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Woei Lo ^a, Han-Jen Niu ^b, Chyan Yang ^c & Yau-De Wang ^d

^a ZyXEL Co. Ltd, Science-Based Industrial Park, Hsin-Chu, Taiwan, 300

^b Graduate Institute of Management Sciences and Department of Management Sciences & Decision Making, Tamkang University, Tamsui, Taiwan, 251

^c Institute of Business and Management, National Chiao Tung University, Hsin-Chu, Taiwan, 300

^d Department of Management Sciences, National Chiao Tung University, Hsin-Chu, Taiwan, 300

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Determinants of Manufacturing Location in China: An Examination of Taiwan-invested Electronics Assembly Plants

WOEI LO*, HAN-JEN NIU**, CHYAN YANG[†] & YAU-DE WANG[‡]

*ZyXEL Co. Ltd, Science-Based Industrial Park, Hsin-Chu, Taiwan 300, **Graduate Institute of Management Sciences and Department of Management Sciences & Decision Making, Tamkang University, Tamsui, Taiwan 251, [†]Institute of Business and Management, National Chiao Tung University, Hsin-Chu, Taiwan 300, [‡]Department of Management Sciences, National Chiao Tung University, Hsin-Chu, Taiwan 300

ABSTRACT *An upswing in labour costs and currency appreciation during the 1980s caused companies from more advanced Asian economies, such as Hong Kong, Japan and Taiwan, to search for new manufacturing sites in order to obtain lower costs. China was one of the main options for these outward investments, with its huge and rapidly growing market, plentiful, low-cost labour and vast territory. The literature on foreign direct investment has analysed the location strategies of multinational enterprises across national borders, but there have been fewer studies of location decisions by foreign investors within the borders of a single country. We examine how companies determine which location offers the best opportunity to establish an assembly-type manufacturing site in China. We surveyed 17 Taiwanese enterprises that have established this kind of manufacturing base in China, and found that the major factors influencing location selection are economics, politics, the cluster effect and bureaucratic efficiency. It was found that the eastern region, which includes Jiangsu, Zhejiang and Shanghai, was considered better for establishing manufacturing bases than other regions.*

KEY WORDS: Consignment contract manufacturer, original equipment manufacturer, foreign direct investment, manufacturing site selection, analytic hierarchy process

Since China began significant economic reform in 1979, its economy has seen remarkable development over the subsequent three decades. These economic reforms mean the Chinese system has been moving away from a planned to a capitalist economy. With its huge population, China offers the promise of being, at some point, the largest market in the world. Following the 1979 reforms, there has been a growing flow of foreign capital into this market. With plentiful and relatively inexpensive land and a large pool of low-cost labour, combined with foreign capital

Correspondence Address: Han-Jen Niu, Graduate Institute of Management Sciences and Department of Management Sciences & Decision Making, Tamkang University, 151 Ying-chuan Road, Tamsui, Taiwan 251. Email: freyaniu@gmail.com

and a developing class of entrepreneurs, the Chinese economy has achieved high and sustained growth rates.

Economic reform coincided with changes taking place in other locations. From the 1980s, wages in Hong Kong began an upward surge. In search of lower labour costs, some Hong Kong enterprises moved to Guangdong province, and especially to the Shenzhen Special Economic Zone (SEZ). To encourage their relocation, the local government provided tax incentives, such as business income being exempt from income tax in the first and second years of operation, and a 50% reduction in the third to fifth years to Hong Kong businesses moving to the Shenzhen SEZ. Following the relocation by Hong Kong firms, Japanese enterprises, struggling with the appreciation of the yen following the Plaza Agreement, also entered Guangdong province.

To reduce labour and land costs, Taiwanese enterprises also moved into Guangdong province and the Shenzhen SEZ, later migrating to the city of Dongguan (located northwest of Shenzhen) attracted by its plentiful land and more relaxed regulations even than Shenzhen. In addition to tax incentives, to attract foreign investors, Guangdong's local government provides very flexible business models for foreign investor selection, such as consignment contract manufacturing.

