

Local Network Relationships and the Internationalization of Small Knowledge-Intensive Firms

SHAMEEN PRASHANTHAM

Abstract

This paper discusses the role of network relationships in the internationalization of small knowledge-intensive firms (SKIFs) by highlighting their local, spatially concentrated network relationships, which can serve as a significant local resource. Little is known in this regard with respect to a developing economy context. Primarily on the basis of a study of four case-firms in the Bangalore software industry and available secondary data, two issues are dealt with: (a) how local network relationships – such as those within clusters or industrial districts – are developed and (b) the impact that these relationships have on the internationalization of SKIFs, specifically in respect to enhancing international competitiveness. Three effects of local network relationships on the internationalization of SKIFs, viz., reputation-related, quality-related and networking benefits, are noted. However, it also emerged from follow-up interviews with local academic experts that these benefits may be passively rather than actively accrued, suggesting that some valuable local resources may be overlooked or wasted.

Introduction

Asian firms are renowned for their effective networking capacities (Chen 2003; Redding 1995). In the context of small firm internationalization, a case of special interest to scholars has been the small knowledge-intensive firm (SKIF),¹ which is similarly noted for its leveraging of network relationships, often leading to accelerated internationalization (Coviello and Munro 1997). Combining these two observations, it would seem likely that Asian SKIFs constitute a fascinating subject for the study of networking dynamics, especially in the context of internationalization. That network relationships constitute a key driver of the internationalization of SKIFs seems consistent with the nature of such firms; their propensity for innovation and their resource-poverty leading to active leverage of network relationships (Prashantham and Berry 2004). These relationships may be based locally (Porter 1998) or overseas (Johanson

and Mattsson 1988). Surprisingly little is known about the former; in the context of internationalization; the focus of most network-based studies is on the latter.

Recent work, however, suggests that local, spatially concentrated network relationships, such as those within a regional cluster, lead to positive externalities that facilitate SKIFs' market-seeking internationalization (Brown and Bell 2001; Brown and McNaughton 2003) to a greater extent than in less geographically concentrated industries (Fernhaber *et al.* 2003). These studies, like much of the literature on SKIF internationalization, are based on developed economy contexts; little information has been garnered with respect to developing countries. Yet improving extant understanding of the latter context seems a worthwhile endeavour, given that many developing countries are seeking to develop globally competitive firms, especially in Asia (Zeng and Williamson 2003). In such a setting, cultural and economic factors make external relationships a significant source of new information and know-how for local firms, and therefore a resource for enhancing international competitiveness (Zhou and Xin 2003). This paper offers a preliminary step toward exploring a developing economy context in Asia, by shedding light on how small Indian software firms benefit from their local network relationships, as they pursue international business.

Thus the fundamental research question that this paper seeks to address is: *How do local network relationships influence the market-seeking² internationalization of SKIFs in a developing economy context?* One difficulty in dealing with this topic stems from the relative dearth of dynamic, knowledge-intensive clusters in developing countries. Research was therefore undertaken in the Bangalore software industry, which proves to be a notable exception in this regard (Dunning 2000). Four case-firms were studied; this exercise was supplemented by expert interviews and available secondary data.

This paper contributes to extant literature by providing a fresh perspective on the role of clusters in small firm internationalization, viz., access to local network relationships with foreign connections, such as with multinational subsidiaries situated within clusters (Birkinshaw and Hood 2000). It also lends its voice to prevailing warnings in the literature that clusters do not always have exclusively positive effects on constituent firms and that cluster-related benefits cannot be guaranteed, nor can they be assumed to exist. Furthermore, drawing on the Asian character of the sample studied, the paper makes the point that Western notions of proximity must be tempered with socio-cultural considerations such

as the role of ethnic ties overseas, when examining the internationalization of specifically Asian entrepreneurial firms.

The paper is structured as follows: the next section examines some of the literature on clusters, a concept closely related to local network relationships and resources. The subsequent section briefly discusses the Bangalore software industry, and provides a discussion of the views of entrepreneurs and experts in Bangalore about the impact of location on SKIF internationalization. The final section draws some conclusions and implications for academics, practitioners and policy-makers moving forward.

