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**EXTENDING ECONOMIC BOUNDARIES:
A NOTE ON SINGAPORE'S GAMBIT IN INDONESIA AND INDIA**

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ABSTRACT

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. This chapter revisits Singapore's flagship projects in Indonesia and India. Evidence from on-site surveys and interviews are presented. This chapter contends that progress in these privileged investment zones remains stymied by particular dependencies and challenges in the host environments.

Key words: Regionalization - Singapore - Industrial Parks - Indonesia - India

INTRODUCTION

Over the last four decades, Singapore, a city-state, has risen to be Southeast Asia's premier world-city, as well as an important base for multinational manufacturing. Singapore's reputation for corrupt-free administration and infrastructural efficiency, coupled with overall integrity of its legal and financial systems, have played a central role in attracting foreign direct investments to fuel the city-state's economic development (Chia, 1986; Pang, 1987; Perry, 1995; Yeung, 2001). However, rising business costs – in the late 1970s and early 1980s - rendered it an imperative for Singapore's economic planners to expand the island's investment horizons¹ and potential economic growth through an overseas direct investment program². Singapore-based companies were goaded to form joint ventures with companies in North America and Europe, to accelerate access to new technology and foreign markets (Caplen and Ng, 1990; Balakrishnan, 1991; Ng & Wong, 1991). However, most of these investments proved unsuccessful, resulting in enormous losses by the early 1990s (Kanai, 1993; Regnier, 1993; Lee, 1994).

A new phase in the internationalization strategy re-focused on expansion within Asia. The strategic repositioning was deliberated at the 1993 Regionalization Forum (Singapore Economic Development Board (SEDB), 1993a), and encapsulated in the policy document, Singapore Unlimited (1995a; 1995b). This stratagem was endorsed by the Committee to Promote Enterprise

¹ Stoeber (1985), Dunning (1988) and Porter (1990), among others, illustrate that a country's relative level and composition of outward and inward investments are systematically related to its stage of development. Dunning's (1988) investment development path model suggests that countries advance through five stages of development which relate to different levels of net outward investment. The thesis suggests that countries in the more advanced stages of development will have to increase their outward FDI in order to achieve greater economic growth. An extension of this thesis is revisited in Dunning and Narula (1996).

² The main ideas were set out in the policy document, Gearing Up for an Enhanced Role in the Global Economy (SEDB, 1988). The 1990 Global Strategies Conference added new dimensions to these deliberations (SEDB, 1990).

Overseas (Singapore Ministry of Finance, 1993). The change from internationalization (or, in local parlance, outer globalization) to regionalization (inner globalization) was rationalized by the liberalization of foreign investment controls occurring at the time in countries like Indonesia, China and Vietnam, and the high growth rates these economies were achieving (SEDB, 1993b; 1993c; Mahizhnan, 1994; Pang 1995; Kwok, 1995; Tan, 1995; Okposin, 1999; Pereira, 2001; Blomqvist, 2002; Sitathan, 2002). The marked increase in outward direct investments into the region is reflected in Table 1.

Singapore's trans-border industrialization initiatives comprised state-led³ infrastructure projects, and a range of incentives and regulatory innovations (Goh et al, 2001; Yeung, 2001), designed to create Singapore-styled industrial townships in regional sites where such positive factors may be lacking (Perry & Yeoh, 2000). A three-pronged 'Singapore Inc' approach was adopted (Zutshi and Gibbons, 1998): senior politicians and civil servants negotiated⁴ the institutional framework for the project, which typically involved garnering special investment conditions in the host location; (Singapore) government agencies and government-linked companies took the lead in infrastructure development; and Singapore's Economic Development Board (SEDB) takes on the role of 'business architect' and 'knowledge arbitrageur' (SEDB, 1995a:42), by encouraging foreign multinationals to locate their regional headquarters in Singapore, whilst redistributing their lower-end operations to the Singapore-styled industrial parks.

³ The principles of government involvement are rationalized in the 1993 Report of the Committee to Promote Enterprise Overseas (chapter 4). For a scholarly discussion on the political economy of Singapore's development strategy, see Rodan (1989), Regnier (1991), Ng, et al. (1992); Huff (1995); Low (1998) and Blomqvist (2001). There is also an extensive political-economy literature on Singapore's regionalization program, succinctly summarized in Bellows (1995) and Yeung (1998).

⁴ The stress on exploiting personal ties accords with business practice preferred by the linked communities of 'overseas Chinese' (Redding, 1990, Yeung, 1997; Brown, 1998; Lehmann, 1998), the 'bamboo network' which Singapore made use of in its industrial parks in Indonesia and China. Personal ties between Chairman, SEDB, and Ratan Tata (of the Tata Group) reportedly facilitated the move into India (Asian Review, 1996).

This strategic maneuver was premised on the perception that the redistribution of economic activities to regional industrial sites would enhance the collective competitiveness (or *shakkei*⁵) of Singapore-based companies, as well as Singapore's own competitiveness as a high-value investment location with strategic linkages to the region (Figure 1). The strategic intent was for Singapore-based companies to tap into the markets, and resources, of regional economies. It was also intended to strengthen Singapore's MNC-linkages through co-investment in the region (SEDB 1993a; 1993b; 1995a; 1995b).

This chapter will focus, specifically, on the first overseas industrial township project, in Batam Island (Indonesia), and the most recent project, in Bangalore, India's IT capital. To provide context to the discussion, the theoretical considerations underpinning these flagship projects are sketched in the next section, followed by an account of the origins and progress of the case study parks. The flagship projects are then evaluated in terms of the progress in attracting investment, the contributions to the strategic objectives associated with the park, as well as to Singapore's broader regionalization initiative. The analysis is reinforced by empirical data from our on-site surveys of the Parks' tenants, and in-depth case studies of selected tenants in both locations. The final section considers the implications of these experiences for Singapore's regionalization program, and evaluates the city-state's determined efforts to harness synergistic complementarities in its strategic intent to restructure the Singapore economy.

⁵ *Shakkei* is a Japanese landscaping strategy, where the scenery from one's garden is enhanced by incorporating the scenery from afar, such that the combined scenery is superior to each on its own. Extrapolated, the collective competitiveness approach envisaged that the development of regional economies, and sites, leads to positive complementary growth for Singapore.

