. However, immigrants used their personal networks to uncover information about the commercial success of fellow immigrants' businesses. Their networks also provided the personal support that motivated them to enter those industries that had proven profitable within their immigrant community (Granovetter, 1985).

The composition of personal networks is also important. Individuals with personal networks, composed of people with technical and business knowledge, are able to call on those networks for specialized information (e.g., Nam, 2000). This increases the probability of startup success by reducing the likelihood that they will make technical errors.

## 2.2. *Business focused networks*

Business focused networks begin to emerge once a business is established. These networks include both organizational and individual dimensions, and emerge as the entrepreneur responds to a new set of concerns related to the entrepreneur's actual operation of their new business. There will obviously be many cases where the line between entrepreneurs' socially constructed personal networks and those that are a byproduct of their businesses' needs will be somewhat blurred (Johannisson, 1992). The research by Bhappu (2000) shows that family links, as they evolve, can be important in the formation of corporate networks. Definitions of business networks often focus on inter-firm aspects and depict them as consisting of companies "that are connected or bound together through some form of sustained interaction, within which there is a degree of commonality" (Huggins, 2000:112). Business focused networks should enhance entrepreneurs' prospects for success, by providing useful business information, advice and access to informal alliances (e.g., Brown and Butler, 1995; Butler and Hansen, 1991). Krackhardt and Stern (1988) show that this may even occur through inter-departmental ties. In this sense, they act to supplement the entrepreneur's pre-existing personal networks, which may continue to supply some information that is useful to the firm's ongoing business operations, while mostly functioning in a social sphere (Ostgaard and Birley, 1996). For instance, Heracleous and Murray

(2001:147) point out that "Chinese business networks are largely constituted of informal personalized connections" while Korean Chaebol "exhibit a mixture of formalized, equity ties with informal personal ties."

Context also has an impact on the form and efficacy of network relationships in business (e.g., Larson and Starr, 1992). Network analysis has focused on outcomes, such as interlocking directorships (Heracleous and Murray, 2001) and business prominence (Zajac and Westphal, 1996), but the factors that underlie the construction and formation of these networks are also important (e.g., Akira, 1989; Ingram, 1971). Research by Hamilton (1991) and the Australian Department of Foreign Affairs and Trade (1995) looked at business networks in a broader context, examining why they take a particular form and showed how they impact economic development in both positive and negative ways. Ultimately, even in very large firms, some managers will notice opportunities while others do not. The composition of the business focused networks of those who notice these opportunities may help explain this difference (Floyd and Wooldridge, 1999).

At the international level, strategic alliances and strategic networks have received some attention (e.g., Jarillo, 1993; Donckels and Lambrecht, 1995). However, these are more formal business-to-business linkages, which tend to have defined boundaries (Johannisson, 1998, 2000; Taylor, 1999). Their focus is not on the individual entrepreneur or their firm, but rather on the benefits that accrue to all firms within the network vis-à-vis firm outside the strategic network or alliance (Huggins, 2000).

The links between business success and network development have been found in some country studies (Brown and Butler, 1993; Izushi, 1997; Sweeting, 1995). Business focused networks have been found to be especially relevant to the efforts of many countries to develop new industrial bases. For instance, networks were found to play a key role in the success of "industrial districts" in northern Italy (Garofoli, 1994).

One of the reasons why there is less research at the organization level relates to the difficulty of collecting information. Personal network methodology has tended to focus on size, diversity, density, and strength of links within networks (Burt, 1992; Granovetter, 1982, 1985; Wasserman and Faust, 1994), and it is much harder to place organizations in these frameworks. In providing their theoretical framework, Floyd and Wooldridge (1999) also showed that accessing networks, at the firm level, is a complex process. Qualitative research, which is better able to explore networking processes and motivations, results in more limited generalizability (Borch and Arthur, 1995). However, increasingly there have been efforts to differentiate and concentrate on those networks developed after the firm is established.

## 2. An integrated model of entrepreneurship

The literature discussed earlier suggests that the entrepreneurial process had two distinct network components related to noticing opportunities, through socially-constructed personal and business networks. These are depicted in figure 1. The importance of these components changes as the firm first starts, and then grows. This means that entrepreneurs are likely to exploit existing personal networks when starting their business as they attempt to identify and then implement their business idea. Once the firm begins operations entrepreneurs

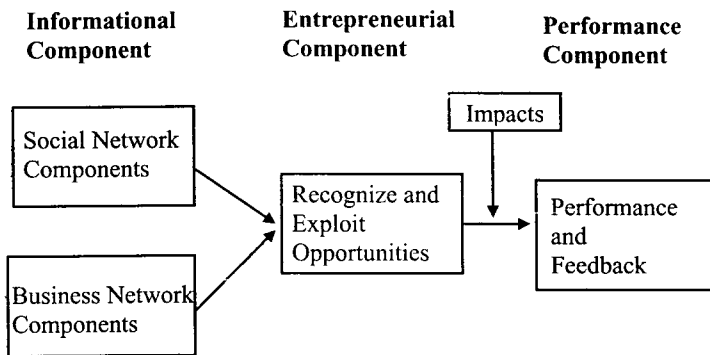


Figure 1. Model of entrepreneurial behavior in a network.

consciously build new networks to correspond to their firm's needs, as it develops and grows. Each of these components pushes the entrepreneurs to collect different types of information. This is also one of the reasons why the networks, for any sample of entrepreneurial firms, appears to be so varied, and this variation should further manifest itself when entrepreneurs engage in international operations because the geography of their network expands.

The first component relates to information, which is especially important during the founding and early stages of an entrepreneurial business. This is because the idea is the central ingredient in entrepreneurship, and entrepreneurs need lots of new information when starting a business. As mentioned earlier, this link between information and entrepreneurship was developed by Austrian School Economist (Kirzner, 1973). They view markets as being in a constant state of disequilibrium, where equilibrium is a rare occurrence. This means that expectations about the appropriate price are varied, and entrepreneurs essentially engage in arbitrage by buying low and selling high, at least initially. One of the reasons this notion of entrepreneurial activity received so little empirical attention was because Austrian school economist had a decided preference for theory over empirical investigation.

However, these disequilibrium concepts have found their way into contemporary entrepreneurship research. At a general level learning by doing, through one's personal and business focused networks is depicted as extremely important if one is to benefit from other's learning (Arrow, 1962). Some modeling, which incorporates the entrepreneur's ability to handle information, could also be seen as tied to disequilibrium concepts of entrepreneurial behavior (Cressy, 1992). Personal networks can provide the information needed to exploit entrepreneurial opportunities and existing research suggests they are extremely important to the initial entrepreneurial activity. Existing network research shows that family, friends, and business associates were seen as providing valuable information about starting a business, and which type of business to found (Dubini and Aldrich, 1991). This does not mean that personal networks cease to be important to older firms, but that these firms have larger knowledge inventories and entrepreneurs begin to use business contacts more often to acquire information needed to operate efficiently or needed to expand. This probably explains why new entrepreneurs have smaller networks than their more established counterparts (Greve, 1995).