The Role of Local Network Relationships in Internationalization

A relevant strand of the literature in the context of local, geographically concentrated relationships is one that deals with clusters. One of the better-known definitions is that of Porter: '*A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities*' (Porter 1998: 199). Enright (2000) has distinguished between two models of cluster-based development – one where clusters provide the opportunity for firms to develop locally and then compete internationally (see, for example, Porter 1990) and the other model where peripheral regions seek to foster clusters and thereby develop the local economy (as discussed in, for example, Peters and Hood 2000). The cluster phenomenon has been generally ascribed to developed economy contexts; there appear to be few robust, knowledge-intensive clusters in developing economies (Porter 1998).³

Geographic proximity among firms can reinforce trust, enhance inter-firm cooperation and facilitate the transfer of tacit knowledge (Malmberg *et al.* 1996). Clusters therefore yield potential network relationships⁴ that are local and spatially concentrated to firms located within them, in the form of suppliers, customers, government agencies, MNC subsidiaries and even competitors (Birkinshaw and Hood 1998; Porter 1990). Related concepts in the literature include that of 'industrial district' and 'national innovative capacity'. A definition of the former is 'local clusters of numerous, mostly small enterprises which alternately compete and cooperate with one another and specialize in particular aspects and phases of production' (Staber 1998: 701); by virtue of this definition the discussion in this paper pertains both to clusters and industrial districts interchangeably. National innovative capacity is clearly a different concept

however, and encompasses a strong common innovation infrastructure, innovative industrial clusters, and robust linkages between these two elements (Furman *et al.* 2002). The spatial concentration of firms does not automatically guarantee a strong innovative capacity.

Clusters emerge for a variety of reasons that span a continuum with serendipity at one end and purely deliberate action – of the public and/or private sectors – at the other. In other words, it is often a combination of serendipitous and deliberate actions and events that lead to the existence of clusters. Determinants of clusters include economies of scale, transport costs, search and transaction costs, innovation, cooperation, knowledge spill-overs and uncertainty (Hoen 2001). Enright (1998) identifies the presence of unique natural resources, economies of scale, specialized labour, local suppliers and infrastructure as economic rationales for clusters. In this context, Balasubramanyam and Balasubramanyam (2000) emphasize educational institutions that produce trained technical labour, state support through tax incentives and subsidies, favourable living conditions, venture capital availability and linkages, both forward and backward. Based on the Porterian notion of clusters (Porter 1990, 1998), the following factors are seen to foster the development of clusters: inherited factors, geography, climate, entrepreneurship, research and educational institutions, regional economy composition, public sector actions and private sector actions. This framework will underpin the discussion of the Bangalore software industry later in the paper.

Extant literature on the role of clusters in firms' internationalization is at a nascent stage. A notable exception is a study by Brown and Bell (2001), which indicates that clusters may influence the internationalization of SKIFs (SKIFs) through marketing externalities such as, for example, intra-cluster referrals, credibility and reputation, informational spill-overs, and active joint marketing. Brown and McNaughton (2003) suggest that while the original location of a cluster may have been accidental/fortuitous rather than rational or deliberative, younger firms often locate in such clusters to benefit from the ensuing externalities. Also, Fernhaber *et al.* (2003) have recently demonstrated that SKIFs based within clusters internationalize to a greater extent than their counterparts that are not based in geographically concentrated industries. Thus clusters can be especially useful by providing external, regional relationships (Almeida 1999; Saxenian 1990) that can compensate for resources it lacks (McNamee *et al.* 2000), as well as facilitate knowledge-building and innovation (Almeida 1999; Audretsch and Feldman 1996; Shaver and Flyer 2000).

In fact, it is suggested that the very nature of innovation (Malmberg *et al.* 1996), which is facilitated by information flow (Enright 1998), causes technological activity to be locally confined. As a consequence, over time, sources of competitive advantage emerge that are highly localized in nature (Berry and Taggart 1994; Enright 1999; Porter 1990, 1998). Reiterating this, Cantwell and Iammarina (2001: 1007) state that 'innovative activity turns out to be spatially concentrated, and this can mainly be attributed to the benefits that stem from a specific case of agglomeration economies, i.e. knowledge externalities or spillovers'. Berry and Taggart (1994: 351) point out that 'technology development remains confined to local clusters of innovation in a variety of global locations'. Consequently, international networks often tap into the local milieu of clusters⁵ (Todtling 1994), as evident when strategic asset-seeking MNC subsidiaries locate within clusters (Birkinshaw and Hood 2000).