In the past three decades, China's economic structure has shifted from labour-intensive to more capital- and technology-intensive industries, with this change being first seen in the special economic zones of the east coast. As various regions have competed for foreign investment, many companies have moved from the initial investment locations in the south, clustered in the Pearl River delta, which had benefited from its proximity to Hong Kong, to the east and the Yangtze River delta.

The literature on foreign direct investment (FDI) has analysed the location strategies of multinational enterprises across national borders in considerable detail. However, there have been far fewer studies regarding the location decisions made by foreign investors within the borders of a single country. In this paper, we examine these decisions for the case of Taiwan-invested firms in China. There are two advantages to investigating this in China. First, China has become one of the most important manufacturing sites in the world. Secondly, China has been successful in attracting foreign investment, to the extent that, by 1995, less than two decades after economic reforms had begun, China had become the second largest recipient of FDI in the world (Tse et al., 1997).

In this paper we examine how companies determine which location offers the best opportunity to establish an assembly-type manufacturing operation, and which locations in China are deemed the best. In the details below, we set out responses from 17 Taiwanese enterprises that have established electronic assembly manufacturing operations in China, seeking to determine the major factors influencing location selection within China. In particular, this paper offers insights into how these firms evaluate different regions when seeking to locate or relocate, and casts new light on Chinese regional economies by focusing on the way in which Taiwan's firms choose particular regions when opening their plants in China. We set out to determine what factors foreign direct investors consider when selecting locations for a manufacturing base abroad, and what specific factors make certain Chinese regions more attractive to companies seeking to establish assembly-type electronics manufacturing bases in China.

Criteria Influencing the Decision to Establish a Manufacturing Base Abroad

The decision to undertake FDI in a particular country is the outcome of a decision process in which projected revenues and costs are evaluated on the basis of economic, political, cluster effect and assessments of government efficiency.

The economic theory of the multinational enterprise focuses on two fundamental aspects of international production activities: the ownership of assets employed in different countries and the location pattern (see Benito, 1996). The theory predicts that a company investing in production facilities will choose the location that minimises total costs, given the distribution of demand in markets. Labour cost differentials, transportation costs, the existence of tariff and non-tariff barriers, as well as government policy, are generally held to be important determinants of location choice. This basic framework has been extended by several authors (see, for example, Carlson, 2000; Doeringer et al., 2004).

The decision to establish a manufacturing base in a country other than one's own is often a difficult one. Daniels (1970) surveyed 40 foreign firms that established their first US manufacturing operations after 1954. He showed that, like domestic firms, foreign firms also consider cost, market and non-economic factors. However, Daniels also found that the results of the considerations differed due to two major impetuses: closeness to home operations and closeness to markets. Tong (1978) surveyed 254 foreign firms in the USA and analysed 32 site variables. His results showed that the most influential site selection factors were availability of transport services; attitudes of labour; space for future expansion; nearness to US markets; and the availability of suitable locations for a plant. Tong concluded that the least important determinants were cost of local capital; availability of local capital; nearness to home operations; and proximity to export markets.

Most of the literature is connected to direct investment, as it pertains to manufacturing. In examining the information costs related to location in China, He (2002) offers some variation, identifying several regions where information costs are low: economic centres, coastal regions, areas with previous foreign investment, and cities implementing policies that encourage foreign investment. In economic centres, communication infrastructure, administrative institutions, and business services are readily accessible for new foreign investors. Coastal regions tend to be open to international markets and enhanced information flows. In areas with previous foreign investment, information can be readily transmitted through business relationships to new foreign investors. Cities implementing policies that encourage foreign investment are active in attracting foreign companies (see also Friedman et al., 1992; Woodward, 1992).

