SOCIAL CAPITAL, DIVERSITY AND (ECONOMIC) DEVELOPMENT: EVIDENCE FROM THE INDIAN IT INDUSTRY, BANGALORE[σ]

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Abstract

Bangalore is known worldwide for its achievements in the high technology domain. Almost every multinational company has located some of its global activities in one of the technology parks around the city thereby integrating Bangalore in their global value chains. Moreover, many indigenous software firms sprouted during this process over the last decade or so have themselves reached reputation on a level not common to Indian companies before.

This paper addresses two sets of questions related to this development and lessons to be drawn for other regions both in and outside India. It is based on previous work rooted in but not confined to economic geography and international business. In order to develop the research hypotheses, literature on the history and anthropology of India has also been consulted. Firstly, based on original fieldwork an additional argument to traditional location literature is deployed. Secondly, related research on the financial services industry conjectures an intersectoral upgrading of the software industry clustered in Bangalore. Hence, the question is whether other regions can duplicate the success factors of Bangalore for both innovative technological development and an eventual industrial diversification. The major empirical finding is that the open and cosmopolitan nature of Bangalore has contributed a large share to the existing diversity of the city which, ultimately, has led to an innovative and thriving (economic) development.

Keywords: Economic Development; Diversity; Social Capital; Regional Culture; Value-Chain Upgrading
JEL-code: O30, R12, Z13, L86

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Social Capital and Diversity in the evolution of Human Capital: Evidence from the Indian IT Industry, Bangalore

Introduction

The growth of the Indian software industry has received a lot of attention. Whereas many factors like first-class higher education and research institutions, both public and private, low labor costs, stimulating (state) policies etc are enumerated, this is rarely done in a systemic approach. Moreover, although most studies analyzing the 'Indian' software industry cover essentially the South Indian clusters, the issue of concentration has become a research issue only recently (Balasubramanyam and Balasubramanyam, 2000; D'Costa, 2003; Vijayabaskar and Krishnaswamy, 2004).

The focus of this paper is on Bangalore as a major Indian IT cluster; it addresses two sets of questions related to this development and lessons to be drawn for other regions both in and outside India trying to attract FDI. It is rooted in but not confined to economic geography and international business. In order to develop the research hypotheses, literature on the history and anthropology of India has also been consulted. I emphasize the importance of human capital (Lucas, 1988) and supplement the economic geography explanations mentioned above with the additional variables social capital (Coleman, 1988) and diversity (Florida, 2002a, b; Ottaviano and Peri, 2003; Alesina and La Ferrara, 2004). The main hypotheses have been developed from a multi-disciplinary survey of economics, geography, history and anthropology literature as well as interview fieldwork in Bangalore; this research can be put in a co-evolutionary context.

Firstly, based on original fieldwork an additional argument to traditional location literature is developed. The novelty of this paper is the incorporation of culture and ethnicity as independent variables in location decisions of IT firms in order to explain the regional concentration of the Indian software industry predominantly in the South. There are three sub-question belonging to the location argument, which are examined through secondary data

from existing interview-based literature and through own fieldwork. 1) some ethnic and cultural groups in India apparently are more prone to knowledge-intensive industries due to their higher appreciation of learning. There are diverse culturally rooted attitudes towards education and technological as well as economic change; 2) the 'regional' culture of the South seems to be also more open in the sense of accommodating entrants from elsewhere - thereby converging initially diverse populations to a 'monocultural' one (cf. Klemm et al., 2005); 3) it is argued that geographical distance can, at least partly, be bridged by other forms of proximity – in this case socio-cultural – through transnational networks given the socio-cultural dimensions of the actors in this industry and their network connections.