THEORETICAL CONSIDERATIONS

Prior to the 1960s, attempts to explain the activities of firms situated beyond their national boundaries represented an amalgamation of (i) the theory of (portfolio) capital movements (ii) empirical and largely country-specific studies on location factors influencing foreign direct investment (iii) modification to the neo-classical theories of trade, (iv) perceived gains of vertical or horizontal integration. Dunning's eclectic paradigm (1970, 1980, 1988, 2001) sought to offer a general framework for determining the extent and activities of MNE engaged in cross-border value-adding activities. The eclectic paradigm was used to explain the ability and willingness of firms to serve markets, and to look into the reasons for their choice of exploiting this advantage through foreign production rather than domestic production, exports or portfolio resource flows through the interaction of ownership-specific advantages, internalization-incentive advantages, and location-specific advantages (OLI). This theory has been extended, in more recent literature, to deliberations on the role of infrastructure in the attraction of new investments (Peck, 1996); the presence of immobile clusters of complementary value-added activities (Markusen, 1996), the transactional benefits of spatial proximity (Porter, 1996) and the business-government nexus in alliance capitalism (Dunning 1995, 1997; 2000; Evans, 1995; Dunning and Narula, 1996, 2000).

Not all advantages provided by the triumvirate of OLI will be evenly distributed across enterprises, industries and countries. These advantages are not static and may affect a firm's strategic response to any particular OLI configuration. Firms excogitate the O advantages through exploitation of firm-specific resources, simultaneously deriving I advantages through the

diminution of transaction costs. As firms' core competencies become increasingly knowledge-intensive, MNEs seek locations (economic and institutional facilities) that are best utilizing their core competencies. In determining the propitious extent in which a firm strategically locates, we will examine, *inter alia*, Singapore's trans-border industrialization efforts, with particular focus on the regionalization of Singapore-based firms, and if the locations of these townships are indeed that strategically advantageous. A *survey questionnaire*, adapted from Yeoh, et al (2000), is applied to the tenants in the case-study parks.

Theories, from the perspective of the firm, have further argued that not only should the production process be viewed as a value chain (Kogut, 1985; Porter, 1986, 1994, 1996), but also, firms should identify comparative or location-specific advantages unique to each country/territory, which will serve to complement the competitive advantage they enjoy as a result of being placed higher up in the value chain. Additionally, in the face of globalization, the location-specific advantages need to be altered to suit the increasing spatial integration of complex and rapidly changing economic activities and to also consider the role of national and regional authorities in their influence over the extent and structure of localized centers of excellence. Thus, a holistic approach must be adopted that takes into consideration firm-oriented competitive advantages as well as comparative advantages offered by regions. Synergistic efforts will occur when a strategic fit between the competitive and comparative advantages exist. To address this aspect of our research, we will present *case studies* of eight firms located in the case-study parks to draw out empirical insights on the dynamics of the case-study parks as centers for value-added activities, *inter alia*, the strategic fit between the value-added chain of the firms and the competitive advantages of the sites.

SINGAPORE'S OVERSEAS INDUSTRIAL PARKS

Batamindo Industrial Park (BIP), Indonesia

The late 1960s witnessed Indonesia's ambition to develop the Riau islands when Batam was identified as a potential logistics and operational base to support offshore oil and gas fields. The first master plan for Batam was prepared by Nissho-Iwai, a Japanese consultancy firm, and Bechtel of the United States. The study was commissioned by the Indonesian state-owned oil company, Pertamina, to develop the island into a base for oil and gas exploration activities. The original master plan was reviewed by the American consultants CRUX in 1977. This study recommended guidelines for a more broad-based development of the island. A significant step in the island's development was the assignment of Batam's development responsibility to the Batam Industrial Development Authority (BIDA) in 1978. BIDA's chairman, B.J. Habibie, favored attempts to engineer accelerated technological breakthroughs based on state-directed investment. This was reflected in the 1979 master plan, which focused on the development of transshipment facilities, the establishment of industrial estates, the development of marshalling areas for imports and exports, the construction of tourist facilities and the provision of infrastructural support. This master plan recognized that the Riau islands with its location-specific advantages such as abundant land cheap labor were well-positioned⁶ to address Singapore's land and labor constraints and, more importantly, to take advantage of Singapore's established business and financial services network and the city-state's efficient facilities for

⁶ The cataclysmic collapse of oil prices in the early 1980s impressed upon Indonesia's economic planners the need for a more broad-based development strategy. The Riau islands were an obvious choice to encourage investments not least because Singapore has shown interest in leasing these nearby islands to transcend the city-state's need for inexpensive land and labor. By the late 1980s, the perception from Jakarta was that Singapore was "bursting at the seams", and that the time was right to position Batam and the other Riau islands to take advantage of the spill-over from Singapore.

communication, transportation and other services (Liew, 1990; Yeoh, 1990; Regnier, 1991; Perry, 1991; Parsonage, 1992; Ho, 1994). A Memorandum of Understanding on bilateral cooperation in the development of Riau Province was signed on August 29, 1990.

BIP was launched in 1992. The Park started as a joint-venture between Singapore's GLCs⁷ and the Salim Group of Indonesia. Salim was Indonesia's largest business conglomerate, and had close links to senior politicians and privileged access to the major investment projects in the Riau Islands (Sato, 1993; Hill, 1996). Singaporean GLCs were given control over the development and management of the Parks, while Salim's role was to facilitate operations and to provide a guarantee of priority over regulatory controls and administrative approvals. Singapore's reputation for transparent and efficient management of projects lent further credibility to the projects and maximized marketing leverage over Singapore-based multinationals (Yeoh, et al; 1992; Naidu, 1994; Peachey et al, 1998; Grundy-Warr, 1999).

BIP was envisaged as a self-contained environment with its communication and business linkages through Singapore rather than through Indonesia. BIP, for instance, has its own power supply, water treatment plant, sewerage system, telecommunications facilities and social amenities. These, together with the location advantages that Indonesia offers, has resulted in an investment enclave offering facilities close to conditions in Singapore, in marked contrast to the conditions immediate outside the Parks.

⁷ The Singapore consortium was led by Singapore Technologies Industrial Corporation (now SembCorp Industries) and Jurong Town Corporation, Singapore's main industrial estate infrastructure developer.

BIP's first tenants were mainly subsidiaries of American, European, and Japanese multinationals already operating in Singapore. Cumulative investments and export value in BIP topped US\$1 billion and US\$2 billion in 2002 respectively, and the number of confirmed tenants increased from 17 in 1991 to 82 in 2003. Of these, 39 were Japanese companies with Singapore-owned companies the next largest concentration at 25. American and European investors have a limited presence. There is a concentration of electronics operations, mainly various component assembly processes, and supporting activities to the electronics sector such as plastic moulding and packaging. Out of total employment of 65,000, over 85% are female, most aged from 18-22. Table 2A shows the operational statistics in BIP, while Table 2B shows the tenant profile by origin and Table 2C, the tenant profile by sector.

International Tech Park Limited (ITPL), Bangalore, India

The idea to create a Singapore style park was first 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. ITPL is located 18km away from Bangalore in India's Silicon Valley⁸. The partners in the ITPL project are a Singapore consortium of companies⁹ led by Ascendas International, the Tata Group 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 Singapore consortium, and the Tata Group have increased their respective stakes to 47 percent each.