The model also depicts business networks, which obviously have some personal aspects, but tend to provide information that is more focused on the entrepreneur's business activities and are developed after the entrepreneur starts their business. These networks are important because entrepreneurs are unlikely to possess all the information and/or technical expertise needed to identify and exploit opportunities. Customers, suppliers and even employees are more likely to have a highly focused business network with the entrepreneur. Past research, discussed above, shows that competitors are often part of these networks. In at least one study, Zaheer and Zaheer (1997) use concepts related to information and alertness to opportunities to show that banks used their information networks in ways that made them more effective. Other research, which is more focused on entrepreneurs (Cooper, Folta and Woo, 1995; Deeds and Hill, 1999), shows a strong link between information, networks and performance.

This suggests:

*H1.1.* Personal networks provide entrepreneurs' firms with information needed to notice and act on opportunities.

*H1.2.* Business networks provide entrepreneurs' firms with information needed to notice and act on opportunities.

The final stage of the research model focuses on performance. In one sense, a positive correspondence between opportunity exploitation and performance is expected. The key issue here is that while a firm may notice lots of opportunities, it does not follow that they will be able to exploit all, or in some firms any of these opportunities. The financial press is full of examples of firms that have mismanaged or failed to exploit obvious market opportunities. The likelihood of this occurring across a large sample is smaller, but exploitation is as important as noticing and is ultimately the key to sustaining the link to profitability. Thus, for any individual firm, the link between networks and action may not hold, but it is likely to hold for any population of firms.

A number of scholars have theorized about the beneficial effects of networking activity (Birley, 1985; Larson, 1992), and there is also some empirical research to support the link between effective networks and firm performance (Aldrich, Rosen and Woodward, 1987; Blundel, 2002; Cell and Baines, 2000). Much of this research involves issues of governance, and the role of firms' boards in expanding firms' networking activities in ways that provide valuable information that leads to better performance (Hillman, Cannella and Paetzold, 2000; Jones, Hesterly and Borgatti, 1997). In other cases the research has focused on efficiency. For instance, George, Wood and Kahn (2001:69), in a study of small banks suggested that boards' networks also enhance performance by "reducing the costs of coordinating change." Finally, a recent study by Blundel (2002) shows how the changing patterns of networks helped two firms both survive and grow over the past fifty years. Their research suggests that the context of the network, or the ability to change and adapt one's networks may be the essential to enhanced performance, or in the case of the English cheese makers they studied, their survival. This study also highlights the fact that firms are impacted by environmental conditions, outside of their control. These impacts will affect the degree to which firms' actions impact performance.

Directly documenting the links between networks to information to performance is difficult outside the context of a qualitative study, but the general thrust of existing research suggests networks provide the information necessary for action, and that action has a major impact on firm performance. Thus:

*H2.1.* Firm's performance will be positively associated with their level of action.

*H2.2.* The impact of action on performance will be moderated by environmental impacts.

## b. Method

### b.1. Sample and data collection

The sample consists of the owner-entrepreneurs of 100 manufacturing firms, located in Thailand. Table 1 contains a profile of the sample. Because the average age of these manufacturing firms is over 17 years, the sample was split at the 12 year point to see if there were response differences on any of the perception items that related to starting the business. Twelve years has frequently been used as the time frame when scholars believe entrepreneurial firms begin to experience slower rates of growth and when some begin the institutionalization process (e.g., Kazanjian, 1988; Flamholz, 1990; Birch, Haggerty and Parsons, 1993; Begley, 1995).

One item, relating to having contacts in the financial community who helped them gain access to funds during the startup period showed a statistically significant difference. Older

Table 1. Means and standard deviations for categorization variables.

Variable description	Mean	Standard deviation
Highest level of general education (1 = less, 5 = more)	3.21	1.42
Level of business education (1 = less, 5 = more)	2.22	.82
Have founded another business (1 = yes, 2 = no)	1.89	.31
Number of other business founded	.18	.61
Original business founder (1 = yes, 2 = no)	1.27	.44
Age of firm (years).	17.6	9.93
Number of employees	269	602
Number of Thai-based competitors	93.79	211.23
Profits expected next year	3.71	.63
Sales growth compared to competitors	3.89	.93
Profitability compared to competitors	3.86	.98
Quality (product) compared to competitors	3.78	.92
Management compared to competitors	3.65	.95
Likelihood of IPO leading to SET listing	3.21	1.22

firm respondents felt that links to the financial community were not necessary, which would be consistent since banks did not provide funds to startup firms in Thailand until very recently, and older firms would have had little access to this type of funding when they began.

Data was collected using a questionnaire that was composed in Thai, but was back translated into English for purposes of reporting results in this paper. Questionnaires were personally delivered to and then collected from respondents, by the members of a part-time MBA class. MBA students were used because the researchers wanted to exploit the students' networks, and because this helps ensure cooperation from local entrepreneurs, and no student reported the entrepreneur they approached refusing to complete the survey. Thai MBA students have a wide range of contacts, which results in a dispersed sample.

Data was collected during April 1996, when economic growth in Thailand was still high. However, exports had begun to enter a slower growth phase, and several governmental officials had expressed concern over this trend. There was also some discussion about the possibility that the baht would weaken against other currencies. External economic conditions should not have had a major impact on responses, since there was little awareness of the precarious state of the property and financial sectors, which led to the financial and currency crises of 1997.

### 3.2. Variables

The variables fall into six broad categories. They are (1) categorization variables, (2) personal networking variables, (3) business networking variables, (4) action variables, (5) impact variables and (6) performance measures.

Personal networking items (11 items) asked respondents about the degree to which certain experiences, institutions, or people had been useful in providing information that was specifically useful in starting their business. Obviously, entrepreneurs maintain personal networks after starting a business but the items here focused on them in the context of being useful at the founding stage. These items included items in the existing literature that related to obtaining advice from bankers, lawyers, friends, and family that was useful in the starting of the business (Bennett and Robson, 1999; Chell and Baines, 2000; Ozcan, 1995). It would be ideal to have the identity, frequency and duration of contacts (e.g., Aldrich, Rosen and Woodward, 1987) but since the respondents were being asked to make their assessments after the fact this was not feasible. Thus, the scale rating serves as a measure of intensity or frequency, which is likely to be correlated to their assessment of the value of the item.

Business network items (18 items) attempted to find out how these entrepreneurs obtained general information that was useful to their business or learned about products and manufacturing equipment that would help their firm. Here the items used were intended to assess the information in terms of its value to the ongoing business, as opposed to its usefulness or lack thereof in the decision to start the business. The items were in a different section of the questionnaire and respondents were specifically asked to relate the items to the ongoing needs of their business, or in terms of its value with respect to new products and equipment. Items included those focused on outside advice as well as their perceptions of the value of different sources of information such as trade fairs and magazines (Brown

nd Butler, 1995). One item in this section, which related to the value of information the respondent acquired at former employers, was eliminated because it was not directly related to information sources at the new firm, leaving 17 items in the analysis.