According to McConnell (1980), regional labour conditions, industrial agglomeration and market demand are all factors affecting the selection of sites of foreign investment. Kravis and Lipsey (1982) found labour costs to have no effect on FDI. However, when Culem (1988) examined US foreign direct investments in the European Economic Community, it was found that market size had no significant effect on capital flows, but that unit labour cost was crucial (see also Seyf, 2001). Glickman and Woodward (1988) surveyed foreign companies in the automobile, semiconductor and computer industries and found that the most important factors in site selection were the costs of labour, transportation of goods, access to markets

and quality of life. In their sample, the least important factors were tax incentives and government services.

Labour Costs as a Criterion in Site Selection

As noted above, some researchers have stressed the significance of labour costs in site selection. Indeed, a number have suggested that labour cost is the most important factor (Hatzius, 1997; Lansbury et al., 1996; Mudambi, 1995; Wheeler and Mody, 1992), while others have determined that high labour costs can act as a deterrent to FDI (Bartik, 1985; Coughlin et al., 1991; Hill and Munday, 1991; Luger and Shetty, 1985). It has long been assumed that when technology levels and product quality are standardised, and cost is the priority, production may be transferred to another area with lower labour costs (Vernon, 1996). Using panel data, Lansbury and colleagues (1996) studied the flows of FDI in Central Europe and found that low labour costs and trade links between the home and host nations were both statistically significant.

The Role of Tax Rates and Tax Incentives in Site Selection

Newman and Sullivan (1988) applied econometric analysis to prove that tax effects are important factors in industrial site selection (see also Bartik, 1985). However, Veugelers' (1991) evidence of the effect of corporate tax rates is more mixed. Mudambi (1995) reported a negative and statistically significant relationship between tax rates and FDI. Several other researchers have found that corporate tax rates had no effect on capital flows (Coughlin et al., 1991; Friedman et al., 1992; Wheeler and Mody, 1992). In addition, both Veugelers (1991) and Woodward (1992) found tax incentives to be ineffective. However, Friedman and colleagues (1992) saw promotion as influential in site selection, a result supported by others (Coughlin et al., 1991; Woodward and Rolfe, 1993).

Other Criteria Influencing Site Selection

A range of other criteria that have been influential in directing FDI has also been suggested. Kindleberger (1965) claimed that international flows of capital between Japan and Taiwan were determined essentially by differences in the term structure of interest rates. Aliber (1970) stressed the desire to avoid exchange rate risk. Brewer (1993) produced a more complex picture of the impact of government policies on FDI, showing that much depends on the types of FDI and on the site. Aristotelous and Fountas (1996) found evidence to support Aliber's hypothesis, whereas Mudambi (1995) showed that country-specific risk (including exchange rate risk) had no significant impact on FDI flows.

Arpan and colleagues (1981) studied 100 foreign manufacturers in the USA, and cited nearness to markets and transportation facilities as the leading factors in foreign site selection. They also found that 34% of their respondents derived the information used in site selection from other firms. According to Wakasugi (2005), special site considerations may affect Japanese transplants in particular industries. Japanese auto suppliers, for example, often locate near specific Japanese auto assembly plants in order to facilitate the scheduling and delivery requirements of

just-in-time supply relationships (see also Head et al., 1995; Smith and Florida, 1994). High-technology industry is also cited as having distinctive site concerns related to the availability of skilled workers or the desire to locate near major high-technology research centres in order to gain access to state-of-the-art research (Kenney and Florida, 1993).

Root (1994) and Mockler and Dologite (1997) compared entry mode decisions between sole venture firms and joint venture firms establishing manufacturing bases in China, and found two groups of significant criteria: business environment and market (see also Jiang, 2004). Environmental criteria are defined by the enforcement and interpretation of laws and regulations and this was among the most influential variables for China. The government's policies and regulations are considered significant because the Chinese Communist Party has been the single ruling party and has controlled all the major organs of state power since 1949. The entire administrative apparatus of both central and local governments is required to follow its instructions. The political risk of this situation is that the government can use its power to establish or change policies in order to fulfil its development requirements. When the government opportunistically alters policies, firm's profits or assets may be expropriated, and foreign direct investment will be deterred. (Holburn and Zelner, 2008).