In general, Indian society being a pluralistic one is characterized by a "coexistence of diverse ethnic groups with strong identities" (Combs et al., 2005). And, although South India always had more closely knit family structures this region is known for its more general openness towards foreign trade (as well as foreigners) compared to the rest of the country. Together with a high affinity to education and learning this has led to the emergence of a substantial stock of social capital. This endowment with social capital is crucial for the generation of relatively and absolutely more human capital in the region (Täube, 2004a) which, in turn, has generated two positive feedback loops. Firstly, the establishment of national research and higher education institutes in Bangalore led to the inflow of a large number of people from very diverse backgrounds. This diversity apparently provided the required setting for creativity and innovation (as found through my fieldwork). Secondly, the transnational networks linking Indian software clusters with Silicon Valley seem to be dominated by South Indians from different states (Dossani, 2002; Saxenian, 1999; see Frederking, 2002 for an alternative setting). Such linkages allow for additional knowledge spillovers from the lead market, hence corroborate the regional clustering of the more innovative branches within the Indian software industry..

DIVERSITY VS. SOCIAL CAPITAL?

Theoretically, both diversity and social capital have been purported to be engines of growth. Whereas the former features primarily in management (e.g. Boone et al., 2004) and regional development literature (Florida, 2002a, b), it has more recently been tested at the more macro level (Alesina and La Ferrara, 2004). Social capital has been deployed in various theoretical fields, from micro-economic job search (Granovetter, 1985) to regional (Putnam, 1993) as well as macroeconomic growth studies (Marini, 2004; Montalvo and Reynal-Querol, 2005). However, both can be interpreted as varying degrees of the same conceptualization of social networks (Walker, Kogut & Shan, 1997). In this case, social capital is the most intense appearance of a network with ties being most densely articulated and rather small in number. Diversity, on the other hand, is the extreme case with many contacts within a social network, but all ties being only loosely developed.

Once a strong tie has been established, firms can try to use it to create sustainable competitive advantage, referred to as relational rent, a term that intends to describe the potential synergy between buyer and supplier (Dyer and Singh, 1998). However, the positive effect of a dense social network has its limitations. There is threshold beyond which the negative costs of the group outweigh its benefits (Uzzi, 1996). On the other hand, in the case of a diversified network, the main advantages stem from a wider reach of the network linkages in order to source human or intellectual capital from an increased number of backgrounds. ‘Structural holes’ characterize a ‘network strategy’ of actors entering, for instance, a regional knowledge clusters establishing redundancy of ties (Burt, 1992). This openness of a network apparently is all the more advantageous the more innovative an industry is. Hence, an industry like software inherently possesses some inclination towards more loosely connected ties. Walker et al. (1997) found the same for networks of market transactions. As we shall see later, the service-oriented part of the Indian software can be characterized as rather organized on arm’s length exchange; whereas software product firms tend to have closer networks with client

organizations in lead markets. To summarize, there might not be a duality problem between social capital and diversity. However, a trade-off exists, making contingency perspective a well-suited approach (Nicolaou and Birley, 2003).

REGIONAL CULTURE OF SOUTH INDIA

A brief outline of the basic economic features of a 'culture' that can be derived from a South Indian background examines whether a regional culture of innovation exists resembling to some extent the one of Silicon Valley (Saxenian, 1994). There is a general misconception of 'the Hindu culture' or attitude towards modernization and innovation. Economists arrived at the crude conclusion that in principle it impedes the modernization of the Indian economy (e.g. Akerlof, 1976; Lal, 1988) not acknowledging existing anthropological fieldwork. While this pessimistic view of traditional 'cultures' has been restated in more general fashion in the collection of essays edited by Harrison and Huntington (2000), there are also more nuanced discussions of the interplay between culture and the economic realm (e.g. Rao and Walton, eds., 2004). Recently, there is more than anecdotal evidence that new Indian enterprises are determined even by the formerly priestly Brahmin caste rather than Vaishyas, the traditional business caste (Das, 2001). It might result from the fact that Brahmins have been involved more generally with activities relating to knowledge (Sen, 1997). Earlier Brahmins had a much more negative attitude towards business, trade and commerce in general (Adams, 2001; Rutten, 2002).