There were 11 action items related to strategic or operational postures designed to enhance the firm's competitive or financial position. These included items related to quality control, product differentiation, customer loyalty, opportunity recognition, and cost control. These items were designed to determine entrepreneurs' perceptions of these "actions" in terms of the environmental and competitive pressures that they faced.

There were 11 items that assessed the degree to which respondents felt a factor impacted their firm. Items included tariffs, environmental, economic, cost, competitive and locational impacts. These are factors that did impact firms in the region during this time period, and the purpose of these items is to assess the degree to which these respondents were able to absorb these impacts.

Table 1 contains the descriptive statistics for self reported measures of expected future profits, sales growth, profitability, export percentage, product quality, management capability, and the likelihood of an initial public offering leading to a listing on the Stock Exchange of Thailand. The performance measures are self-reported because, in emerging markets such as Thailand, accurate and transparent financial data is still not available for smaller firms. Thus, the use of subjective measures is appropriate because managers tend to be biased in their assessment of performance (Dess and Robinson, 1984; Venkatramen and Ramanujam, 1986).

A 5 point Lickert scale was used for non-categorization items. "Five" indicated strong agreement with a statement or that the item was perceived to be extremely important. Several items were reversed coded on the questionnaire.

### 3.3. Factors

Factor analysis, using principal components extraction and a varimax rotation, was used to reduce multiple items to a manageable number of factors (Childs, 1990; Gorsuch, 1983; Kline, 1994). In exploratory factor analysis the goal is to include as many items as feasible, with the goal that the factors derived will validly represent an underlying construct (Kline, 1994). The varimax rotation, which is an orthogonal rotation, is designed to ensure that the factors are not correlated with each other, or at least to the degree that this is possible. In this respect, the orthogonal rotation helps to enhance discriminant validity by producing distinct factors while achieving convergence through inter-item correlation.

The final variables chosen to represent each factor were selected to maximize reliability using standardized alpha as the reliability coefficient (Cronbach, 1951), and to facilitate interpretability (Gorsuch, 1984). Thus, when the loadings on one factor were not above .5 the item was not included. Items were also dropped if they cross loaded highly on a second factor and the difference between the loadings was low.

Analysis of the items related to using one's personal network for useful information when founding their business yielded four factors. These are detailed in Table 2. Only two of these factors are used in subsequent analysis. Factor 1 has an acceptable reliability coefficient of  $\alpha = .76$  (Nunnally, 1978). Factors with reliability coefficients in the  $\alpha = .60$  and above

Table 2. Rotated component matrix for items related to usefulness of different factors or people in starting a business.

Items (mean)	Component			
	1	2	3	4
Attorneys necessary to start business (2.92)	<b>.832</b>	.174	.180	-.064
Bankers provided assistance (3.64)	<b>.744</b>	-.199	.064	.204
Government agencies helpful (3.01)	<b>.730</b>	.114	-.105	.319
Business not entirely my idea (3.87)	-.515	.205	-.085	.264
Family members provided lots of information (3.70)	.111	<b>.844</b>	-.012	.053
Family members provided extremely valuable information (3.51)	-.023	<b>.749</b>	-.180	.174
Gained information from working in family business (3.20)	-.191	<b>.619</b>	-.075	-.220
Friends provided useful information (3.37)	.241	-.060	<b>.804</b>	-.057
Friends in financial community provided access to funds (2.93)	-.085	-.174	<b>.779</b>	.201
Personal savings did not provide most of start up funding (2.51)	.113	-.155	-.006	<b>.827</b>
Relatives were a good source of start up funds (2.13)	.146	.279	.256	<b>.559</b>
Eigenvalue	2.194	1.916	1.411	1.339
Reliability coefficient (standardized alpha)	.76	.65	.53	.39

range regularly appear in the literature (e.g., Antoncic and Hisrich, 2001; Brown, Davidsson and Wiklund, 2001), and even Nunnally (Nunnally and Bernstein, 1994) modified his stand on the level of reliability needed. Thus, the second factor, with a reliability coefficient of  $\alpha = .65$  was retained. The third and fourth factors were eliminated because their reliability coefficients were too low, even for exploratory research.

These two factors have been labeled NetStart1 and NetStart2 because they relate to using one's personal networks in the business formation process. NetStart1 relates to professionals in one's personal network, in terms of their value during the startup phase of these entrepreneurs' businesses. NetStart2 is more focused on the information and assistance provided by family members. Thus, from a conceptual basis the two constructs are distinguishable. In addition, both NetStart1 and NetStart2 have statistically significant correlations with each of the items contained in these constructs, which supports convergent validity. NetStart1 does not have any statistically significant correlations with the items in NetStart2, nor does NetStart2 have any statistically significant correlations with the items in NetStart1. The two constructs are not highly correlated with each other (see Table 6), which supports divergent validity.

Five factors were extracted related to the usefulness of certain items or people during the ongoing operation of the business. These are detailed in Table 3. Only two of the factors were deemed to have sufficient levels of reliability to be used in the subsequent analysis. These have been labeled NetOperate1 and NetOperate2 because they relate to ways that networks provide entrepreneurs with information that is useful during the firm's ongoing operations. One item was eliminated from NetOperate1 (Government Agencies) because it had a high cross loading on NetOperate2 and related to products and equipment rather

Table 3. Rotated component matrix for items related to value of item or people in the actual operation of business.

Items (mean)	Component				
	1	2	3	4	5
Outside the firm business meetings—GI (3.12)	<b>.816</b>	.127	-.076	.281	.040
Business courses at universities—GI (2.46)	<b>.746</b>	.245	-.032	-.017	-.060
Government sources—GI (2.61)	<b>.717</b>	.112	.371	-.009	.320
Government agencies (domestic and foreign)—PMEI (2.75)	<b>.661</b>	.403	.191	-.104	.125
Business newspapers and magazines—GI (3.07)	<b>.644</b>	.219	.197	.406	-.123
Firm's banker—GI (3.63)	<b>.535</b>	.132	.498	.247	.133
Personal friends—PMEI (3.34)	.076	<b>.793</b>	.125	.281	.018
Suppliers' sales representatives—PMEI (3.69)	.096	<b>.785</b>	.321	.008	.315
Trade magazines—PMEI (3.13)	.459	<b>.728</b>	.026	.187	-.044
Even aggressive search tactics—PMEI (3.31)	.191	<b>.703</b>	.166	-.057	.430
Trade fairs—PMEI (2.55)	-.297	<b>-.604</b>	.068	-.211	.035
Competitors—PMEI (3.68)	.217	<b>.516</b>	-.088	.314	-.226
Firm's customers—GI (4.41)	-.067	.158	<b>.845</b>	.072	-.121
Suppliers of equipment and material—GI (3.68)	.323	-.017	<b>.723</b>	.226	.219
Business acquaintances—GI (3.51)	.111	.253	.056	<b>.759</b>	.136
Personal acquaintances—GI (3.14)	.085	.141	.305	<b>.678</b>	.147
Family and relatives—GI (3.38)	.054	.095	.011	.228	<b>.865</b>
Eigenvalue	3.403	3.336	1.960	1.720	1.346
Reliability coefficient (standardized alpha)	.81	.84	.62	.58	na

GI—indicates item relates to general business information.