⁸ Indian universities reportedly graduate about 20,000 to 30,000 software engineers every year, and Bangalore has been a 'hunting ground' for Singapore companies and Singapore-based multinationals seeking low-cost IT specialists.

⁹ 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).

Marketed aggressively as an environment that “cuts through the red tape and bottlenecks that are a part of India’s infrastructure and operating environment”¹⁰, ITPL was slated to provide total business space solutions to multinationals and other conglomerates, within a state-of-the-art technology park. More distinctively, ITPL guarantees uninterrupted power supply and telecommunication facilities, immediate-occupancy business incubator space, and the formulaic ‘one-stop’ service. Its futuristic design comes complete with value added services like business/office support centers, medical center, food court, restaurants, recreational centers. ITPL also houses the Indian Institute of Information Technology, which provides professional and skilled manpower for the Park’s tenants. Operating profits have been registered, and ITPL is projected to break even within the next 4 years.

The blend of location-specific advantages such as technology and infrastructure on one hand, and competitive skilled labor on the other led to high value added activities taking place at ITPL. ITPL’s earliest clients included SAP Labs, First Ring and 24/7. As at January 2003, there are 100 confirmed tenants, of which 93 are operational with 8500 employees. More than half of these tenants are represented by wholly or partially foreign-owned firms which include some well known global players like AT&T, IBM, Motorola, Sony, Texas Instruments, Citicorp and Thomas Cook. The industries there include Software development, Business Process Outsourcing and Manufacturing.

¹⁰ The Straits Times, August 8, 1999

Both BIP and ITPL reflect an “industry cluster” strategy. In BIP, this cluster is that of a concentration of electronic firms (50%) while ITPL reflects a concentration of software and e-service based firms (70%). However the difference is that while 91% of firms in BIP are engaged in manufacturing activity, the corresponding percentage in its counterpart, ITPL is only 10%. Table 3A presents ITPL’s operational statistics, Table 3B shows the tenant profile by country of origin and Table 3C, the tenant profile by sector.

RESEARCH METHODOLOGY

Prior analyses on the Parks have relied primarily on secondary data from official publications, press reports, etc. To obtain primary data 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, we surveyed the tenants in ITPL in December 2002 and June 2003, and for BIP, in July 2003. The first set of questions sought to determine the profile of the respondents: type of ownership, nature of operations and size of establishment; and the second set was structured to gather information on the push-pull affecting the investment decisions of the tenants. Other questions pertaining to the respondents’ views on the facilities and services in the Parks were culled from the open-ended questions. A total of 60 responses were collected from the two Singapore-styled investment enclaves.

Questionnaire Survey

Profile of the respondents

There were 27 respondents in the BIP survey, of which 7 were wholly Singapore-owned, 5 were Singaporean joint ventures, and 15 were wholly foreign-owned. The respondents were mainly involved in the manufacturing of intermediate products. 7 of the respondents were involved in the manufacture of consumer products, and another 5 were providers of industrial services. There were 7 respondents with a sales turnovers of less than US\$5 million, 14 respondents with turnovers between US\$5 million and US\$50 million, and the remaining had turnovers exceeding US\$50 million.

Of the 33 respondents from ITPL, 4 were wholly Singapore-owned, 6 were joint venture and 23 were wholly foreign-owned. As for the nature of operations, 16 of the respondents were involved in software development, 4 were involved in support services and 2 in research and development. 15 respondents had a sales turnover less than US\$5 million and 4 respondents had sales between US\$5 million and US\$50 million.

Statistical Treatment of Survey Results

Apart from analyzing the descriptive statistics and popular rankings on the responses related to factors and constraints, logit analysis was used to compare the push/pull factors influencing the tenants' decision to locate in the Parks. The logit model, 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 being located in the particular park
exp refers to the exponentiation operator, and
 Z_i is a linear function of the push/pull factors defined as

$$Z_i = \alpha_0 + \sum_{i=1}^{i=6} \alpha_i F_i$$

where: $F_1 = 1$ if “Political commitment from the Singapore government” is selected, 0 otherwise
 $F_2 = 1$ if “Political commitment from the host country government” is selected, 0 otherwise
 $F_3 = 1$ if “Investment incentives” is selected, 0 otherwise
 $F_4 = 1$ if “Competitive labor costs” is selected, 0 otherwise
 $F_5 = 1$ if “Reliable infrastructure facilities” is selected, 0 otherwise
 $F_6 = 1$ if “Access to domestic market” is selected, 0 otherwise
 α_0 = constant term
 α_i = coefficient of independent (explanatory) variable

Estimated coefficients in the logit model, if statistically significant (as indicated by the p-values), would suggest that the firm choosing that particular push/pull factor is more likely to be from BIP than from ITPL. A similar logit model was applied to the constraints faced by the Parks’ tenants:

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

where: P_i is the probability of firm being located in the particular park
 \exp refers to the exponentiation operator, and
 Z_i is a linear function of the constraints defined as

$$Z_i = \beta_0 + \sum_{i=1}^{i=n} \beta_i C_i$$

where: C_i (1 to n, depending on the type of constraint) = 1 if constraint i is selected, 0 otherwise
 β_0 = constant term
 β_i = coefficient of independent (explanatory) variable

In this case, estimated coefficients in the logit model, if statistically significant, would suggest that the firm choosing that particular constraint is more likely to be from BIP than from ITPL.

Analyses and findings

Factors influencing respondents' decision to invest in BIP/ITPL (Table 4)

Singapore leverages on its infrastructure development expertise and the location-specific advantages available in the host environments to market its industrial parks. It supplements these purported advantages with its political commitment to the Parks, as demonstrated by the many bilateral agreements between the GLCs and host governments, or politically-linked business conglomerates, and a host of investment incentives to entice multinationals to locate their activities to these self-contained enclaves.

However, while BIP offered businesses cheap labor for their low value added activities, ITPL, with its skilled as well as cheap manpower, could facilitate activities higher up the value chain. Not unexpected, the reliable and efficient Singapore-styled infrastructure was the main draw of both BIP and ITPL. 85% and 82% of BIP and ITPL tenants surveyed cited it as the main pull factor for them to locate in the Park.

Competitive labor costs is a major pull factor for BIP tenants compared to ITPL tenants, as indicated by the positive and statistically significant α_4 (= 4.274). This is expected since BIP serves as a low-cost investment enclave, and a large proportion (71%) of the tenants in BIP engage in manufacturing activities. Manufacturing being labor intensive inherently requires low-cost labor. ITPL tenants, while valuing cheap labor as well, do not require it in the sheer amounts

that manufacturing demands. 82% of ITPL survey respondents had less than 50 employees, while 52% of BIP respondents employed more than 500 people. Hence ‘competitive labor costs’ was a significant pull factor in the case of BIP compared to ITPL.

