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Extending Economic Boundaries and Exporting Expertise: New Evidence on Singapore's Gambit in Indonesia, Vietnam 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 paper[1] revisits Singapore's flagship projects in Indonesia, Vietnam and India. Evidence from on-site surveys and interviews are presented. This paper contends that progress in these privileged investment zones remains stymied by particular dependencies and challenges in the host environments.

Key Words: Regionalization – Trans-border Industrialization – Singapore's Overseas Industrial Parks

1. 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 (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 horizons[2] and potential economic growth through an overseas direct investment program[3]. 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; Wong and Ng, 1991). However, most of these investments proved unsuccessful, resulting in enormous losses by the early 1990s (Kanai, 1993; Regnier, 1993; Murray and Pereira, 1995).

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 (SEDB, 1995a; 1995b). This stratagem was endorsed by

the Committee to Promote Enterprise 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; Lee, 1994; Mahizhnan, 1994; Pang 1995; Kwok, 1995; Tan, 1995; Okposin, 1999; Pereira, 2001; Blomqvist, 2002; Sitathan, 2002).

Singapore's trans-border industrialization initiatives comprised state-led[4] infrastructure projects, and a range of incentives and regulatory innovations (Zutshi and Gibbons, 1998; Goh, et al, 2001; Yeung, 2001), designed to create Singapore-styled industrial townships in regional sites where such positive factors may be lacking (Perry and Yeoh, 2000). A three-pronged 'Singapore Inc' approach was adopted (Yeoh, et al, 2004a). Senior politicians and civil servants negotiated[5] the institutional framework for the project, which typically involved garnering special investment conditions in the host location; (Singapore) government agencies and government-linked companies (GLCs) took the lead in infrastructure development; and Singapore's Economic Development Board took 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.

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*[6]) of Singapore-based companies, as well as Singapore's own competitiveness as a high-value investment location with strategic linkages to the region. 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); thus these industrial townships were located in key areas of high economic growth in various countries in the region. The most well-known of these, the China-Singapore Suzhou Industrial Park (CSSIP), and its effects on both Singapore and the Suzhou region are well-documented[7] (Suzhou Industrial Park Administrative Committee, 1999; Pan, et al, 2000; Pereira, 2003); less so, however, are the effects of its lesser-known cousins.

This paper will focus, specifically, on Singapore's lesser-known industrial township projects, in Batam Island (Indonesia), Ho Chi Minh City (Vietnam), 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 discussed in the next section, followed by an account of the origins and progress of the case study parks. Two core issues in the paper – the attractiveness of these industrial parks to their tenants and the future challenges faced by the owners and management of these parks – will then be sequentially examined.

In the first issue, we determine the flagship projects' 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 our on-site surveys of the decisions by firms to invest in the three parks. Following from the investment decisions, we examine the current challenges faced by the parks' tenants, to determine whether the current owners and management had followed up with the second phase of the project, which is to encourage more firms to locate in the parks while satisfying the needs of the parks' current tenants. In-depth case studies of selected tenants in all three locations further substantiate our findings.

The paper then incorporates these findings with the underlying macro environment (in terms of heightened competition and political 'patronage'), thereby leading to a comprehensive examination of the second issue - the future challenges faced by the owners and management of these parks. We conclude our findings by considering the implications of these experiences for Singapore's regionalization program, and evaluating the city-state's determined efforts to harness synergistic complementarities in its strategic intent to restructure the Singapore economy.

2. 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 (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; 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.

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.

Before we take up the discussion on our empirical findings, a sketch of the case-study parks is presented in the next section.

3. 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 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 in 1977 with recommendations 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. The then 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 transhipment 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 and cheap labor were well-positioned[8] 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 communication, transportation and other services (Liew, 1990; Yeoh, 1990; Ng and Wong, 1991; 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 GLCs[9] 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).

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.

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$1billion 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 1A sets out BIP's operational statistics, while Table 1B shows the tenant profile by country of origin and Table 1C, the tenant profile by sector.

