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The Challenge of Developing across Borders: Singapore's Gambit in Bangalore, India

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**The Challenge of Developing Across Borders:
Singapore's Gambit in Bangalore, India¹**

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Abstract

The hallmark of the Singapore 'success story', state-led, market-driven interventions and their efficacy have often been a matter of academic contention. This paper, as part of our series on this topic, revisits Singapore's state-enterprise strategy in the context of the city-state's determined efforts at internationalization. Singapore's regionalization stratagem led to the establishment of industrial parks in China, India and several South-East Asian countries. The strategic intent behind these overseas projects was two-fold: exporting Singapore's competencies such as management know-how, technological capabilities and corrupt-free administration to regions where such positive factors were lacking and secondly, exploiting comparative advantages that each region had to offer. Controversy, however, arises from both of the above; whether the city-state's vaunted competencies were truly exportable, and whether said comparative advantages were truly present and applicable in the first place; such controversies are additionally present in India, where the high-tech focus of the park places the above into further doubt. To shed some light on this controversy, we present the latest evidence culled from surveys and interviews conducted in the Singapore-styled industrial-township in India; our results showing that, while the township is an undeniable economic success, the other motives behind its establishment have been somewhat less satisfied, and that concerns for the future yet remain on the horizon.

Key words: Internationalization; State Enterprise Networks; Singapore's Overseas Industrial Parks

Introduction

Despite its resource-constrained domestic environment, Singapore has achieved significant economic growth by focusing on its core-competencies. Singapore's infrastructural abilities, technological know-how and favourable reputation among foreign companies, coupled with its constant economic reform programs played a significant role in attracting foreign direct investment into the city-state. Such a move started as early as the mid-1960s which saw the beginnings of the Singapore government's aggressive approach to woo foreign MNCs to fuel the city-state's economic development (Chia, 1986; Pang, 1987). However, while much of Singapore's initial growth relied upon such inflow of foreign investment, a reversal of trend was being observed by the mid 1980s. Rapid economic growth and liberalization of foreign investment controls in the Asian region presented Singapore with foreign investment opportunities for developing its external economy; indeed, by the early 1990s, the changing business environment almost necessitated the exploitation of these opportunities, locally known as the 'second wing'. This 'second wing' offered immense opportunities in the form of location-specific resource advantages that were either limited or totally absent in the city-state. The city-state, therefore, sought to counter its own deficiency of resources by leveraging on the advantageous economic resources of neighbouring countries.

The regionalization program saw the establishment of industrial parks in the region that simulated a 'Singapore-styled' business environment in the emerging economies (Perry and Yeoh, 2000; Sitathan, 2002). Regionalization was intended to create economic space for local and Singapore-based multinationals to redistribute their resource-dependent operations, and to upgrade their operations in Singapore to higher-end activities, utilizing the unique set of benefits and competencies offered by each location – in locations such as in China, for example, were hinged on the perceived bountiful labour market and the explosively growing domestic economy. Designed, for the most part, to accommodate the more resource-dependant operations of firms, it was envisaged that these industrial parks would enhance the competitiveness of Singapore-based companies that redistribute particular operations to reap location advantages from the regional sites. This not only enhances the cost-competitiveness of firms, but develops Singapore as a high-value investment hub with strategic linkages to resource-abundant locations in the region. To augment the location advantages of the strategic sites, Singapore lends its reputation and competitive strengths in infrastructural development and management to the regional sites. As we will note, however, the Singapore-styled park in India proved to be an exception to the above description in many ways. To provide the context for this discussion, the theoretical considerations underpinning the project in Bangalore are sketched in the next section. The following section takes a closer look at the progress of the International Tech Park Bangalore (ITPB), and examines the challenges confronting this flagship project. The analyses were further reinforced by in-depth case studies of the

Park's tenants. The final section considers the implications of the new evidence to Singapore's broader regionalization initiative.

Theoretical Considerations

Dunning's Investment Development Path

Singapore's move towards regions outside its shores accompanied by heavy outward foreign direct investment, after being at the receiving end of substantial foreign investment into the country for more than two decades can be explained by Dunning's Investment Development Path (IDP). Dunning (1981, 1986) and Narula (1996) argue that a country's net outward investment (NOI, outward FDI minus inward FDI) is systematically related to its economic development. The IDP conceptualises a U-shaped relation between economic development and a country's net outward investment position. It suggests that countries tend to go through five main stages of development, that is, there are consistently observable patterns of structural change congruent with development, and these changes have systematic relations with patterns of FDI.

As economic development takes place, net inward direct investment will first grow and then decline. In the earliest phase of such inward capital flows, a country's infrastructure will be inadequate to support such inward investment. However, such investment will not only be supported but will continue to increase as economic growth occurs. A parallel can be drawn between the above description and Singapore's developmental period during its first two decades of existence (from the mid-1960s to the mid-1980s). The city-state experienced a similar increase in inward investments with an increasing growth rate. In fact, its long-established stratagem of economic development through foreign direct investments is well documented (Chia, 1986, Pang, 1987, Yeung, 2001).