PMEI—indicates item relates to information about products or manufacturing equipment.

can general information. One item was eliminated from NetOperate2 because it had a low loading. Both constructs have high levels of reliability as indicated by their standardized alpha coefficients of  $\alpha = .81$  and  $\alpha = .84$ . The other three factors did not have sufficient levels of reliability to be used as constructs in subsequent analysis.

NetOperate1 and NetOperate2 have a positive and statistically significant correlation with each other, which reduces their level of discriminant validity. Each of the constructs has a significant correlation with respect to items that compose it as well as the other construct. However, the difference between a construct's correlation with its own items and the other constructs' correlation with its items is quite large. In no case is this difference in correlation coefficients less than .204, and it ranges to a high difference of .458. This suggests some degree of discriminant validity. Additional support for discriminant validity comes from the fact that the items in NetOperate1 all relate to general information (GI) while the items in NetOperate2 all relate to information relating to products and manufacturing equipment.

In terms of their convergent validity, each of the constructs contains items that are consistent with information gathering in a business context and that appear in the existing

Table 4. Rotated component matrix for items related to action impact items designed to produce competitive advantage and enhanced financial performance.

Items (mean)	Component			
	1	2	3	4
Quality control program necessary for consistent quality (4.06)	<b>.727</b>	.109	.069	-.340
Our products easy to distinguish from competitors' products (3.40)	<b>.697</b>	-.023	.031	.001
High quality products most important success factor (4.06)	<b>.640</b>	.339	-.380	-.119
Having customers that are willing to wait for your product (4.02)	<b>.600</b>	.431	-.005	.025
Finding ways to reduce costs is important (3.81)	<b>.589</b>	-.049	.479	.002
Important to recognize opportunity early (3.94)	-.028	<b>.863</b>	.167	-.107
Customer relationships that are more important than low price (4.01)	.337	<b>.739</b>	-.144	.119
We keep production cost low to set low price (3.45)	.126	.175	.790	-.162
Low price is most important factor (3.00)	-.112	-.174	.655	.349
Being first provides a competitive advantage (3.59)	-.005	-.033	-.141	.779
My firm's success is attributable to me (3.11)	-.136	.043	.213	.633
Eigenvalue	2.293	1.672	1.546	1.312
Reliability coefficient (standardized alpha)	.72	.58	.37	.26

literature. In addition, as indicated above, each of the constructs have extremely high, and significant correlations with the items of which they are composed.

The factor analysis of the set of items related to action is presented in Table 4. The label "Action" is being used in the broadest possible way. Factor analysis of these items yielded a 4 factor solution, although only one factor had sufficient levels of reliability ( $\alpha = .72$ ) to be retained as a construct for further analysis. This construct consists of 4 items with one item being eliminated because it had a high cross loading on another factor. This construct had statistically significant correlations with the items it contains, which supports convergent validity. The items are all consistent with decisions related to product quality or product differentiation. The results should not be interpreted as meaning that cost issues are not important, because these items have high mean values.

The final set of items relate to impacts (see Table 5) that can affect the firm. Factor analysis of these items yielded a four factor solution. Only one factor had sufficient levels of reliability to be included as a construct in subsequent analysis ( $\alpha = .75$ ). The correlation between the construct and the items it contains were statistically significant. Convergent validity is also supported by the fact that all the items in this construct relate to governmental policies or foreign pressures.

### 3.4. Analysis

Hypotheses were tested using Pearson correlations and OLS regression. These techniques were used to determine the degree to which constructs linked in the model were related, as

Table 5. Rotated component matrix for items related to impacts that affect financial performance.

Items (mean)	Component			
	1	2	3	4
Reduction of tariffs in ASEAN helpful (3.09)	<b>.866</b>	.007	.150	-.015
Events in other countries affects my business (2.99)	<b>.763</b>	.302	.097	-.155
Government policies impacted my firm (3.30)	<b>.674</b>	.318	-.329	-.204
Foreign competitors are a major concern of our firm (3.05)	<b>.542</b>	.064	.323	.242
Tariffs in other countries impact our business (2.87)	<b>.496</b>	.063	-.410	-.439
Poor performance is due to causes beyond our control (3.42)	.060	<b>.741</b>	-.128	.129
Company's performance tied to economy (3.73)	.192	<b>.700</b>	-.018	-.098
Special services or a low price cannot overcome bad economy (3.13)	.044	<b>.468</b>	-.425	.265
Location is extremely importing in manufacturing (4.05)	.286	<b>.453</b>	-.435	-.435
Transportation costs increasing more rapidly than other costs (3.42)	.106	-.120	<b>.804</b>	.055
Difficult to pass labor cost increases on to customers (3.37)	-.061	.073	.148	<b>.869</b>
Eigenvalue	2.468	1.685	1.468	1.362
Reliability coefficient (standardized alpha)	.75	.46	na	na

outlined in the previous research hypotheses. Because this is a cross-sectional study, causality cannot be established. However, correlation provides some indication of connectedness. In addition, it helps to identify if multicollinearity is a serious concern in the subsequent regression analysis. The between construct correlations are below the levels where multicollinearity is considered a problem (Kline, 1994). However, this issue was also addressed during regression analysis by examining the tolerance scores and variance inflation factors (VIF). Myers (1990) and Neter, Wasserman and Kutner (1984) suggested that if VIF scores were more than 10 the construct was redundant. Kline (1994) suggests that tolerance scores below .10 are a cause for concern. In this analysis of the standard models no VIF score were above 1.05 and no tolerance score were below .64, indicating that the results are not seriously affected by multicollinearity. Those models containing the interaction term (2.2, 3.3, and 4.4) had VIF scores above 10 for both the interaction and impact variable, as expected.

#### 4. Results and discussion

At one level the link between networks and action can be inferred from the absolute value that entrepreneurs place on these network items. An examination of the mean scores for the various items, contained in each of the Personal factors (see Tables 2 and 3), provides some support for hypothesis 1.1 and 1.2. The mean scores, in parenthesis, for the items indicate that entrepreneurs recognize that they provide useful information, since a score of two recognizes some level of contribution of useful information with respect to starting the business or its ongoing operation. Respondents in this sample recognized the value of

information they received from family members, friends and professionals, as indicated by their higher mean scores (Table 2). Attorneys, government agencies, and friends in the financial community with funds to invest were rated lower. This may reflect the fact that lawyers are viewed as an expense, friends with funds to invest are probably rare, and much of the entrepreneurship research shows entrepreneurs often rate government assistance low on scales. For instance, almost twenty percent of respondents in this sample rated government sources as having no value. However, many respondents saw even these sources as valuable suppliers of information.

In general, these entrepreneurs appear to place a very high value on the information they received from their personal networks. These mean scores provide some support for hypothesis 1.1, since entrepreneurs likely would value sources that provided information about business opportunities or how to successfully start a business.