Vietnam-Singapore Industrial Park (VSIP)

VSIP is Singapore's flagship investment in Vietnam. The plan was first mooted in March 1994 by the then Vietnamese Prime Minister, Vo Van Kiet, and Singapore's Prime Minister, Goh Chok Tong. VSIP was launched in 1996. The 1,000-hectare Park is located in Binh Duong Province, 17 km north of Ho Chi Minh City, and is within a 40-minute drive from the international airport and seaports. A self-contained, self-sufficient industrial park with prepared land plots, and ready-built factories, bolstered by Singapore-style management expertise and infrastructure support, VSIP provides a 'hassle-free', one-stop service to its tenants. VSIP boasts an on-site customs unit, which allows the convenience of customs procedures and documentation to be done within the Park, and customs inspections within tenant's factories. A 200,000 working population within a 15-km radius from VSIP provides a ready pool of low-cost, skilled labor (*VSIP Connection, various issues*). Training is largely provided by the S$9.5

million Vietnam-Singapore Technical Training Centre (VSTTC) established in 1998. VSTTC is a three-way project between the Singapore and Vietnam governments, and VSIP.

In VSIP, Singapore applied lessons learned from its China experience and made deliberate efforts to foster strong collaboration with local authorities. A Management Board[10] was set up, chaired by the Vice Chairman of the Binh Duong Province People's Committee, which pre-empted the perception that VSIP was a partnership forced upon by the central government. The SembCorp Industries-led consortium[11] holds a 51-percent stake. The Vietnamese partner is Becamex, a state-owned enterprise.

VSIP's early tenants included 3M, Sandoz, Sakata Inc, Godrej (India), Liwayway Food Industries (Philippines), and a mix of Singapore manufacturers like ST Automotive, Star Chemicals and Hwa Hup. The role of Singapore's EDB has been acknowledged. VSIP had, by November 1998, attracted US$370 million in investments and thirty investors from ten different countries investing in a broad swathe of industries: food, electrical and electronics, pharmaceuticals and healthcare, specialty materials, consumer goods and light industries. Investment commitments in VSIP are currently valued at over US$600 million from 124 tenants, of which 80 are already operational (Table 2A). Thus far, 24,000 jobs have been created, with the number expected to rise to 40,000 when the remainder of the tenants start their operation. Phases 1 and 2 have been fully taken up, with another 200 hectares left to be developed as part of phase three. This is expected to start in 2004.

VSIP has a list of 'priority' industries, which adheres closely to the official list of preferred industries[12]. Unlike BIP, where the focus on electronics complements Singapore's economic development, VSIP holds no such objective. It is less selective of target industries. The tenant mix reflects the importance of Asian MNCs, while the sector mix ranges from textiles, to electronics and pharmaceuticals (Tables 2B and 2C). Among the tenants, Singaporean and non-Asian firms come from diverse industries, while Japanese firms which locate in VSIP are more likely to be manufacturers of electronics and other parts and components. VSIP posted its first profits of US$4million in 2002.

International Tech Park Limited (ITPL), India

The idea to create a Singapore-styled 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 Valley[13]. The partners in the ITPL project are a Singapore consortium of companies[14] 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.

Marketed aggressively as an environment that 'cuts through the red tape and bottlenecks that are a part of India's infrastructure and operating environment'[15], 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, and 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 (Table 3A). 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. The tenant profile by country of origin, and by industry sector, is set out in Tables 3B and 3C respectively.

4. ANALYSES AND FINDINGS

Prior analyses on the Parks have relied primarily on secondary data from official publications, press reports, etc. To add empirical rigor to this paper, we applied the survey questionnaire developed in *Yeoh, Perry and Lim (2000)* through direct interviews with the tenants in BIP, VSIP and ITPL, to gauge the differential impact of various push/pull factors on firms' decision to locate in the case-study parks, along with the differential impact of different types of constraints on their operations. 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 factors affecting the tenants. Other questions pertaining to the respondents' views on the facilities and services in the Parks were culled from the open-ended questions. On-site interviews were undertaken in August 2002 (VSIP), December 2002 and June 2003 (ITPL) and July 2003 (BIP). This section presents our survey results.

Profile of Respondents

Of the 83 respondents, 27 were from BIP, 23 were from VSIP, and the remaining 33 were from ITPL[16]. Of the 27 BIP respondents, 7 were wholly Singapore-owned, 11 were wholly Japan-owned, 5 were Singapore joint ventures with foreign countries and 4 were wholly foreign-owned. In terms of operations, 14 and 7 of the respondents manufactured intermediate products and consumer products respectively. The remaining 6 firms were engaged in industrial services. In terms of employment size, 12 firms hired between 101-500 employees and 14 hired beyond 500 employees. In terms of sales for the annual year 2002, 9 had sales between US$10-50 million and 5 had sales beyond US$50 million.