Dunning also states that such inward investment will help create firm-specific assets that would allow outward direct investment. However, in backward regions it will take longer to accumulate such assets in order to initiate any kind of outward capital flow (Dunning, 1988; Caves, 1996). Over time, learning-by-doing will cause this process to evolve and outward FDI will emerge. Invariably, with the reversal of trend propelling investments outward, the country will experience an erosion of its comparative cost competitiveness, thus reducing the incentive for inward investment and further increasing the incentive for outward investment. The scenario in Singapore followed the same trend with rising business costs in the mid-1980s crippling the island and diminishing its cost competitiveness. However, with the city-state becoming wealthier it looked to channel its financial resources in the form of outward investments in order to retain its competitiveness. Such a move manifested in its regionalization strategy. This growth in outward investments demonstrates Singapore's determination in strengthening her economic prospects and further advancing in her economic development process.

The Eclectic Paradigm

Dunning's Eclectic Paradigm (1970, 1980, 1988, 2001) proffers an analytical framework in which to examine the pattern and extent of activities of firms engaged in value-added activities beyond their national boundaries. It seeks to explain the ability and willingness of firms to serve markets by delving into the reasons behind their choice of exploiting this advantage through foreign production rather than domestic production, exports or portfolio resource flows. The Eclectic Paradigm postulates that foreign investment will only occur if it is advantageous to combine spatially transferable intermediate products produced in the home country, with at least some immobile factor endowments or other intermediate products in another country (Dunning, 1988). Specifically, the configuration of ownership-specific advantages, location-specific advantages, and internalization-incentive advantages (OLI) – the three types of advantages into which Dunning classifies the reasons for the behaviour of firms – determines international production and its nature.

The framework goes on to assert that the import of each advantage in the OLI triumvirate and the relationship between them varies across firms, industries and countries and is context-specific, based on factors including the company's country of origin, and the country it seeks to invest in. What is common in most firms, however, is the acquisition of the O advantages through exploitation of firm-specific resources, and the simultaneous procurement of I advantages through the diminution of transaction costs. As well, as firms' core competencies become increasingly knowledge-intensive, MNCs will tend to seek locations in which they can best utilize their core competencies; or, by the Eclectic Paradigm, OLI configurations that will work most to their advantage. Dunning goes so far as to comment that the OLI triad of variables may be likened to a three-legged stool, each leg supportive

of the other and the stool is only functional if the three legs are evenly balanced (Dunning, 1998). In so far as the third leg completes this balancing it may be regarded as the most important. Given such a diagnosis, what comes across clearly is how the location-specific advantages associated with the Indian venture form the third leg of the stool, being the single-most important reason for Singapore's foray into India.

Traditional location theories dealt with asset-exploring activities which were designed to maximize the firms' current efficiency whilst identifying the transaction costs and benefits of neighbouring activities. Contemporary theories postulate that in locating their activities within a limited spatial area, firms maximize the benefits of dynamic learning economies at the same time minimizing transaction costs associated with space (Dunning (edited), 2000). Firms' strategic choice of location reflects twin aims; to not only transfer their resources to the host countries, but gain access to the available strategic assets as well (Lecraw, 1993; Dunning, 1995; Porter, 1994, 1996; Makino and Delios, 1996; Chen and Chen, 1998; van Hoesel, 1999; Frost, 2001).

Regionalization: Establishment on the Indian Sub-continent

As mentioned above, the regionalization endeavour witnessed the growth of Singaporean industrial parks in numerous countries such as Indonesia, China, Vietnam and India. However, this paper's focus, the regionalization venture in Bangalore, India, was markedly different from its sister parks in several important ways. Initiated in 1994, timed to coincide with India throwing her doors open to foreign investment as part of a determined liberalization procedure in order to boost economic growth (akin, in fact, to measures taken by Singapore itself in the early years of the city state's development), the establishment of the International Technology Park (ITPL) in Bangalore, the country's IT capital, was premised, like the other parks, on the tremendous location specific advantages that India put forward. The cheap and plentiful availability of both skilled and unskilled labour, the abundant land resources, espoused with the cooperative and encouraging attitude of the Indian government would definitely translate into a myriad of advantages for the city-state, were it (or rather, some of its local corporations) to relocate some number of operations to India – but unlike the other parks, said operations were not to be of the resource-dependent variety that the city-state was quickly growing unable to support. Rather, the information technology boom accompanied by the vast disposal of IT facilities and highly-skilled software specialists presented Singapore an avenue for building a technology park wherein high-end activities could take place. Hence, while its sister parks were to engage primarily in manufacturing or logistics activities, ITPL was to provide Singapore with a unique and competitive means to blend low-cost and high-end activities in a single location. ITPL was subsequently renamed to International Technology Park Bangalore (ITPB). The next section of the paper delves further into the International Tech Park at Bangalore, India, giving a detailed description of its functioning and characteristics. A micro-level analysis involving in-depth case studies of five in-house multi-national companies at ITPB is also presented.

