

Comparative International Entrepreneurship: The Software Industry in the Indian Sub-Continent

Abstract

In this preliminary study we seek to explore the notion of comparative international entrepreneurship (IE), using the software sector in India and Pakistan as an illustration. Based on in-depth interviews in Bangalore and Lahore, exemplar case studies from both sub-national regions are presented, which highlight the relative significance of local milieu and ethnic ties in international entrepreneurship. The global nature of the software industry and the central role of the innovative milieu in the USA have important implications for the comparative IE literature. These refer particularly to the coordination and integration of the entrepreneurial processes of opportunity discovery, evaluation and exploitation across frontiers.

Introduction

Although large multinational enterprises are often deemed to be the major actors in the globalized economy, there is recognition that entrepreneurial younger firms play a significant role, particularly in global industries such as information technology (Young, Dimitratos and Dana, 2003). Indeed, following Oviatt and McDougall's (1994) conceptualization of international new ventures, considerable research interest in the field of international entrepreneurship has been generated (Oviatt and McDougall, 2005).

Consistent with the views of Buckley and Ghauri (2004) on international business research in general, Zahra (2005) has pointed out that a deficiency in the international entrepreneurship literature is the neglect of the influences of the institutional environment and economic geography.

A helpful framework through which to address this deficiency has been developed by Baker, Gedajlovic and Lubatkin (2005) who address the topic of comparative international entrepreneurship (IE). Baker *et al.* (2005) argue that the comparative social and institutional context in which new ventures are developed profoundly influence the manner in which they discover, evaluate and exploit new opportunities. In particular, they identify the role of sub-national local context of the venture as being vitally important. They distinguish among three types of local context: regional agglomerations (mostly associated with advanced economies), broadly developed niches and less developed niches (mostly associated with developing economies).

In this paper we seek (a) to extend Baker *et al.*'s (2005) conceptual framework, emphasizing particularly the 'international' dimension of comparative *international* entrepreneurship, (b) by undertaking exploratory empirical research within a global industry, and (c) focusing on two local ecologies, namely a regional agglomeration and less developed niche about which little is known.

The research objective of the paper is thus to explore the notion of comparative international entrepreneurship using the software sector in India and Pakistan as an

illustration. We focus specifically upon the software industries in Bangalore and Lahore, which are arguably the most important software locations in the two countries; and represent a regional agglomeration (at least by emerging economy standards) (Baker *et al.*, 2005) and a less developed niche, respectively. These sub-national regions constitute an interesting setting given that they share a common colonial past but yet have had contrasting institutional environments over the past six decades since 1947 when the British Raj came to an end.

Below, we identify relevant literature that forms the basis of our investigation; highlight the methodology used which comprised a set of 30 in-depth interviews across the two research sites; present findings including four case-studies; and offer a discussion designed to extend the literature and our understanding of this recently emerging and significant theme.

Literature Review

Comparative Entrepreneurship: A Framework

The subject of international entrepreneurship (IE) has provided a major stimulus to research inquiry since Oviatt and McDougall's (1994) conceptualization of international new ventures. The importance of younger entrepreneurial firms in the global economy is widely recognized (Young *et al.*, 2003) as is their contribution to national and regional economic development in high technology and knowledge-intensive sectors (OECD, 1998). Despite the expanding literature in IE, numerous gaps remain, as identified, for example, by Zahra and George (2002), Young *et al.* (2003), Coviello and Jones (2004),

Dimitratos and Jones (2005), and Zahra (2005). Of particular importance to this paper are deficiencies in our understanding of the genesis of international entrepreneurship, and the effects of the institutional environment and economic geography on IE.

This study on comparative international entrepreneurship in a global industry is particularly influenced by two recent papers, the first by Baker *et al.* (2005) on comparative IE in which the authors seek to develop a framework for comparing entrepreneurship processes across nations; and the second, by Fromhold-Eisebith (2004) on innovative milieu and social capital, especially relevant to the industry and country context of this article.

Building on the Shane and Venkataraman (2000) framework, the research by Baker *et al.* (2005) examines *how* and *why* entrepreneurial processes of opportunity, discovery, evaluation and exploitation differ across nations. The authors focus upon the antecedents of entrepreneurship, paying especial attention to the influencing roles of institutions and national cultures. Of particular relevance here is the opportunity exploitation stage of the entrepreneurial process where Baker *et al.* (2005) use ecological theory and economic geography to distinguish three representative types of ecology, namely, Regional Agglomerations, Broadly Developed Niches and Less Developed Niches.

The literature on Regional Agglomerations is very extensive (from Marshall, 1920 onwards) with Silicon Valley and the 'Third Italy' being widely cited illustrations. Innovative regional agglomerations encourage new firm creation through easier access to

specialized resources, such as venture capital and skilled labour, and state-of-the-art infrastructure and services (Tavares and Teixeira, 2006). Recognizing the stimulus to entrepreneurialism provided by regional agglomerations, Baker *et al.* (2005) also draw attention to a potential challenges in such agglomerations such as an institutional ‘blind spot’ derived from their highly specialized nature; and the high and rapid returns and quick sales typically required by venture capitalists.

The contrast with the regional agglomeration is the Less Developed Niche, where entrepreneurs in developing and emerging economies lack access to specialized resources and institutional support. Family business groups (FBGs) are highlighted as one indigenous entrepreneurial response to these ‘institutional voids’ (e.g. Khanna and Rivkin, 2001), by providing a ‘gap-filling function’ to support new enterprise. According to Baker *et al.* (2005: 499), ‘FBGs are networks of many (usually small-scale) businesses that are linked together through kinship ties’ (see also Redding, 1990). While this strong kinship-based governance may stimulate entrepreneurship, subsequent growth may be inhibited because of the narrowness and myopia of kinship networks, and may be linked to national cultural differences. Interestingly for this paper, Baker *et al.* (2005: 501) mention Bangalore as an example of a ‘robust agglomeration’, and contrast this with most of India (to which one could add Pakistan) which resembles an ‘archetypal LDN’ [less developed niche]).

