

What lessons can the Brazilian Software Industry learn from the Indian Software Industry?

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1. Introduction

"The world is moving so fast these days that the man who says it can't be done is generally interrupted by someone doing it"

(Elbert Hubbard: N.D.)

The current global economy is a highly competitive, interconnected, and rapid changing environment where succeeding is becoming a difficult task. The rise and speed of countries like China, India, or Brazil are questioning the supremacy of Western powers while challenging the rise of other emerging economies. This situation becomes more visible in industries like software, a fast moving sector where production capabilities have shifted from North to South over the last two decades, and which is starting to witness a shift in innovation capabilities in the same direction. A combination of both, but especially the development of innovation capabilities, is the key determinant for competitiveness and success in the global economy. However, the acquisition of innovation capabilities has not occurred equally throughout the different countries in the software industry.

India is widely acclaimed as a success story amongst the software industries in emerging economies. Its rapid growth, export market orientation, integration in global

value chains, and the acquisition of innovation capabilities make India one of the global leaders in the software industry. The Brazilian software industry has been very much based on the domestic market and the development of innovation capabilities has remained limited. As a result, even though Brazil has also followed an astonishing rise during the last two decades, its relative position in the world ranking amongst the biggest software industries has declined in recent years.

As stated in the title, the main aim of this paper will be to study what lessons can Brazil learn from the Indian software industry. It will identify the key factors that could help improve Brazil's innovation capabilities and its performance in the international arena. The paper will first analyze the different theories about the acquisition of innovation capabilities. Second, it will describe the evolution and main characteristics of the Brazilian software industry. Third, it will carry out the same analysis for the Indian software industry. Fourth, it will compare the development of both industries and their respective orientation towards the domestic or the external market. Finally, it will identify the key lessons that Brazil can learn from India to improve its innovation capabilities and international performance.

2. Moving Towards Innovation

It is increasingly acknowledged that fostering innovation and knowledge acquisition are key determinants for the competitiveness of firms, clusters, regions, and nations (Morrison et al.: 2008). Orientation towards the domestic or the external market plays a major role in the development of these innovation capabilities. Developing countries tend to compete in the “low road”, which is characterized by squeezing profit margins and wages instead of improving productivity. Moving to the “high road” of competitiveness is determined by the acquisition of different capabilities and it is often

identified as upgrading (Giuliani et al.: 2005). Upgrading has been traditionally defined as the ability to make better products, to produce them in a more efficient way, or to move into activities that require higher skills. As argued by Pietrobelli and Rabellotti, I will define “upgrading as innovating to increase value added” (2006, p.1) and in this way interlink the concepts of upgrading and innovation.

Traditionally there have been two main groups of literature that have focused on the analysis of the acquisition of capabilities for upgrading, one that emphasized the importance of local linkages and the other that focused on global linkages (Humphrey and Schmitz: 2002). Recent studies tend to concentrate on a combination of both local and global linkages as the right recipe for upgrading. The balance and way in which firms or industries decide to integrate in the local or the global economy depends on two main factors: firm strategies and industrial policies. Correctly managing the integration process and selection of policies is crucial to enabling local firms to compete in global markets (Schmitz: 2007). Schmitz also highlights the importance of recognizing the change of policies and strategies over time (2007).

The two main approaches of the literature that focus on local linkages are the Cluster and Innovation System approaches. The cluster literature assumes that the main capabilities for upgrading come from the locality and tends to ignore the influence of external links for upgrading (Humphrey and Schmitz: 2002). The innovation system approach argues that the acquisition of innovative capabilities depends on the quality and density of the relationships between producers, users, and specialized support institutions and focuses on the importance of the region-specific cultural and institutional context (Altenburg et al.: 2008).

The literature on Global Value Chains (GVC) concentrates on the relationship between buyers and suppliers within the GVC, independent of where they are located.