International Technology Park Bangalore

Based on the perception that Singapore agencies have advantages in infrastructural development, ITPB (initially, as mentioned above, ITPL) was initiated as a real estate development in India. Located 18km away from Bangalore in India's 'Silicon Valley'¹, the objectives behind ITPB's development were, too, substantially different from those behind its fellow industrial-township projects in Indonesia, China and Vietnam. While the other parks had a political objective to demonstrate the strength of the 'Singapore development model' and its transferability to other Asian environments, ITPB had, instead, more focused commercial objectives; to further develop Singapore's high-tech sector in a region famed for and defined by its IT focus. The corollary to this difference is the predominance of service and support operations in ITPB, as opposed to manufacturing operations in the other industrial townships.

The concept for ITPB was mooted by Singapore's Prime Minister Goh Chok Tong and India's Premier, P.V. Narasimha Rao, in 1992. Construction commenced in September 1994, and the park was officially inaugurated in 2000. The partners in the ITPL project are a Singapore consortium of companies² led by Ascendas International, the Tata Group (India's largest business conglomerate) and the Karnataka state government in a 40-40-20 arrangement. The Karnataka state government has since reduced its stake to 6 percent, while the Ascendas has taken over the

² The Singapore consortium, Information Technology Park Investments Pte Ltd, includes RSP Architects, Planners and Engineers, L&M Properties, Sembawang Industrial, Technology Parks (a Jurong Town Corporation subsidiary) and Parameswara Holdings (the investment arm of the Singapore Indian Chamber of Commerce).

stakes of Tata Group in ITPB since 12th April 2005. ITPB was marketed as an environment that “cuts through the red tape and bottlenecks that are a part of India’s infrastructure and operating environment” (*The Straits Times, August 8, 1999*). ITPB was slated to provide total business space solutions to multinationals and other conglomerates, within a state-of-the-art technology park. The park currently boasts 6 state-of-the-art multi-tenanted buildings, specifically Discoverer, Innovator, Creator, Explorer, Inventor and navigator. Navigator, which boasts of accommodation for up to 4000 employees, was just inaugurated on 10th April 2007, and occupation has already exceeded 80% as of today. These technology buildings, with built-up office, production and retail space, adopts the Singapore-styled, integrated ‘work, live and play’ concept. ITPB’s futuristic design comes complete with numerous amenities, facilities and support services, and includes residential apartments and penthouses. More distinctively, ITPB guarantees uninterrupted power supply and telecommunication facilities, immediate occupancy business incubator space, and the formulaic ‘one-stop’ service. To date, over S\$330 million (US\$220 million) has been invested in ITPB, creating a total of 2.3 million sq ft of prime IT space over 20.3 acres. Ascendas has further identified another 26 acres within the Park for a second phase to develop about 3 million sq ft progressively, according to market demand. This next phase is expected to cost another S\$270 million (US\$180 million). ITPB is also developing 2 customised Built-to-Suit facilities for IT and biotech majors. A 200-room 5-star business hotel located at the Park is expected to be operational next year. ITPL also houses the Indian Institute of Information Technology, which provides professional and skilled manpower for the park’s tenants. The earliest clients included SAP Labs, First Ring and 24/7. The first 39 tenants started their operations in 1999, and created some 2000 jobs. To-date, there are over 19,000 employees working for more than 120 companies in the fields of IT & ITES, bioinformatics, software development, telecommunications, electronic and other hi-tech industries in ITPB (Table 1). More than half the tenants are wholly or partially foreign-owned firms, and nearly 50 percent are in software development alone (Table 3), belying India’s reputation among certain administrations as ‘call-centre central’. ITPB’s tenants include global players like AT&T, IBM, Motorola, Sony, Texas Instruments, Citicorp and Thomas Cook. Operating profits have been registered, and ITPL is projected to break even within the next 4 years.

TABLE 1 INTERNATIONAL TECHNOLOGY PARK BANGALORE
OPERATIONAL STATISTICS (AS AT APRIL 2007)

General Information	
Scale of Development	20.3 acres
Developed Area	2.3 million square feet
Total Investment Value	US\$220 million)
Confirmed Tenants	120
Park Population	19,000

TABLE 2: ITPB – TENANT PROFILE BY COUNTRY OF ORIGIN

Country	Percent
USA	42
India	36
Europe	16
Asia	6

TABLE 3: ITPB – TENANT PROFILE BY SECTOR

Sector	Percent	Sector	Percent
Software Development	49	IC Design	3
BPO/ITES	24	R&D	1
Biotech/Bio-Informatics	3	Educational Institutions	2
Manufacturing	10	Others	8

Source: ITPB, Bangalore

Field Research

Analysis of the Singapore-styled parks, relying primarily on secondary data from official publications and press reports, is not enough to ascertain the situation on the ground. To obtain primary data from the tenants of parks, we applied the questionnaire developed in Yeoh et al (2000), and surveyed the case-study parks on the differential impact of various pull factors on firms' investment decisions, along with the differential impact of different types of constraints on their operations.