Overall, Baker *et al.*’s (2005) work is useful in understanding the social context of comparative entrepreneurship, and the categorization of ecologies provides a helpful way

of distinguishing between India and Pakistan. But in general the article is weaker in its contribution to the ‘international’ dimension of comparative international entrepreneurship, a topic on which the present paper has much to add.

Innovative Milieu and Social Capital

In deepening our conceptual understanding, useful insights can be obtained from the work of Fromhold-Eisebith (2004), who addresses the notions of innovative milieu and social capital from a regional development perspective and focuses upon competitiveness within sub-national regions. These concepts have similarities with Baker *et al.*’s regional agglomerations and kinship ties in less developed niches.

The notion of innovative milieu refers to ‘the complex network of mainly informal social relationships on a limited geographical area, determining...a sense of belonging, which enhance the local innovative capability through synergistic and collective learning processes’ (Camagni, 1991: 3). The notion of social capital refers to ‘the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit’ (Nahapiet and Ghoshal, 1998: 243).

Fromhold-Eisebith (2004) articulates the differences between innovative milieu and social capital as follows: innovative milieu entail one-time or project-related interaction among heterogenous actors with a focus on achieving change, in particular the

commercialization of innovation. Social capital¹, on the other hand, involves everyday routines carried out by homogenous actors with a view to mastering capabilities and ensuring survival or stability.

Her main point is that both of these aspects are relevant to the economic development of sub-national regions. Each set of actors provides benefits that have utility, particularly for smaller firms. The innovative milieu is a source of ‘unconnected resources and competencies’ and thereby ‘creative outcomes’ (Fromhold-Eisebith, 2004: 754). Social capital emanating from what is referred to as ‘firm communities’ provides support and advice to compensate for inexperience or deficiencies in everyday activities such as sales or hiring.

An important point to note that it takes access to a heterogenous set of actors for certain benefits such as innovation outcomes to accrue. Thus for smaller firms in a regional agglomeration, a likely advantage over their counterparts in local niches is the novelty of information and opportunities that they have access to (McEvily and Zaheer, 1999). Of course, the likelihood that these will flow across a network is enhanced when social capital is built among actors (Inkpen and Tsang, 2005). Social capital fosters trust,

¹ It is interesting that she chooses to apply the ‘social capital’ label to only one of these two collective entities. Both notions have commonalities, particularly in relation to the emphasis on the importance of socially embedded interorganizational relationships within a local milieu (Inkpen and Tsang, 2005). Management researchers who apply social capital research in the study of entrepreneurial ventures (e.g. Davidsson and Honig, 2003) would perhaps argue that Fromhold-Eisebith (2004) is actually referring to two types of social capital viz. bridging and bonding social capital. Bridging social capital is associated with the benefits, such as innovation, arising from heterogenous actors in an innovative milieu (McEvily and Zaheer, 1999); indeed, while analyzing the Silicon Valley cluster, Cohen and Fields (1999) make explicit reference to the social capital generated through interactions among such dissimilar actors as universities, policy-makers, companies and law firms. The stability and moral support arising from homogenous actors are associated with bonding social capital (Putnam, 2000). This of course may merely be a semantic matter.

thereby reducing barriers to exchanging and combining resources (Nahapiet and Ghoshal, 1998).

In the context of the development of international new ventures, the types of heterogeneous actors that are likely to facilitate entrepreneurial behaviour include companies, funding bodies, educational institutions, specialist suppliers, demanding customers and supportive policy-makers (Porter, 1998). This is particularly true of a global industry such as software.

Investigating innovative milieu and social capital as complementary or redundant concepts of collaboration-based regional development, Fromhold-Eisebith (2004) places particular attention on the role of and relationships among actor groups. Because of this, discussion of key features of innovative milieu, particularly the institutional and infrastructural characteristics which are critical for creativity and innovation, is largely omitted.

Similarly the notion of social capital as discussed by Fromhold-Eisebith (2004) does not discuss the important *comparative* dimension which derives in part at least from national cultural characteristics.

Finally, considering these two core research papers, neither develops the genuinely 'international' dimensions of comparative entrepreneurial exploitation. These derive from the cross-border flows of ideas, knowledge, capital and human resources which are vital

ingredients in international entrepreneurship. These are important gaps to be explored in the current research.

Methodology

Given the exploratory nature of the research, a set of in-depth interviews were undertaken in Bangalore and Lahore (Ghauri and Grønhaug, 2002). In each case the objective was to conduct interviews with a number of international entrepreneurs and to supplement these with interviews of other industry experts including academics, trade body officials and MNC managers. In addition, a large amount of secondary data from company websites and industry reports were studied. The use of multiple respondents and secondary data sources was a means to achieve triangulation (Miles and Huberman, 1994).

The Bangalore fieldwork was undertaken in July 2006 by one of the authors. 16 interviews were conducted covering six software ventures, four MNC managers and four other experts including officials of the trade body for software, Nasscom. The ventures were identified through suggestions made by Nasscom. The objective was to interview highly innovative companies and the interviewees had all been recognized for meritorious innovation.

An interview guide was used to ensure some uniformity in the content of the interviews to facilitate data analysis. Interviews lasted on average for 90 minutes. In addition to the extensive field notes taken, the interviews were recorded.

The Lahore fieldwork was undertaken in March 2007. A similar approach was adopted as in Bangalore, although in this instance all three co-authors participated in data collection. 14 interviews were undertaken, involving seven ventures and seven other industry experts. Again interviews lasted 90 minutes on average, and were tape-recorded and extensive field notes taken. Interviewees were identified using a snowballing technique; initial contacts were made by one of the authors with strong local networks. This was an inevitable approach given that this was an under-researched context.