Items with the highest mean values in terms of their usefulness to the ongoing business related to information provided by customers, competitors, suppliers and their sales representatives. These entrepreneurs appear to believe that useful information was provided by their network contacts, even recognizing that formal business courses at universities are of some use, although see as less useful than other items. While the entrepreneurs indicate that these items are of informational value, linking them to action, even in a cross sectional way is more difficult.

The correlational support for hypotheses 1.1 and 1.2 is not strong (see Table 6). Only NetOperate2 has a statistically significant positive correlation with Action, although the other three constructs do have positive correlations. NetOperate2 includes items that relate to providing information about products and services, which may explain the strong correlation with Action. However, it could also relate to the fact that, having decided on taking some action, entrepreneurs must then secure information related to manufacturing or designing a new product. In summary, the results of the correlation do not support hypothesis 1.1, and provide limited support for hypothesis 1.2. Obviously, the processes and dynamics behind this relationship provide an agenda item for future research.

The regression results (see Table 7) suggests that the informational constructs, which are not statistically significant and have negative beta coefficients, approaching statistical significance in the case of NetOperate2, are not linked to action. While the results are not supportive of hypotheses 1.1 and 1.2, they are consistent with some of the literature discussed earlier. Entrepreneurs may well notice opportunity in its broader scope initially, and then enact their information search. Hypotheses 1.1 and 1.2 are not supported by these results.

Thai manufacturing entrepreneurs appear to value their networks but not in ways that directly links their value to firm action. In South East Asian countries, network building is a highly valued and engrained activity. It may well be that networks are more institutionalized among Thai entrepreneurs and not linked to specific firm activity, or that links becomes more specific and useful after determining to take actions steps. Entrepreneurs, or at least South East Asian entrepreneurs may view building and maintaining networks as part of their normal day-to-day routine and thus be less conscious of the specific nature of their informational contributions. It may also be that networks in East Asian countries provide a broad range of information, ranging from gossip to information that is highly relevant to



Table 6. Correlation for network factors, action factors, and performance variables.

	NetStart1	NetStart2	NetOperate1	NetOperate2	Action	Impact	Sales growth	Exports %	Profits	Quality	Management
NetStart1											
NetStart2	-.018										
NetOperate1	.362**	.108									
NetOperate2	.248*	.037	.492**								
Action	.064	.035	.015	.226*							
Impact	.345**	-.053	.479**	.399**	.238*						
Sales growth	.097	-.066	.041	.154	.030	.017					
Export %	.023	-.050	.183	.086	-.201	.217*	.209*				
Profitability	.000	.041	.098	.141	.021	.064	.692**	.224*			
Quality levels	.299**	.057	.188	.287**	.195	.230*	.486**	.068	.333**		
Management	.154	-.053	.105	.205*	.299**	.246*	.569**	-.016	.337**	.454**	
Public listing	.343**	-.175	.396**	.223*	-.099	.251*	.131	.188	.016	.125	.042

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

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

Table 7. Results of regression analysis for action constructs.

Dependent variable	Model number 1	
	Action	Std. error
Constant	3.183**	.472
Age of Firm	.010	.007
lnEmployees	-.004	.043
NetStart1	.036	.086
NetStart2	.023	.088
NetOperate1	-.086	.079
NetOperate2	-.260*	.097
F value	1.27	
R-Square	.094	

\*Significant at .10 level.

\*\*Significant at .01 level.

the entrepreneur's business. In that case it is only natural that the contributions of networks might be less focused and more difficult to recognize that those that assist entrepreneurs in Europe and North America.

Thus, while certain aspects of personal and business focused networks are viewed as important, their links to action are not supported by the results here. The results also depart from some of the previous research that found such networks important to immigrant groups or among winemakers. It may be that manufacturing requires higher levels of industry specific experience on the part of the entrepreneur. This experience may act to reduce the need of these Thai entrepreneurs to tap their networks, and the degree to which they credit them when they do access them.

The final links in the model, expressed in hypotheses 2.1 and 2.2, suggests that there should be a link between action and performance, but one that is moderated by environmental impacts. One of the hardest decisions to make with an entrepreneurial sample is the selection of a performance measure that is relevant. Thus, a number of performance measures were collected (see Table 1), while the subset of them presented in Table 8 includes only those where the independent variables were statistically significant.

The correlation results provide some support for hypothesis 2.1. Action has a positive and statistically significant correlation with managerial competence (Table 6). The beta coefficient for action is also statistically significant in Eqs. (3.1) and (3.2) (Table 8), which supports a link between action and at least this aspect of performance. Again, these are cross sectional results so it could be that managerial competence is driving action, and not the other way around.

Action is not statistically significant with respect to other measures of performance, and has a negative correlation and negative beta with respect to export percent as a performance measures. Thai manufacturing has traditionally engaged in low labor cost manufacturing, which may explain the negative link between exports and action. Many of these manufacturers may see themselves as order takers with respect to exports. This may be a function

Table 8. Results of regression analysis for performance measures.

Model number	2.1		2.2		3.1		3.2		4.1		4.2	
	Profit	Std. error	Profits	Std. error	Management competence	Std. error	Management competence	Std. error	Export %	Std. error	Export %	Std. error
Constant	3.183**	.782	3.129*	1.856	1.165	.737	-.947	1.728	43.73	.41	84.6	69.9
Age	-.036**	.011	-.038**	.011	.009	.010	.005	.011	-.740*	.41	-.667	.430
InEmployees	-.037	.069	-.034	.070	.068	.065	.081	.065	6.453*	2.60	6.205*	2.643
Action	.135	.195	.296	.499	.403*	.184	.981*	.465	-13.45*	7.37	-24.6	18.82
Impacts	.133	.152	.299	.497	.158	.143	.752*	.463	8.281	5.72	-3.203	18.72
Interaction			-.046	.130			-.163	.121			3.16	4.893
F value	3.363**		2.326*		3.298**		3.031*		4.560**		3.702**	
R-Square	.15		.15		.15		.17		.20		.21	

\*Significant at .05 level.

\*\*Significant at .01 level.

•Significant at .10 level.

of the fact that differentiated products are marketed locally and that firms engaged in this type of activity would be increasing their percentage of domestic sales. A limitation of this research is the failure to develop an action construct related to low cost.

The regression results here do not support a link between Action and profits (Eqs. (2.1) and (2.2)), or the other performance measures for which regression results are not reported. Firm age accounted for much of the variation in most of the performance measures (see Eqs. (2.1), (2.2), (4.1) and (4.2)). Of course the older firms would have a more stable base of customers, which might account for the age to profit link.

The interaction term is not significant in Eq. (3.1), which is the relevant one to examine for a moderating relationship. Thus, hypothesis 2.1 cannot be supported. This result suggests that these firms may have been quite proficient in taking actions that correctly anticipated environmental occurrences, or that they were very adept at quickly adapting to them.