Methodology: Questionnaire Survey

The questionnaire was designed as a comparative study to investigate the various factors influencing firms' investment decisions, along with the problems faced by their operations; specifically, to test tenants' perception of the created variables meant to give the parks an advantage, as mentioned earlier in this paper, as well as measure said past perception against the current reality. The question sets for the tenants in the three industrial parks are similar. The surveys sought to highlight the different push/pull factors facing the park tenants when they chose to relocate their operations in the respective parks, and the operating constraints faced by the respective park tenants. The survey focused on three main areas. Firstly, the basic profile of the respondent: type of ownership, nature of operations, number of employees, sales turnover and its market orientation. Secondly, the factors that attracted the respondents to invest in the park. Data on various constraints was gathered in the third section.

Questionnaire surveys were conducted in ITPB from December 2002 to December 2006. In all cases, the surveyed tenants were carefully selected so as to obtain a representative distribution of all tenants in the park across both industry and nature of operations; to illustrate this distribution, the respondents were further reclassified in terms of type of ownership, nature of their operations, number of employees, and target markets. The surveys were conducted through face-to-face interviews in the case-study parks lasting an average of 45minutes, with staff in senior managerial positions or above present in all cases, to ensure the response of the selected tenants, and the holistic and accurate nature of the obtained responses.

The following sections present the primary data gleaned from these surveys and interviews; firstly, case studies of five multinational companies in ITPB compiled through interview responses; secondly, logits derived from empirical data obtained through both surveys and interviews; and finally, the interpretation thereof, and conclusions derivable from, both of the former.

Case Studies

Case A – IT solutions

Company was founded in 1995 in Dallas, America. It provides cost effective IT solutions worldwide. It moved one of its operating offices to ITPB due to the limited availability of skilled labour in America, as talented or highly educated people in America would rather work for companies with bigger names such as Infosys, Wipro or Microsoft. Company A cited that rent in ITPB is significantly lower compared to setting up an additional office in America. They also expressed that the turnover rate for employees in India is generally lower than in America, surmised to be due somewhat to the higher standard of supporting facilities in ITPB, but probably due more to the high turnover rate endemic in America. Employees in company A are satisfied with the welfare and convenience associated with working in ITPB. However, company A also mentioned that due to a lack of up-to-date information in India's IT sector, much time and money has to be spent on R&D.

Case B- Business Process Outsourcing

Company B, a US-based firm is in the business of providing e-services. With its headquarters in Los Gatos, California and operations at ITPB, the company is looked upon as an industry standard provider in customer support services and solutions to Global 500 companies. The company was initiated by a management team with long-standing and valuable expertise and experience in the delivery of large-scale mission-critical customer support programs.

ITPB is highly suited for the company's operations. With its facilities catering to small and medium enterprises engaged in R&D and the service sector, the park has become a nesting ground for a large number of firms involved in Business Process Outsourcing (BPO). Located at the 'Creator' building of ITPB, company B is one of many such companies. Today, it has become one of ITPB's established tenants employing 800 employees, occupying 60,000 square feet. Company B has been operating at ITPB since April 2000.

Its areas of operations in the park extend to real-time customer service management and the provision of technical support to foreign firms. In fact, the facility in ITPB is the largest call centre in the state of Karnataka. With the likes of Altavista as its customers, the company's chief activities include implementation of successful programs such as outbound telemarketing inbound phone customer service, inbound phone technical service, with service areas spanning countries worldwide, particularly in the U.S and Europe.

Conducting global services primarily through one-on-one telephone services and web based customer assistance, 24-hour connectivity is an indispensable requirement for the company that the park successfully meets. It is on the combination of such factors – the uninterrupted power supply, the 24-hour speedy connectivity and the plug and play services of ITPB – that the unique selling proposition of the park rests, and, this goes a long way in attracting a myriad of companies in the BPO industry.

Moreover, the city of Bangalore has to its credit a multitude of excellent schools and universities wherein a high standard of education is maintained. This serves as an added advantage in that, such institutions have become a constant source of supply of English speaking graduates for the call centres located in the park. Company B, too, makes immense use of this pool of supply of potential employees.

Case C - Healthcare

Company C is an established company in America and decided to open an office in ITPB on the strength of the Singapore brand name and the availability of talented Indian personnel. Company C deals mainly with supply chain management, web development and healthcare. It has around 250 employees as of Dec 2006. Company C cited that the main attracting force in India is the availability of very IT-savvy Indians with very good credentials. They also mentioned that employees in India have high productivity rate and they are willing to work long hours for the company. They also expressed that they are very satisfied with the flexibility they are given when it comes to determining how much space they want to rent in ITPB, as compared to other Technology Parks in India, where there are only fixed office spaces for rent.

However, one problem they stated with their office in ITPB is the high employee turnover rate – an observation that does not seem commensurate with the comments by Company A. This, Company C surmises, is due to the presence of many different IT companies in ITPB, which give employees additional mobility and choice of working conditions – which might point to a variegation in the actual 'availability' of labour across different IT subsectors, or simply a difference in working conditions between Companies A and C. Furthermore, profit margins began to decrease over the years due to rising overheads and rising labour costs.