Political commitment from the host government is another major concern for BIP tenants compared to ITPL tenants, indicated by the positive and statistically significant α_2 (=1.992). This can be explained by the instability of Indonesia’s political system. Since Soeharto was made to step down in 1998, the presidential position has changed hands several times, from Habibie, to the first democratically-elected President, Abdurrahman Wahid, and finally Megawati Sukarnoputri, on her predecessor’s impeachment. Key economic positions were reshuffled and economic advisors changed frequently, as power jockeying among the parties, ministries, legislature, central bank, and other institutions continued. All these served to complicate investors’ assessment of Indonesia’s political outlook.

Constraints on respondents’ operations in BIP/ITPL (Table 5)

BIP is now an established industrial estate development. ITPL is relatively new. All the same, our study alludes to some emerging constraints which have undermined the attractiveness of the Parks. These constraints are categorised into three broad groups: labor-related constraints, organization and technology-related constraints, and those relating to the economic “environment”, such as government policies and regulations.

Labor-related constraints

The 'cheap' labor resources which drew companies to BIP proved to be a perception rather than the reality, as "rising labor costs" was the main constraint faced by 21 (78%) of the BIP tenants surveyed. BIP tenants also found rising labor costs to be more of a concern than ITPL tenants as indicated by the positive and statistically significant β_3 (= 2.283). Other labor constraints experienced by BIP tenants (but less so by ITPL tenants) include shortage of semi-skilled and skilled labor and industrial relations problems as indicated by the positive and statistically significant β_1 (=2.770) and β_4 (= 3.330). In fact, industrial relations problems were frequently cited as being very disruptive to the operations of the tenants in BIP, as workers unhappy with labor laws often use pressure tactics such as strikes, demonstrations and work-to-rule.

Organizational and technological-related constraints

The Singapore-styled infrastructure, though reliable and efficient, also proved to be costly, as facilities such as the power plant, waste-treatment system and water supply are independently managed. This resulted in high overhead costs, especially in BIP where 74% of respondents cited it as a constraint they faced. This view was also echoed by 16 (48%) of ITPL tenants surveyed. Other organizational/ technological constraints faced by BIP tenants (but not as much by ITPL tenants) include the lack of good supporting services ($\beta_3 = 2.504$) and difficulty in introducing new technology and techniques ($\beta_2 = 2.541$), both of which are positive and significant.

'Environmental' constraints

'Impact of host government regulations' and 'competition from overseas industry competitors' were constraints faced by both BIP and ITPL tenants. However, whereas 89% and 78% of BIP tenants cited the above two constraints respectively, less than one third of the ITPL tenants

indicated likewise. This accounts for the positive and statistically significant β_1 (=2.312) and β_2 (=2.920). The government's control over the operating environment and the economic landscape shaped by overseas industry competitors prove to be stifling the operations of the tenants in BIP more than that of tenants in ITPL.

Case Studies (The first four companies are in BIP)

Company A (Electronics)

Company A is part of a US-based conglomerate, which operates in all 50 US states as well as over 100 countries throughout the world. The group as a whole manufactures critical infrastructure components, catering to diversified needs of businesses and governments, educational and medical institutions, and commercial industries from food to automobiles. The subsidiary in Batam is under the electronics arm of the conglomerate. The latter is a major producer of passive and active electronic components, such as complete power systems, private radio systems for governments, and undersea fiber optic telecommunications systems.

The existing Batam operations started in 1992, but belonged to a competitor German electronics components manufacturer, which located to BIP to take advantage of the stable infrastructure and low labor costs. In October 2000, Company A acquired its rival and took over all its manufacturing operations, including the facility in BIP. It has since become a leading maker of passive electronic components such as automotive relays and connectors. The BIP operations currently employ 560 workers and occupy 4,500 square meters. The company sources its inputs from around the world, and the facility in BIP is mainly for production. The final products are shipped to the US, Australia and some parts of ASEAN.

The company praises the one-stop service provided by the park's management, citing the efficient and transparent administration as a boon to its operations, by providing a more stable operating environment. However, being primarily labor-intensive, the company is feeling the impact of the rising labor and overhead costs on its operations. Specifically, it would like to see more efforts made to lower the operating overheads, such as having variable electricity rates.

Despite facing the uncertain political climate and the heightened terrorism threat, the company has intentions to expand its current operations within BIP, the key reason being that moving to other locations would be cost-prohibitive, given the huge amount of costs the company has sunk into its BIP operations.

Company B (Crystal oscillators)

Company B is a 100% owned Japanese firm which disburses in the production of crystal oscillators. Its various plants have been strategically positioned in diverse countries such as Thailand, Vietnam, USA and China. Occupying a massive space of 6,000 square meters of land, serviced by a workforce of 432 employees, the company manufactures about 100 various types of oscillators to be used in an array of products, from clocks to TGX (Mobiles). Operations and outbound logistics are administered mainly in Batam, with the parent base in Japan engaged in the development of new technology.

In 1997, economical prices on rent, utilities and labor enticed the company to invest in the Industrial Park. In surmising to locate in Batam, the company's production manager reminisce

the lack of utilities in India, and BIP's competitive operational cost as compared to Thailand. Further inquiries revealed several perceived strengths that compensated the inherent weaknesses, which inveigle the company to remain. Strengths include the availability of utilities, provision of medical services and the proffer of legal documentation; poor traffic conditions, paranoia caused by SARS and banned IDD calls due to Telecom's monopoly were constituents of perceived constraints.

The company suffered losses for the fiscal year 2001-2, considering Sept 11 economy downturn and the region's instability, which further pushed down investors' confidence. Volatile mobile phone market, coupled with economic uncertainty has forced the company to reassess its investment in BIP. In a bid to maintain its cost competitiveness, the company aims to streamline its production processes, and employ advanced technology. It remains optimistic of a potential buoyant economy, fueled by the reduction of leading economies' interest rates in a bid to spur consumer spending, which bodes well for its overseas markets.

Company C (Electronic switches)

A joint venture between Singapore and Switzerland, Company C is an electronics contract manufacturer involved in printed circuit board assembly and box-build assembly. Many of its products, such as refrigerator switches, are used in industry as intermediate products. While USA was the primary market for the company's products, the events following September 11 has dealt a severe blow to demand for its products, and has led the company to restructure and diversify its markets to Europe and elsewhere in Asia. The BIP operations employs about 200 workers, and occupies one medium-sized factory. All its products are exported out of Indonesia.