In general, the results show that entrepreneurs value many of the items that are associated with personal and business networks. However, the results fail to support the type of linked model that the existing literature suggests should operate if networks are to ultimately affect performance in entrepreneurial firms. Some of this relates to the lack of identified and valid network measures, as well as the failure of this research effort to obtain multiple action constructs that had high levels of reliability.

## 5. Conclusions

Research on networks, and how they fit into entrepreneurship and entrepreneurial behavior, has been increasing and this was an effort to expand the research to a South East Asian setting. From a theoretical perspective, network based explanations of entrepreneurial behavior appeared to offer more promise than the initial efforts to relate entrepreneurship to some set of personal traits. The results here certainly suggest that Thai entrepreneurs see network elements as valuable, but they also suggest that exactly how they manifest their benefits may be less direct, or at least apparent in this manufacturing context.

In terms of Asian Pacific firms in developing countries, one interesting issue is why respondents tended to place a high value on their networks at both the founding and ongoing businesses stages, but links to entrepreneurial action and firm performance were less strong, in a statistical sense. Recent research by Kenis and Knoke (2002) suggests that networks may have an optimal level of density. If they become too dense, with too many ties, there will be no room for new entrants. New entrants are an important source of new information to any network. Since many Thai businesspersons are heavily networked, and this is common in the region, it may be that their networks are extremely dense, which means that they are less likely to receive information from weak links that have been found to be important to entrepreneurial action.

The link to performance may also suffer because the motivation for network building is quite different in East and Southeast Asia. Reciprocity, which for the Chinese is embedded to the concept of *quanxi*, exists throughout the region. Thus, requests are often linked to specific needs, such as borrowing funds, rather than open-ended discussions of business issues that lead to advice that is valuable although it may not have been specifically solicited.

The link between networking and firm performance, although present in some cases, may be affected by the hierarchical nature of many business relationships in the Asian Pacific region. For instance, Thai businesspersons actively attempt to develop ties with well-known business and political leaders. However, the nature of the communication in such networks is affected by the status differences of the parties. This will also affect the degree to which there is reciprocity in their communications. The degree to which the communication is neither ongoing nor reciprocal could affect the degree to which it will directly impact the performance of the lower status person's firm.

East and Southeast Asian businesspersons tend to be extensively networked. However, it may be that the effort expended in being so extensively networked results in lower rates of return on these networks. Potential entrepreneurs and owners of small and medium sized businesses may be better served by extracting higher quantities of information from a more selective set of personal and business orientated networks.

More research is needed in this area. The key for researchers is to extend our efforts to identify those activities that can be most highly leverage to achieve higher levels of entrepreneurship and more directly impact firm performance. Another area for future research relates to the ongoing role of personal networks after a firm is established. The extent to which and the areas in which personal networks are valuable needs additional research. The key for practicing managers is to focus on those segments of their networks that provide the most essential information and to focus more on the quality rather than the quantity of network links.

This research also highlighted a number of methodological issues that need to be addressed. Networks using surveys suffers from a lack of highly specific items and a lack of precisely validated constructs with high degrees of reliability. More effort is needed in this area if theoretical advances are to be validated and explored empirically.

### Acknowledgment

We thank the two anonymous reviewers and Kulwant Singh for their comments, suggestions and patience.

### References

- Akira, S. (1989). *Capital Accumulation in Thailand: 1855–1985*. Tokyo: The Center for East Asian Studies.
- Aldrich, H. and C. Zimmer. (1986). "Entrepreneurship Through Social Networks." In D. Sexton and R. Smilor (eds.), *The Art and Science of Entrepreneurship*. Cambridge, MA: Ballinger Publishing Co.
- Aldrich, H., B. Rosen, and W. Woodward. (1987). "The Impact of Social Networks on Business Founding and Profit: A Longitudinal Study." In N. Churchill et al. (eds.), *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.
- Aldrich, H. and R. Waldinger. (1990a). "Trends in Ethnic Businesses in the United States." In R. Waldinger, H. Aldrich, and R. Ward (eds.), *Ethnic Entrepreneurs: Immigrant Businesses in Industrial Societies*. Newbury, CA: Sage.
- Aldrich, H. and R. Waldinger. (1990b). "Ethnicity and Entrepreneurship." *Annual Review of Sociology* 16, 111–135.
- Antonic, B. and R.D. Hisrich. (2001). "Intrepreneurship: Construct Refinement and Cross Cultural Validation." *Journal of Business Venturing* 16, 495–527.
- Arnold, D. (2000). "The Seven Rules of International Distribution." *Harvard Business Review* 78(6), 131–137.
- Arrow, K.J. (1962). "The Economic Implications of Learning by Doing." *Review of Economics and Statistics* 29, 115–173.
- Australian Department of Foreign Affairs and Trade. (1995). *Overseas Chinese Business Networks in Asia*. Canberra: Australian Government Printing Office.
- Bartlett, C.A. and S. Ghoshal. (1992). "What is a Global Manager?" *Harvard Business Review* 70(5), 124–132.
- Beckman, C.M. and P.R. Haunschild. (2002). "Network Learning: The Effects of Partners' Heterogeneity of Experience on Corporate Acquisitions." *Administrative Science Quarterly* 47, 92–124.
- Begley, T.M. (1995). "Using Founder Status, Age of Firm, and Company Growth Rate as the Basis for Distinguishing Entrepreneurs from Managers of Smaller Businesses." *Journal of Business Venturing* 10, 249–263.
- Bennett, R.J. and P.J. Robson. (1999). "The Use of External Business Advice by SMEs in Britain." *Entrepreneurship and Regional Development* 11, 155–180.
- Bhappu, A. (2000). "The Japanese Family: An Institutional Logic for Japanese Corporate Networks and Japanese Management." *Academy of Management Review* 25, 409–415.
- Birch, D., A. Haggerty, and W. Parsons. (1993). *Who's Creating Jobs?* Cambridge, MA: Cognetics.
- Birley, S. (1985). "The Role of Networks in the Entrepreneurial Process." *Journal of Business Venturing* 1, 107–117.
- Blundel, R. (2002). "Network Evolution and the Growth of Artisanal Firms: A Tale of Two Regional Cheese Makers." *Entrepreneurship and Regional Development* 14, 1–30.
- Bohm-Bawerk, E. von. (1884). *Kapital und Kapitalzins*. Innsbruck: Wagner.
- Boisot, M. and J. Childs. (1996). "From Fiefs to Clans and Network Capitalism: Explaining China's Emerging Economic Order." *Administrative Science Quarterly* 41, 600–628.
- Boissevain, J. (1974). *Friends of Friends: Networks, Manipulators and Coalitions*. New York: Free Press.
- Bonacich, E. and I. Light. (1988). *Immigrant Entrepreneurs*. Berkeley, CA: University of California Press.
- Borch, O. and M. Arthur. (1995). "Strategic Networks Among Small Firms: Implications for Strategy Research Methodology." *Journal of Management Studies* 32, 419–441.
- Brockhaus, R.H. and P.S. Horwitz. (1986). "The Psychology of the Entrepreneur." In D.L. Sexton and R.W. Smilor (eds.), *The Art and Science of Entrepreneurship*. Cambridge, MA: Ballinger.
- Brown, B. and J.E. Butler. (1993). "Networks and Entrepreneurial Development: The Shadow of Borders." *Entrepreneurship and Regional Development* 5, 101–116.
- Brown, B. and J.E. Butler. (1995). "Competitors as Allies: A Study of Entrepreneurial Networks in the U.S. Wine Industry." *Journal of Small Business Management* 33 (3), 57–66.
- Brown, T.E., P. Davidsson, and J. Wiklund. (2001). "An Operationalization of Stevenson's Conceptualization of Entrepreneurship as Opportunity-Based Firm Behavior." *Strategic Management Journal* 22, 953–968.
- Bryson, J., P. Wood, and D. Keeble. (1993). "Business Networks, Small Firm Flexibility and Regional Development in UK Business Services." *Entrepreneurship and Regional Development* 5, 265–277.
- Burt, R.S. (1992). *Structural Holes: The Social Structure of Competition*. Cambridge, MA: Harvard University Press.
- Butler, J.E. and W. Chamornmarn. (1995). "Entrepreneurial Characteristics: Reflections of a Changing Economy." *Chulalongkorn Journal of Economics* 7, 89–110.
- Butler, J.E. and G.S. Hansen. (1991). "Network Evolution, Entrepreneurial Success, and Regional Development." *Entrepreneurship and Regional Development* 3, 1–16.
- Cell, E. and S. Baines. (2000). "Networking, Entrepreneurship and Microbusiness Behaviour." *Entrepreneurship and Regional Development* 12, 195–215.
- Child, D. (1990). *The Essentials of Factor Analysis*. London: Casell.
- Cooper, A.C., R.B. Folta, and C. Woo. (1995). "Entrepreneurial Information Search." *Journal of Business Venturing* 10, 107–120.
- Cressy, R. (1992). "The Theory of the Opportunistic Entrepreneur." *Small Business Economics* 4, 267–271.
- Crombach, L.J. (1951). "Coefficient Alpha and the Internal Structure of Tests." *Psychometrika* 16, 297–334.
- Deeds, D.L. and C.W.L. Hill. (1999). "An Examination of Opportunistic Action within Research Alliances: Evidence from the Biotechnology Industry." *Journal of Business Venturing* 14, 141–163.
- Dess, G.G. and R.B. Robinson. (1984). "Measuring Organizational Performance in the Absence of Objective Measures: The Case of the Privately-Held Firms and Conglomerate Business Units." *Strategic Management Journal* 5, 265–273.