Case D - Business Process Outsourcing

Company D is a wholly owned subsidiary of its Virginia-based parent company, having been incorporated in May 1999. The parent company is considered a frontrunner in integrating the expanding capabilities of information technology, telecommunications and the internet, by providing services such as voice-based services, internet services, back-office functions, and interactive teleservices. One of the larger tenants of ITPB, the company occupies 42,000 square feet of space in the park, employing 12,000 personnel.

Similar to Company B, Company D's operations within the park largely focus on Business Process Outsourcing, which include both inbound and outbound customer care, and due to its mid-sized nature, it considers itself to be well suited for the park. Also similar to other BPO firms within the park, Company D makes good and grateful use of the consistent and round-the-clock power supply and connectivity, as well as the supporting infrastructure that the park provides; forming the chief reasons behind its establishment in the park. The company also employs a sizeable amount of the IT graduates that Bangalore churns out every year.

A company official affirms that the firm considers the park's excellent and professional support services and maintenance programs as a tremendous advantage that gives the company the added advantage over its counterparts that are located elsewhere. The Singapore presence can be accredited with making the provision of such benefits possible. However, the company is deeply concerned about the advent of other call centres who are looking to exploit the same advantages since this leads to other problems such as increased competition, unnecessary sharing of resources and erosion of comparative advantages.

Case E - Insurance

Company E is one of the companies on the Fortune 500 list. It is one of the world's largest insurance providers and boasts over 30% growth in the past few years. In 2005, company E sold about USD\$8.2 billion of insurance and have a market size of about USD\$20 – 30 billion. They hire mainly graduates who speak, read and write in English and the credentials of the Indian applicants are of utmost importance to them. Company E cited that they chose India because it operates in exactly the opposite time zone from America. When workers in America are asleep, the Indian component will take over. In this way, they are able to keep their business running 24 hours a day, 7 days a week. Furthermore, India is geographically well placed and Bangalore is located strategically in India. Company E mentioned that India offers massive recruitment opportunities for them to expand their work force as students in India are taught how to speak English since they start school. ITPB was chosen as a branch office due to the Singapore branding and it is one of the few parks in India which offers the "World in a Park" concept and customized office spaces.

Case F - Inter-Enterprise Software

Company F is a 100% subsidiary of its German parent and is a highly reputed software giant. It carries out similar operations as its German parent, that of providing collaborative business solutions and development of software. Its parent company is a world-renowned provider of business solutions and high-quality software for all types of industries and markets and is the world's largest inter-enterprise software company and the third largest independent software supplier overall, employing 28,000 employees in over 50 countries.

Initially, Company F operated in the Koramangala district of Bangalore as an autonomous unit. Thereafter it was bought over by the aforementioned parent company in 1998. The change in ownership also saw a shift in location into ITPB. With operations of other companies at ITPB beginning only in late 1997, the company's establishment in 1998 made it one of the first occupiers. Today, company F is one of the largest tenants in the park, in terms of space occupancy, covering about 100,000 square feet (9,000 square metres).

Company officials reveal that before moving into ITPB, the company had considered other city locations which were comparatively cheaper in terms of rentals, offering prices as little as one-fourth of ITPB's rate. However, ITPB was chosen over the other locales, again, due to attractive benefits it provided in terms of power supply, state-of-the-art infrastructure and excellent communication channels. In fact, the company recognises and has experienced that the excellent operating facilities have generated an increase in revenue and this increase is larger than the increased costs it has to bear (in terms of rental), thus justifying its move into ITPB. The company primarily undertakes software development activities within the park and functions as a 100% export unit. All its exports go to Germany.

Within 4 years of operations in the park, the company expanded rapidly, growing from a company of 70 employees to 500 employees. Ironically, its own growth forced the shift out of the park. Ideally suited for small and medium sized enterprises, ITPB could no longer support its fast growing activities. Hence, space constraint was singled out as the key factor for relocation; a larger (and less expensive) area was necessary to support the new scale of their activities, as well as generate economies of scale. Hence, the company chose to reposition itself into an expansive new 15-acre plot within the Export Promotional Zone itself.

Another reason for the move, however, was that being a global corporate giant, the company was also looking to separate itself in order to establish and reaffirm its identity, something which it had limited opportunity to do in a space shared by so many other tenants (as well as with an identity of its own) like ITPB. However, given ITPB's unique advantages and the image and branding associated with it, Company F yet retains office space in the park's new BTS (Built-To-Suit) facilities.

Statistical Analysis: Logit Estimations

Apart from analyzing the descriptive statistics and popular rankings on the responses relating to factors and constraints, a logit model was applied to compare the perceived advantages influencing the tenants' decision to locate in the case-study parks. A similar model was also applied to the constraints faced by the tenants in these parks. The logit estimations are set out in Tables 4 and 5 respectively.