The company cites the competitive costs of unskilled labor and overheads, and political commitment and incentives from the Indonesian government as pull factors which drew it to BIP. In particular, it singled out the reliable infrastructure as the park's greatest strength. It was also quite satisfied with the one-stop service provided by the park.

Granted, labor may be cheaper, but the company felt that productivity was lacking and its operations were often disrupted by industrial relations problems. There were many loopholes in labor laws which were exploited by the unions and employees. The higher overhead costs were also a concern. Though the one-stop service was commendable, the company still felt stifled by red tape as new technologies could not be easily imported.

The recent Bali bomb blasts did not have any effect on the company's plans for its Batam operations. Its operations decisions are based on demand factors outside of Indonesia. The company has plans to expand within BIP, considering the expected pick-up in demand after the current economic downturn.

Company D (Adhesives)

Company D is a manufacturer of a diverse range of adhesives for both domestic and industrial usage. It is also involved in the manufacture of the aluminum packaging for its adhesive products. The company is a wholly-owned subsidiary of a Singapore-based company, which in turn is affiliated to a larger Japanese conglomerate.

The manufacturing facility in BIP was set up in 1996, and involved the shifting of all activities purely related to manufacturing from Singapore, where labor costs were eroding their profitability. In this sense, the factory in BIP operates as an independent cost centre. All inputs for its operations are imported through Singapore. The company does not have a license to export its products, so it has to ship all final products back to Singapore for re-export. Thus, it is a purely export-oriented facility. It currently employs 150 workers and occupies 2 medium-sized factories.

Although the management acknowledges the reliable and stable infrastructure, it is generally displeased with the high cost of utilities, and feels that the premium charged is excessive compared to the benefits obtained from such basic necessities. They revealed that water and electricity were charged in Singapore dollar, rather than the Indonesian rupiah, and were in fact more expensive than in Singapore.

Another major complaint was labor. Labor costs were lower in BIP, but there had been many industrial disputes which caused much uncertainty to its operations and strained relations between the company and its workers. Unions, both registered and unregistered, wield considerable power in negotiations and even a short disruption to the company's operations could have a significant impact on the company's production schedule. Moreover, although labor costs were low, absenteeism was high and the local workers generally had poor work ethics. Labor laws were also deemed to be too protective towards workers. These laws were made known to the company only after it had established its operations. To alleviate these labor problems, the company tends to hire on a short term contract basis. While the problems it faced

are significant, the company has no plans to relocate out of BIP. Neither does it have any plans to expand, or scale down its operations in BIP.

Case E (Inter-enterprise software)

Company E is a wholly-owned subsidiary of an international software giant. Its German parent is recognized as the world leader in providing collaborative business solutions for all types of industries and major markets, and enjoys the position of being the world's largest inter-enterprise software company, and the world's third largest independent software supplier overall. The parent company also employs 28,800 people in over 50 countries.

Company E was initially a German IT company, operating in Bangalore's Koramangala district. It was taken over in 1998, a move that was accompanied by a shift into ITPL. With actual operations within ITPL beginning only in 1997, the company's establishment in 1998 made it one of the first occupiers. It also boasts of being the park's largest tenant, in terms of space occupancy, covering about 9,000 m². The company initially had a choice of relocating itself at ITPL or at other city locations, which offered one-fourth the rent. The company chose ITPL, despite its higher rents, largely due to the following critical advantages that ITPL provided: uninterrupted power supply, state-of-the-art infrastructure, ease and speed of setting up shop, and excellent communication channels. In justifying the company's relocation into ITPL, a company official had this to say: "For any company, ITPL provides excellent operating facilities, which brings about an increase in revenue. This increase in revenue is larger than the increase in costs (in terms of rent)". The company's primary operation within the park is confined to software development, and is described as a "100% export unit". All its exports go to Germany.

The company, after having completed four years in the park, has decided to move out. The principal reason given for this is the rapid growth of the firm. In the four years since its inception, it has grown from a little over 70 employees to 500 employees today. Space constraints within the park have forced the company to look at other locations. ITPL has been unable to cater to the growing and irregular needs of the company, being a park suited for small and medium enterprises. As a fast expanding company, the company no longer views ITPL's costly rents as one that can be justified. Instead, the company has moved into an expansive new campus, 15 acres in area, where it can enjoy economies of scale. Furthermore, the company views such a shift as an opportunity to establish its own identity, which it had not fully experienced in a multi-tenanted place like ITPL. However, given ITPL's 'distinct' advantages, the company has not fully relocated. Instead it continues to retain office space in the Park's new BTS (Built-To-Suit) facilities.

Case F (Business process outsourcing)

Company F is an American-based firm undertaking e-services. It is known to provide the industry standard in customer support services and solutions to Global 500 companies. It was founded by an experienced management team with proven expertise in delivering large-scale, mission-critical customer support programs, with its corporate headquarters in Los Gatos, California, and operations at the ITPL, Bangalore.

ITPL, with its facilities best suited for small and medium enterprises engaged largely in R&D and in the service industry, has become a breeding ground, of sorts, for companies involved in

Business Process Outsourcing (BPO). Located at the 'Creator' building of ITPL, company F is one of many such companies. Established in the park in April 2000, the company has over 800 employees, occupying 60,000 square feet.

Its key operations in the park include call centers, real-time customer service management and technical support to foreign firms. In fact, the facility in ITPL is the largest call centre in the state of Karnataka. Catering to customers as big as Alta Vista, the company has conducted successful programs such as outbound telemarketing, inbound phone customer service, inbound phone technical service, with service areas spanning countries worldwide, particularly, U.S and Europe.

Involved in email and telephone-based customer services targeted at customers all round the world, the company, like all others concerned with BPO operations, requires a facility that will provide the necessary round-the-clock resources. ITPL successfully makes available the same. The regular power supply, the 24-hour speedy connectivity and the plug and play services of ITPL have proven to be the distinguishing factors in luring the company. An added advantage is seen in the fact that the city of Bangalore abounds with excellent schools and universities. This coupled with the high standard of education, serves as a continuous source of skilled employment for the call centers located in the park. The company sees this pool of potential employees as an added advantage in carrying out its operations in ITPL.

Case G (Business process outsourcing)

Company G is a wholly American owned firm, with its parent company being considered a frontrunner in integrating the expanding capabilities of information technology,

telecommunications and the internet. The parent company has its headquarters in Virginia, U.S.A. Its services include voice-based services, internet services, back-office functions, and interactive tele-services. Company G was incorporated in May 1999 as a 100% subsidiary. Its facility within the park spreads over 42,000 square feet and employs 12,000 employees. The company's functions within the park largely focus on Business Process Outsourcing, which include both inbound and outbound customer care.