This approach focuses on the role of the lead firm as the determinant for the acquisition of upgrading capabilities by local producers. These capabilities are mainly reflected in process and product upgrading (Humphrey and Schmitz: 2002). More recent literature argues that apprenticeship in national markets, prior to operation in GVCs, is needed in order to promote functional upgrading (Bazan and Navas-Alemán: 2004). Furthermore, Navas-Alemán concludes in a recent study that those firms operating simultaneously in multiple VCs, domestic and global, benefit from better upgrading opportunities in all types of upgrading than those companies that only focus on GVCs. When operating simultaneously in VCs that are governed differently, firms can acquire different capabilities from each chain (2011).

In the same way, the literature on innovation and export orientation supports the need to be connected to both the local and global markets to promote upgrading capabilities (Kesidou and Szirmai: 2008). Nevertheless there are some differences with the GVC approach. A recent study by Damijan et al. analyses the causal relationship between exporting and innovation concluding that there is only enough evidence to affirm that past export activities directly relate to process upgrading, but this study is not conclusive with respect to product upgrading (2010). The literature on outsourcing and innovation reinforces the idea that developing countries need to attract Research and Development (R&D) by Transnational Companies (TNC) in order to become better connected to Global Innovation Networks (GIN). Moreover, it argues that foreign sources of knowledge are the necessary catalyst for learning and capability formation (Ernst: 2008). Furthermore, it focuses on the importance of global linkages, internal firm initiatives and strategies, and it minimizes the importance of local linkages for the acquisition of new capabilities (Lema: 2009).

Table 1 summarizes the main trends in the literature covered and identifies the

opportunities and constraints of focusing on the domestic versus the external market for the acquisition of innovation capabilities:

Table 1. Pros & Cons of Focusing on Internal or External Markets for Innovation

	Domestic Market	External Market
Pros	Proximity to Customers No obstacles posed by lead firms for upgrading Strong linkages to support institutions and universities	Access to a broader market base Exposure to international standards Access to GINs Access to foreign knowledge
Cons	Lack of exposure to international standards Limited market access	Distant from Customers Obstacles posed by lead firms for upgrading

Source: Author's own.

It is important to clarify that different sectors vary in technological complexity and in the sources and modes of upgrading and innovation (Schmitz: 2007). Consequently some of the theories described above may differ slightly in the case of the software industry. Giuliani et al. conducted a study of Latin American software clusters and analyzed their specific upgrading patterns. With regard to product upgrading, they concluded that the existence of network relationships with users, the degree of collective efficiency within the clusters, and the flow of skilled people inside the clusters were determinants of their product upgrading. The enforcement of linkages between local universities and software firms were proved to have enhanced process upgrading. Finally, they concluded that collective initiatives and activities like marketing campaigns or joint participation in fairs promoted functional upgrading (2005). However, the clusters selected for the analysis were mainly focused on the domestic market; consequently, the conclusions of this study could change in the case of export-oriented clusters.

3. The Brazilian Software Industry.

During the 1990's Brazil developed a vibrant software industry, which has grown at double-digit rates for almost two decades and in 2001 became the world's 7th largest with a value of US\$ 7.7 billion (Botelho et al.: 2003). Seven years later Brazil descended to 12th position, around US\$ 15 billion sales, equivalent to only 0.96 per cent of the Brazilian GDP (SOFTEX: 2008, as cited in Miranda and Figueiredo: 2010). The evolution of the Brazilian software industry in recent years indicates that even if the industry has maintained a solid growth rate, its performance in the international arena has declined compared to other competitors like the Indian or the Chinese software industries. To understand the international underperformance of the Brazilian software industry it is necessary to review the national policies over the last four decades.

The evolution of the software sector in Brazil can be divided in two different stages: The period before 1990, which was marked by import substitution policies, and the period after 1990, characterized by a process of progressive liberalization (Cassiolato et al.: 2007).