- Ding, C.H. (1970). "Sino-British Mercantile Relations in Singapore's Entrepot Trade 1870-1915." In J. Chen and N. Tarling (eds.), *Studies in the Social History of China and South-East Asia*. Cambridge: Cambridge University Press.
- Jodd, S.D. and E. Patra. (2002). "National Differences in Entrepreneurial Networking." *Entrepreneurship & Regional Development* 14, 117-134.
- Donckels, R. and J. Lambrecht. (1995). "Networks and Small Business Growth: An Explanatory Model." *Small Business Economics* 7, 273-289.
- Jubini, P. and H. Aldrich. (1991). "Personal and Extended Networks are Central to the Entrepreneurial Process." *Journal of Business Venturing* 6, 305-313.
- Lloyd, S.W. and B. Wooldridge. (1999). "Knowledge Creation and Social Networks in Corporate Entrepreneurship: The Renewal of Organizational Capability." *Entrepreneurship Theory and Practice* 23(3), 123-143.
- Jaglio, C.M. (1997). *The Entrepreneurial Opportunity Identification Process*. Chicago, IL: University of Chicago (Unpublished Doctoral Dissertation).
- Garfoli, C. (1994). "New Firm Development and Regional Development: The Italian Case." *Regional Studies* 28, 381-393.
- Gartner, W.B. (1988). "Who is an 'Entrepreneur?' is the Wrong Question." *American Journal of Small Business* 12, 11-32.
- George, G., D.R. Wood Jr., and R. Kahn. (2001). "Network Strategy of Boards: Implications for Small and Medium Sized Enterprises." *Entrepreneurship and Regional Development* 13, 269-285.
- Gorsuch, R.L. (1983). *Factor Analysis*. Hillsdale, NJ: Lawrence Erlbaum.
- Granovetter, M. (1973). "The Strength of Weak Ties." *American Journal of Sociology* 78, 1360-1380.
- Granovetter, M. (1982). "The Strength of Weak Ties: A Network Theory Revisited." In P.V. Marsden and N. Lin (eds.), *Social Structure and Network Analysis*. Beverly Hills, CA: Sage.
- Granovetter, M. (1985). "Economic Action and Social Structure: A Theory of Embeddedness." *American Journal of Sociology* 91, 481-510.
- Greve, A. (1995). "Networks and Entrepreneurs: An Analysis of Social Relations, Occupational Background and Use of Contacts During the Establishment Process." *Scandinavian Journal of Management* 11, 1-24.
- Hamilton, G.G. (1991). *Business Networks and Economic Development in East and Southeast Asia*. Hong Kong: University of Hong Kong Press.
- Hansen, E.L.W. (1995). "Entrepreneurial Networks and New Organization Growth." *Entrepreneurship Theory and Practice* 19(4), 7-19.
- Heracleous, L. and J. Murray. (2001). "Networks, Interlocking Directors and Strategy: Towards a Theoretical Framework." *Asia Pacific Journal of Management* 18, 137-160.
- Hillman, A., A. Cannella, and R. Paetzold. (2000). "The Resource Dependence Role of Corporate Directors: Strategic Adaptation of Board Composition in Response to Environmental Change." *Journal of Management Studies* 37, 223-255.
- Huggins, R. (2000). "The Success and Failure of Policy-Implanted Inter-Firm Network Initiatives: Motivations, Processes and Structure." *Entrepreneurship & Regional Development* 12, 111-135.
- Ingram, J.C. (1971). *Economic Change in Thailand, 1850-1970*. Stanford, CA: Stanford University Press.
- Izushi, H. (1997). "Conflict Between Two Industrial Networks: Technological Adaptation and Inter-Firm Relationship in the Ceramics Industry in Seto, Japan." *Regional Studies* 31, 117-129.
- Jarillo, J.C. (1989). "Entrepreneurship and Growth: The Strategic Use of External Resources." *Journal of Business Venturing* 4, 133-147.
- Jarillo, J.C. (1993). *Strategic Networks: Creating the Borderless Organization*. Oxford: Butterworth-Heinemann Ltd.
- Johannisson, B. (1992). "Entrepreneurship-The management of Ambiguity." In T. Polesie and I.L. Johansson (eds.), *Responsibility and Accounting*. Lund, Sweden: Studentlitteratur.
- Johannisson, B. (1998). "Personal Networks in Emerging Knowledge-Based Firms: Spatial and Functional Patterns." *Entrepreneurship & Regional Development* 10, 297-312.
- Johannisson, B. (2000). "Networking and Entrepreneurial Growth." In D.L. Sexton and H. Landström (eds.), *Handbook of Entrepreneurship*. Oxford: Blackwell.
- Jones, C., W.S. Hesterly, and S.P. Borgatti. (1997). "A General Theory of Network Governance: Exchange Conditions and Social Mechanisms." *Academy of Management Review* 22, 911-945.
- Kazanjan, R.K. (1988). "Relation of Dominant Problems to Stage of Growth in Technology-Based New Ventures." *Academy of Management Journal* 31, 257-279.
- Kenis, P. and D. Knoke. (2002). "How Organizational Field Networks Shape Interorganizational Tie Formation." *Academy of Management Review* 27, 275-293.
- Kirzner, I.M. (1973). *Competition and Entrepreneurship*. Chicago: The University of Chicago Press.
- Kirzner, I.M. (1979). *Perception, Opportunity and Profit: Studies in the Theory of Entrepreneurship*. Chicago: The University of Chicago Press.
- Kline, P. (1994). *An Easy Guide to Factor Analysis*. London: Routledge.
- Krackhardt, D. and R. Stern. (1988). "Informal Networks and Organizational Crisis: An Empirical Simulation." *Social Psychology Quarterly* 51, 123-140.
- Larson, A. (1992). "Network Dyads in Entrepreneurial Settings: A Study of Governance of Exchange Relationships." *Administrative Science Quarterly* 37, 76-104.
- Larson, A. and J.A. Starr. (1993). "A Network Model of Organization Formation." *Entrepreneurship Theory and Practice* 17, 5-15.
- Leonidou, L.C. and C.S. Katsikeas. (1996). "The Export Development Process: An Integrative View of the Literature." *Journal of International Business Studies* 27, 527-551.
- Light, I. (1972). *Ethnic Enterprise in America*. Berkeley, CA: University of California Press.
- Lincoln, J.R., M.L. Gerlach, and C.L. Ahmadjian. (1996). "Keiretsu Networks and Corporate Performance in Japan." *American Sociological Review* 61, 67-88.
- Margretta, J. (1998). "Fast, Global and Entrepreneurial: Supply Chain Management Hong Kong Style." *Harvard Business Review* 76(5), 102-114.
- McGrath, R.G. and I. MacMillan. (2000). *The Entrepreneurial Mindset*. Boston: Harvard Business School Press.
- Menger, C. (1871). *Grundsätze der Volkswirtschaftslehre*. Vienna: W. Braumüller.
- Misra, S. and E.S. Rumar. (2000). "Resourcefulness: A Proximal Conceptualization of Entrepreneurial Behavior." *Journal of Entrepreneurship* 9, 135-154.
- Myers, R. (1990). *Classical and Modern Regression with Applications*. Boston: Duxbury Press.
- Nam, Y.H. (2000). "The Role of Incubator Organizations in Hi-Tech Venture Creation in Korea." *Asia Pacific Journal of Management* 17, 277-296.
- Neter, J., W. Wasserman, and M.H. Katner. (1985). *Applied Linear Statistical Models*. Homewood, IL: Irwin.
- Nunnally, J.C. (1978). *Psychometric Theory*. New York: McGraw Hill.
- Nunnally, J.C. and H. Bernstein. (1994). *Psychometric Theory*. New York: McGraw-Hill.
- Ostgaard, T. and S. Birley. (1996). "New Venture Growth and Personal Networks." *Journal of Business Research* 36, 37-50.
- Oviatt, B.M. and P.P. McDougall. (1994). "Towards a Theory of International New Ventures." *Journal of International Business Studies* 25(1), 45-64.
- Powell, J.J. and J.P. Bradford. (2000). "Targeting Intelligence Gathering in a Dynamic Competitive Environment." *International Journal of Information Management* 20, 181-196.
- Reynolds, P.D. (1991). "Sociology and Entrepreneurship: Concepts and Contributions." *Entrepreneurship Theory and Practice* 16, 47-70.
- Russell, R.D. (1999). "Developing a Process Model of Intrepreneurial Systems: A Cognitive Mapping Approach." *Entrepreneurship Theory and Practice* 23(3), 65-84.
- Shackle, G.S.L. (1979). "Imagination, Formalism, and Choice." In M.R. Rizzo (ed.), *Time, Uncertainty and Disequilibrium: Exploration in Austrian Themes*. Toronto: Lexington Books.
- Staber, U. and H. Aldrich. (1995). "Cross-National Similarities in the Personal Networks of Small Business Owners: A Comparison of Two Regions in North America." *Canadian Journal of Sociology* 20, 441-467.
- Starr, J.R. and I.C. MacMillan. (1990). "Resource Cooptation Via Social Contracting: Resource Acquisition Strategies for New Ventures." *Strategic Management Journal* 11(Summer), 79-92.
- Sweeting, R. (1995). "Competition, Co-Operation and Changing the Manufacturing Infrastructure." *Regional Studies* 29, 87-94.
- Taylor, M. (1999). "The Small Firm as a Temporary Coalition." *Entrepreneurship & Regional Development* 11, 1-20.
- Venkatraman, N. and J. Ramanujam. (1986). "Measurement of Business Performance in Strategy Research: A Comparison of Approaches." *Academy of Management Review* 11, 801-814.