The logit model involves a binary choice of the i^{th} firm which can be represented by a random variable, Z_i , which takes the value of 1 if a certain choice is made and the value 0 if that choice is not made. The (cumulative) *logistic* distribution function, estimated by the maximum likelihood, takes the following form:

$$P_i = \exp(Z_i) / [1 + \exp(Z_i)]$$

where: P_i is the probability of firm i choosing the factor in question; \exp refers to the exponentiation operator and Z_i is a linear function of the firm attributes, defined as

$$Z_i = \alpha_0 + \alpha_1 S + \alpha_2 J + \alpha_3 P + \alpha_4 M$$

where: $S = 1$ if wholly Indian-owned, 0 otherwise; $J = 1$ if established via Joint-Venture, 0 otherwise; $P = 1$ if in the business process outsourcing for IT enabled services industry, 0 otherwise; $M = 1$ if targeting the domestic market, 0 otherwise; $\alpha_0 =$ constant term; and $\alpha_i =$ coefficient of independent (explanatory) variable.

Hence, if the estimated coefficients in the logit model is statistically significant (as indicated by the z -statistics and p -values, this would imply that the probability of a firm (e.g. foreign-owned) choosing a particular factor is greater than the probability of another firm (of different ownership type) making the choice, after taking into consideration the types of goods and services produced.

Factors Influencing the Respondents' Decision to Locate in the Case-Study Park

(Table 4)

The first observation we must make is the seeming homogeneity of the results obtained. Perhaps due to the narrow high-tech industry focus in ITPB, and on a slightly more specific level the overwhelming focus on software development and on business process outsourcing of IT enabled services (BPO/ITeS), respondents, in general, seemed to have much the same opinion on the same perceived advantages across the board. For the most part, this is not surprising – due, again, to the high-tech focus of firms in ITPB, and the worldwide interest in the high-tech products of said firms, those targeting the domestic market are not so different from those targeting overseas markets; thus even in variables where one would expect to find some difference of opinion, such as in the presence of major buyers and suppliers, no significant variance can be observed. Much the same applies toward explaining the lack of especial concern among firms targeting the domestic market towards proximity to high-growth technology firms; leading to the conclusion that, possibly because of said large number of software development and BPO/ITeS firms, most tenants in ITPB are fairly united and homogenous in their requirements from the park. Another inference, however, may be drawn from these results; that the heavy industry slant towards software development and BPO/ITeS might, instead, be due to the presence of these perceived advantages; while other high-tech industries, at the current time barely a significant figure in our results, might wish for other competitive advantages, that may or may not actually be being provided.

Out of the homogeneity observed in the results, we find that significant results are truly few and far between – which is not to say without significance, pardon the pun. An interesting fact about ITPB – ostensibly a Singapore-styled park with a heavy connection to the city-state – is the sheer dearth of Singapore-owned companies in the park. In point of fact, there seem to be next to no operations originating in and owned purely by Singapore companies; the presence of the city-state seems diminished to its role in administration, and in some number of joint-venture parks, most of which have the Singapore ownership in the minority. With this in mind, then, the significant results returned from our logit estimations, while few, take on interesting new meanings.

We begin with the expected. At a significant and positive α_1 (= 0.1598), wholly Indian-owned companies show an unsurprising concern for the political commitment of the local (note: not the state) government. Interestingly, though, they do not seem to have borne an especial concern for the similar commitment of the local authorities; possibly meaning either a snub towards said local authorities on their part, or non-wholly Indian-owned companies being rather more concerned with local authorities than with the local government. Information from our interviews appears to hint slightly towards the latter, but not strongly enough to draw a conclusion either way – a rather interesting possibility, given that most of these other companies are, as noted above, not or only partially owned by Singaporeans, who, from our prior research in ITPB’s fellow industrial parks, tend to display less comparatively concern for the local government. Somewhat unexpected is the highly significant and positive α_1 (= 19.87) which signals that wholly Indian-owned companies placed much more import on investment incentives than other respondents; something perhaps due to limited capital availability compared to US-owned firms in the park, but just as possibly a sign of a far more practical mindset reigning among local companies than joint ventures and foreign-owned companies. Easily the most surprising, and perhaps most portentous, of the significant results, however, is the significant and positive α_1 (= 0.1042) for relatively low restrictions on foreign ownership – signaling, rather amazingly, that wholly Indian-owned companies cared more about low restrictions on foreign ownership than *actual foreign-owned companies* did. As odd as this result is, the only possible sensible interpretation is, in fact, a fairly positive one – that wholly Indian-owned companies, in general, appear to be amenable to (perhaps even welcoming of) the prospect of becoming joint ventures or foreign-owned companies at some point in the future; a possibility that, if true, is surely of much interest to investors with an eye on India.

Major Constraints on the Respondents’ Operations

(Table 5)

Looking at present constraints experienced by companies, we again find our results, for the most part, a swathe of homogeneity – leading to the obvious conclusion that, for the most part, any problems are being felt by all respondents in a mostly equal fashion... if any problems are being felt at all. And indeed, taken together with our interviews and the case study firms mentioned above, it would seem as though, for the most part, the latter is indeed the case – the picture of ITPB’s function, to date, appears fairly roseate, with perhaps only some difficulty with the introduction and implementation of new technology (largely blamed on an insufficiency of research & development facilities and activity) remaining a continuous murmur among tenants of the park.