As in the case of other companies in the same industry, Company G, too, cites the permanent power supply, 24-hour connectivity and supporting infrastructure as the vital factors that prompted it to situate in the park. The company also employs a sizeable portion of the IT graduates that Bangalore churns out every year. In addition to the above, according to a company official, the firm perceives ITPL's excellent and professional support services and maintenance programs as a huge advantage that gives it an added edge over its peers that are located elsewhere. Such benefits have been the direct result of the Singaporean-styled management. However, the company has expressed reservation over the numerous other call centers making their way into ITPL to make use of the same advantages, which escalates into other problems such as heightened competition, further sharing of resources, and the "the pool of entry level people getting smaller".

Case H (Travel and financial services)

Company H is one of the world's leading international travel and financial services groups and serves over 20 million customers a year. It provides services at 4,500 locations in more than 100 countries and employs over 20,000 people. Establishing itself in India as early as in 1881, today,

the company's Indian subsidiary has a network of 54 locations in 16 cities across India and is the largest travel and financial services group in the country. Foreign exchange, corporate travel, leisure holidays, travel insurance and credit cards form the core activities of the company.

Company H is one of the very few companies that were approached by the ITPL management itself to set up shop at the park. On the management's behest, the company acquired an office within the park's premises largely to provide money-changing activity. Its core operations within the park, therefore, include ticketing and foreign exchange services. Company H is a small entity with only 5 employees. However, it has managed to secure a large customer base largely due to the fact that it is the only tenant providing such services within the park. Moreover, the company also caters to an increasing number of firms outside the park who find it convenient to visit its office in the park, which is in close proximity, instead of approaching its other branches placed in the city-center.

Discussion

Our in-depth case studies substantiate the survey results. For BIP, lower labor cost and greater availability of labor compared to Singapore were key elements in their decision to locate some of their production operations in Batam. Managers we interviewed cited labor cost and labor availability as primary reasons for relocation of labor-intensive operations, within the value chain, to Batam. However, all companies found infrastructure costs such as transport relatively uncompetitive, despite the institutional and infrastructural framework put in place in BIP. Nevertheless, each of the four companies believed that the savings in labor costs allowed them to capture competitive advantage in operations. However, these companies did not capture competitive

advantage in the labor chain solely through reduced labor costs. Another, albeit related element of the functional differentiation is that, the relocation of labor-intensive operations to Batam is coupled with lower investments and therefore greater savings in production technology. This was due to a variety of factors: the difficulty in automating those processes; the use of low-cost labor as an alternative to investments in technology; the low skill of the labor force; the maintenance and upgrading of the more automated operations in Singapore. In this sense, the functional and spatial differentiation of the value chain segment 'operations' was used by those companies having production operations both in Singapore and in Batam to reduce costs both in terms of labor and in technology investment. Investment in high technology was reserved for operations in Singapore. In short, the search for cost advantages has led to a spatial fragmentation of the production process, and MNCs breaking their value-added chains across national borders to maximise the competitive advantages of the contiguous economies.

The tenants at ITPL pose a stark contrast to those in BIP, which has managed to attract a significant majority of their tenants on the basis of abundant low-cost, low-skilled labor. The scenario in ITPL is decidedly different. Our study suggests that the same advantage of plentiful labor, and competitive labor costs, has not been the sole influencing factor in attracting firms to the park. The primary reason, which has encouraged firms to settle in the park, has been that of excellent infrastructural facilities and the Singapore-styled management characterized by its quintessential efficiency. Anecdotal evidence from our case studies suggests that international IT firms have relocated to ITPL from other locations for this reason. ITPL represents a modified version of the Porter-Kogut analytical framework, whereupon ITPL has witnessed the location of firms engaged in marketing and sales, and other services (viz, the primary activities), which were

supported by other activities such as technological development and infrastructure within the park (viz, the secondary activities), sufficiently provided by the Singapore partner. A case in point is the rapid establishment of companies in the BPO industry, and the myriad of e-services, including telemarketing and customer sales services, by simply making utmost use of the telecommunication facilities that the park showcased, as substantiated by our case studies. This, along with the advanced technology made available at ITPL, has helped make the park the cynosure of companies engaged in the non-manufacturing industries, that is, those placed in the higher end of the value chain.

To a large extent, the case-study parks have succeeded in providing the crucial links within the value-added chain that give client firms a competitive advantage. The problem lies on the flip side of the desired strategic fit – the host country’s ability to provide comparative advantages. In both scenarios, the host government has succeeded only in making available the advantages of ‘basic factors of production’. Thus, while the case-study parks do provide some components of comparative advantage which the host country does not (e.g. reliable infrastructure), the strategic intent of these flagship projects remains stymied by non-economic, socio-political complexities in the larger host environment.

ISSUES AND CHALLENGES

The special privileges secured by Singapore’s overseas industrial township projects share a common trait: many of the privileges obtained were unprecedented, and unique, to the case-study parks. For instance, the Singapore partners were granted licenses to build and operate their own

power and water treatment plants and telecommunication facilities which, in Indonesia and India, was an exclusive concession. As such, the Parks could leverage on their reputation of reliable infrastructural facilities in areas where these facilities were an anomaly. Moreover, since local government officials were usually part of the management boards of the parks, once bureaucratic procedures, such as investment approvals, construction activities, import/export permits and immigration matters became accelerated processes. The Parks serve to attract investors with its formulaic one-stop service within a self-sufficient, self-contained environment which is unburdened by inefficient administration. Significantly, Singapore's positive reputation with multinational corporations for its stable, corrupt-free investment environment lends credibility, such that it seems privileged to be located in the Parks¹¹.

Influence can also be exerted through inter-governmental interaction and, where existing, through the links to influential ethnic business groups in the investment location who often rely on state patronage for their access to infrastructure development projects. The main Singapore partners involved in these projects were government-linked companies (notably, SembCorp Industries, Keppel Corp and Ascendas International), and Temasek Holdings (the Singapore government's main investment holding company). For the Indonesian parks, the main local partner was the Salim Group, which, albeit private, is nevertheless well known for its close links to senior Indonesian politicians and privileged access to major investment projects. ITPL also shares the characteristic of strong government involvement, with the Indian counterparts being the Karnataka state government and the Tata Group, which, though private, is nonetheless well connected with local authorities. The strategic alliances between Singapore's own state-owned

¹¹ This was a constant refrain throughout our interviews in ITPL.

enterprise networks, and its counterparts in the regional sites, were instrumental in mobilizing the financial resources to complete these multi-million projects and, in most cases, within a comparatively short time-frame of 18 to 24 months.