It should be noted that several researchers have claimed that there is no single, universally accepted definition of political risk (see, for example, Fatehi-sedeh and Safizadeh, 1989; Formica, 1996). Political risk is most commonly conceived in terms of (usually host) government interference with business operations. According to Hong et al. (1999: 1), "Very simply, political risk refers to the possibility that political decisions or events in a country will affect the business climate in such a way that investors will lose money or not make as much money as they expected when the investment was made."

As our review of the literature shows, the decision to establish a manufacturing site abroad involves a number of complex factors. In deciding on the factors to examine in our study, we presume that for those companies planning to invest in China, motives will include the need to be closer to a huge Chinese market; the intention to fully utilise cheaper labour and supply costs to retain competitive manufacturing advantages; the possibility to share business risks through geographical diversification; the wish to expand into new markets to gain market share to obtain or improve profits; and the necessity to acquire technological know-how or expertise.

What is an Appropriate Site in China?

How to choose an appropriate site for a manufacturing base is obviously of considerable import for foreign investors. China's size means that different provinces have varying characteristics of climate, people, economic base and geography, making such decisions complex on several levels. Initially, though, government mandates meant that selection was limited to Shenzhen, Zhuhai, Xiamen and Shantou, which were the first four coastal cities opened up to foreign investment in 1979. They became the original sites of foreign investment (Table 1).

Shenzhen was originally a small fishing village near Hong Kong, while Zhuhai is located adjacent to Macau, thus giving both cities geographical advantages. Shenzhen's SEZ was established as part of an economic field trial to allow Western

Table 1. Milestones in the opening of Chinese coastal cities to foreign investment

Period	Major events
1979–80	Shenzhen, Zhuhai, Shantou and Xiamen SEZs formed.
1984	Fourteen coastal cities – Tianjin, Shanghai, Dalian, Qinhuangdao, Yantai, Qingdao, Guangzhou, Lianyungang, Nantong, Ningbo, Wenzhou, Fuzhou, Zhanjiang and Beihai – open up to FDI. In these cities, business income was exempted from income tax or allowed a 50% deduction.
1985	Shanghai opened.
1986	Bohai Economic Development Zone, Shanghai’s Minhang and Hongqiao Economic Development Zones created.
1988	Hainan SEZ formed. 153 cities opened, which cover Tianjin, Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong and Guangxi Zhuang Autonomous Region. Shenyang, Wuhan, Nanjing, Dalian, and Chongqing city are opened up. Peninsula of Shandong Economic Development Zone formed.
1990	The State Council approves the creation of the Shanghai Pudong Economic Development Zone and establishes the Pudong Economic Development Zone as a bonded zone.
1992	Five Yangtze riverside cities opened: Chongqing, Yueyang, Wuhan, Jiujiang and Wuhu. Four border coastal cities opened: Harbin, Changchun, Huhehot, Shijiazhuang. Eleven inner cities opened: Taiyuan, Hefei, Nanchang, Zhengzhou, Changsha, Chengdu, Guiyang, Xi’an, Lanzhou, Xining and Yinchuan. Four Border Economic Corporation Zones opened: Heihe, Suifenhe (Heilongjiang Province), Huchun (Jilin Province) and Manzhouli (Inner Mongolia Autonomous region). Total cities opened reaches 992.

capital and management practices in a Chinese environment. It was strategically selected by the Chinese government to be a managed location for developing a relationship between foreign capitalism and Chinese state socialism.

At the beginning of the economic reform, the first coastal cities to open to foreign capital obviously gained considerable foreign investment and attracted the initial foreign enterprises. Table 2 shows that the amount of investment made by Taiwanese enterprises in southern China, including Guangdong and Fujian provinces, was higher than for eastern China. However, it is also noticeable that, from 2000, Taiwanese company investments in the eastern part of China, including Jiangsu and Zhejiang provinces, have indicated an uptrend, with investment in southern China slowing down as opportunities for investment in other provinces have been opened by the government (Table 3).