Building upon the foregoing discussion, three potential benefits of being based within a cluster, for the internationalization of SKIFs, can be identified. First, a key benefit of location within a milieu of innovation is *reputation*. Reputation enhances the prospect of a firm within that region being perceived as being competent, and this resource resides outside a firm's boundaries within the collective network resources. When this reputation becomes international, it enhances the possibility of (a) unsolicited orders coming the way of firms within the cluster and (b) a positive disposition towards a firm from the cluster that proactively seeks business from a prospective foreign customer (Karagozoglou and Lindell 1998). Second, another key benefit pertains to an *enhancement of quality*; this is distinguished from the perception of quality that comes from reputation, previously discussed. An important determinant of quality is the access to specialized resources, including manpower (Saxenian 1990), suppliers and support services (Lorenzoni and Ornati 1988; Pouder and St John 1996; Shaver and Flyer 2000) that a cluster typically affords its constituent firms. Third, SKIFs enjoy *access to local network relationships with useful international links*. Access to multinational subsidiaries that locate within a cluster (Birkinshaw and Hood 2000), for instance, provides an opportunity to SKIFs for collaboration (Enright 2000), which has the potential to lead to international business opportunities.

To elaborate further on the third point above, the paradoxical notion that local network relationships – such as with multinational subsidiaries or internationalized domestic firms – could provide useful access to foreign markets is perhaps the most interesting consideration and constitutes the essential focus of the paper. Brown and Bell (2001) have

already indicated that local network relationships can, when leveraged appropriately, lead to joint efforts that are synergistically efficient. This paper offers an additional perspective, viz., access within clusters to international firms, both MNC subsidiaries (Birkinshaw and Hood 2000) and internationalized indigenous firms (Fernhaber *et al.* 2003) to facilitate small firm internationalization. Furthermore, dynamic clusters in Asia are likely to attract investment from ethnic entrepreneurial firms (e.g., based in the US) who may wish to invest in their homeland (Saxenian 2002). Potentially SKIFs could develop ties with such firms and benefit from their foreign links, through business opportunities (including links to their customer bases), trade leads/referrals and advice (Prashantham 2004); this notion has certain normative and policy-related implications as discussed in the concluding section. The next section discusses this paper's methodological approach.

Methodology

Two broad questions are broached in this paper:

1. **How are systems of local network relationships built?** This is addressed by highlighting the development of the Bangalore software cluster, largely based on ten in-depth interviews with experts and available secondary data.
2. **How do these local network relationships influence SKIF internationalization?** This question is addressed by synthesizing the views expressed by the CEOs of four case-firms, supplemented by the views of the experts. The findings are presented in the next section. This section provides further information on the selection of the four case-firms and the research methodology employed.

In March 2002, four case-studies of small software firms (Eisenhardt 1989, Yin 1994) were undertaken in Bangalore using the in-depth interviewing technique, which was deemed appropriate for this type of research (Easterby-Smith *et al.* 1991). In-depth interviews, ranging in duration from 60 to 120 minutes, were conducted with the four software entrepreneurs. An interview guide was followed to ensure consistency in the issues raised with each of the entrepreneurs. The main issues discussed were:

- the development and nature of local networks within the Bangalore software industry;
- the process of internationalization of SKIFs in Bangalore; and
- the perceptions of the role played by location in Bangalore to local SKIFs' internationalization.

The selection of the four entrepreneurs was based on two variables: (a) the age of their firm and (b) the current extent of their firm's internationalization. Firms that were founded six or more years before the interview were deemed to be old⁶ (Zahra *et al.* 2000) and firms with greater than 50 percent of their revenues accruing from overseas were deemed as highly international. Each of the four entrepreneurs interviewed fall under different categories in relation to the two stated variables of firm age and internationalization; in other words, a representative cross-section was achieved by interviewing:

- An entrepreneur of an old, highly internationalized firm
- An entrepreneur of an old, less internationalized firm
- An entrepreneur of a young, highly internationalized firm
- An entrepreneur of a young, less internationalized firm.

The four case-studies were then supplemented by in-depth interviews with ten experts who closely monitor the progress of the local software industry in their respective roles as academics (three), consultants (two) and managers (five).⁷ A similar approach (interview guide; approximately 90 minutes' duration) as in the case of the CEOs was adopted. The purpose of these interviews was to elicit the experts' views on the development and trends in the Bangalore software industry; the main issue discussed was the role they perceived the Bangalore cluster to play in the internationalization of local SKIFs. The next section presents the findings of the study.

TABLE 1: Sample of Four Small Indian Software Firms

		Level of Internationalization	
		Low (<50% export intensity)	High (>50% export intensity)
Firm Age	Young (< 6 years)	Mitoken	New Creation
	Old (>= 6 years)	Vikas	Ekomate

Source: Author

Role of Bangalore's Local Network Relationships in SKIF Internationalization

As noted, the literature is dominated with examples of dynamic clusters from developed (rather than developing) economy contexts. A significant exception is the Bangalore software industry (Balasubramanyam

and Balasubramanyam 2000; Dunning 2000; Nadvi 1995), which could serve as an exemplar for developing economies wishing to facilitate the emergence of competitive, knowledge-intensive industries and firms. The Bangalore software industry is discussed below based on the interviews conducted and available secondary data.