Import Substitution (1970's and 1980's)

In the 1970's India and Brazil pioneered, in the developing world, the design and implementation of policies aiming to support and develop IT products and services. The main goal of the Brazilian government was to develop local technological capabilities and reduce their dependence on foreign technology (Cassiolato et al.: 2006). In 1972 the import substitution model led to the establishment of a principle of market reserve, which protected Brazilian hardware producers from foreign competition (Botelho et al.: 2005). During the 70's and 80's policies for the software industry were mainly indirect as they were linked to the hardware policies. The main consequence of the market reserve policies imposed during these two decades was that the whole IT sector remained very

much domestic oriented (Cassiolato et al.: 2007).

Progressive Liberalization (1990's and 2000's)

As a result of the weakening of the original inward-oriented policy of the IT sector, the economic recession, and the shift from dictatorship to democracy, the beginning of the 90's brought a shift towards a greater openness (Botelho et al.: 2005). The new changes combined mechanisms for attraction of foreign capital, trade liberalization, and privatization. In the hardware sector an important part of the liberalization process was the attraction of international MNCs, with the idea that they would use the country as an export platform, but in reality they were only interested in the internal market (Cassiolato et al.: 2006). In 1992 a program called SOFTEX was created with the aim of strengthening the software sector and promoting the commercialization of Brazilian products and services abroad. However the strategies followed by SOFTEX failed and the objectives were not reached. This failure was caused by the absence of a client-led drive, instead of attending to the needs of potential clients the effort focused on exporting what was available in the country, expecting these products and services to satisfy the needs of the international clients (Cassiolato et al.: 2007).

Current Composition of the Industry

Analyzing the current situation of the Brazilian software industry is a complex task, due to the level of integration that software activities still have with other IT activities and the heterogeneity of the business models in the industry. In 2003 sixty thousand workers were employed in the software industry and 93 per cent of the labor force had completed at least secondary education. This high ratio of education materialized in relative higher salaries in the informatics sector as a whole and almost doubled the average salaries of the Brazilian formal economic sector (Cassiolato et al.: 2007). However, the amount of students in domestic postgraduate programs or abroad in

developed countries like the USA has remained low compared to countries like China or India (Behrens: 2005).

The size of the majority of the firms in the Brazilian software industry can be classified into the micro or small segments, most of them employing less than 50 workers and only a few with more than 500 employees (Behrens: 2005). The origins of the firms competing in the Brazilian software industry are varied (Table 2). As a consequence of the liberalization policies followed during the 90's, IT became one of the top three destinations for foreign direct investment in Brazil (Botelho et al.: 2005).

Table 2. Largest Software Firms in Brazil: 2004

2004	Firm	Origin
1	MICROSOFT SÃO PAULO (SP)	USA
2	COMPUTER ASSOC. S.PAULO (SP)	USA
3	ORACLE SÃO PAULO (SP)	USA
4	SAP SÃO PAULO (SP)	GER
5	CONSIST SÃO PAULO (SP)	USA
6	CPQD CAMPINAS (SP)	BRA
7	PEOPLESFT SÃO PAULO (SP)	USA
8	MICROSIGA SÃO PAULO (SP)	BRA
9	DATASUL JOINVILLE (SC)	BRA
10	RM SISTEMAS B.HORIZONTEE (MG)	USA

* BRA Brazil; GER: Germany; USA: United States of America

Source: Exame Informatica from Cassiolato et al.: 2007.

The process of establishing new firms lost its impetus at the end of the 90's, being replaced by a tendency of firms' specialization and consolidation. A study from 2002 shows that the majority of companies currently existing were created as the outgrowth of pre-existing companies. Some appeared as the result of a spin-off from the parent

company; others were created by ex-employees from the parent firm. However, some of the major players are still government firms created in the 80's like SERPRO and some multinationals that have a long and well established presence in the country (Botelho et al.: 2003).