- Vesper, K.H. (1980). *New Venture Strategies*. Englewood Cliffs, NJ: Prentice-Hall.
- Wasserman, S. and K. Faust. (1994). *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.
- Zaheer, A. and S. Zaheer. (1997). "Catching the Wave: Alertness, Responsiveness, and Market Influence in Global Electronic Networks." *Management Science* 43, 1493-1509.
- Zajac, E.J. and J.D. Westphal. (1996). "Director Reputation, CEO-Board Power, and the Dynamics of Board Interlocks." *Administrative Science Quarterly* 41, 507-529.

**John Butler** is a Professor of Management at The Hong Kong Polytechnic University. He received his Ph.D. from New York University. He has served as the managerial columnist for "The Nation" since 1992 and is Editor of "Entrepreneurship Theory and Practice" and the monograph series "Research in Entrepreneurship and Management." His current research interests are in the area of entrepreneurial networks, entrepreneurial succession, and entrepreneurship in South East Asia.

**Brad Brown** is an Associate Professor at the McIntire School of Commerce, at the University of Virginia. He received his Ph.D. degree from the University of Washington. His current research is in entrepreneurial network organizations and corporate social responsibility, particularly regarding human rights auditing in factories around the world. He has teaching and research experience in Vietnam, and on the editorial boards of *Corporate Reputation Review* and *Multinational Business Review*.

**Wai Chamornmarn** is an Associate Professor of Human Resources and Organization Management, Faculty of Commerce and Accountancy, Thammasat University, Bangkok, Thailand. He is a doctoral candidate at Kyoto University, Japan. He has served as the Associate Director of the Institute of East Asian Studies and his research interests are in the area of entrepreneurship, management values, technological innovation, and the historical development of entrepreneurs and entrepreneurial behavior in Thailand.