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# Regionalisation and Singapore's Transborder Industrialisation: A New Perspective on Suzhou Industrial Park

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**Regionalisation and Singapore's Transborder Industrialisation:  
A New Perspective on Suzhou Industrial Park<sup>1</sup>**



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## **Regionalisation and Singapore's Transborder Industrialisation: New Perspective on Suzhou Industrial Park**

### **ABSTRACT**

The dynamics of international economic competition have prompted governments to re-examine accustomed policies, and search for alternative strategies, in order to re-position their economies for the future. This paper takes a look at Singapore's search for a competitive positioning in the global marketplace, and focuses on the city-state's much-publicized, and controversial, flagship project in China, viz, the Suzhou Industrial Park (SIP). This strategic initiative is premised on the perceptions that Singapore's positive reputation with multinational corporations, and 'guanxi' (or connections) with regional governments, will give the regional sites a strategic advantage in the competition for foreign investments. Earlier studies have established that the privileges secured for the investment enclaves are vulnerable to changes in the socio-political milieu, and that Singapore's reputation for efficiency, is at risk from the administrative complexities in emerging economies. This paper, however, contends that with the 'realignment of interests' in 2001, the outlook of the SIP project is promising.

Key words: Regionalisation - transborder industrialisation – Singapore – Suzhou, China.

### **INTRODUCTION**

Singapore has risen to be Southeast Asia's premier world-city as well as an essential base for multinational manufacturing over the last four decades. Given the inherent constraints of a city-state, it has been driven to hone its ability in leveraging global resources to sustain its economic growth. However, by the mid-1980s, a combination of rising domestic labor costs and increasing competition from regional economies created a necessity for Singapore to shift away from a labor-intensive paradigm to one more focused on quality and service; one that produced more 'value-added' activities, so as to maintain its technological edge and regional hub status. Along with this came a greater need to access foreign markets and their latest technologies, which the Singapore government attempted to accomplish in 1988 with an overseas investment program (Singapore Economic Development Board, 1988, 1990) that sought to encourage Singapore-based firms to venture into North America and Western Europe (Caplen and Ng, 1990). Most of these investments achieved little in terms of opening up either markets or technology, and instead resulted in immense accumulated losses (Balakrishnan, 1991; Kanai, 1993). Clearly, a reformulation of strategy was imperative. The new strategy embraced by the Singapore government focused instead on expansion within Asia, interest in the region having been fueled by phenomenal growth in the economies in the region, notably that of China (Regnier, 1993; Pang 1995; Okposin, 1999; Pereira, 2001, 2003).

The main thrust of Singapore's new regionalisation strategy involved the establishment of industrial township projects – or, as they are now more commonly known, 'industrial parks' – in China, India, Indonesia and Vietnam, and the offering of a wide range of regulatory and monetary incentives to assist Singapore firms and individuals to move into overseas markets. This was to facilitate the transition of Singapore into a 'total business centre', with low-value manufacturing relocating to other countries, while the domestic economy restructuring itself into one focused on high-value manufacturing. The 'industrial township' model was of especial interest because it allowed government-linked companies (GLCs), to take a direct role in the regionalization drive; as well, the infrastructure required in such townships offered opportunities for small-scale operators and service providers to play a role in the development of these flagship projects (Tan, 1995). Co-operation with the host governments would also lay the groundwork for other collaborative ventures beyond the immediate projects. Singapore's selling point to the host governments was the country's reputation for infrastructural efficiency, stable and corrupt-free administration, and

transparent business practices. More than money or expertise, the Singapore brand name was to be the city state's other main contribution.

This paper will focus on Singapore's much publicized, and highly controversial, Suzhou Industrial Park, located in Jiangsu Province, China. To provide the context to this paper, the theoretical considerations underpinning this flagship project are sketched in the next section, followed by an account of the origins and progress of the case-study park. The analyses are reinforced by empirical evidence drawn from our on-site survey of the SIP tenants; case studies, based on in-depth interviews with selected firms, were conducted at the same time. The final section considers the implications of the SIP experience on the 'exportability' of the Singapore industrial-development model, and on a broader note, on the future of Singapore's transborder industrialisation strategies.