Inherited Factors

One view that was expressed more than once by respondents is that Bangalore's software industry emerged quite by accident, facilitated by historical factors. At the time of national independence (August 1947), a strategic decision was taken to locate certain key entities away from the nation's capital of New Delhi owing to its proximity to two potentially hostile neighbours – China and Pakistan. Thus Bangalore, a city located centrally within the South Indian peninsula and with an established military presence from the days of British rule, was chosen as the location of such vital public sector undertakings as Hindustan Aeronautical Limited and National Aeronautical Limited (Balasubramanyam and Balasubramanyam 2000). Additionally, the Indian Institute of Science was established in Bangalore and these corporations and educational institutions attracted technical talent from across the country. This pool of talent was arguably the forerunner to the relatively abundant (yet not necessarily sufficient; see Merchant 2001) supply of software professionals now available in Bangalore, which was tapped into by global players such as Texas Instruments and Motorola, when they set up offices in Bangalore during the early 1990s (Ramamurthi 2004).

Geography

As discussed above, the militarily 'safe' location of Bangalore induced the location of certain strategic, defence-related organizations there.

Climate

Bangalore has a mild climate compared to other major cities in Southern India which is, at best, a minor incentive for software professionals to settle there as well as for international executives to base themselves there when required. Climate, in general however, has little bearing on the software industry (Balasubramanyam and Balasubramanyam 2000).

Entrepreneurship

This, arguably, is of vital importance in relation to Bangalore. The greatest impact of the Indian software industry on the rest of the nation is arguably as a model in terms of how entrepreneurship – and business management in general – can be a success. In a largely risk-averse part of the country,

software entrepreneurs have demonstrated great enterprise and won the respect of fellow practitioners, the media, the government and the public at large (Arora *et al.* 2001). Doyens of the Indian software industry – who are mostly Bangalore-based – such as Mr N. R. Narayana Murthy of Infosys and Mr Azim Premji of Wipro – are popular speakers at top industry forums and business school convocations. Their esteem has indeed been hard-won, through innovatively attracting talent (such as through equity-sharing schemes, a novelty for India) and building processes of the highest quality (over half of the world's most stringently followed software quality management systems can be found in India-based companies, the majority of which are Bangalore-based). These success stories have been an inspiration for others to follow and have helped in stemming the perennial problem of the 'brain drain', whereby the best talent had a tendency to emigrate, especially to the US (Saxenian 2000, 2002).

Research and Educational Institutions

As discussed previously, the early establishment of the prestigious and highly capable Indian Institute of Science gave an impetus to technical development in Bangalore. While several hundreds of engineering colleges have also emerged, of vital significance are a couple of other centres of excellence which, though not purely technical, have fostered the availability of local talent. These are the Indian Institute of Management and the more recently established Indian Institute of Information Technology (Ramamurthi 2004; Saxenian 2000).

Regional Economy Composition

In terms of regional economy, there has really not been much else preceding the 'software boom' apart from the almost accidental location of aeronautical and related organizations in the region, as discussed. As such, the regional economy cannot be said to have greatly influenced the development of the software industry (Balasubramanyam and Balasubramanyam 2000).

Public Sector Actions

There are some who would argue that the Indian government's greatest contribution to the software industry lies in its benign neglect of it for so many years (Arora *et al.* 2001)! This apparently uncharitable view suggests that in India, governmental intervention has not been always perceived to be conducive to private enterprise. Further, infrastructural shortcomings act as impediments for the software and other industries, and the benefits of technology have not percolated down to the masses

of private citizens (Donald 2001a, 2001b). It may be noted, however, that indirect effects of public policy – including an unmistakable element of protectionism and an emphasis on self-reliance – have resulted in the development of indigenous software firms. More recently, however, the government has sought to play a key role by transforming the Department of Electronics (DoE) into the Ministry of Information Technology (MIT) under an able member of the Cabinet, and setting up Software Technology Parks. However this is recent and as such it is private rather than public sector initiatives that account for the growth of the software industry in Bangalore (Ramamurthi 2004).