In terms of the top three industrial sectors favoured by Taiwanese investors, 48.66% of investments in Mainland China since the year 2000 were in the electronics and electrical appliance sectors, 6.73% in the fabricated metal sector and 5.78% in the chemical sector (Table 4).

Study Methodology

With the literature review showing a range of possible factors impacting location decisions, in assessing these for China, we used the Analytic Hierarchy Process

Table 2. Approved Taiwanese investments in Mainland China by province (US\$100 million)

Province	1991-96	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Shanghai	10.73	5.88	2.86	1.51	3.21	3.76	9.49	11.04	11.75	10.18	10.42	14.40
Jiangsu	11.48	6.59	4.08	3.24	9.31	10.46	22.23	26.01	24.87	23.49	28.87	38.42
Zhejiang	2.95	1.95	0.86	0.79	0.69	2.08	5.12	6.08	6.89	4.85	5.91	6.91
Fujian	8.89	4.72	1.51	0.59	0.99	1.20	7.50	4.92	4.53	3.98	5.20	3.88
Guangdong	20.72	17.24	8.25	5.00	10.20	7.88	16.35	20.54	14.04	12.20	14.15	19.78
Hebei	0.84	0.30	0.07	0.07	0.01	0.01	0.42	0.20	0.12	0.14	0.24	1.36
Liaoning	1.34	0.53	0.08	0.04	0.14	0.18	0.59	0.56	0.25	0.19	0.55	1.04
Shandong	1.91	1.09	0.66	0.04	0.12	0.28	0.64	1.08	1.38	1.09	1.09	2.82
Hubei	0.73	0.51	0.32	0.18	0.01	0.28	0.15	0.98	1.16	0.39	0.31	1.61
Hunan	0.81	0.30	0.05	0.01	0.00	0.09	0.13	0.11	0.19	0.12	0.02	0.53
Sichuan	0.98	0.22	0.14	0.13	0.07	0.11	0.50	0.26	0.92	0.31	1.01	0.70
Other summary	2.56	1.89	0.55	0.37	0.37	0.22	1.72	2.23	1.60	1.22	5.70	4.63

Source: Investment Commission (2009).

Table 3. Regions and provinces of China

Region	Province
Eastern	Jiangsu, Shanghai ^a , Zhejiang
Southern	Fujian, Guangdong, Guangxi, Hainan,
Central	Henan, Anhui, Sichuan, Chongqing ^a , Hubei, Hunan
Northern	Beijing ^a , Tianjin ^a , Hebei, Shandong, Liaoning, Jilin, Heilongjiang

^aMunicipality directly under the jurisdiction of the Central Government.

Source: Keng (2002: 411).

(AHP) to compare the importance of various factors in site selection decision making. The AHP is a mathematical decision-making technique that allows consideration of both qualitative and quantitative aspects of decisions. AHP is applied by deconstructing the decision problem into its elements. The decision elements are compared in pairs to determine the importance of each relative to the other (see Lo et al., 2008). Numerical techniques are then used to derive quantitative values from verbal comparisons. AHP reduces complex decisions to a series of one-on-one comparisons, then synthesises the results. In contrast with other ranking or rating techniques, AHP utilises the human ability to compare single properties of alternatives. It not only helps decision makers to choose the best alternatives, but also provides a clear rationale for the choice (see Saaty, 1980).

Subjective preferences, expert knowledge and objective information can all be included in one and the same decision analysis. AHP is easy to apply and understand and, thus, the reformulation of the decision problem and repeated comparisons can be profitable and educational. On the basis of our literature review, we established four major criteria influential in site location decision making: (1) economics; (2) politics; (3) cluster effect; and (4) bureaucratic efficiency. These are the basis of our AHP expert questionnaire criteria (Table 6). The expert questionnaire uses the Delphi method to collect information from experts and has proven face validity (see below).