## **THEORETICAL CONSIDERATIONS**

Dunning's eclectic paradigm (1970, 1980, 1988, 2001) sought to offer an analytical basis for determining the extent and activities of MNE engaged in cross-border value-adding activities. The eclectic paradigm can be applied 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 (O) advantages, internalisation-incentive (I) advantages, and location-specific (L) advantages. Firms excogitate the O advantages through exploitation of firm-specific resources, simultaneously deriving I advantages through the diminution of transaction costs. This theory has been extended, in more recent literature, to deliberations on the role of physical and institutional infrastructure in the attraction of new investments (Peck, 1996); the location tournaments for foreign investments (Lundan 2003); the presence of immobile clusters of complementary value-added activities (Markusen, 1996); the agglomeration economies of spatial proximity (Krugman, 1991, 1998; Porter, 1996); and the business-government nexus in alliance capitalism (Dunning, 1995).

Porter (1994, 2000a, 2000b) and Dunning (1998b), amongst others, have reiterated the importance of the spatial dimension, i.e. location-advantages in the new economics of competition. Firms' strategic choice of location thus reflects twin aims; to not only transfer their resources to the host countries, but gain access to strategic assets (Chen and Chen, 1998; Makino and Delios, 1996) and markets (Davies and Weinstein, 2003). More recent literature has widened the ambit of The Eclectic Paradigm to include 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), and the transactional benefits of spatial proximity (Porter, 1996).

Following from this thesis, rationalization theories have argued that the production process should be viewed as a value chain, wherein firms attempt to exploit the location-specific advantages of the locale to complement the ownership-specific advantages associated with their core operations. Singapore's involvement in SIP represents an effort to synergize superior infrastructure and transparent management practices, with the location-specific advantages of China. The strategic intent is to create an enclave, within a more certain environment, where firms can exploit location-specific advantages with greater ease and security.

## **CHINA-SINGAPORE SUZHOU INDUSTRIAL PARK**

China-Singapore Suzhou Industrial Park (CS-SIP) was Singapore's most ambitious, and controversial, overseas industrial township project. The project cost was estimated at US\$20 billion. The Singapore model, as applied to CS-SIP, envisaged a large-scale project to facilitate institutional innovation, autonomy from aspects of local government control and investment in

administrative practice or 'software development' (Perry and Yeoh, 2000). This project encompassed high quality infrastructure, pollution control, 'one-stop' non-corrupt operating and decision-making processes, minimum entry or performance regulation, transparent financial charges, and the delivery of social and welfare services to support an efficient and co-operative workforce and a work-oriented community. Three landmark agreements were signed in Beijing on February 26, 1994, and CS-SIP was officially launched on May 12, 1994.

The project was a joint venture between a consortium of Chinese and Singapore-based investors known as the China-Singapore Suzhou Industrial Park Development Company (CSSD). The Suzhou Industrial Park Administrative Committee (SIPAC), a local authority, was formed to oversee CSSD's work. The Chinese consortia's 35 percent stake was shared amongst 12 organisations, mainly national state-owned enterprises and investment companies of the Suzhou city, Jiangsu province. The Singapore consortium's 65 percent stake was distributed amongst 24 organisations, mainly Singapore GLCs, and the Salim Group (through a subsidiary, KMP China Investments). The two consortia retained separate identities and responsibilities, taking up projects according to their agreed roles (SIPAC, 1999).