Data were analyzed in keeping with the approach advocated by Yin (1994). Thematic analysis of the content was undertaken first for each case-firm and then across cases. The additional expert interviews were then analyzed with a view to identifying the reiteration of or contradiction to themes identified from the interviews with the case-firms' entrepreneurs.

The general findings from the data are discussed initially, with characteristics of the local context (milieu) and the use of ethnic ties emerging as particularly salient issues. From the range of case studies, two from each setting that illustrate these differences particularly well were identified and are presented below.

Findings: India (Bangalore) vs. Pakistan (Lahore)

The software sector in India is clearly very different to that in Pakistan in terms, for example, of longevity, overall size, worldwide reputation and the number of businesses of scale. But the countries themselves have common roots and British colonial

backgrounds; and these differences and similarities provide a useful context for exploring the constituents of comparative international entrepreneurship.

The Bangalore Software industry

Local milieu. According to Nasscom² the Indian IT industry generated revenues of \$30 billion during 2006-7 – approximately 5% of GDP – of which nearly \$24 billion (80%) was accounted for by international business. Nasscom estimates that 1.3 million people are employed in this industry, claiming this to be “the largest pool of suitable offshore talent”, representing 28% of global offshoring labour. Yet, despite producing 501,000 engineering graduates in 2006-7, India appears to face a manpower shortfall. To help bridge this gap, Nasscom proposes that a number of finishing schools for IT graduates be set up at leading institutions, as part of a wider industry-academia partnership agenda.

Another challenge being addressed is that of setting up an “ecosystem for innovation” to upgrade the level of knowledge-intensity of activities undertaken. Perhaps nowhere is the focus on capability upgradation perceptible as much as in Bangalore, which accounts for a third of India’s software export revenues. In relation to milieu characteristics, it seems fair to say that Bangalore has demonstrated signs of maturity – even though there is scope for improvement – on a number of key issues such as an entrepreneurial environment, FDI attraction, IPR protection, access to capital and competencies, institutional support and reputation effects (Balasubramanyam and Balasubramanayam, 2000).

² These data can be found on the 2007 factsheet for the Indian software industry published on the Nasscom website at <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=2374>

Some of these issues are linked. For instance, Bangalore's reputation effects have led to FDI attraction (and thereby the presence of leading MNCs) and access to venture capital, both domestic and international. Another key issue is the long-standing emphasis on education in public policy which had led to a large pool of qualified engineers.

It would be naïve, however, to assume that there is no scope for improvement. It became apparent that although Bangalore possesses a strong "soft infrastructure" (Khanna and Palepu, 1997) in the form of, for instance, support from Nasscom, there were shortcomings in the physical infrastructure. Traffic congestion and prohibitive hotel rates were cited by respondents as impediments to the future progress of the Bangalore cluster.

Ethnic ties. Significantly, compared to prior research findings from Bangalore (e.g. Prashantham, 2006) there was little mention of ethnic ties as being a critical resource. Rather, it appeared that the strong presence of Indian technologists in the US, and particularly in Silicon Valley (Saxenian, 2002) had resulted in regular interflow of people, resources and opportunities between the two milieux.

Besides anecdotal evidence of returnees from the US, the inter-milieu links were embodied in the work of a networking organization, The Indus Entrepreneurs (TiE). TiE had been founded in Silicon Valley as a networking organization for technologists of South Asian origin. Chapters soon developed in several parts of the world, notably the US and India. The Bangalore chapter of TiE hosts regular events featuring guest speakers

from Silicon Valley, many of them of Indian origin. For example, a recent such speaker was the noted venture capitalist, Vinod Khosla.

Overall, however, it emerged from the interviews in Bangalore that Indian software ventures were not as heavily reliant on ethnic ties as they might have been once; institutionalized links with Silicon Valley appeared to exist and the Bangalore milieu had attained sufficient reputation effects (Prashantham, 2004) for ventures to be confident enough to engage with international markets without necessarily leveraging ethnic ties.

The Lahore Software industry

Local milieu. Lahore could not at present be described as a local milieu for the software industry. Statistics are hard to come by, but PASHA (Pakistan Software Houses Association) data indicate a total of 350 software houses based in Pakistan with revenues somewhere between \$100m and \$200m. The industry came into existence largely because of Y2K, and Lahore developed as the hub because the best universities were located there. The firms clustered in Lahore highlight a fragmented industry structure with no large companies (the biggest is NASDAQ-registered NetSol with about 600 employees); a few with c50 employees; and the remainder micro-firms originating from universities in the US and Pakistan.

The institutional structure is still in its infancy, although the Pakistan Software Export Board (based in Islamabad not Lahore) is gaining respect, as is PASHA and the Computer Society of Pakistan. Their influence and that of the companies themselves has

been important in government education policy, resulting in a very large increase in investment from the early 2000s. Even so interviewees reported that the quality of graduates was lacking, in part because of the problems of getting IT faculty. The cost of labour is the major attraction, with direct labour costs 10-15% of those in the US; compared with India, one respondent cited direct labour costs in India of \$40-45 per hour compared with \$12-25 per hour in Pakistan.

Telecoms infrastructure has improved significantly after earlier problems with bandwidth, although large additional investment is still required in data and cable internet. Plans are underway for the establishment of a series of IT parks and incubators.

The regulatory environment was perceived as being weak, in terms, for instance, of protection of intellectual property rights (IPR), meaning that companies had to license IPR offshore; and the same was true for quality assurance.

In terms of the operating environment for business, the interviewees contrasted the transparent environment in the US with the opaqueness of that in Pakistan. Related issues mentioned included ethics in business and payment problems.

Overriding the internal challenges in developing a sustainable software industry was the 'geopolitical' situation and global market access problems. In particular, perceptions of US customers created anxieties towards outsourcing to Pakistan. This was particularly

problematic when the internal market in Pakistan was still emerging, with a slow pace of computerization within government and its agencies.