Nonetheless, as most openly admitted, the strategically 'engineered', inter-government endorsement of the flagship projects, and the enormous resources mobilized through the strategic partnerships, have 'failed' to shield the Parks from a gamut of problems. Issues pertaining to the scale and character of development of BIP, viz, BIP's resemblance to a Japanese investment enclave and vulnerability to a withdrawal of Japanese investments, and infrastructural dilemmas, as well as the limited impact of the Indonesia parks on the transfer of low value operations from Singapore, and the associated upgrading of linked activities in Singapore, are discussed in Peachey et al (1998), Grundy-Warr et al (1999) and Yeoh et al (*forthcoming*). Peachey et al (1998) have drawn attention to the influx of immigrants to the islands and, concomitantly, to the social problems of squatter settlements which threaten to overwhelm the investment value of the Indonesian parks. The following observations update, and offer new insights, on BIP in Indonesia, and present data on recent developments in ITPL, India.

Heightened Competition

Singapore's overseas industrial parks are increasingly facing strong mounting competition from competing parks within their vicinity. Competitor parks, some of which are backed by prominent Indonesian politicians, have mushroomed around BIP. Panbil Industrial Park, for instance, is located directly opposite BIP, and offers similar factories at competitive rentals. The premium placed on the Park's one-stop support service, and self-sufficient operating environment, is

increasingly called into question. As well, competition is not limited to within Indonesia. Indonesia's minimum wage, at US\$43 to US\$70 a month, depending on the region, prices it out of the global competition for cheap labor. Investors can get similarly-skilled labor from Bangladesh, Vietnam, and Sri Lanka at monthly wages of US\$17, US\$32, and US\$40 respectively. Recent press reports on Riau's investor exodus¹² cite sluggish bureaucracy, 'rowdy' labor scenes, lack of legal certainty and security, and unclear investment policies as reasons for investors relocating their investments from Riau Province, and Indonesia. Populist measures such as raising the minimum wages before the general elections due in 2004, further heighten the reluctance of investors to pour money into the country.

ITPL's success hinges on the "Singapore-styled design and management" reputation. However, the premium placed on ITPL's formulaic 'one-stop' service and self-sufficient infrastructure is similarly, and increasingly, eroded by intense competition from newer, albeit, smaller parks being developed by street-savvy Indian entrepreneurs, and ITPL's capacity to provide stable electricity is the only differentiating factor from other IT parks like the Software Tech Park and Electronics City. These competitor parks market themselves aggressively on price, charging significantly lower rentals for "no-frills" factory space. A case in point, ITPL's listed lease price is Rs50 (approximately US\$1) per square foot, whereas the rate in other areas, and within Electronic City itself, just outside ITPL, is less than Rs15. Our interviews with IPTL tenants have alluded to the possibility that the Park's attractiveness may, in time, be eroded, as more IT parks and companies are established within the vicinity to capitalize on the area's repute, while offering lower rentals with reliable energy, as the state develops.

¹² The Straits Times, 30 August 2003, The Straits Times, December 5, 2003..

Political 'Commitment'

Reliance on political patronage (and personal ties) rather than transparent contracts has had advantages and disadvantages. For BIP, the reliance on the Salim Group has been necessary in the context of the Indonesian system of 'crony capitalism' fostered by then President Soeharto. The end of the Soeharto era, and pressure from the IMF and western governments for financial transparency, has diminished Salim's political and commercial influence. Ownership changes at BIP have brought about uncertainties¹³, as the Parks' privileged access to senior politicians and policy-makers in Jakarta has proved more difficult. Compounding these uncertainties, inter-governmental endorsements, post-Soeharto, no longer suffice to secure commitments at the lower tiers of government. Anecdotal evidence¹⁴ points to a more complex regulatory environment for foreign companies, as they have to deal more intensively with the provincial and sub-provincial (district) governments. The Parks' reputation as investment enclaves has also not been left unscathed by political developments in the aftermath of the Asian financial crisis, the September 11 attacks in the United States, and more recently, the Bali and Jakarta-Merriot bomb blasts. In addition, negative press reports on active terrorist cells within the region serve little to quell the innate risk-aversion of potential investors. BIP could do without these added sentiments in its larger environment.

¹³ The Indonesian Bank Restructuring Agency has reportedly offered to sell the Salim Group's stakes in all the Riau projects – estimated to be worth S\$500 million – in a packaged deal (The Business Times, August 28, 2001). Further restructuring have taken place, with the three main stakeholders now being SCI, Ascendas and the Indonesian government.

¹⁴ Law No. 22/199 allows provincial, district and municipal governments to write provincial laws, some of which contradict national laws, or test the boundaries of their power. The Megawati administration is now proposing a revision of laws on regional autonomy, but the direction remains unclear. For a discussion on the problems with regional autonomy and their impact on business, see Van Zorge, Heffernan & Associates (April 2002). Interviews with BIP executives and tenants, in September 2002 and July 2003, respectively, have alluded to this changed operating environment.

In India, varying degrees of commitment and support by different state governments towards the country's development can affect ITPL's competitive advantage. The lack of good supporting infrastructure in the surrounding environment, and the disparity in local state-government supporting different cities, serve as a deterrent to investors, even as cities like Hyderabad, Mumbai and Chennai continue to advance technologically. On a broader front, corruption remains endemic, and bureaucratic red-tape is difficult to circumvent. These considerations are, by themselves, deterrence to potential investors, even with Singapore's presence and involvement. To hedge Singapore's strategic interests in India, Ascendas is reportedly partnering India's largest construction conglomerate, Larsen and Toubro, to build Cyber Pearl in Hyderabad's Hitec City, while plans are in place to develop similar IT parks in Chennai and other Indian cities, on a *turnkey basis*.

CONCLUDING REMARKS

Singapore's overseas parks tend to exist as investment enclaves within a disjointed economic and policy environment. They are linked to transnational investment networks, business elites and specific government commitments. The positive aspect of this is that the parks can be sites of investment privilege, in respect of their regulatory controls, infrastructure quality and status with public and private agencies. The weakness is that the privileges obtained are vulnerable to changes in political allegiances, and the infrastructure efficiency is at risk from the uncontrolled broader environment in which the park is located.

An outright assessment of failure or success may not be appropriate, given the mixed economic and political objectives¹⁵. However, our study suggests the economic theorization that underscores Singapore's regionalization stratagem continues to be overshadowed by the policy nuances that radiate from the host environment. The calculated, schematized efforts at trans-border industrialization, though remarkable, have been overly optimistic and have failed to engender equally compelling results, more often than not frustrated by the intricacies of socio-political realities in the host economies. The limits to '*Singapore Unlimited*' have been exposed in this chapter.