SIP was touted as a locale which offers abundant labour, and other local resources, at competitive costs, and in proximity to target markets. The primary factors are purportedly enhanced and strengthened by world-class infrastructure within the park, strong commitment and support from the local authorities, and growing bilateral economic cooperation between Singapore and China. The envisaged product of this combination is an industrial park, distinct amidst the competition, which presents itself as attractive investment enclave. However, the synergy that was envisioned at the onset of the project did not materialize. Singapore's disappointment was indicated by Senior Minister Lee Kuan Yew's public questioning of the commitment of the Chinese partners to the project (The Straits Times, 1997, December 5). By end-1998, there were only around 1,000 residents in the township and a total workforce of 6,000 (SIPAC, 1998). The slow progress resulted in financial losses for the Singapore-led consortium, which funded the land development and infrastructure, and also for Singaporean investors involved in peripheral projects. Official estimates placed Singapore's investment in CS-SIP at only US\$147 million (The Straits Times, 1999, August 4). In June 1999, it was announced that Singapore would reduce its involvement in the project and transfer majority ownership of CSSD to the Chinese consortium from 2001 (The Straits Times, 1999, June 30).

Interestingly, investment began to pour in following the handover. To date, SIP has managed to secure contractual investment worth US\$15.6 billion, and established its status as an investment hub for high-tech industries (SIPAC, 2004). Its tenant profile included, significantly, a high proportion of American and European investors, with over 70% of their investments in electronics, information technology and other high-tech segments. The Park is now an investment hub for 46 Fortune 500 companies (SIPAC, 2004).

CSSD has plans to be listed by 2005 in China, and possibly in Singapore. The completion of the second and third phase of the transportation network and other infrastructure developments, at an estimated cost of US\$10 billion, is in progress. The infrastructure development for the entire 70 sq km site is due for completion over the next two years (SIPAC, 2004). Table 1 updates on SIP's operational statistics.

## **FINDINGS**

Conventional tools of analysis on SIP have drawn on secondary data from official publications, press reports, etc. This is inadequate. The success of the Park hinges in large measure on its ability to harness the micro-economic processes of specific firms and industries operating in a global environment. In particular, the alliance between Singapore and China should ideally provide a suitable framework within which firms can pursue and develop strategies which support their global business operations and competitiveness. The driving assumption behind the formation of the Park

is that each of the partners offers different, yet complementary, advantages to firms. As such, the attractiveness and competitiveness of SIP is the extent to which the firms' manufacturing operations are synergistically linked to the advantage proffered by the Park.

To obtain such primary data, we applied the questionnaire developed in Yeoh, et al. (2000) to the tenants in SIP. We added further empirical rigor to our field work with case studies of selected SIP tenants.

### **Survey Results**

Our survey questionnaire was designed to gauge the differential impact of various push/pull factors on firms' decision to locate in the case-study park, along with the differential impact of different types of constraints on their operations. The survey questionnaire focused on three main areas. The first set of questions sought to determine the profile of the respondents: type of ownership, nature of operations and size of establishment; the second set was structured to gather information on the push/pull factors affecting the tenants, and the third set, on the various constraints faced by the Park's tenants. The fieldwork was conducted in July 2004.

### **Profiles of Respondents**

There were 53 respondents in SIP, of which 13 were wholly Singapore-owned, 8 were wholly China-own, 26 were wholly foreign-owned, 2 were Singapore joint ventures and 4 were joint ventures of other countries. In term of operation, 4 manufactured consumer products, 9 manufacture intermediate products, 5 manufactured capital products, 7 provided in industrial services and 30 engaged in other types of operations such as software development or electronic devices testing. In term of employment size, 16 employed less than 25 employees, 9 employed between 26-50 employees, 12 employed between 51-100 employees, 13 employed between 101-500 employees and 3 employed between 501-1000 employees. In term of top three target markets, 52 had China, 25 have Japan, 11 had ASEAN, 46 had other east Asia countries and regions, 29 had USA, 16 had OECD members and 8 had other countries or regions not listed above.

### **Pull Factors**

The pull factors of SIP are categorized into political climate, investment climate, physical resource, human resource, related and supporting industries as well as strategic location (Table 2).