The names of firms to be included in our survey and analysis were chosen from a publicly available list compiled by the Taiwan Stock Exchange Corporation. Convenience sampling, a method where the items that are most conveniently available are selected as part of the sample, was utilised in this study. According to the Delphi method, small numbers of experts are better than large numbers to reach a consensus. Ludwig (1997: 2) documents that the majority of Delphi studies have used between 15 and 20 respondents. Because of the heavy concentration in the electronics sector in China indicated above, we surveyed 17 Taiwanese electronic assembly-type manufacturers, all listed on the Taiwanese stock exchange, all featured in the list of Taiwan's top 1000 manufacturers in 2006, and all with established manufacturing sites in China. These companies had combined sales revenues of NT\$3294 billion (around US\$102.93 billion) in 2006, and they comprised 48% of the total assembly manufacturers' sales revenues in the list of Taiwan's top 1000 manufacturers in 2006. Our sample crossed industry sectors, including manufacturers of notebook computers, network equipment, scanners, digital cameras, computer peripherals, opto-electronic products and electronic manufacturing

Table 4. Approved Taiwanese investments in Mainland China by industry (US\$100 million)

Manufacturing industry classification	1991–6	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Petroleum and coal products	0.02	0.01	0.02	0.00	0.03	0.01	0.01	0.04	0.04	0.01	0.02	0.24
Chemicals	2.82	0.88	0.92	0.86	0.80	1.23	3.73	4.63	3.58	2.99	4.00	1.42
Chemical products	1.57	1.24	0.40	0.53	0.25	0.31	0.83	1.05	0.77	0.60	1.38	1.08
Medical goods	0.44	0.18	0.13	0.04	0.02	0.08	0.18	0.23	0.12	0.03	0.09	1.75
Rubber products	2.01	0.73	0.60	0.09	0.11	0.62	1.31	0.98	1.05	1.07	0.64	0.98
Plastic products	4.51	3.16	0.63	0.96	1.82	1.52	3.90	3.89	2.60	2.49	2.20	5.84
Non-metallic mineral products	3.61	3.84	0.88	0.34	0.84	1.07	2.15	4.51	4.21	1.80	3.87	2.31
Basic metals	1.22	0.53	0.07	0.08	0.41	0.42	0.79	1.60	0.76	0.92	1.78	5.18
Fabricated metal products	4.76	3.36	1.25	0.97	1.38	1.49	5.40	5.49	6.38	5.42	4.42	3.09
Electronic parts and components	3.48	2.84	2.81	1.54	4.12	6.01	10.88	8.16	14.82	8.50	16.19	24.26
Computers, electronic and optical products	3.85	3.14	3.42	2.72	6.99	4.93	10.63	9.76	11.40	12.43	14.72	16.88
Electrical equipment	5.02	3.15	1.61	1.19	4.27	2.65	6.30	7.42	5.93	5.61	6.65	10.47
Machinery and equipment	2.49	2.03	1.19	0.44	0.73	1.30	2.86	3.28	2.14	3.53	2.15	5.04
Motor vehicles and parts	0.89	0.85	0.49	0.10	0.20	0.27	1.16	1.63	1.95	1.50	1.16	1.39
Other transport equipment	3.04	0.76	0.35	0.22	0.33	0.31	1.02	1.57	0.64	0.31	0.25	1.18
Furniture	0.95	0.64	0.07	0.04	0.00	0.05	0.84	0.61	0.12	0.04	0.11	0.21
Manufacturing not elsewhere classified	3.62	2.13	0.50	0.21	0.11	0.22	2.72	2.74	1.37	1.15	2.67	1.50
Total	68.74	43.34	20.35	12.53	26.07	27.84	67.23	76.99	69.41	60.07	76.42	76.42
Electronics-related investment in total investment (%)	17.97	21.04	38.53	43.45	59.01	48.80	41.35	32.92	46.33	44.19	49.14	67.54

Source: Investment Commission (2009).

services (Table 5). Nine of the companies surveyed have manufacturing sites in the eastern China region, while eight have manufacturing sites in the southern region.