Private Sector Actions

Some of the most vital private sector actions that facilitated the growth of Bangalore came from foreign players: Texas Instruments and Motorola are often cited as pioneers in this area. Initially seeking low-end coding work to be handled out of their low-cost Indian bases, more and more multinational companies have set up development centres with an ever-growing mandate in terms of the quality of work required (Ramamurthi 2004). One company from Austin, Texas, is rumoured to be paying their Indian professionals in Bangalore the same salaries as their professionals in the US. Such examples, however, are few and far between, and at this stage cost advantage continues to be a major attraction for foreign firms wishing to outsource labour-intensive parts of their businesses. In addition to the multinationals, Indian firms have also made a significant contribution to developing the software industry. As mentioned already, the most successful firms and their business leaders have emerged as national heroes. Many of them have gained from international networks – primarily involving Indian software professionals and entrepreneurs based in Silicon Valley (Luce 2001). In fact, it is said that one in every three Silicon Valley start-ups was founded or co-founded by an Indian (Murdoch 2000). A vital player in the Indian private sector initiative is the National Association for Software Service Companies (Nasscom), the key industry body that has taken a strong role both in terms of lobbying the government and in representing the Indian software industry abroad in forums such as trade fairs (Arora *et al.* 2001).

The preceding discussion has sought to identify various factors that have led to the emergence of a system of local network relationships, i.e., a dynamic cluster, in Bangalore. As seen, these factors are a combination of fortuitous circumstances (some historically based) and deliberate public or private sector action. The discussion now turns to the role of local network relationships in the internationalization process, through a

discussion of perceived benefits by the four case-firms that were studied in the Bangalore software industry.

The findings from the four case-studies conducted in Bangalore suggest a perception of certain benefits accruing from being Bangalore-based, which in turn facilitates internationalization – this is a view supported by the received literature. The specific situations of the four firms varied greatly in terms of their origin, domain of expertise and endowment of local network relationships. The following is a brief account of the four firms with respect to their local network relationships:

- **Ekomate** was started in 1996 by a software engineer returning to India following postgraduate study at the University of Texas. His father was also an entrepreneur, albeit in a traditional industry sector, but this has meant strong local business networks. A noticeable effect of this has been the appointment in 2002 of a senior executive at a large software firm as the company's Chief Mentor; this was a direct consequence of the entrepreneur's (and his father's) local social networks. This Chief Mentor has been influential in bolstering internationalization efforts and has provided useful foreign contacts of his own. Additionally, Ekomate has benefited from unsolicited business from the UK, which the entrepreneur perceives to be partially a consequence of Bangalore's reputation effects with respect to software development.
- **Mitoken** is a unique company in that it was spun-off from the Bangalore subsidiary of Motorola, to commercialize technology developed by the CEO and his team of three other directors while they were engineers at Motorola. Thus, in a sense, Mitoken was incubated by a multinational subsidiary. As all four managers hold qualifications from prestigious Indian and American engineering and business schools, there currently exist widespread networks both locally and overseas. Further, as a corporate sponsor, Motorola provides strong network ties in India and potentially abroad. Such a wealth of relationships has meant that Mitoken has adopted a global mindset from inception, although at the time of the interview all business was domestic. This was, however, a deliberate strategy to first perfect the technology with initial customers at home before venturing abroad. Thus local network relationships with customers were clearly being utilized, albeit indirectly, in the context of internationalization.
- **New Creation**, like Ekomate, was started by an Indian software engineer trained in the US. However this individual subsequently

spent nearly a decade overseas as a software professional and consequently, when he returned to India, he found himself being far better endowed with foreign than local network relationships. To maximize this advantage, he has sought to focus primarily on international markets, specifically the US.

- **Vikas** presents the mirror image of New Creation in the sense that its entrepreneur was locally trained with strong local network relationships, but lacked – at least initially – foreign connections. Consequently, this entrepreneur has always focused strongly on the domestic market; international business has come almost fortuitously and appears to be of relatively less importance in comparison with Ekamate or Mitoken. However, when he had the opportunity to serve foreign markets, he found that he was well placed to do so because of what he perceives as strong infrastructure in Bangalore, relative to other cities of India. Further, he believes that the likelihood of receiving unsolicited international business is higher in Bangalore than in other Indian cities.

The above-mentioned entrepreneurs clearly exhibit different levels of network relationships and utilization of the same. Endowment of these network relationships seems to be largely entrepreneur-driven; further, the entrepreneur's education and prior work experience appear to determine their access to such connections. In terms of utilization or leverage, it appears to be the firms with a clear global mindset who leverage local network relationships, directly or indirectly, with a view to enhancing international competitiveness, thereby facilitating internationalization. Collectively, the four entrepreneurs' views regarding the benefits derived from local network relationships resonate with the literature, as briefly discussed below.