Orientation towards the Internal Market

As described earlier, the historical policies undertaken by the Brazilian government made the software industry focus greatly on the internal market and implemented inward development strategies. In 2001 the domestic market accounted for approximately 98 per cent of sales (Cassiolato et al.: 2007). These inward strategies and the increase in software imports during the 90's resulted in an environment of customization of unsophisticated products to individual customers, growth through diversification in regional markets, and numerous small regional firms lacking strategic focus. However, during the last decade this pattern has started to change and there has been an emergence of specialized firms in some subsectors at the national level (Botelho et al.: 2005).

Even if Brazil is considered a developing country, some subsectors in the economy are particularly well developed and have complex software needs. The success of some software firms in these sectors has depended greatly on their ability to develop advanced software. The Brazilian banking sector is remarkably sophisticated and has become a world leader in online banking, being the single largest investor in IT in Brazil (Botelho et al.: 2003). The telecommunications sector is also sophisticated and foreign firms have dominated it since the deregulation of the 90's. Public administration has also played a major role in the development of the software industry, as it has sophisticated needs in terms of information processing (Botelho et al.: 2005).

Even if Brazilian software firms have relied heavily on the internal market to develop themselves, a study by Bothelo et al. reflected that the export of services is seen as a key source for market growth in the future (2003). The increasing global outsourcing of software offers Brazil an opportunity to access international markets, generate more jobs, and increase the talent pool of the industry (Cassiolato et al.: 2007). Moreover, in 2009 BRASSCOM launched a joint initiative with Apex-Brazil to boost outsourcing and IT-BPO exports by 2010 (BRASSCOM: 2009). However, to fully take advantage of this opportunity it is necessary to understand the main weaknesses, strengths, challenges, and opportunities faced by the Brazilian software industry.

The main strength of the industry is the sophistication and specialization of sectors like banking, telecommunications, and government. These accumulated competences could be applied to a broader range of activities, like insurance or financial markets. Here Brazilian firms have a major opportunity to stand out internationally, as they have forged a solid position as a world-class solutions provider, with competitive wages compared to its main competitor in this segment. Moreover, some Brazilian firms have already started to position themselves in new dynamic niches like free software or digital games. Furthermore, Brazilian's high technological standards, high intellectual property rights, business culture, and proximity to the main potential markets are some of the most important strengths of the industry (Cassiolato et al.: 2007).

On the other hand the Brazilian software industry has some weaknesses, like the fragmentation of its industrial structure, which creates disincentives to promote cooperation between small and medium firms. Additionally, the average wages of the industry are not sufficiently low to compete with countries like India in the low-value segment. Furthermore, it faces challenges, like the need to create a well-known image in

the international software market and the lack of English language capabilities. Moreover, it needs to create flexible policy measures that create incentives to upgrade local human resources, invest in innovation, and build competences to be capable of adapting to the heterogeneity of its industrial structure (Cassiolato et al.: 2007).

Moving towards Innovation

Those companies competing in the high-value-added segment of the Brazilian software industry stand out in terms of product upgrading, investment in R&D, and technological qualifications. This situation has been fostered by the adoption of new business models like joint ventures with leading companies from sectors like banking, telecommunications, and government. Due to the institutional and structural conditions of the industry and the weak linkages between firms and universities the majority of technological development takes place within the companies and not in the academic sphere. However, large companies use the universities to complement their own innovative efforts. Some authors argue that strengthening the educational system and promoting a better connection between firms and universities is needed to promote innovation and the accumulation of capabilities in the Brazilian software industry (Cassiolato et al.: 2007).

4. The Indian Software Industry.

For the last four decades subsequent generations of Indian Prime Ministers have been keen to develop a solid and competitive Information and Communication Technology (ICT) industry in the country (Baskaran and Muchie: 2006). One of the most remarkable developments has been that of the software industry, characterized by double-digit growth for the last two decades, which has made the Indian industry emerge

as a major industry leader and exporter of software services in the international arena (Athreye: 2005). The Indian case is especially remarkable amongst software industries in developing countries. It is mainly oriented towards services instead of products, it relies greatly on exports rather than in the domestic market, and it is largely managed by professional and entrepreneurial managers (Arora et al.: 2001).