With regard to South India there are a few notable deviations. Primarily, there have always been high-caste non-Brahmins pertaining to the indigenous population who were not only engaged with the learning of their sacred scripts but 'who were adept in Sanskrit learning as well' (Stein, 1999: 52). Hence, the foundations for a knowledge-based society have existed in South India ever since and, moreover, have been much more diffused throughout the broader society. Secondly, and related to the first, the population of the South is said to be much more

homogenous than in the North. For instance, political movements in favor of backward groups started much earlier in South India and led to a more equal pattern compared to the still traditionally dominated, hierarchically oriented North (Jaffrelot 2002). Altogether, the Southern part of India seems to exhibit a more distinct regional culture of learning, not only in the sense of the regional development literature (Gertler 1997) but also literally. Apparently, this attitude is a solid foundation for the absorptive capacity necessary in order to adapt to new technologies. Although institutions of higher education have been allocated evenly over the whole country, there is a more than proportionate share of colleges, especially for engineering, and enrolment in the South (Chalam, 2000) (see tab. 1).

Table 1: Number of engineering colleges and enrolment compared to population

Region	Engineering colleges[I]		Enrolment[I]		Population[II]
	No.	National share	Sanctioned capacity	National share	National share
Central	50	7,54%	9,470	6,05%	-
East	25	3,77%	4,812	3,07%	25,8%
North	140	21,12%	25,449	16,26%	31,3%
West	140	21,12%	34,165	21,83%	19,6%
South	308	46,46%	82,597	52,78%	23,2%
Total	663	100,00%	156,493	100,00%	100,00%

[I] Source: Arora & Athreye (2002)

[II] Source: Dossani (2002)

Some features in South Indian cultures do not only provide a foundation for a more pronounced human capital base, but also increase the intensity of interaction in social networks. Thus ‘cultural proximity’ is presumably more significant in the South, thereby

increasing the level of trust that exists in these communities. This, in turn, enhances the potential for knowledge-intensive industries by facilitating the required communication, especially without geographical proximity by means of ICTs. This potential seems to be further nurtured by the immigration patterns to be found among Indians in the US, which triggers a positive feedback mechanism mentioned earlier (see Täube 2004b for an extensive discussion)

The other interesting characteristic is that many of the IT professionals, and probably the students too, apparently have a Brahmin background (Xiang 2002). A study on technical and scientific manpower in the four South Indian states indicates that lower castes are represented much below their share in the population (Deshpande 2000). While it seems plausible that there is a high percentage of Brahmins in the industry workforce the industry leadership seems to be dominated by South Indian Brahmins too (Fromhold-Eisebith 1999). This is insofar fascinating as South Indians as a social group used to be excluded from the entrepreneurial pool of the Indian business houses (Kapur & Ramamurti 2001). In general, this is consistent with the findings of a review of interview-based studies on the Indian IT industry (Täube, 2003); however there is no differentiation between entrepreneurs and employees. Moreover, Indian migrants in the US, in contrast to earlier, rather low-skilled those working in knowledge-intensive high-tech sectors, in particular software are among the best educated in the host economy. Their Indian background is most often to be found in a South Indian Brahmin family and upbringing (Eischen, 2002)

PRIMARY EMPIRICAL EVIDENCE

Between November and December 2003 I visited the Indian Institute of Science, Bangalore and conducted 33 Interviews with a sample of firms, universities and public sector entities. This sample was selected both randomly and through networking, as well as by chance. The

random sample is used in order to get a differentiated picture of the Indian IT industry in Bangalore, and has been selected from a Nasscom directory. The diverse nature of both MNCs and Indian companies is reflected through my selection. Among the Indian companies both big players as well as medium and very small companies are represented. Moreover, there are hardware companies and software companies, both service and product.