¹⁵ Sentiments at SembCorp Industries and Ascendas International remain optimistic, as is the willingness of senior management to search for alternative strategies to re-position these flagship projects. In our discussions, the Parks' management reasons that competition is inevitable. And, rather than engaging in a price war, management has indicated a preference to adjust rates to 'better reflect market situations' while, at the same time, endeavor to differentiate the Parks from competitors by catering to higher value-added activities. For instance, in BIP, there are plans to create new initiatives for the Parks' tenants, such as offering broadband services ahead of competitors, and providing supply-chain management solutions for its tenants. Interestingly, the Parks' management view competitors as essential components of a 'living system in which all entities within the system constantly adapt to their dynamic environment and are synergistically integrated'. In the case of BIP, it is argued, co-existence must be established to augment a positive image of the Riau Islands as an investment haven, and competitors are viewed as an imperative to the long-term attractiveness of BIP. As well, Bintan Industrial Estate, in close geographical proximity to BIP, serves as a cheaper alternative for cost-conscious companies to locate their operational activities. In the case of ITPL, the project is perceived as a strategic thrust to capitalize upon first-mover advantages in a regional economy with immense market potential. ITPL, as the first entrant to successfully develop and manage a state-of-the-art technology park, has arguably enhanced Singapore's reputation for industrial-township projects. More subtly, ITPL's apparent success may leverage Singaporean companies' foray into India's aggressive infrastructure plans and commercial-residential township projects.

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TABLE 1**Singapore's Total Direct Investment Abroad by Destination**

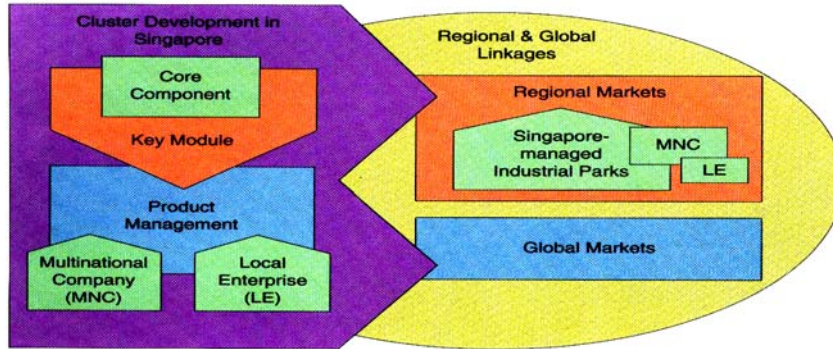
Millions of S\$, Stock as at Year-End

Destination	1996	1997	1998	1999	2000
China	11.5	13.8	16.1	15.4	16.3
Malaysia	17.3	11.8	11.4	9.2	10.1
Hong Kong	10.8	10.7	10.1	11.2	8.4
United States	4.7	3.8	4.1	4.5	6.5
Indonesia	7.0	8.6	5.9	5.9	5.8
Mauritius	0.7	3.3	4.3	3.7	4.5
British Virgin Islands	2.6	3.8	5.3	5.2	4.2
Liberia	4.2	5.2	3.5	2.6	4.0
Total (%)	58.8	61.0	60.6	57.8	59.6
Total (S\$m)	55,536	75,807	75,622	92,720	91,949

Source: Singapore Department of Statistics.

FIGURE 1

Singapore's Transborder Industrialization



Source: Adapted from *Singapore Unlimited* (Singapore Economic Development Board, 1995).

TABLE 2A
Batamindo Industrial Park - Operational Statistics (June 2003)

General Information	
Investment by Developer	US\$470 million
Committed Tenants	82
Area Taken Up	320 hectares
Investment by Tenants	> US\$1 billion
Annual Export Value (for 2002)	> US\$2 billion
No. of Employees	65,000

Source: SembCorp Industries.

TABLE 2B
Batamindo Industrial Park – Tenant Profile by Country of Origin (June 2003)

Country	Percent
USA	9
Japan	48
Europe	11
Singapore	30

Source: Batamindo Industrial Park, Tenants' List, June 2003

TABLE 2C
Batamindo Industrial Park – Tenant Profile by Sector (June 2003)

Sector	Percent	Sector	Percent
Electronics	44	Packaging	6
Precision Parts	15	Medical	4
Plastic moulding	11	Pharmaceuticals	1
Electrical	11	Others	9

Source: Batamindo Industrial Park, Tenants' List, June 2003

TABLE 3A
International Technology Park Limited - Operational Statistics (June 2003)

General Information	
Scale of Development	About 70 acres
Developed Area	1.6 million sq ft
Total Investment Value	SG\$200 Million
Confirmed Tenants	100
Operating Tenants	93
Area Taken Up	1.4 million sq ft.
Park Population	8,500

Source: Ascendas International.

TABLE 3B
International Technology Park Limited – Tenant Profile by Country of Origin (June 2003)

Country	Percent
USA	42
India	36
Europe	16
Asia	6

Source: Ascendas International.

TABLE 3C
International Technology Park Limited – Tenant Profile by Sector (June 2003)

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: Ascendas International.

TABLE 4

Factors Influencing the Respondents' Decisions to Invest in BIP/ITPL

Variables	Maximum Likelihood Estimates - Binary Logits		Popular Ranking			
			BIP		ITPL	
	α_i	<i>p-value</i>	<i>Frequency</i>	<i>Rank</i>	<i>Frequency</i>	<i>Rank</i>
Political commitment from Singapore government	1.422	0.237	17	4	6	4
Political commitment from host country government	1.992	0.058**	21	3	6	4
Investment incentives	1.253	0.291	16	5	14	2
Competitive labor costs	4.274	0.003***	22	2	1	5
Availability of skilled/educated labor	-0.644	0.622	16	5	12	3
Reliable infrastructure facilities	-1.124	0.424	23	1	27	1

Note: ^ψ Estimated values were taken from “forced entry” regression.

^φ p-values are for 2-tailed tests.

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

Source: Questionnaire surveys.

TABLE 5
Major Constraints on the Respondents' Operations in BIP/ITPL

Variables	Maximum Likelihood Estimates - Binary Logits	
	α_i	<i>p-value</i>
<i>Labor Constraints</i>		
Shortage of semi-skilled and skilled labor	2.770	0.024**
Shortage of professionals and managers	-0.182	0.865
Rising labor costs	2.283	0.021**
Industrial relations problems	3.330	0.002***
Others	1.235	0.336
<i>Organizational/Technological Constraints</i>		
Difficulty in obtaining capital equipment	1.246	0.226
Difficulty in introducing new technology and techniques	2.541	0.009***
Lack of good supporting services	2.504	0.007***
Difficulty in securing funds for expansion	1.699	0.135
High and/or rising overhead costs	0.914	0.303
Others	-18.831	0.999
<i>Environmental Constraints</i>		
Impact of host government regulations	2.312	0.018**
Competition from overseas Competitors	2.920	0.001***
Others	-2.705	0.084*

Note: ^ψ Estimated values were taken from “forced entry” regression.

^φ p-values are for 2-tailed tests.

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

Source: Questionnaire Surveys.