First, with respect to reputation, the esteem of the 'Bangalore' brand was a recurring theme in the interviews. Especially with international customers, having Bangalore as their address 'makes the job of marketing much easier', in the words of one software entrepreneur. This was particularly the case when certain software 'booms' existed, such as the demand for software to help clients overseas deal with the Y2K problem – apparently Bangalore was the first stop for many international customers. This is interesting because Bangalore does not boast a significantly larger number of firms than some other regions; in fact, some statistics (Arora *et al.* 2001) suggest that Bangalore had fewer software firms than the National Capital Region (Delhi and surrounding suburbs). Thus, Bangalore has clearly achieved an enviable reputation for its software

industry *vis-à-vis* other Indian cities, and this – as has been discussed in the previous section – has emerged over time as the consequence of a combination of serendipity, entrepreneurial successes and policy efforts. One respondent's first international business contract was the result of a British businessman watching a television programme in the UK on the Bangalore software industry, which led him to seek out a Bangalore-based software firm through the Internet. Good reputation led to unsolicited orders for another SKIF as well, this time from Australia. The business from Australia was particularly significant for this firm as it did not otherwise have ready access to foreign network relationships as the entrepreneur had neither worked nor studied overseas. These findings support Brown and Bell's (2001) thesis that clusters lead to externalities such as credibility and reputation.

Second, in relation to quality, a perceived effect of the Bangalore software industry on SKIFs' international competitiveness pertains to support services and infrastructure, which enabled firms to maintain a high level of quality in their offerings. The high standard of quality maintained by Bangalore-based software firms is evident from the fact that approximately half of the world's software companies with the highest international quality ratings⁸ are based in Bangalore (Arora *et al.* 2001). One entrepreneur commented on the ease with which instructions can be given to architects, office equipment suppliers and plumbers who are well acquainted with the requirements of a typical software office. Reputedly, this level of support service cannot be easily found in other upcoming software centres in India. Related to this locational advantage is that of access to computing and communication facilities. The resultant remote electronic access to distant clients is critical to SKIFs' international business activities, especially when they provide real-time service to a customer in, for instance, North America or Europe. In terms of infrastructure, Bangalore City has made noticeable efforts in terms of drainage, cleanliness and garbage disposal, and improvement of roads; furthermore, a new international airport is being built. Specifically in relation to internationalization, the presence of suitable infrastructure enhances the confidence of prospective international clients and also attracts foreign players to set up a presence in Bangalore, which could bring with it additional internationalization opportunities for local firms with whom network relationships are formed. One of the respondents was able to gain access in Bangalore to a new type of entity in the Indian software industry – viz., the business development contractor – who would canvass for international business for a set of

non-competing clients. Once again, this finding is consistent with the literature (Saxenian 1990).

Third, with regard to cultivating foreign network relationships, it was mentioned during the interviews that networking – albeit primarily informal networking – within the software industry was a useful consequence of being located in Bangalore, and this supports the findings in the extant literature (e.g., Almeida 1999). The opportunities of meeting other entrepreneurs in similar situations are considerable in Bangalore. A few entrepreneurs listed the types of benefits that can accrue from such networking, include effective recruitment, lead generation and general sharing of insights and experiences. Two forums where software entrepreneurs meet were mentioned: one was The Indus Entrepreneurs (TiE) forum, spearheaded by Silicon Valley-based Indian entrepreneurs and the other was the Confederation of Indian Industry (CII) Information Technology panel. Caution must be applied here, however, as such networking can prove to be as much of a problem for entrepreneurs as an opportunity when, for instance, rivals 'poach' good employees from each other. Also, cooperation and sharing of insights may often be superficial and rather basic, given the obsession for confidentiality and secrecy among Bangalore-based software firms. This is consistent with concerns in the literature that the effects of social networks in general (Granovetter 1973) and clusters in particular (Porter 1998) may not be entirely positive.

Furthermore, the follow-up expert interviews indicated that the benefits accruing from being based within the Bangalore software cluster were often passive rather than active, with little evidence of collaborative marketing efforts or strong inter-linkages to the rest of the economy. This is a cause for concern as it could imply that key local resources are being overlooked and wasted. In the literature, proactive strategies are associated with successful or success-seeking firms (Liao *et al.* 2003) and regions (Beals *et al.* 1995). Asian managers have been found to adopt reactive rather than proactive strategies when faced with an environment that is perceived as hostile or non-conducive to their business (Tan and Litschert 1994). However, this does not generally seem to be the case either with Bangalore locally or the global technology markets that Bangalore-based software firms have traditionally served. Thus there are clear warning bells from the experts for SKIFs in Bangalore that mere proximity to important local network relationships is not enough (Martin and Sunley 2003; Romjin and Albu 2002).