81% of the tenants surveyed stated access to domestic market to be the main draw for locating in SIP, making it the top pull factor for the park. The investment incentives that entice companies to locate their lower value-added activities in these self-contained enclaves was considered as the second most important pull factor for the park by 75% of the tenants surveyed. The political commitment from China ranked third with 72% of the respondents citing this factor. This goes a long way towards explaining the turnaround in the park's performance after it was handed over to the Chinese partner, given the corresponding increase in the level of political commitment from China. Not unexpectedly, the reliable and efficient Singapore-styled infrastructure was also one of the Park's main draws, with 70% of the SIP tenants surveyed citing it as a pull factor for them to locate in the Park. The fifth most significant pull factor was the availability of skilled and educated labour, cited by 53% of tenants surveyed, which again explained the location-specific advantage offers to firms by SIP.

### **Push Factors (Constraints on the Respondents' Operations in SIP)**

SIP is now an established industrial estate development, but our study alludes to some emerging constraints which have undermined the attractiveness of the Park. Competition from China-based companies and overseas competitions were cited as main constraints by 76% and 62% of the tenants surveyed, respectively. Intense competition may discourage companies from locating in SIP, thus hindering the future development of the Park. High/rising overhead costs and rising labour costs were considered major constraints by the respondents. The 'cheap' labour resources which drew companies to China seem to be more perception than reality in SIP (Table 3)

### Statistical Treatment of Survey Results

As many leading MNCs were encouraged by the Singapore Economic Development Board (SEDB) to use the Park, it is worth analyzing the different views of these large firms as compared to firms of differing sizes, pertaining to the competitive edge and limitations of SIP. Companies manufacturing capital products may require stronger infrastructure as compared to firms producing computer software or providing industry services, thus a study of these companies is particular relevant to examining the effectiveness of the Singapore-style facilities in SIP. Our logistic distribution function is formulated to examine these differentiating characteristics.

The (cumulative) *logistic* distribution function, estimated by the maximum likelihood, takes the following form:

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

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

$$Z_i = \alpha_0 + \alpha_1 F + \alpha_2 L$$

where:  $F = 1$  if large (> 500 employees for SIP), 0 otherwise  
 $L = 1$  if producing capital goods, 0 otherwise  
 $\alpha_0$  = constant term  
 $\alpha_i$  = coefficient of independent (explanatory) variable

Hence, if the estimated coefficients in the logit model is positive and statistically significant (as indicated by the *p-values*), this would imply that the probability of a firm (e.g. large size) choosing a particular factor is greater than the probability of another firm (of different size) making the choice, after taking into consideration the type of products that the firm produces.

The logit estimations, presented in Table 2, showed that larger firms are not likely to consider the presence of major buyers, but the one-stop service provided by SIP, as one of the main pull factors when compared to firms of other size, as indicated by the negative ( $\alpha_1 = -1.113$ ) and positive ( $\alpha_2 = 1.123$ ). From Table 3, difficulty in securing funds for expansion is not much a problem for large firm as compared to firms of other sizes, as suggested by the negative and statistically significant ( $\alpha_1 = -2.079$ ). Firms manufacturing capital products are more likely to choose efficient host government institutions as well as conducive industrial relations, as compared to firms manufacturing other type of goods, as indicated by the positive and statistically significant ( $\alpha_1 = 2.279$ ) and ( $\alpha_2 = 1.758$ ).

### Case Studies

Turning to the case studies, we now present evidence culled from indepth interviews with five firms in SIP. All interviews were conducted in July 2004. Primarily, the semi-structured interviews

were designed to draw on the firms' experiential evidence in the Park, viz, the attractiveness of the location-specific advantages, and the competitiveness of SIP going forward.

### ***Company A: IT Services***

Company A is a spin-off from one of China's leading IT groups. Established in 2000, the company set up its SIP division in the International Science Park in the form of a joint venture with a Hong Kong partner. Today, the company has grown to be one of the leading IT service providers in China, with the Suzhou subsidiary contributing annual sales revenue of more than US\$10 million.