For VSIP, 6 respondents were wholly Singapore-owned, 1 was a joint-venture and 16 were wholly foreign-owned companies. There were 7 small firms, 8 medium-sized firms, and 8 large firms. As for the nature of operations, 8 manufactured consumer products, 3 manufactured intermediate products, and 2 were involved in industrial services. None of the companies surveyed were manufacturers of capital goods. In terms of targeted markets, 9 targeted only the domestic (Vietnam) market, 4 targeted ASEAN countries, while 7 targeted both Vietnam and surrounding ASEAN countries. The remaining are export-based manufacturing entities catering to non-ASEAN countries.

Of the 33 respondents in ITPL, 4 were wholly Singapore-owned, 2 were wholly Japan-owned, 21 were wholly foreign-owned and 2 were Singapore joint ventures. In terms of operation, 16 were engaged in software

development, 4 in support services, 2 in telecommunications and 2 in research and development. In terms of sales for the annual year 2002, 15 had sales less than US$ 5 million, 3 had sales between US$ 5–10 million and 2 had sales beyond US$ 10 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:

$$P_i = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

*w*here: P_i is the probability of firm being located in the particular park, 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, would suggest that the firm choosing that particular push/pull factor is more likely to be from that particular park than other similar industrial parks. A similar logit model was applied to the constraints faced by the Parks' tenants:

$$P_i = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

*w*here: P_i is the probability of firm being located in the particular park, 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 that particular park than other similar industrial parks.

Factors influencing respondents' decision to invest in the case-study parks[17] *(Tables 4A and 4B)*

Singapore leverages on its infrastructure development expertise and the low-cost labor 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. Furthermore, there is a host of investment incentives that entice multinationals to locate their lower value-added activities in these self-contained enclaves.

Not unexpectedly, the reliable and efficient Singapore-styled infrastructure was the Parks' main draw, with 85%, 70% and 82% of the BIP, VSIP and ITPL tenants surveyed citing it as a pull factor for them to locate in the Park respectively. Singapore appears to have succeeded in exporting its 'expertise' in infrastructure development and creating a location-advantage which is clearly in demand by companies in the South East Asian region.

Political commitment from the Singapore and the Indonesian governments is a major concern for BIP tenants, as indicated by the positive and statistically significant α_1 (=1.727) and α_2 (=2.184) for BIP. This can be explained by the instability of Indonesia's political system. The post-Soeharto era was significant for BIP, as many firms pulled out of BIP during the political unrest. The situation was further exacerbated by the political uncertainties with the Indonesian presidency changing hands, from Habibie, to the first 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 serve to complicate investors' assessment of Indonesia's political outlook, making it imperative for both countries to signal their political commitment to the progress of the Park. Political commitment

from both the Singapore and Indonesian governments became particularly important in keeping the tenants' confidence in BIP.

On the other hand, political commitment from the Singapore government is not a concern for VSIP firms, with only 3 respondents citing it as an affirmative pull factor. This observation suggests that companies which invest in Vietnam are more concerned with the operational conditions in VSIP, such as the reliable Singapore-styled infrastructure facilities, than with the Singapore government's commitment to the success of the Park.

Another pull factor for BIP is 'competitive labor costs', with 81% of the tenants indicating so, and as indicated by the positive and statistically significant α_4 (=2.055). This is expected since BIP serves as a low-cost investment enclave, and a large proportion (81%) of the tenants in BIP engage in manufacturing activities. Manufacturing being labor intensive inherently requires much low-cost labor. The cheaper cost of labor is an added bonus to companies which locate in ITPL, but is not a deciding factor as indicated by the negative and highly significant α_4 (=-3.620) for ITPL.

Constraints Faced by Respondents' Operations (Tables 5A and 5B)

BIP, VSIP and ITPL are now established industrial estate developments, but our study alludes to some emerging constraints which have undermined the attractiveness of the Parks. These constraints are categorized into three broad groups, namely, those relating to labor, those relating to organization and technology, and those relating to the economic 'environment', such as government policies and regulations.