Evolution of the Indian Software Industry

The history of the Indian software industry shares certain similarities with the Brazilian case, but the result has been radically different. The beginning of the Indian software industry was characterized by a strong orientation towards the domestic market. At the end of the 80's this situation began to change with a shift of public policy, which promoted greater export orientation. In the 90's the Indian government promoted large-scale financial liberalization and large MNCs entered the Indian market. In this phase, offshoring of software services appeared as a business model between MNCs and domestic firms. Innovations in communications during the 90's reduced the need for close proximity between buyers and suppliers and an increasing trend of outsourcing IT tasks and functions from developed countries determined the export orientation of the Indian software industry. This situation has been maintained over the last decade mainly supported by cost differences (Commander: 2005).

Current Composition of the Industry

In 2010 the aggregate amount of revenues generated by software and services in India grew to US\$ 63.7 billion, of which US\$ 50.1 billion was generated by exports. Software services account for over 99 per cent of the total amount of exports and employ around 1.8 million people (NASSCOM: 2010). Even if prices have risen in recent years India still offers a low cost alternative for outsourcing to developed countries. Moreover, India has a remarkable pool of high skilled people. In 2006 India graduated

over 500,000 engineers and in 2010 3.7 million Indians graduated (Altenburg et al.: 2008; NASSCOM: 2010). Major domestic players dominate the industry, but in recent years subsidiaries of MNCs have expanded their operations aggressively in India (Table 3).

Table 3. Top 10 Indian IT Services Exporters: 2009-2010

2009-2010	Firm	Origin*
1	TATA CONSULTANCY SERVICES LTD	IND
2	INFOSYS TECHNOLOGIES LTD	IND
3	WIPRO TECHNOLOGIES LTD	IND
4	HCL TECHNOLOGIES LTD	IND
5	TECH MAHINDRA LTD (FORMERLY MAHINDRA-BRITISH TELECOM LTD)	JVT
6	MPHASIS (HP COMPANY) LTD	USA
7	PATNI COMPUTER SYSTEMS LTD	IND
8	ARICENT TECHNOLOGIES (HOLDINGS) LTD	USA
9	CSC INDIA PRIVATE LIMITED	USA
10	L&T INFOTECH LTD	IND

* IND: India; JVT: Joint Venture; USA: United States of America

Source: NASSCOM: 2010

Orientation towards the Internal Market

Only 20 per cent of the revenue produced in the industry is generated in the internal market. The main activities for software sales in the internal market consist of reselling software packages developed by foreign companies, in-house software development by users, and development of software packages by some Indian firms targeting the domestic market (Arora et al.: 2001). Some of the reasons that explain the weak development of the domestic market are evident. There is a small base of installed Personal Computers (PC) in the country, amounting to less than 15 PCs per 1000 people.

The cost of buying hardware in the domestic market is still high and the costs associated with piracy are high as well. The profits associated with software exports are significantly higher than those associated with domestic sales (Illian: 2008).

Export Orientation and Outsourcing

Starting from zero, the Indian software industry grew at levels close to 50 percent annually during the 90's, but at the beginning of the 2000s the growth rate was reduced to annual levels between 20 and 30 per cent. Part of the deceleration has been caused by the slowdown of the IT industry and particularly of the US (Desai: 2005). There are several reasons that explain the outstanding export performance of the Indian software industry. The continuous rise in the offshore services, the quality of the services, the timely delivery, entry into new markets, and international linkages are some of the main explanations. Moreover, some initiatives promoted by the government like tax concessions, procedures simplification, creation of technology parks, and liberal foreign investment policies have contributed greatly to the success. Furthermore, India has some comparative advantages like the second largest pool of English speaking scientific skilled manpower, low labor costs, and national proactive institutions at the national level like NASSCOM (Illian: 2008).