Unlike other companies surveyed, the single most important market for Company A is the domestic (Chinese) market; as such, its Suzhou division serves as a "regional" headquarters, covering the entire Yangtze area such as Shanghai and Zhejiang. The company chose SIP primarily because of the attractive investment incentives as well as availability of land—the company regards SIP's International Science Park as an ideal business location with excellent hardware and software support, and which has attracted a significant cluster of big and small IT firms.

While the company is generally satisfied with the supply of skilled labour in the Park, one of the problems that have been plaguing the company is the shortage of R & D personnel. This is not a problem unique to Company A. Although much effort has been put into attracting quality workers, the bottleneck persists. Despite this, the company plans to expand its existing operations in the Park. It considers SIP an important strategic location. The rising costs, it would seem, do not significantly affect the company's operations.

### ***Company B: Electronics***

Company B is a Finnish firm engaged in manufacturing activities. Its Suzhou division is also a relatively new establishment (set up in June 2002). The company employs about 200 workers; the majority is local, except for a few key personnel in the senior management team. Gaining access to the China market was the strategic consideration for their SIP setup.

The company was satisfied with the development and upgrade of SIP's supporting infrastructure, as well as residential amenities. It was specifically mentioned that European and American firms were generally the preferred employers compared to most Asian firms, such as those from Japan, Taiwan and South Korea. Some of the reasons for this observation included better human resource policies, as well as more relaxed corporate culture and working lifestyle, etc. The company's respondent was of the view that SIP catered more for American and European firms, while many Asian firms have chosen to locate elsewhere, notably to Kunshan, Suzhou New District and Wuxi-Singapore Industrial Park.

As for the major constraint faced by company B, it was highlighted that while the Singapore-styled Central Provident Fund system has helped attract talent to the Park, it has also added to the operational costs.

### ***Company C: Industrial Equipment***

Company C is a major Japanese manufacturer of industrial equipment. The company has been beefing up its production in China, even as it shuttered operations in Japan. In the two years to March 2004, it closed down 15 out of its 19 production plants in Japan, while boosting production capabilities in China. The group invested some 4,000 million yen to set up the China division. A 20,000 sq m factory started operations in October 2003. It targets sales at 25 billion yen by 2005, and a staff count of 1,000.

The decision to retain only four plants in Japan, focused on high value-added production, is a strategic attempt to consolidate plant operations and reduce inter-plant logistics costs. As part of



the company's restructuring, its China division was established in SIP as the group's regional headquarters. A tenant of SIP since October 2002, the company has been banking on the Suzhou plant to stay competitive, by delivering high-quality, cost-competitive products to customers worldwide. Over the long term, the company has its eyes on China's market potential, aiming to capture 30 per cent of market share by 2010.

#### ***Company D: Healthcare Products***

Company D is a Japanese-Singapore joint venture. Established in 1994, the manufacturer of healthy lifestyle products (such as massage chairs and foot reflexology machines) is one of the pioneer tenants in the Park. SIP was the top choice when the Singapore partner decided to establish a manufacturing plant in China:

“We wanted to look for a place which can make quality products at reasonable price and SIP fits the bill. While SIP is marginally more expensive than the rest of China, it is considered a safer option as there is no hidden cost.”

From the interview with the Chief Financial Officer, the company clearly regards a reliable management system and a sound investment environment above costs. Indeed, the Singapore brand and the positive reputation for excellent infrastructure and corruption-free management associated with it are clearly attractive not only to foreign MNCs.

Company D believed that although management know-how can be easily copied elsewhere, SIP's transparent business practice, which has become almost the culture there, is something that the other parks would be hard put to emulate. Therefore, “hidden cost” in SIP is very low, compared to other regions in China.

#### ***Company E: Automation***

Company E is a German manufacturer of automated machines. Established in 1998, its Suzhou division remains small-scale, with an employment force of less than 50 workers and annual sales turnover of about US\$3 million.

Targeted mainly at the China and European markets, the company was drawn to SIP by the superior infrastructure facilities and support services, as well as by the variety of investment incentives. In addition, the serious commitment demonstrated by the Chinese authorities also added to the company's confidence in SIP.