Labor-related constraints

The 'cheap' labor resources which drew companies to Indonesia proved to be mere perception rather than a reality in BIP, as 'rising labor costs' is the main constraint faced by the majority (78%) of the BIP tenants surveyed. The logit coefficient, at β_3 (=3.433) is also positive and significant. Low labor productivity exacerbated the difficulties faced by the tenants, which perform predominantly labor-intensive activities in BIP. This is further documented by constant lamentations of industrial relations problems during our interviews with the tenants, and which are substantiated statistically by 63% of the BIP tenants and the positive and significant β_4 (=4.194). Many VSIP

tenants, on the other hand, did not face a problem of rising labor costs, as indicated by the negative and significant β_3 (=-3.658). Instead, many VSIP tenants surveyed (74%) cited shortage of professionals and managers as a labor constraint, further substantiated by our logistic regression model where β_2 (=2.462) is positive and significant. ITPL tenants, on the other hand, do not face such a problem, as indicated by the negative and significant β_1 (=-1.538) and β_2 (=-1.618). This could be explained by the fact that the city of Bangalore has excellent schools and universities, and serves as a continuous source of English-speaking, skilled talent for tenants in the park.

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, and to some extent less so in ITPL where the corresponding percentage is 48%. The positive and highly significant β_5 (=2.497) for BIP supports our rankings analysis. Other organizational/technological constraints faced by BIP tenants (and less so by ITPL tenants) include difficulty in introducing new technology and techniques (β_2 = 1.970 for BIP; β_2 = -1.454 for ITPL) and the lack of good supporting services (β_3 = 2.214 for BIP; β_3 = -1.289 for ITPL).

'Environmental' constraints

'Impact of host government regulations' and 'competition from overseas competitors' are constraints faced by both BIP and VSIP tenants. However, whereas 89% and 78% of BIP tenants cited the above two constraints respectively, only about half of the VSIP tenants and less than a third of ITPL tenants indicated likewise. This accounts for the positive and significant β_1 (=2.291) and β_2 (=2.163) for BIP and the negative and significant β_1 (=-1.353) and β_2 (=-2.137) for ITPL. The government's control over the operating environment and the economic landscape shaped by overseas industry competitors has proven more stifling to the operations of the tenants in BIP than to those in VSIP and ITPL.

To date, the Parks may have attracted a sizeable number of investments, but they have not met the expectations of the current tenants. While BIP may have been the most successful and profitable to date, only 52% of surveyed BIP tenants want to expand within the Park within the next 5 years, compared to 64% of tenants in ITPL, and 61% in VSIP. However, 41% of surveyed BIP tenants plan to retain the current size of operations within the next 5 years,

compared to 22% in VSIP and 27% in ITPL. In all three parks, insignificant proportions have plans to scale down operations or relocate from the parks. These statistics indicate a high degree of economic inertia amongst current tenants. A US-based precision electronics conglomerate with operations in BIP best sums up the general sentiments of the tenants: 'moving to other locations would be cost-prohibitive, given the huge amount of costs the company has sunk into our BIP operations.'

5. ISSUES AND CHALLENGES

Our accompanying studies (Yeoh, et al, 2004b; Yeoh, et al, 2004c; Vaidyanath, et al, 2004), which featured in-depth case analyses of respondent firms, allude to problems with the host country's ability to sustain the strategic fit between the value-added chain of the client firms, and the competitive advantages of the sites. Put differently, while the case-study parks do provide some components of competitive advantage which the host countries do not (e.g. reliable infrastructure), our earlier papers suggest that the strategic intent of these flagship projects have been stymied by non-economic, socio-political complexities in the larger host environment. To address this added dimension to our present research, we conducted further *in-depth interviews* with the Parks' senior executives and tenants, to draw further empirical insights on the host environments in which the parks are located.

To begin with, the special privileges secured by Singapore's overseas industrial-park projects share a common trait: many of the privileges obtained were unprecedented, and unique, to the case study parks. For instance, the Parks were allowed to build and operate their own power and water treatment plants, and telecommunication facilities which, in all three sites, were an exclusive concession granted to the Singapore partners. As a result, the Parks enjoy the reputation of reliable infrastructural facilities in areas where these facilities are an anomaly. As well, the Parks' management boards typically include local government officials, an arrangement which facilitates their privileged access to investment approvals, construction activities, import/export permits and immigration matters. Together, the Parks' self-sufficient, self-contained environment presents investors with a formulaic one-stop service which filters out administrative uncertainties associated with emerging economies. One ITPL tenant cites the park's 'excellent and professional support services and maintenance programs' as a 'tremendous advantage that gives us the added advantage over our counterparts that are located elsewhere.' Significantly, Singapore's positive reputation

with multinational corporations for its stable, corrupt-free investment environment lends credibility, such that locating within the Parks seems to 'boost our company's prestige'[18].