Moving towards Innovation

D'Costa argues that India's ability to maintain their position, as a major software exporter, will depend on the ability of its industry to foster innovative capabilities (2004). Some authors like Arora et al. defend the position that the innovation capabilities of the Indian software industry remain relatively weak, with the great majority of the "inventive activity" still being located in the USA (2008). It is true that the Indian software industry has focused for a long time on low value added activities, like low cost programming services. Nevertheless, authors like Lema argue that the adoption of open business

models in developed countries has fostered the movement of the Indian software industry towards more complex and high value added activities and niches (2010). In the same way, Athreye explains how the adoption of the outsourced business model and the evolution of the labor market for software firms have promoted the development of organizational and process management capabilities by Indian firms (2005). In conclusion, a relevant part of the exiting literature supports the idea that there has been some product and process upgrading within the Indian software industry as a consequence of the adoption of outsourcing business models.

5. Learning Lessons

Four decades ago the Brazilian and the Indian software industries had more similarities than they do currently. Understanding why and how both industries have evolved in a certain direction over the last decades is necessary to answer the question of this paper. As mentioned in section two, the way and balance in which firms or industries decide to integrate in the local or the global economy depends on national industrial policies, firm strategies, and the stage of evolution of the markets.

Table 4. Brazilian and Indian National Trajectories

	Brazilian Software Industry	Indian Software Industry
1980's	Import substitution and market reserve	Import substitution and de-linkage of SW and HW policies*
1990's	Attraction of foreign capital, trade liberalization, privatization, and promotion of exports	Attraction of foreign capital, export orientation, and financial liberalization
2000's	Failure of export policies and great domestic market orientation	Great export orientation, little focus on the domestic market

* SW: Software; HW: Hardware

Source: Author's own.

Table 5. Evolution of Brazilian and Indian Firm Strategies

	Brazilian Software Industry	Indian Software Industry
1980's	Production of low-quality products	Production of low-value added products
1990's	Creation of JVs between local and foreign IT companies*	High-quality SW services, and adoption of offshoring as BM*
2000's	Small firms customize SW packages, SWVs develop complex SW products, and beginning of offshoring and outsourcing BM*. Product innovation in narrow fields	High-quality SW services and innovation under outsourcing BM. Broad and deep product and process innovation of services.

* SW: Software; BM: Business Model; JV: Joint Venture; SWV: Software Venture (i.e. with banking industry)

Source: Author's own.

Table 6. Current Domestic vs. External sales of Software and Services

	Brazilian SW Industry	Indian SW Industry
Domestic Market	98%	21%
External Market	2%	79%

Source of Data: Cassiolato et al.: 2007; NASSCOM: 2010.

Tables 4 and 5 show the evolution of country policies and firm strategies in both countries during the last three decades. It can be observed that during the 80's the software industry in both countries shared similar characteristics, both at the firm level and the country policy level. The policies implemented during the 90's in both countries were oriented towards a greater openness of the market and focused on export orientation. However, firm strategies, particularly the capability to implement these strategies, have differed from each other. The adoption of new business models like offshoring and the greater focus on services rather than products made it possible for the Indian software industry to build a well known name in the international arena. On the other hand, the Brazilian software industry did not succeed in the process of

externalization because it focused on the mere promotion of existing products instead of the promotion of new, flexible, and client-led business models. The result of these policies and strategies can be clearly seen in Table 6, as the proportion of sales generated in the internal versus the external market.

In terms of innovation both industries have also followed a different evolution over the last decades. In the case of Brazil, some firms have benefited from product upgrading while the majority of small firms have stagnated. The reason for this upgrading can be attributed to the adoption of Software Venture business models between some software firms and leading companies in highly sophisticated sectors like banking, telecommunications or government. In the case of India, it has already been explained how authors like Lema or Athreye have argued that the adoption of open business models like outsourcing have fostered product and process upgrading of services (2010; 2005).