The company is generally satisfied with the investment environment in the Park, in particular with respect to availability of raw materials, supply of skilled labour as well as presence of major buyers. Company E is located in a typically Singapore-styled industrial estate, together with many other manufacturers, many whom are the company's direct customers.

Like other respondents, the company is facing the problem of rising labour and overhead costs. While the company is planning to expand its current operations in the Park, it now has to consider the increasing competition from locally based competitors, which is “getting brutal”, as quoted from the manager who was interviewed.

## **DISCUSSION**

Most of the companies interviewed have expressed general satisfaction with SIP's infrastructure and management, as well as the market environment. While proximity to markets was one of the pull factors indicated by the interviewees, they were quick to point out that the Singapore-styled environment was one of the most important reasons for their companies' decision to locate in SIP, rather than other alternative sites elsewhere in China. In addition, the investment incentives

offered also added to SIP's attractiveness. At the initial stage of the Park's development, Singapore's reputation in industrial management had been a huge draw factor not only to MNCs, but also to Singaporean SMEs, who consider SIP a "safer" choice without the plague of "hidden costs" commonly found in other regions in China.

It seems that SIP has been able to retain this advantage, despite concern over rising competition from surrounding areas. Most of the firms interviewed still cited excellent general infrastructure as an important consideration in selecting their location. Contrast to the popular perception, the transfer of ownership and management control in 2001 was not a cause of concern to the Park's tenants or, for that matter, to potential entrants. Most welcomed the change as costs in the Park fell following the transfer. Significantly, the Chinese management, primarily represented by Suzhou Industrial Park Administrative Committee (SIPAC), is perceived to be sufficiently competent to run the area as efficiently as their Singapore partners had. This has also been reflected in the second and third phase of the Park's development, where the Chinese developers have been following closely the Singapore-style industrial-township model.

## CONCLUSION

Singapore's policymakers have played great faith in SIP's success. This initial optimism was not fully justified, at least in the early years of the Park's establishment. The protracted difficulties are well documented<sup>2</sup>. Our study contends that the years of experimentation in adapting Singapore's development software (SIPAC, 2004), and the transfer of ownership and management to the Chinese partners, have realigned the interest of the key stakeholders. The exportability of the Singapore model is now more apparent and, *prima facie*, this has offered the Park an edge over the competition.

The measured success of the Park has demonstrated the appeal of the Singapore industrial-development model. The investments attracted have provided the basis from which the Park can grow. However, our study points to the need for realignment of interests which, *pari passu*, translates into an incentive structure for the local partners to make the project a success. As well, this study contends that planners should take cognizance of the broad host environment in which the project is being 'cloned'. That considered, the SIP experiment may well provide the model for replication in other emerging markets.

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<sup>2</sup> This is now an extensive literature on the problems encountered in the China-Singapore Suzhou Industrial Park project (Pereira 2003); feature articles in popular magazines such as Asia Week, Far eastern Economic Review, Fortune, Forbes and The Economist (e.g. January 3, 1998); and an unpublished (confidential) report commissioned by the Singapore government.

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**Table 1: CS-SIP operation statistics**

General Information on CS-SIP (Feb 2004)	
<b>Country Profile of Tenants (by % of size of investment)</b>	
Scale of Development (hectares)	7,000
Investment by Developer (US\$ million)	12,400
Committed Tenants	573
Area Taken Up (hectares)	980
Investment by Tenants (US\$ million)	15,200
Export Value (US\$ million) (2003)	5,960
No. of Employees	137,029
<b>Country Profile of Tenants (by % of size of investment)</b>	
Japan	13.4
Singapore	22.7
North America	19.2
Europe	14.7
Other Asian economies (and Oceania)	29.1
Others	0.9
<b>Sector Profile of Tenants (by % of size of investment.)</b>	
Electronics/Electrical/IT/Software	58.8
Precision Engineering/Mechanical	7.5
Chemical/Pharmaceutical & Healthcare	11.9
Food & Beverage	5.8
Light Industry	7.9
Logistics and Supporting	8.1
Others	-