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 BIP, the then 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. In VSIP, the local partner, Becamax, is a state-owned enterprise. Working closely with the Singapore-led consortium, the local government expedited foreign investment approvals, and facilitated trade documentation and cargo clearance. ITPL similarly shares the characteristics 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 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, inter alia, 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 Grundy-Warr, et al (1999) and Yeoh, et al (2004d). 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.

A brief comparison with CSSIP further elucidates the gravity of the circumstances facing the three parks. Most notably, similar to the three case study parks, the collaboration for CSSIP to be a national economic development strategy was stymied by the indecisive reactions to the dynamic external environment, particularly the intense competition from Suzhou New District and the preferential treatment given to the latter by the provincial government. Even though the context for state collaboration for BIP, VSIP and ITPL is decidedly different from that for CSSIP, and the main problems confronting CSSIP as identified in Thomas (2001), Yeung (2002) and Pereira (2003) – differences in partners' objectives and complex involvement of different levels of governments – are largely avoided, socio-political complexities of a different context continues to plague the three case-study parks.. The following observations update, and offer new insights, on BIP in Indonesia, and present data on recent developments in VSIP, Vietnam and 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 exodus[19] 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.

VSIP's attractiveness has been eroded by competition from newer, albeit smaller, industrial parks developed by experienced and street-savvy developers from Korea, Taiwan and interestingly, Thailand. These competitor parks market themselves aggressively on price, charging significantly lower rentals for 'no frills' factory space. Not unlike

BIP, the economics of heightened competition have called into question the premium attached to the 'superior infrastructure' in low-cost industrial-investment enclaves like VSIP. As well, the Park was launched at the same time as Singapore's other flagship projects in China. VSIP struggles to maintain investor interest, vis-à-vis other regional sites, notably Asia's new powerhouses - China and India.

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 paks market themselves aggressively on price. 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.

Political 'Commitment'

Reliance on political patronage (and personal ties) rather than transparent contracts has brought about 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 uncertainties[20], 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 evidence[21] 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 Park's reputation as an investment enclave 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-Marriot 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.

In VSIP, the 'special' support from the local authorities has proved to be less significant than initially thought. Improvements on infrastructural projects have translated into a plethora of miscellaneous fees, and added to operating costs. Corruption remains endemic. Our on-site interviews, conducted in August 2002, further point to negative undercurrents over Singapore's control and management of VSIP. Anecdotal evidence suggests that, while there is an interest in learning from Singapore, tensions have arisen over Singapore-styled management practices, and these have translated into perception differences, protracted conflicts and project delays. Local sentiments towards the Singapore partners were not unlike those expressed in the *Suzhou-Wuxi* experience in China, albeit to a different degree. It is conceivable that the ownership-management structure of VSIP may, in time, be restructured to reflect a better alignment of interests. Significantly, SembCorp Industries has announced plans to divest itself of part of its stake in VSIP[22], even as it is now registering positive returns on its investment.

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*.

5. 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 objectives. Official commitment to the projects remains, in the willingness of the Parks' management to cut 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' managements 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 VSIP and ITPL, the projects are perceived as strategic thrusts to capitalize upon first-mover advantages in regional economies with immense market potential. As well, VSIP and ITPL, as the first entrants to successfully develop and manage state-of-the-art industrial parks in the host economies, have arguably enhanced Singapore's reputation for industrial-township and/or infrastructural projects. More subtly, it has propositioned that the 'apparent success' of these strategic initiatives may leverage Singaporean companies' foray into the host countries' aggressive infrastructure plans and commercial-residential township projects. This may well be the case, with exciting possibilities for further research.

However, our immediate study suggests the economic theorization that underscores Singapore's trans-border industrialization stratagem continues to be overshadowed by the policy nuances that radiate from the host

environments. 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 paper.

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[2] Stoever (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).