The only significant result returned, in fact, lies in a highly positive and significant β_4 (=6.5097) for high and rising overhead costs – a problem already alluded to in many of our interviews as well as in some of our case study firms, and one long endemic across all the Singapore-styled industrial parks, but in this case apparently especially critical for firms targeting the domestic market. The reason for this, unfortunately, is unclear, even from our interviews – a case can be made that with the high concentration of firms engaged in similar activities in the same location, together with the generally lower amount of capital available in the domestic market than, say, the US market, cost factors become very much more of a consideration as price competition becomes a necessity; again, however, information at this time is not clear enough to draw any firm conclusions.

Other than the above noted issues, however, respondents appear to have few issues with ITPB and the current state of their operations, instead enjoying the global upswing in demand for new software, business process outsourcing, and a host of other IT services. It is worth noting, however, that the lack of said issues is sometimes due to advantages not directly linked to ITPB, and still readily enjoyable by firms outside of it. Company F of our case studies, for example, still enjoys the ready pool of skilled labour from local universities and training centres, despite no longer being located except peripherally in ITPB.

Issues and Challenges

Investment enclaves or ‘shaded places’ attract foreign direct investment (Lundan 2003), and Peck (1996) suggests that these investment clusters form in and around centers of international infrastructure. The Singapore-developed parks sought to capitalize on this by combining superior infrastructure with a range of exclusive investment concessions acquired via negotiations with the various stakeholders in the host countries, acquiring a host of (at least initially) mostly unprecedented and exclusive privileges that provided a competitive advantage over competing

locations. For example, the parks were permitted to build and run their own on-site power and water treatment plants as well as telecommunications facilities; the result being that these parks enjoyed reliable infrastructural facilities in locales where water cut offs and electricity blackouts were common – an advantage that more important, and therefore the impact of which was far more pronounced, in ITPB than in any other park. Furthermore, the parks' management boards more often than not included government officials from the host country. This arrangement was to facilitate the parks' privileged access to investment approvals, endorsements for construction activities as well as immigration-related permissions and import/export permits. This synergistic combination of factors rendered the parks self-sufficient and capable of offering investors the formulaic one-stop service that the Singapore-styled infrastructure is reputed for; services otherwise atypical in emerging economies beset with administrative uncertainties. In addition, the parks would supposedly attain credibility through their inherent association with Singapore, which has enjoyed a positive reputation with various multinational corporations for its stable, corruption-free business ethos. Furthermore, strategic alliances between Singapore's own state enterprise networks and its counterparts in these regional sites were critical in mobilizing the financial resources to complete these multi-million projects. In most cases, these were achieved within a relatively short time frame of 18 to 24 months.

Our empirical findings ascertain that the investment-friendly institutional framework as laid by the Singapore and host governments plus factor availability have been instrumental in engendering competitive advantage for ITPB. Tenants within these parks have reaped significant advantages through tapping on the low-cost competitive environments, on top of relying on Singapore's infrastructure, management and expertise. It should also be noted that Singapore's reputation with multinational corporations was, in fact, perceived to lend a measure of credibility, as may be observed from our case studies. Truly, in ITPB, all does indeed seem to be going well.

Nonetheless, some issues still remain causes for concern, and possible flashpoints of the future. The first lies in the aforementioned fact that many of the advantages which ITPB enjoys, such as the steady stream of skilled labour and professionals from the Indian Institute of Information Technology and other local universities, are not actually exclusive to the parks themselves, and are general advantages that are also available to competitors (both current and future) in the region – competitors that are, in fact, growing in both size and number as the development of the region continues. The second issue is that, to this day, ITPB remains optimized for small- to medium-sized companies; as tech firms grow from strength to strength, it is inevitable that some number of current tenants will go the way of Company F and leave the now too-constricting nest, so to speak. Ascendas has, apparently, recognized both of these issues – the company has recently taken a larger stake in CyberPearl, in Hyderabad. A good business move, but not one necessarily beneficial for Singapore's industrial park project.

Two more issues remain, one practical, one more abstract. The more practical issue lies in the oft-quoted issue with a lack of R&D in the park, and the subsequent problems with implementing new technology; an issue that stems, it seems, not from a lack of able and willing personnel, but simply from the lack of facilities and support – and no wonder, with only 1% of tenants with their focus on actual R&D. Given the importance of R&D to a sector such as the high-tech industry, this should, perhaps, be a cause for concern for both tenants and administrators of the park. On a more abstract level lies the final concern – that, for a park with the stated motive of establishing a 'second wing' for Singapore, and opening the door to both a conducive space and environment to pursue the high-tech industry for Singapore companies, ITPB seems to have precious few firms actually from the city-state. While undoubtedly, at the current time, an economic success, ITPB seems to have had, like its sister parks, some difficulty with achieving its non-monetary objectives.