Ethnic ties. While much criticized, the Hofstede (2001) research on national cultures is a useful starting point for India – Pakistan comparisons. Scores for the individualism dimension rates India as 21st out of 53 countries, while Pakistan was 47th out of 53 (Hofstede, 2001:215). The implication is that Pakistan is a highly collectivist society characterized by business behaviour traits such as: ‘keeping ethnic or other in-groups together supports productivity’; the employee has to be seen in a family and social context’; ‘in business, personal relationships prevail over the task and the company’; relationships with colleagues are cooperative for in-group members, hostile for out-group’; and ‘relatives of the employer and employee are preferred in hiring’ (Hofstede, 2001: 244-45).

Such notions were expressed by all respondents. Quotations from returnees from the US included the following: ‘Business is not like it is in the US – everyone relies on networks’; ‘personal networks are easy to build’; and ‘Pakistan society relies on favours’.

Nearly all of the entrepreneurs interviewed studied at elite universities in the US (MIT and Stanford); but in raising finance, launching their businesses, and finding initial customers (at least), they turned to ethnic Pakistanis. As mentioned below, Techlogix described the entrepreneurship consequences of this as leading to an (unsustainable)

‘friends / friends of the family’ business model. In a sense the Pakistani entrepreneurs were ‘within the US software milieu but not of it’.

A meeting was held with the Lahore chapter of TiE, established, like the Karachi chapter, in 2000. The impression gained was that TiE was being widened out beyond its software roots, perhaps to stimulate membership. A number of the entrepreneurs interviewed were TiE Lahore members; and Rozee (see below) in particular was very praiseworthy of the support that had been received in respect of credibility and access to business owners in Pakistan. However, other responses suggested an arm’s length approach to TiE, or reduced involvement because of limited benefits from the TiE association. One respondent suggested that the Organization of Pakistani Entrepreneurs of North America (OPEN) which was formed in the US in 2000 was perhaps an attempt to distance Pakistan from TiE.

Case Study Findings

Skelta, Bangalore

Skelta was founded in Bangalore in 2002 as a software product company. Skelta’s product orientation is relatively uncommon among Indian software companies, the vast majority of whom – including some of the best known ones such as Infosys and Tata – operate predominantly as services companies. Although some are sceptical about India’s prospects for producing genuinely world class software products companies, Skelta’s co-founders have been adamant in their self-belief that Skelta could achieve global success, based out of India.

The founders include CEO Sanjay Shah, whose previous experience includes co-founding another software venture in India, iCode, which sought to offer enterprise-wide resource planning software for SMEs. Prior to this he co-founded Accel, a retailer of PCs, in Washington DC. Shah is a graduate of the prestigious Indian Institute of Technology (Mumbai) and holds a postgraduate engineering degree from the US. Another co-founder is Paritosh Shah, who is responsible for marketing who also has previous entrepreneurial experience in India and abroad, chiefly in the Middle East.

Skelta's flagship offering is known as Skelta BPM.NET. As evident from the name, this software application is focused on business process management (BPM) which involved the application of information technology to efficiently streamline and manage a variety of organizational processes. The second half of the product's appellation indicates that the offering is built on Microsoft's .Net platform technology, the underlying component on which software applications can be written for a Windows operating environment.

The decision to ally its product technologically with Microsoft was a significant decision taken early on by the company founders. Microsoft technology was seen as attractive given its widespread adoption by a range of companies across several countries. Thus a company like Skelta that offers technology solutions that are built on a Microsoft platform stand a better chance of integrating with client companies' extant Microsoft-based applications. From Microsoft's viewpoint, such applications are of benefit too. Every time a Skelta product licence is sold, so is a Microsoft operating system licence.

Not surprisingly, then, Skelta a core part of Skelta's strategy has been to cultivate a deep relationship with Microsoft. Evidence of how seriously this relationship is taken is seen from the fact that the company has a separate function, alongside other conventional functions such as sales and finance, headed by a senior manager, which is referred to as the Microsoft relationship function. It is also a measure of Skelta's success in forging a cross-border, multi-faceted relationship with Microsoft.

What is interesting to note, however, that Skelta were able to build a global relationship with Microsoft through efforts that began in Bangalore – their own backyard, as it were. A Microsoft manager in Bangalore who was responsible for forging relationships with technology partners such as Skelta notes that it was Skelta that had proactively approached Microsoft. Skelta's technology impressed Microsoft as did the proactive approach of the top managers in seeking to gain visibility for Skelta.

The Skelta-Microsoft relationship initially began at the local level through Skelta's participation in Microsoft events and other promotional activities. For example, Skelta was invited to participate in Microsoft road shows whereby the product could be demonstrated to prospective clients in different parts of the country. Skelta's CEO was invited to speak at a seminar organized for partner organizations of Microsoft in India on how Indian software products companies could achieve local and global success. Also, when Microsoft hosted an industry-wide workshop on the topic of innovation, Skelta was showcased as an example of an innovative company.

Before long, the Indian subsidiary of Microsoft started promoting Skelta within the wider Microsoft network. To illustrate, in 2004 Skelta were invited to participate in the Microsoft Worldwide Partner Conference in Canada. The following year, Skelta was nominated by Microsoft India to be considered for an international innovation award at the Microsoft Conference in Boston which it went on to win. In 2006, Skelta was among a set of internationally selected companies featured on Microsoft's Vista promotion website, resulting in global visibility. By this stage, Skelta had acquired about 200 clients across a range of advanced economy markets including the US, UK and Canada.

Thus, the Skelta experience illustrates that, given relational capabilities of proactively establishing a valuable relationship with a significant player such as Microsoft, Bangalore provides local firms with access to international networks via the local environment. Clearly, the local milieu in Bangalore was able to attract the presence of large players like Microsoft, and in this was has greatly facilitated Skelta's progress. As Skelta's relationship with Microsoft has prospered so has the company, as evident from various distinctions achieved by Skelta in 2006. It was selected for a special award for innovation from the national trade body for software companies, Nasscom. It was recognized as a one of Asia's fastest growing technology companies by the trade publication *Red Herring* which had famously recognized Google's potential before many other industry observers had. Perhaps most significant of all, Skelta which had thus far been privately held, received its first round of venture capital amounting to \$1.5 million from an Indian venture capital fund.