Lessons for Brazil

The major lesson that Brazil can learn from India is the importance of integrating into GVCs, which would help expose the industry to international standards and foreign knowledge (Table 1). Supplying outsourcing services to client companies abroad with open business models could be a key factor for the acquisition of new capabilities (Lema: 2010). Integrating into GVCs with countries like the USA would help Brazil access an extensive market of advanced users, but it can be a challenging task due to the lack of English language capabilities (Cassiolato et al.: 2007). As proposed by Navas-Alemán, VCs from neighboring countries with similar levels of development, combined with domestic VCs, may offer important upgrading opportunities (2011). Moreover, by operating in different VCs in South America, Brazil would find it less difficult to overcome the language barrier. However, the correct identification of countries with

similar levels of development and sophisticated clients in sectors like banking, insurance, or telecommunications will be an important step to take.

At the domestic level, the collective efficiency and communication between micro and small firms remains low. The creation of clusters and the promotion of collective initiatives and activities will help promote upgrading (Giuliani et al.: 2005). The reinforcement of linkages between firms and universities and the promotion of policies that foster the enrollment of students in post-graduate programs and overseas education will help improve the image of the Brazilian software industry abroad. Furthermore, Brazil may find it difficult to compete in the low-value added segments of international markets due to its relatively high labor costs compared to countries like China (Cassiolato et al.: 2007). Consequently the reorientation of the software industry to client-led services, rather than merely software products, will promote the necessary apprenticeship in the high-value added segment for small firms before competing in foreign markets.

Lessons for India

During the course of this analysis some insights have emerged and there are also steps that India could take to improve its performance. The most important lesson that India can learn from Brazil is the need to promote the development of the internal market (D'Costa: 2004), which could reduce obstacles for innovation posed by lead firms and reduce distance with customers (Table 1). The Indian domestic market is booming in several sectors, but not in software. The main challenge faced when developing the domestic market will be the development of good IT infrastructure outside the already existing IT areas. In this case India could learn from the Brazilian experience, as Brazil is classified as the top networked economy in South America (Behrens: 2005).

By operating in the domestic VC and GVCs simultaneously, the Indian software industry would benefit from better opportunities for product, process and functional

upgrading (Navas-Alemán: 2011). Building on the conclusions reached by Navas-Alemán and a study carried out by D'Costa for the World Bank (2006), there is another important lesson that India should learn. The Indian software industry is still extremely dependent on the US economy and, by not engaging in other regional VCs, governed in more similar to the Japanese market; Indian firms are not benefiting from different and alternative forms of learning and acquisition of capabilities. However, the ability of the industry to reorient its capabilities to new markets will be a determining factor for its success.

6. Conclusion.

The original question of this paper aimed to identify the key lessons that the Brazilian software industry could learn from India, however some insights have emerged during the analysis and there are also lessons that India could learn from Brazil.

The acquisition of both production and especially innovation capabilities are determinants of competitiveness in the software industry. This paper has examined how different profiles in terms of market orientation have promoted different innovation patterns. Recent studies have proven that India's export market orientation and the types of business models adopted have fostered the development of both production and innovation capabilities. In the case of Brazil, its domestic market orientation and its relative underperformance at the international level have resulted in limited development of innovation capabilities.

The combination of national industrial policies, firm strategies, and evolution of the market has determined the acquisition of innovation capabilities differently in the Brazilian and Indian software industries over the last thirty years. The main factors that

Brazil can learn from India to acquire new capabilities are: the importance of integrating in global and regional VCs, outsourcing services to client companies abroad with open business models, the creation of clusters and business associations to promote collective efficiency, and the reinforcement of linkages between firms and universities. The main lessons for India are the importance of developing good IT infrastructure at the national level to promote the development of the domestic market and the importance of operating simultaneously in multiple VCs to benefit from better innovation prospects.

Both Brazil and India need to find the correct balance between the domestic and the external market and in this way foster the acquisition of deeper and broader innovation capabilities, which will help them secure a place amongst the top software industries in the future.

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