Conclusion

The progress of Singapore's overseas parks over a comparatively short period of time indicates the ability of the Singapore's state enterprise network to mobilize economic and political resources to create economic space to maintain her economic competitiveness. These projects have obtained special investment conditions within their overseas localities, with government endorsements further underscoring their significance. In ITPB we find that this combination (albeit more the former), have, together with locally created advantages, formed a most attractive business environment for the IT industry, one additionally beneficiary of the worldwide focus on said industry. In this context, it comes as no surprise that ITPB, at the current time, is hailed by many as a success.

Our findings, however, ascertain that even among this ‘golden age’ for the Indian Singapore-styled park, a number of issues remain unresolved; not least of which is the burgeoning economic reality of competitors arising that can take equal, or even better, advantage of the location advantages not specific to ITPB, which are – to say the least – myriad and legion. We also find that, despite ITPB’s economic success, it remains questionable whether ITPB has achieved its other objectives – the political objective of demonstrating the exportability of the Singapore model, and the development objective of providing a bridge and gateway into the IT industry for Singapore firms. It is not, after all, that ITPB does not suffer from many of the woes that beget its sister parks – merely that, as mentioned in our case studies, that firms yet find them ignorable in light of the benefits they bring, as in Company F’s statement about higher costs and rentals. How long this can continue, what may be done to make it continue, and which measures should be taken when it eventually *cannot* continue – these will be the questions that park administrators will have to face in the future, in the economic dimension alone. Fortunately, given the disconnect between the people and the politicians of India, the political dimension is largely a non-issue – still, it is far too early for ITPB’s administrators, owners, and other stakeholders to sleep soundly. No wave does not crash, after all – and while certainly no bubble, the IT sector in India is certainly riding high. The question is whether it, and ITPB, will be steady on their boards as the wave eventually crests, and falls.

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Table 4: Factors Influencing Firm's Decision to Invest in the Park

	Type of Ownership		Industry	Target Market
	Wholly Indian-owned	Joint Venture	BPO/ITeS	Domestic
Political commitment: local-state government	0.1598	0.0001	1.2455	1.3233
	0.0627	0.9994	0.8736	0.7664
Political commitment: local authorities	1.8892	38	1.4917	0.6073
	0.4829	0.9994	0.7763	0.6027
Investment incentives	19.8705	3.0924	91	0.2967
	0.0089	0.4740	0.9994	0.2351
Relatively low restrictions on foreign ownership	0.1042	0.0001	0.8333	4.2
	0.0640	0.9994	0.9057	0.153
Competitive overheads	1.1	0.0001	5.5	0.9091
	0.9487	0.9995	0.2896	0.9487
Reliable infrastructure facilities	1.9024	0.8858	0.7927	0.3122
	0.4437	0.9371	0.8639	0.1642
Competitive labour costs	0.5926	0.0001	0.0001	1
	0.6129	0.9994	0.9993	1
Conducive industrial relations	0.0001	0.0001	5	0.2667
	0.9988	0.9994	0.3182	0.2897
Availability of skilled and educated labour	2.4112	0.8231	0.6889	0.3569
	0.3098	0.8986	0.7846	0.2242
Presence of major buyers	12	0.0001	49	0.0001
	0.9984	0.9994	0.9983	0.9984
Presence of major suppliers	0.9206	0.0001	0.0001	1.0862
	0.9524	0.9995	0.9995	0.9524
Close proximity to high-growth tech firms	2.6071	0.0001	4.0463	0.6854
	0.3548	0.9995	0.3506	0.7292

Table 5: Constraints Faced by the Firms in the Park

	Type of Ownership		Industry	Target Market
	Wholly Indian-owned	Joint Venture	BPO/ITeS	Domestic
Shortage of skilled and educated labour	0.3935	0.0001	2.1481	1.0987
	0.4588	0.9994	0.5953	0.9296
Shortage of professionals/managers	0.5614	0.0001	1.3030	4.0610
	0.5689	0.9994	0.8494	0.2517
Shortage of R&D personnel	0.0001	0.0001	0.0001	12
	0.9987	0.9994	0.9993	0.9986
Rising labour costs	1.8807	2.1531	0.9154	1.3830
	0.4310	0.6071	0.9483	0.6882
Industrial relations problems	1.1450	3.6950	1.0639	3.0156
	0.8745	0.4037	0.9640	0.2528
High turnover rate	0.5714	0.5714	0.2857	1
	0.4830	0.7057	0.3570	1
Diff in introducing new technology/techniques	0.0001	0.0001	9	1
	0.9987	0.9994	0.1305	1
High and/or rising overhead costs	0.3230	0.3954	0.3099	6.5097
	0.2560	0.5757	0.4250	0.0452
Impact of govt regulations	0.9119	0.0001	0.0001	1.0967
	0.9290	0.9996	0.9993	0.9290
Competition from overseas competitors	0.4612	0.0001	0.0001	2.1681
	0.5455	0.9996	0.9993	0.5455