Despite its considerable success, in the course of 2007, Skelta retained a Seattle-based management consulting to facilitate collaboration with strategic partners and hired an ex-Infosys executive to head the company's sales function for the US, based in Atlanta.

Liquid Krystal, Bangalore

Liquid Krystal is a Bangalore-based e-learning company that was founded in 1999 by Anand Adkoli and a partner, Ramana Gogula (who has since left the world of technology for a successful career as a music director in the Hyderabad film industry). Adkoli, the co-founder who was interviewed, had gone to the US in the 1980s to pursue postgraduate studies in computer science. He stayed on in the US for over a decade where he worked for Oracle as a software architect in the server division. In parallel, he also developed a keen interest in computer education and authored several text books on programming with special reference to Oracle technology.

Adkoli's career with Oracle took him, in the 1990s, to a development centre in Melbourne and subsequently to a newly established facility in Hyderabad. By 1999, Adkoli felt the need for a change of direction in his career. He was strongly attracted to the prospect of returning to his native city of Bangalore and devoting more time to his writing interests. However, at this time a venture capital fund, Global Technology Ventures was set up in Bangalore in conjunction with the Bank of America. The venture capitalists at this firm were scouting around for new business ideas. Attracted by the prospect of gaining access to venture capital, Adkoli and his business partner proposed to

set up an e-learning business, Liqwid Krystal. They were successful in raising \$2 million from Global technology Ventures. In retrospect, it is without the doubt that the Internet boom of that period compounded the venture capitalists' positive sentiments towards the business idea.

Liqwid Krystal's business proposition was based on the observation that whilst much information on computer programming was contained in the conventional medium of printed textbooks, much of the practical work was carried out in a completely different medium viz. through a keyboard and monitor of a PC. Consequently, it was often not easy for students to easily relate to what textbooks said about various aspects of programming. The founders of Liqwid Krystal believed that students could make a far better transition between theory and practice if they were given access to e-books whereby hyperlinks could be used to access the relevant software on which to write a piece of software code.

This was a relatively simple but effective idea. Between 1999 and 2001 the company developed CodeSaw, a software product that integrated texts on programming with the facility for practical application by students. As for gaining access to textbook content, Adkoli used his publishing contacts in the US, given his own background as a textbook writer, to forge contractual relationships with such reputed publishers as Addison-Wesley and Thomson Learning. The basis for Liqwid Krystal's revenues would be royalty payments whenever an e-book was sold from these publishers.

However, the finalization of Liqwid Krystal's offering coincided with a decline in the fortunes of the US information technology industry, triggering a decline in the derivative demand for computer education. The next couple of years were a period of struggle for the venture as it was locked into the publisher contracts. In 2004, it decided to terminate these contracts with the publishers. This allowed the company the flexibility to then negotiate contracts with a wider range of publishers that were less exclusive in nature. This meant that in addition to licensing content, Liqwid Krystal could provide such value-additions as assessment modules.

Following this re-orientation of the company, Adkoli became conscious that he had ignored two rapidly growing markets for computer education, viz. China and India. He turned his attention to India first of all. His objective was to sign up universities as clients; the company would then provide an e-learning solution that every student could access at less than \$10 per head per year. By 2006 the first contract was signed with an Indian university comprising 60,000 students. Subsequently, the company has forged a strategic partnership with the prestigious Indian Institute of Science (IISc) in Bangalore. Computer students at an advanced level can study on-line via Liqwid Krystal's learning platform, gyanX to obtain certification from IISc.

The experiences of Liqwid Krystal suggest that their Bangalore base has provided them with access to venture capital, strategic tie-ups with prestigious academic institutions and a large market for on-line computer education. However, a complaint that Adkoli has – which is somewhat contradictory to Skelta's positive experience – is that large

companies, be they indigenous or foreign-owned, are not as supportive of young ventures as they might be. As the company consolidates on its recent successes, the future plans involve making a foray into China with a view to tapping into the large education market in that country.

Techlogix, Lahore

Techlogix is one of the largest and most-respected software companies in Pakistan. Registered in Bermuda, it employs 250 people worldwide, 30 of whom are in the United States, 170 in Pakistan where its Development Centre is located, and 40 in another Development Centre in China. The company operates a differentiated services model supplying major MNEs such as GE, Motorola and Shell, with 86% of revenues being generated in the US. The two co-founders are based in Pakistan but spend about half their time in the US.

The co-founder of Techlogix who was interviewed - Salman Akhtar - has family in the US and took his BBS and MS degrees there before enrolling for a PhD at MIT. While at MIT he linked up with another Pakistani student with whom he had been at school, and together they established a company called The Technology Group in 1992/93 to provide telephone banking software in Pakistan, growing the company from 2-14 employees and revenues of \$100K by year four.

New funding was required to grow the company in the US: Akhtar was unaware of the US venture capital (VC) business at this time and efforts were made to raise money in

Pakistan; eventually most funding came from former Pakistani college room mates who had returned to Pakistan. \$100K was raised and Techlogix was formed. Early in 1996 Akhtar linked up with a Pakistani whose company, Visage, located near Boston, operated in the driver's licence market and required a 'facts on demand' software system. Techlogix established a Boston office to supply Visage, and for the next 2-3 years grew through business with Visage and by opportunistic customer extension; the latter included business in the UK which derived from a Pakistani connection.