A chain of personal contacts through networks are deployed where it is necessary to learn from key decision makers (Bewley 2002). Most interviews have been conducted at the interviewee's office. But some have been more informal, visiting people at their home, or meeting them in a café. Two interviews have been arranged spontaneously meeting people on campus in the Indian Institute of Science or at a private socializing event. The average length of an interview was 45 minutes, ranging from 20 to 150 minutes. Since most of the people interviewed were founders, CEOs or other senior executives, I decided to design the interviews in a semi-structured way, thereby leaving more space for open answers on part of the industry insiders. I relied on a questionnaire of more than 30 questions as a guideline to the interviews where applicable. The questions were centred around general company information, employee and recruiting, social networks, regional networks and international networks, and policy. In general, all questions have been touched through this kind of open discussion.

Most of the results conform to the literature on the success of Bangalore as the leading Indian IT cluster. Generally, there has been a discussion on the factors contributing to this evolution. These factors can be perfectly subsumed and analysed in more detail under an innovation system approach. First, there has always been a strong research base, esp. electrical engineering, manufacturing (machine tools), but no chemical industry. With the early location of military, hence defense research and later also space research, i.e. the concentration of research-intensive high-tech industries Bangalore became the prime location for high technology equipment in an economy rather left out of technological developments due to a

prohibitive import tariff structure. Many employees of these research institutions later trained the graduates of the many engineering colleges in the city and the state. The number of these graduates has been much higher than in other Indian regions since the late 1970s, when the privatization of higher education in the state of Karnataka witnessed a first boost. It has been the first state to privatize higher education, many decades back. Many of these privately funded colleges received not only the regular fees, but also a capitation fee for a quota of the student intake. These funds made possible the establishment of computer labs required for teaching students in IT. This co-evolution of research and training institutions perhaps best reflects the systemic character of what led to the initial competitive advantage (cf. Murmann 2003).

Other, more profound, factors include the more stable society described earlier, and the most favourable climate, that helped to both locate early research labs in the 1950s as well as making Bangalore a city most attractive for future employees. From early on the latter has been a major concern of decision makers, since people are the most valuable asset in IT companies.

The Relevance of being cosmopolitan

Interestingly, one factor which came out very clearly in my interviews concerns the social composition of the IT industry. Virtually no one found the industry to be really dominated by South Indians; only few conceded a marginal lead over other communities. But, more importantly, most of my interview partners even argued in the opposite way. They claimed, it is very much the cosmopolitan nature of the city and the historical and traditional openness towards foreigners, both Indian and from abroad which had a high impact on the IT industry. Compared to other states in India, the investment climate has eventually been much more hospitable to foreign direct investment.

Bangalore has been very cosmopolitan for many centuries, for at least two reasons. Since colonial times, it has been one of the climatically most pleasant places for the British. Hence, Bangalore became an important cantonment. Secondly, it is a 'border city' only 30-40 km from the neighboring states Tamil Nadu and Andhra Pradesh. This led to a population of the city consisting of people not originally from the city of more than 50%. The city has grown even more cosmopolitan due to the central government's policy to locate national institutions, like Hindustan AeronauticsLimited, or Bharat Electronics Limited there (Lema, 2005). These national institutions were staffed with people from the Indian Administrative Service IAS, or researchers employed after nation-wide job announcements and recruitment processes. The following relocation of many Indians from other parts of the country as early as the 1950s enhanced the already established cosmopolitan nature of the city. More recently, due to the prospects of a booming economy and job market there is a continuous inflow of foreigners (for non-economic factors motivating migration in India see Gidwani and Sivaramakrishnan, 2003). Therefore, I was not surprised to find a similar pattern among my randomly sampled respondents with a total of 54,5% not being from Bangalore (s. table 2).