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

[4] 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); 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).

[5] The stress on exploiting personal ties accords with business practice preferred by the linked communities of 'overseas Chinese' (Redding, 1990, Yeung, 1997; Brown, 1998; Lehman, 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).

[6] 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.

[7] This is now an extensive literature on the problems encountered in the China-Singapore Suzhou Industrial Park project (e.g. Cartier, 1995; Law, 1996; Dolven, 1999; Perry and Yeoh, 2000; Thomas, 2001); various news reports, for example, The Economist (January 3, 1998), The Straits Times (December 5, 1997; May 14, 1999; June 30, 1999); and an unpublished (confidential) report commissioned by the Singapore Government.

[8] 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.

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

[10] The Board, with representatives from the ministries of Trade, Finance and Interior, as well as the General Customs Department oversees the issue of investment licenses, import/export permits, and construction permits.

[11] Other members of the consortium include Temasek Holdings, JTC International, UOL Overseas Investments, Salim's KMP Vietnam Investment, LKN Construction, Sembawang Engineering and Mitsubishi Corporation.

[12] Details are given in Circular No. 8, List of Encouraged, Limited and Prohibited Industries in Export Processing Zones and High-Technology Industrial Zones, issued on July 29, 1997.

[13] 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.

[14] 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).

[15] The Straits Times, August 8, 1999

[16] Population size of firms in each park is the number of operating tenants at the time of survey of each park - 78 for BIP, 64 for VSIP, and 90 for ITPL. Sample size is thus sufficiently large and the logit model is sufficiently robust and reliable.

[17] 'Respondents' decisions to invest' refer to past investment decisions, made at the time the park was built and/or marketed to the tenants, so as to reveal the effectiveness of Singapore's initial efforts at building a 'second wing'.

[18] This was a constant refrain throughout our interviews in ITPL.

[19] The Straits Times, August 30, 2003; The Straits Times, December 5, 2003.

[20] 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.

[21] 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 2003 have also alluded to this changed operating environment.

[22] The Straits Times, December 3, 2003.

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Table 1A 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 1B 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 1C Batamindo Industrial Park – tenant profile by sector (June 2003)

Sector	Percent	Sector	Percent
Electronics	44	Packaging	6
Precision Parts	15	Medical	4
Plastic molding	10	Pharmaceuticals	1
Electrical	11	Others	9

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

Table 2A Vietnam-Singapore Industrial Park - operational statistics (September 2003)

General Information	
Investment by Developer	US$600 million
Committed Tenants	124
Area Taken Up	300 hectares
Investment by Tenants	> US$1 billion
Annual Export Value (for 2002)	> US$2 billion
No. of Employees	24,000

Source**:** SembCorp Parks Management.

Table 2B Vietnam-Singapore Industrial Park – tenant profile by country of origin (September 2003)

Country	Percent
Singapore	24
Japan	21
Taiwan	17
Other Asian Countries	22
US and Europe	16

Source**:** SembCorp Parks Management.

Table 2C Vietnam-Singapore Industrial Park – tenant profile by sector (September 2003)

Sector	Percent	Sector	Percent
Electronics	11	Consumer goods	14
Food	9	Logistics	14
Light industries	20	Parts and components	10
Pharmaceuticals	9	Others	13

Source**:** SembCorp Parks Management.

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 4A Factors influencing respondents' decisions to invest in BIP, VSIP and ITPL (by popular ranking)

Variables	*BIP*		*VSIP*		*ITPL*	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Political commitment from the Singapore government	17	4	3	6	6	4
Political commitment from the host country government	21	3	7	4	6	4
Investment incentives	16	5	12	2	14	2
Competitive labor costs	22	2	11	3	1	6
Reliable infrastructure facilities	23	1	16	1	27	1
Availability of skilled/educated labor	16	5	6	5	12	3

Source: Questionnaire surveys.