Looking for opportunities associated with the dot.com boom, Akhtar and his partner moved to California in 1999 and launched a new software product based on the latter's PhD work at MIT from which the software was licensed. The product had a variety of applications including the car industry; and while sales potential was substantial long sales cycles were involved which presented cash flow problems for a small firm like Techlogix. Consequently the company returned to the services business and began its transition into enterprise software in California, with a specialization in commercial finance. An early breakthrough came with a successful tender for work with GE, based on an offshoring model; and GE (the godfather of outsourcing to India) has remained as a leading customer.

Gradually Techlogix developed a second generation model based around five or six practice areas where they were world-class; and they began bidding for global vendor status as vendors consolidated on a worldwide basis. On this basis, the company was successful with Motorola, at a time when all their IT work was directed to Oracle or

Infosys, and then with global players such as BTM and Shell. The basis of global competitive advantage is their differentiated services model, where differentiation combined with ‘best in the world’ expertise enables Techlogix to succeed against much larger competitors.

In the early years of Techlogix, virtually all personnel were based in Pakistan; while Akhtar himself lived with his family in the US between 1997 and 2003 before returning to Pakistan. It was accepted that the Pakistan connection posed perception problems for some US customers; and the Development Centre in China was a customer-driven decision. This wholly-owned Development Centre in Beijing is run by a Pakistani. As Techlogix globalizes in terms of customers and geography, access to global talent has become an issue: a recent high-level appointment was an American formerly employed by Infosys; and the company has hired 5 employees with Rhodes Scholarships.

Efforts are being made to diversify the revenue base from a position where the US represents 86% of sales, and to include small as well as large customers. The attitude to business in Pakistan has until recently been ‘take it or leave it’, but Techlogix is now putting a serious sales team into the country. Similarly the composition of revenues has changed significantly – in the early 2000s, 80% of revenues were derived from application development, a figure which as at 2007 was down to less than 10%.

For the future Akhtar wanted to grow the company to a size of 1,000 people which was considered to be feasible with a differentiated services business model. Interestingly it

was observed that at its current size, Techlogix would have attracted acquisition interest had it been an Indian company. As a Pakistani enterprise, the geopolitical situation was a barrier to the acquisition of a small firm like Techlogix.

Commenting on the software industry in Pakistan generally, Akhtar described it as a being largely based on a ‘friends / friends of the family’ business model in which most companies were very small and could survive by ‘scratching around’. He argued that: ‘Outsourcing is not the basis for long-term competitive advantage. Outsourcing is a mechanism not a model’. By comparison, the Techlogix pitch was on specialization and complex solutions, using a ‘global delivery model’.

Rozee.com, Lahore

The founder - Monis Rahman – operates through a holding company, Naseeb Networks Inc., based in the US. Described as a ‘Silicon Valley new media company’, it employs 30 people in offices in Karachi and Lahore with Islamabad (Pakistan) to follow shortly (as of March 2007), and 2 people in America. This job total includes employees working in a Matchmaking site which had been launched in Pakistan in October 2003, but principally in Rozee.com which was established in August 2004 and is Pakistan’s #1 job website.

Rahman studied at Stanford in the US and subsequently worked in California with Intel and ABB. His initial venture into personal entrepreneurship was in the US in 1997 with the establishment of a consulting business to site webcams in Day Care Centres. After one year’s experience the technology was acquired, and Rahman began to look for other

opportunities. While he was exposed to a wide network, including VCs, through TiE, ideas for a new business engineered around the first received only limited funding support. While supporting his offshoring notion as a mechanism to reduce costs quickly, the VCs were asking for an office in India.

Rahman returned to Pakistan in May 2003, but instead of providing offshore services for the US market, he identified a void for a matchmaking site targeting the Muslim community (his model was JDate a Jewish singles network). After six months working from home, the site was launched in October 2003. With ‘staggering numbers’ visiting the free site, Rahman spent \$60K converting to a paid service which started on 19th April 2004. The investment was recovered in 2 months and this business continues to grow profitably as a global network. Currently 65% of revenues are generated in the US.

Rahman wanted to reinvest in other spaces, and, seeing first hand the problems of hiring in Pakistan, he launched Rozee as a job site in August 2004. Initially a ‘quick and dirty’ ad. posting site, it was converted to a partially paid website in January 2007, paralleling the early usage of the internet by major employers in Pakistan. There are plans to export the model from Pakistan to markets in the Middle East, and then globally, drawing on the experience from the matchmaking site. To date, growth has been completely organic, although Rahman has plans for various new growth avenues including a potential strategic alliance with Pakistan’s leading media house.

Rahman described Pakistan as a ‘society based on favours’, where survival was not possible without networks. As a returnee, Rahman was recruited into the local chapter of TiE by the founder of the organization in Pakistan (who was also the founder of the leading Business School in the country – LUMS [Lahore University of Management Sciences]). Accepting that the TiE network in Pakistan provided Rahman with vital access to business owners and credibility, nevertheless, the nature of the TiE culture was perceived to be very different to that in the US, with suspicion replacing the transparency of US TiE.

Market access internationally was considered as the biggest barrier to Pakistan software firms, and this applied particularly to links with multinationals where a real credibility problem existed. On the positive side, people were moving back to Pakistan, and the Vice-President Products for Rozee was formerly employed by AOL. As further evidence of optimism, Rahman cited the raising of venture capital funds in the US, and the recent acquisition of a neighbouring company – Cambridge Docs. – by a Chinese enterprise. Aside from market access, a major challenge was considered to be the limited number of IT graduates (20,000 per annum) being produced by Pakistan universities, and the limited proportion of these (2-3000) who were of acceptable quality.

Discussion: Comparative International Entrepreneurship in the Indian Sub-Continent Software Industry

The Indian and Pakistani software industries proved to be a useful context for exploring the topic of comparative international entrepreneurship; and similarly the notions derived

from the literature were appropriate for comparative purposes. In general, it would appear that Bangalore reflects characteristics of a regional agglomeration (Baker et al, 2005) which seems to relate to the innovation milieu notion (Fromhold-Eisebith, 2004) whereas Lahore depicts a less developed niche (Baker et al, 2005) that is heavily reliant on social capital (Fromhold-Eisebith, 2004) – and in particular on ethnic ties.