Table 2: Origin of interview partners in own fieldwork

	Bangalore	Not Bangalore	n.a.	
total	9	18	6	33
	27,3%	54,5%	18,2%	100,0%
firms	6	10	3	19
	31,6%	52,6%	15,8%	100,0%
univ	1	4		5
	20,0%	80,0%	0,0%	100,0%
Govt	2	4	3	9
	22,2%	44,4%	33,3%	100,0%

Cosmopolitan nature has not only been purported by many respondents, but seems to also resemble the diversity argument in Florida (2002a, b). Other proponents of diversity as an engine of growth are Feldman and Audretsch (1996) and Ottaviano and Peri (2003). However, the formers' argument is rather based on a differentiated industrial structure in a city. Similarly, Glaeser and Saiz (2004) find evidence of both amenities and a diversified industrial structure as key ingredients for attracting skilled human capital. My interpretation of the advantage an ethnically diversified labor force possesses is the increased number of linkages it provides from a social network perspective. Although such linkages would not have the density and frequency positively associated with social capital, they enlarge the knowledge base by merely expanding the number of potential contacts generating ideas in a network of innovators (cf. Agrawal *et al.*, 2003; Kotkin, 1993). There is also the anthropological argument of 'contingent dynamic and relativity of structurally opposing groups'; in other words, people usually feel closer to socially or ethnically more distant groups the further they are from their home environment (Evans-Pritchard, 1940). However, there are also drawbacks from too high a diversity level, most prominently an increased risk of conflicts.

Apparently Bangalore has reached a level of diversity that allowed to benefit more from the positive effects of diversity than suffer from its negative ones. Two plausible explanations for the beneficial impact of diversity to be found rather in developed countries are advanced: first, an institutional framework that mitigates conflict situations ethnically diverse societies are more prone to and, secondly, a higher level of economic development in which diverse elements in the production structure reveal their complementarities (Alesina and La Ferrara, 2004). The reasons why this might be valid in the case of Bangalore too are the above mentioned high level of human capital existing in the agglomeration as well as the relative peaceful societies in South India more generally. Lema (2005) tested the argument of collective efficiency which bears some resemblance to social capital, and found it to be not

significant as an explanation for Bangalore's success, thereby implicitly lending further support to the openness argument.

Due to the prominence of Bangalore in IT and IT enabled services, the prospects for a sustained (economic) development are reasonably good. Given the specialization of the Indian software service vendors in banking and financial services there is increasing evidence of an intersectoral upgrading of IT clusters into this kind of related knowledge-intensive industries (Grote and Täube, 2005 *forthcoming*). Although lagging behind Mumbai – as the leading financial center – Bangalore has been able to attract a good share of foreign direct investment not only in IT, but also in financial services. Thus, an important lesson for any other Indian region as well as those in other countries is not to limit economic development to the technological domain as can be witnessed in the less successful case of Indonesian Bandung (Fromhold-Eisebith, 2002).

SUMMARY AND CONCLUSION

In conclusion, taking a perspective that is almost highly economic in nature the outlook for a continuation of Karnataka's development is very positive. Broadening the perspective, however, one arrives at a somewhat different picture. Assessing the socio-economic advancement of disadvantaged groups of society reveals the unbalanced structure of Bangalore's growth strategy. For instance, a study on technical and scientific manpower in the four South Indian states indicates that lower castes are represented much below their share in the population (Deshpande, 2000). While it seems plausible that there is a high percentage of *Brahmins* in the industry workforce the industry leadership seems to be dominated by South Indian *Brahmins* too (Fromhold-Eisebith, 1999). Apart from the distributional effect, this is fascinating insofar as South Indians as a social group used to be excluded from the entrepreneurial pool of the Indian business houses (Kapur and Ramamurti, 2001).

Lessons for other states or countries include that co-evolution of research and industry perhaps best reflects the systemic character of what led to the initial competitive advantage (Murmann, 2003). But, apart from these well known components of an innovation system (e.g. Nelson, ed., 1993), the openness and diversity seems to have played a substantial role. With this line of reasoning from diversity to innovation being reflected not only in my interview statistics, but also in official figures, it seems to be worthwhile doing further research in this direction. Furthermore, a policy recommendation following this argument would probably yield more than economic development; in order to achieve the desired diversity actions promoting disadvantaged groups of society might be considered in an even more critical light.

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