Finally, it must be borne in mind that the importance of proximity to other actors within a cluster or innovative milieu as emphasized in the

TABLE 2: Findings from the Four Case Firms

	Ekomate	Mitoken	New Creation	Vikas	Synthesis
Endowment of local network relationships	Strong ties through family business	Strong local MNC ties through former employer, Motorola; also alumni network	No significant local ties owing to lengthy absence.	Strong local ties through conducting business in that market for over 6 years	Entrepreneur responsible for most network relationships; prior education and work experience are a key source of ties
Leverage of local network relationships	Led to firm's Chief Mentor, a strong advocate of Ekomate's international business-seeking activities.	Led to domestic customers; low-risk opportunity to improve technology before launching overseas	Negligible owing to dearth of relationships	Led to domestic customers, which is the primary focus for this company.	Firms that leverage their local network relationships the best (provided they have them) are those with a clear global vision.
Role of local network relationships in internationalization	Indirect access to valuable foreign ties through Chief Mentor; also reputation effects perceived.	Indirect access to valuable foreign ties through Motorola.	Bangalore's infrastructure is conducive to serving international customers	Bangalore provides good support services and human resources.	Benefits that enhance international competitiveness: · Reputation · Infrastructure/quality · Networks

Source : Author

(developed country) literature, must be 'balanced' by cultural factors in developing countries such as India, as manifested by the importance of family and ethnic networks.⁹ For instance, there appear to be significant links between Bangalore-based software firms, both Indian and multinational, and the Silicon Valley cluster through technologists of Indian origin based in that region (Saxenian *et al.* 2002). An important link is provided by such Indian professionals returning to India, with 45 percent of those based in Silicon Valley expressing an intention to do so eventually (Saxenian *et al.* 2002). A recent study has estimated that the preferred destination for these returning Indians is Bangalore (Leclerc

2004). Also, as already mentioned, the networking organization called The Indus Entrepreneurs provides useful connections between Indian professionals in the West and their counterparts in India. Ethnic ties can result in ethnic social capital which has both bonding (in terms of ethnicity) and bridging (in terms of geography) properties, and is therefore of great potential value to resource-constrained firms in the home country (Prashantham, forthcoming). Of course, this phenomenon is not surprising in light of Asian firms' acknowledged propensity to leverage network relationships, as noted at the outset. Thus, in the Asian context, Western models of clusters should be supplemented and moderated by cultural influences such as ethnic ties.

Conclusions and Implications

This study has sought to contribute to an understanding of the phenomenon of SKIF internationalization in two ways. First, it has focused on local network relationships, which is relatively neglected area in comparison with network relationships located overseas. Second, it has considered a developing economy context, on which there is generally a dearth of literature. Four case-studies that were conducted in an Asian setting, viz., the Bangalore software industry, suggest that important benefits – particularly pertaining to reputation, quality and networks (including foreign ones) – do accrue to SKIFs in a developing economy. However, subsequent expert interviews highlighted the disturbing passiveness that generally characterizes the accrual of such benefits by these firms. This observation is a crucial one and leads to several vital implications, considered below.

In normative terms, a key implication for SKIFs is that there should be conscious leverage of spatially concentrated *local* network relationships; it may well be the case that SKIFs are overlooking significant resources that are 'right under their noses'. These local network relationships could lead to international business opportunities, thereby compensating for a firm's lack of foreign network relationships. There are several practical ways in which this can be achieved. There needs to be wider and more intensive utilization of valuable local forums such industry bodies. In particular, efforts should be made to build ties with ethnic entrepreneurs in overseas markets, particularly in regions like Silicon Valley, which are at the cutting edge of technology; this of course is easier for certain countries (e.g., China, India and Israel) than others. As seen from (the somewhat extreme) case of Mitoken, potentially useful relationships can be fostered with local multinational subsidiaries (Enright 2000; Zhou and

Xin 2003). Equally, ties can be usefully built with other local, domestic firms; SKIFs should seek to leverage economies of scale through efforts such as collaborative marketing (Brown and Bell 2001).

From a policy perspective, an intriguing challenge relates to how developing countries like India can foster the development of more clusters like Bangalore. While historical factors, such as the linguistic benefits of colonial rule, cannot be reversed, the Bangalore experience does suggest that non-interference with entrepreneurial activities, a clear governmental commitment and the provision of infrastructure (such as the Software Technology Parks of India), can be great facilitators. Indeed, aspiring clusters should be encouraged by the emerging success of other Indian cities like Hyderabad, which has received very strong governmental support in recent years (Leclerc 2004). Policy-makers should make efforts to enhance the international reputation of clusters and, perhaps more importantly, to facilitate the accrual of active benefits for the internationalization of clusters' constituent firms. Additionally, of concern to policy-makers in developing economies such as India, is how to enhance the knowledge-intensity of SKIFs so that they move up the value chain to compete for higher-value business from abroad and avoid becoming vulnerable to cost-based competition from other emerging economies, such as China.