Table 4B Factors influencing respondents' decisions to invest in BIP, VSIP and ITPL
(by maximum likelihood estimates - binary logits)[ψ, ϕ]

Variables	*BIP*	*VSIP*	*ITPL*
Political commitment from the Singapore government	1.727	-1.602	-0.188
	(0.034)**	(0.031)**	(0.821)
Political commitment from the host country government	2.184	-0.706	-1.048
	(0.005)***	(0.251)	(0.126)
Investment incentives	0.929	-0.095	-0.398
	(0.265)	(0.877)	(0.558)
Competitive labor costs	2.055	0.882	-3.620
	(0.007)***	(0.147)	(0.001)***
Reliable infrastructure facilities	-0.077	-0.309	0.704
	(0.935)	(0.641)	(0.357)
Availability of skilled/educated labor	0.865	0.720	-0.091
	(0.281)	(0.233)	(0.896)
Constant (α_0)	-3.252	2.413	4.178
	(0.002)***	(0.002)***	(0.003)***

Note: [ψ] Estimated values were taken from 'forced entry' regression.
[ϕ] Values in parentheses are p-values for 2-tailed tests.
*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level
n.c. Non-convergence

Source: Questionnaire surveys.

Table 5A Major constraints on respondents' operations in BIP, VSIP and ITPL (by popular ranking)

Variables	*BIP*		*VSIP*		*ITPL*	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Labor constraints						
Shortage of semi-skilled and skilled labor	11	3	12	2	3	4
Shortage of professionals and managers	10	4	17	1	4	3
Rising labor costs	21	1	1	4	7	1
Industrial relations problems	17	2	0	5	3	4
Others	4	5	4	3	7	1
Organizational and Technological constraints						
Difficulty in obtaining capital equipment	5	4	6	1	3	4
Difficulty in introducing new technology and techniques	11	3	5	2	3	4
Lack of good supporting services	13	2	5	2	4	2
Difficulty in securing funds for expansion	4	5	2	6	2	6
High and/or rising overhead costs	20	1	5	2	16	1
Others	0	6	5	2	4	2
Environmental constraints						
Impact of host government regulations	24	1	11	1	8	1
Competition from overseas industry competitors	21	2	11	1	4	3
Others	1	3	7	3	6	2

Source: Questionnaire surveys.

Table 5B Major constraints on respondents' operations in BIP, VSIP and ITPL
(by maximum likelihood estimates - binary logits)[ψ, ϕ]

Variables	*BIP*	*VSIP*	*ITPL*
Labor constraints			
Shortage of semi-skilled and skilled labor	2.975	-0.119	-1.538
	(0.023)**	(0.902)	(0.055)*
Shortage of professionals and managers	-0.991	2.462	-1.618
	(0.330)	(0.005)***	(0.021)**
Rising labor costs	3.433	-3.658	-0.353
	(0.001)***	(0.003)***	(0.606)
Industrial relations problems	4.194	n.c.	-1.817
	(0.001)***	n.c.	(0.022)**
Others	1.907	-0.673	-0.235
	(0.168)	(0.485)	(0.753)
Constant (β_0)	-7.174	n.c.	4.758
	(0.003)***	n.c.	(0.001)***
Organizational and Technological constraints			
Difficulty in obtaining capital equipment	0.617	0.925	-1.081
	(0.441)	(0.242)	(0.170)
Difficulty in introducing new technology and techniques	1.970	-0.293	-1.454
	(0.011)**	(0.693)	(0.049)**
Lack of good supporting services	2.214	-0.874	-1.289
	(0.004)***	(0.247)	(0.057)*
Difficulty in securing funds for expansion	1.638	-1.013	-0.672
	(0.088)*	(0.369)	(0.479)
High and/or rising overhead costs	2.497	-2.466	0.533
	(0.003)***	(0.001)***	(0.382)
Others	n.c.	-0.192	-0.297
	n.c.	(0.840)	(0.736)
Constant (β_0)	n.c.	3.272	4.246
	n.c.	(0.126)	(0.024)**
Environmental constraints			
Impact of host government regulations	2.291	-0.485	-1.353
	(0.003)***	(0.378)	(0.030)**
Competition from overseas industry competitors	2.163	0.104	-2.137
	(0.001)***	(0.848)	(0.001)***
Others	-1.856	0.846	-0.360
	(0.129)	(0.192)	(0.632)
Constant (β_0)	0.577	0.273	2.989
	(0.630)	(0.709)	(0.003)***

Note: [ψ] Estimated values were taken from 'forced entry' regression.
[ϕ] Values in parentheses are p-values for 2-tailed tests.
*** Significant at 1% level
** Significant at 5% level
* Significant at 10% level
n.c. Non-convergence
Source: Questionnaire surveys.