Source: Suzhou Industrial Park Administrative Council and SembPark Management Pte Ltd

**Table 2: Factor influencing the Respondents' Decisions to Invest in SIP  
(By Popular Rankings and Maximum Likelihood Estimates – Binary Logit) <sup>ψ</sup> <sup>ϕ</sup>**

pull factors	frequency	Rank	Large	Capital
Political commitment from Singapore	7	13	1.385 0.102	0.789 0.530
Political commitment from China	38	3	-0.663 0.307	-0.676 0.492
Investment incentives	40	2	0.437 0.557	-0.766 0.435
Efficient host government institutions	6	14	1.267 0.193	2.279 0.045 **
Availability of raw materials	6	14	-19.529 0.998	0.624 0.618
Competitive overheads	4	16	20.041 0.998	-18.211 0.999
Availability of land	10	12	-0.007 0.992	0.079 0.947
Reliable infrastructure facilities	37	4	0.344 0.612	-0.446 0.646
Competitive labour costs	14	9	0.288 0.669	-20.284 0.999
Conducive industrial relations	13	10	0.143 0.842	1.758 0.074 ***
Availability of skilled/educated labour	28	5	-1.331 0.039	-0.764 0.440
Good work ethics	15	8	0.109 0.906	-19.244 0.999
Presence of major buyers	22	7	-1.113 0.098 ***	-1.292 0.271
Presence of major suppliers	12	11	-0.917 0.279	0.860 0.387
Presence of major competitors	3	17	0.102 0.936	-18.483 0.999
One-stop service provided by CS-SIP	23	6	1.123 0.071 ***	-0.030 0.976
Access to overseas market	12	11	1.099 0.113	-20.000 0.999
Access to domestic market	43	1	-1.030 0.160	19.757 0.999

**Table 3: Major Constraints on the Respondents' Operations in BIP  
(by Popular Rankings and Maximum Likelihood Estimates - Binary Logit) <sup>ψ</sup> <sup>φ</sup>**

Push/pull factors	Frequency	Rank	Large	Capital
Shortage of semi-skilled & skilled labour	18	7	0.292 0.647	1.232 0.204
Shortage of professionals & managers	22	5	0.089 0.884	-1.125 0.331
Shortage of R & D personel	19	6	-0.678 0.314	1.045 0.282
Rising labour costs	25	4	0.111 0.855	-1.374 0.235
Low labour productivity	10	12	-0.657 0.443	0.014 0.990
High absenteeism	1	16	18.417 0.998	-16.607 0.999
Industrial relations problems	11	11	-0.817 0.336	-0.133 0.911
Difficulty in obtaining capital equipment	10	12	0.061 0.937	1.211 0.224
Difficulty in sourcing raw materials	12	10	0.245 0.730	0.960 0.330
Difficulty in introducing & implementing new tech	8	12	0.969 0.220	-19.479 0.999
Lack of good supporting services	18	7	-0.209 0.745	-0.810 0.486
Difficulty in securing funds for expansion	13	9	-2.079 0.058 ***	-20.388 0.999
High and/or rising overhead costs	30	3	-0.715 0.244	1.161 0.
Impact of government regulations	6	14	0.916 0.301	-19.141 0.301
Competition from overseas competitors	33	2	0.337 0.608	-2.051 0.077 ***
Competition from china-base companies	40	1	-0.937 0.160	0.178 0.881
Restricting mkt access to developing countries	4	15	-0.194 0.873	1.302 0.307
Restricting mkt access to developed countries	8	13	-1.197 0.289	1.478 0.152

Note: <sup>ψ</sup> Estimated values were taken from "forced entry" regression.

<sup>φ</sup> p-values in parentheses are for 2-tailed tests.

\* Significant at 1% level

\*\* Significant at 5% level

\*\*\* Significant at 10% level

n.c. Non-convergence

Source: Questionnaire Survey