In respect of India, the Bangalore milieu is recognized worldwide as providing a stimulating environment for creativity and entrepreneurship, illustrated in the company cases, for example, by the presence of world-class multinationals and local venture capital funds³.

The comparison with Pakistan could hardly be greater. The relatively small cluster of enterprises in Lahore depend greatly on ethnic ties and social capital, in part a replacement for weaknesses in the business and institutional environment. The advantages of Pakistani ethnic ties, consistent with the literature on bonding social capital (Putnam, 2000) include ease of information flow; access to seed capital; ease of building personal networks; overcoming national prejudices; and cross-border movement of businesses. However, there are disadvantages, associated with network closure, such as information redundancy; restricted opportunities; failure to “breakout” of initial market; traditionalist aversion to high-tech entrepreneurship; and nepotism.

³ Yet it is far from being a fully-developed innovative milieu comparable to Silicon Valley or Route 128. Gaps in the milieu relate, for example, to the quality of the physical infrastructure, the highly specialized nature of business activities and networks (Baker *et al.*, 2005) and incomplete openness to trade and investment.

Where our study goes beyond the literature (e.g. Baker et al, 2005) is by highlighting the role of *cross-border linkages between milieux* (see Figure 1). Considering the theme of comparative international entrepreneurship, what is particularly interesting is to compare India/Pakistan–US and India-Pakistan relations as influences on entrepreneurship in the software industry. In different ways, bonds with the US are critical to international entrepreneurship in both India and Pakistan.

Insert Figure 1 around here

Close inter-milieu links provide the opportunity to access complementary assets and business networks in the US. While Indians have had a huge influence on the development of Silicon Valley, their ties with Bangalore seem primarily to be based on hard-nosed business relations. But in relation to Pakistan, while the US milieu is critical for all aspects of the entrepreneurial process, the issue of closed networks may be a major barrier to long-term growth. As suggested earlier, ‘Pakistani entrepreneurs were within the US software milieu but not of it’.

Thus a major difference that emerged from our study between India and Pakistan is that, unlike in the case of Lahore, Bangalore’s linkages to Silicon Valley are increasingly transcending (often ad hoc) individual interpersonal ties to take on an institutionalized-like appearance facilitating a strong interchange of ideas, knowledge, capital and human resources through cross-border transactions and reverse migration (i.e. returnees from Silicon Valley).

A vital implication of our observation pertains to the coordination and integration of the entrepreneurial processes of opportunity discovery, evaluation and exploitation across frontiers. Of theoretical interest is that this is an issue raised by Oviatt and McDougall (1994) that has received little subsequent attention. They described the “global start-up” as a specific type of INV which “derives significant competitive advantage from extensive coordination among multiple organizational activities...[by] proactively acting on opportunities...” (Oviatt and McDougall, 1994: 59). Our research highlights out such coordination and integration may actually commence at the pre-startup phase, which resonates with their more recent definition of IE in terms of opportunities relation to “*future* goods and services” (Oviatt and McDougall, 2005: 540; emphasis added).

Useful managerial and policy implications follow. Learning from the Indian experience, policy-makers should undertake milieu-enhancing activities that yield potentially valuable networks to internationalizing new ventures. Learning from the Pakistan experience, efforts should be made to leverage ethnic ties. This is a strategy that countries across the world, not just in Asia, are adopting, witness the GlobalScot initiative to allow Scottish business to forge links with expatriates. A key message for entrepreneurs is the importance of actively leveraging network relationships on a personal basis as well as via institutionalized arrangements such as TiE.

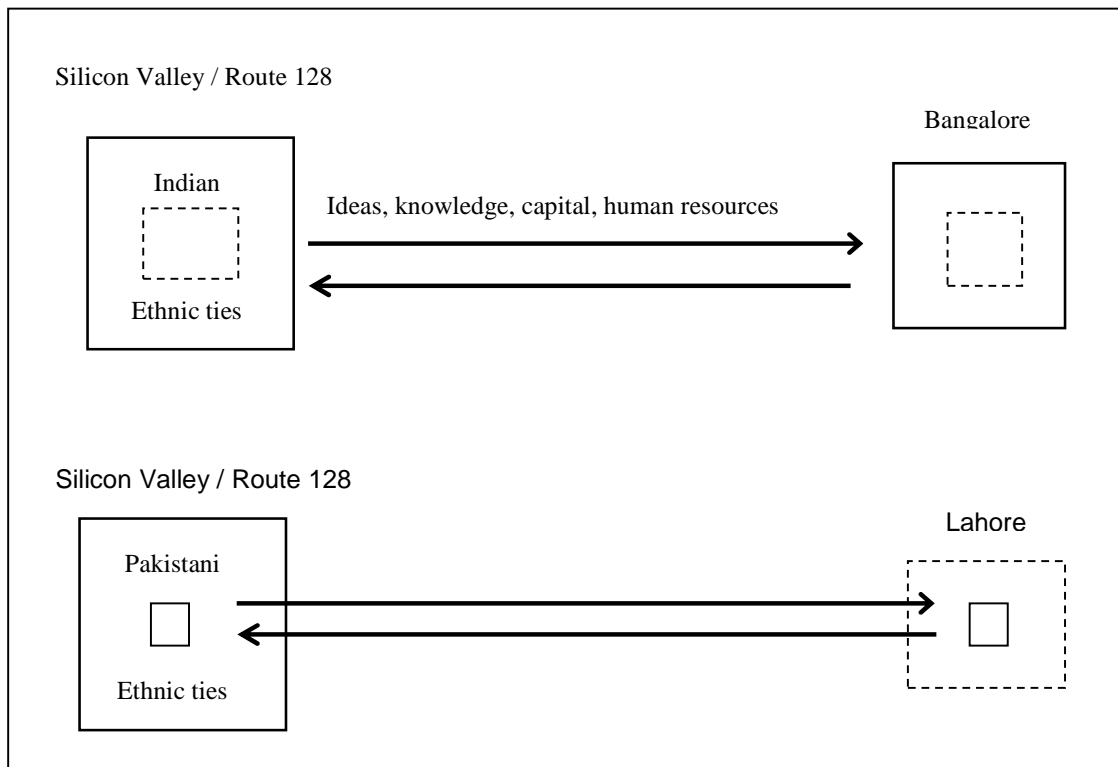
As a concluding thought, we note also that geopolitical factors and sensitive India-Pakistan relations mean that the potentially beneficial complementarities that could stimulate software entrepreneurship in and between both countries are not being realized.