In terms of theory development, clearly more scholarly work is required, involving larger samples and quantitative methodology, to provide generalizable findings on the role of clusters in the internationalization of SKIFs, particularly in a developing economy context. Issues of interest that could be explored are:

- the differences in propensity to internationalization between SKIFs located within clusters and ones that are not;
- comparisons of developing economy clusters (like Bangalore) with developed economy ones (like Silicon Valley);
- the influence of MNE subsidiaries within a cluster; and inter-cluster links on SKIF internationalization.

As for the last mentioned point, it could well be that there is an interesting phenomenon in terms of the linkage between the Bangalore software industry and Silicon Valley, with its strong Indian presence; this is an issue warranting further research. In summary, consistent with the managerial recommendations above, the most valuable research will seek to unpack the conditions under which local network relationships are leveraged actively, effectively and creatively; herein may lie

an important key that unlocks the potential for developing economy SKIFs to become world class, globally competitive players.

Shameen Prashantham is a Research Fellow at the Graduate School of Business and Doctoral Researcher at Strathclyde International Business Unit, University of Strathclyde.

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NOTES

- ¹ This paper adopts Prashantham and Berry's (2004) definition of a small knowledge-intensive firm as one *'that has fewer than 100 employees, the majority of whom comprise a highly qualified workforce which is its most important resource and is engaged in knowledge work - meaning that knowledge is inherent in the firm's main activities - as its central preoccupation'*.
- ² While it is recognized that internationalization may be both inward and outward (market-seeking), the latter remains a vital component of the firm's growth and continues to attract widespread policy interest. Moreover, the work that this paper builds upon (e.g., Brown and Bell 2001) explicitly focuses on market-seeking internationalization, and as such, that is where this paper's interest lies.
- ³ Harvard's meta-study of clusters worldwide (Van der Linde 2002, 2003) identified no fewer than 106 clusters in India; however only one appears to be a truly knowledge-intensive one, viz., the software cluster in Bangalore. Another software cluster identified in the study is based in Dublin, Eire. It thus appears that although other regions in India, such as the National Capital Region surrounding and including Delhi, have a comparable number of software firms, they are not as densely concentrated or perceived to be a cluster. Of course, other authors such as Ramamurthi (2004) take the view that India's software industry comprises a 'cluster of clusters' but even he acknowledges the leading role played by Bangalore as evident from the fact that eight of the top 20 MNC subsidiaries, in terms of software exports, have located in Bangalore, more than in any other Indian city.
- ⁴ The study adopts Prashantham and Berry's (2004:153) definition of network relationships, which are 'relationships with customers, suppliers, competitors, alliance partners, universities, government bodies, industry associations and so on'. Thus a distinction is made between the concept of a cluster and of network relationships; the

- latter form a constituent of a cluster and cannot be deemed to be a given; indeed, they must be created and cultivated (Dyer and Singh 1998; Gulati 1999). Local network relationships can be a valuable resource to firms (Westlund and Bolton 2003).
- ⁵ Paradoxically, the emergence of information technology and digitization has been argued as reinforcing, rather than dampening, agglomerative tendencies of firms including those in the information technology sector, owing to their propensity for innovation-seeking behaviour, as noted above. Leamer and Storper (2001) point out that the Internet facilitates 'conversations' but not 'handshakes', and therefore the clustering of knowledge-intensive firms can be expected to continue.
 - ⁶ This proved to be quite appropriate and useful in the case of the sample given that firms with at least 6 years' existence were likely to be quite different from younger ones, given the impetus – particularly around 1998/9 – for new venture creation to leverage software-related business opportunities arising from requirements in developed economies relating to Y2K and Euro conversion.
 - ⁷ The experts were a professor from the Indian Institute of Management, two professors from the Indian Institute of Information Technology, a consultant each from McKinsey and Boston Consulting Group, two executives each from Sun Microsystems and MindTree and a manager from VisualWeb.
 - ⁸ Bangalore is home to 19 of the world's 40 companies with the highest international quality ratings based on the system developed by Carnegie Mellon University's Software Engineering Institute (i.e., Capability Maturity Model or SEI CMM level 5 companies).
 - ⁹ The author thanks an anonymous reviewer for the thoughtful suggestion of including this facet of SKIFs in Bangalore in the present discussion.

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