References



- Baker, T., Gedajlovic, E. and Lubatkin, M (2005). A framework for comparing entrepreneurship processes across nations, *Journal of International Business Studies*, 36, 492-504.
- Balasubramanyam, V.N. and Balasubramanyam, A. (2000). The software cluster in Bangalore. In J.H.Dunning (ed.), *Regions, Globalization and the Knowledge-based Economy*, London: Routledge.
- Buckley, P.J. and Ghauri, P.N. (2004). Globalisation, economic geography and the strategy of multinational enterprises', *Journal of International Business Studies*, 35, 81-98.
- Camagni, R. (1991) *Innovation Networks: Spatial Perspectives*. London: Belhaven Press.
- Cohen, S.S. and Fields, G. (1999). Social capital and social gains in Silicon Valley, *California Management Review*, 41, 108-130.
- Coviello, N.E. and Jones, M.V. (2004). Methodological issues in international entrepreneurship research, *Journal of Business Venturing*, 19, 485-508.
- Davidsson, P. and Honig, B. (2003). The role of social and human capital among nascent entrepreneurs, *Journal of Business Venturing*, 18, 301-331.
- Dimitratos, P. and Jones, M.V. (2005). Future directions for international entrepreneurial research, *International Business Review*, 14, 119-128.
- Fromhold-Eisebith, M. (2004). Innovative milieu and social capital – complementary or redundant concepts of collaboration-based regional development, *European Planning Studies*, 12, 747-765.
- Ghauri, P. and Grønhaug, K. (2002) *Research Methods in Business Studies*. London: PrenticeHall.
- Hofstede, G. (2001). *Cultures Consequences*. London: Sage.
- Inkpen, A.C. and Tsang, E.W.K. (2005). Social capital, networks, and knowledge transfer, *Academy of Management Review*, 30, 146-165.
- Khanna, T. and Palepu, K. (1997). Why focused strategies may be wrong for emerging markets, *Harvard Business Review*, 75/4, 41-49.
- Khanna, T. and Rivkin, J.W. (2001). Estimating the performance effects of business groups in emerging markets, *Strategic Management Journal*, 22, 45-74.
- Marshall, A. (1920) *Principles of Economics*, London: Macmillan.
- McEvily, B. and Zaheer, A. (1999). Bridging ties: a source of firm heterogeneity in competitive capabilities', *Strategic Management Journal*, 20: 1133-1156.
- Miles, M. B. and Huberman, A. M. (1994) *Qualitative Data Analysis*. London: Sage.
- Nahapiet, J. and Ghoshal, S. (1998) 'Social capital, intellectual capital, and the organizational advantage', *Academy of Management Review*, 23: 242-266.

- OECD (1998). *21st Century Technologies*. Paris: OECD Publications.
- Oviatt, B.M. and McDougall, P.P. (1994). Toward a theory of new international ventures, *Journal of International Business Studies*, 25, 45-64.
- Oviatt, B.M. and McDougall, P.P. (2005). Defining international entrepreneurship and modeling the speed of internationalization, *Entrepreneurship Theory and Practice*, 29, 537-554.
- Porter, M.E. (1998). Clusters and the new economics of competition, *Harvard Business Review*, 76, 77-90.
- Prashantham, S. (2004). Local network relationships and the internationalization of small knowledge-intensive firms, *Copenhagen Journal of Asian Studies*, 19, 5-26.
- Prashantham, S. (2006). Foreign network relationships and the internationalisation of small knowledge-intensive firms, *International Journal of Entrepreneurship and Innovation Management*, 6, 542-553.
- Putnam, R. (2000) *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster.
- Redding, G. (1990) *The Spirit of Chinese Capitalism*, Berlin: de Gruyter.
- Saxenian, A.L. (2002). Transnational communities and the evolution of global production networks: the cases of Taiwan, China and India, *Industry and Innovation*, 9, 183-202.
- Shane, S. and Venkatarama, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25, 217-226.
- Tavares, A. T. and Teixeira, A. (2006). *Multinationals, Clusters and Innovation. Does Public Policy Matter?* Basingstoke: Palgrave Macmillan.
- Yin, R.K. (1994) *Case Study Research: Design and Methods*, London: Sage.
- Young, S., Dimitratos, P. and Dana, L-P. (2003). International entrepreneurship theories: what scope for international business theories?, *Journal of International Entrepreneurship*, 1, 31-42.
- Zahra, S.A. (2005). A theory of international new ventures: A decade of research, *Journal of International Business Studies*, 36, 20-28.
- Zahra, S.A. and George, G. (2002) International entrepreneurship: the current status of the field and future research agenda. In M. A. Hitt, D. Ireland, D. Sexton and M. Camp (eds.), *Strategic Entrepreneurship: Creating an Integrated Mindset*, Oxford: Blackwell.

**Figure 1 – Local Milieu and Ethnic Ties:
A Comparison of Cross-Border Entrepreneurial Linkages**



Key: *Outer boxes*  refers to an innovative local milieu (Silicon Valley / Route 128) or emerging local milieu (Bangalore).  Refers to a cluster of firms but not a local milieu.

Inner boxes.  refers to strong ethnic ties.  Refers to weak ethnic ties.