We conducted interviews with members of the top management of these 17 firms in the middle of 2006. To the extent that we could, we sought participation from managers representing key functional areas within each firm, with emphasis on investment and manufacturing. We asked all participants to describe in their own words the criteria that influenced the entry and location selection decision process their firm used. We then further subdivided the data by the initial four criteria into a number of sub-criteria (Table 6). We asked survey participants to identify what importance the individual sub-criteria had in site selection.

Research Results

The results of our survey are shown as raw data in Appendix A. In analysing these data, four sets of criteria (economics, politics, the cluster effect and bureaucratic efficiency) were found to influence site selection strategies. In all four major criteria

Table 5. Profile of the surveyed enterprise

Stock market listed code	Company name	Location ^a			Scope of business
		Jiangsu	Guangdong	Fujian	
5371	Coretronic Corp	1	2	–	Projectors
2332	Alpha Network	2	1	–	Networking ODM/OEM
2340	OptoTech Corp	1	–	–	LED monitors
2391	Zyxel Communications	1	–	–	Telecom equipment
2449	King Yuan Electronics	1	–	–	Testing and packing
2352	BENQ	1	–	–	Electronics consumer products
6133	Golden Bridge Bectech		1	–	PC peripherals/consumer electronics
903 (HK)	TPV (AOC)	2	–	1	LCD monitors/TVs; CRTs
2380	Avision Imc	1	–	–	Scanners
2386	Ambit Broadband	2	1	–	Broadband products
2345	Accton Tech	2	1	–	Consumer network products
3059	Altek Corp	1	–	–	Digital cameras
3231	Wistron Corp	2	1	–	PC/notebook computers
LOGI	Logitech	1	–	–	PC peripherals
3290	Donpon Precision	–	1	–	Opto-electronics ODM/OEM
2382	Quanta Computer	1	–	–	Notebook computers
2317	Hon Hai Precision (FOXCONN)	2	1	–	Electronics manufacturing services

^a1 and 2 refer to the first and second plants, respectively, established in China.

Source: Authors' compilations from survey data.

evaluated, the eastern China region's coefficient of variation is the lowest (where the lower the CV, the better the convergence; consequently, the higher the probability that the factor in question does, indeed, influence site selection). This means that the eastern region is the best choice for Taiwanese electronics assembly-type manufacturers from amongst the four regions (Table 7). In terms of plant site classification, we also found that the AHP coefficient of variation of the eastern region is the lowest (Table 8). Table 5 also shows that there are six manufacturers who relocated their second plant from the south to the east. It seems the eastern region is the overall preferred site among the 17 companies surveyed.

In terms of economic sub-criteria, our analysis shows that the CV of tax incentives is lower than that of all other sub-criteria (Table 9). Based on our analysis of the coefficient of variation, the importance of the sub-criteria can be ranked as follows,

Table 6. AHP criteria

Criteria	Economics	Politics	Cluster effect	Bureaucratic efficiency
Sub-criteria	Market	Policy uncertainty	Position in supply chain	Infrastructure readiness
	Land costs	Information transparency	Resources sharing	Tax audit fairness
	Labour costs		Transportation costs	Customs clearance efficiency
	Material costs		Security	Public security
	Tax incentives			Officer integrity
	Investment incentives			Government's quick response ability
				Policy comprehension and execution ability

Table 7. AHP score analysis by major criteria

Criteria	Statistical variables	Regions			
		Southern	Eastern	Central	Northern
Economics	STDEV:	0.08680	0.06747	0.05813	0.08224
	AVERAGE	0.17707	0.59274	0.10375	0.12644
	CV:	0.49017	0.11383	0.56033	0.65045
Politics	STDEV:	0.09789	0.11454	0.08323	0.12746
	AVERAGE	0.18415	0.46390	0.12299	0.22895
	CV:	0.53158	0.24691	0.67670	0.55670
Cluster effect	STDEV:	0.11895	0.12103	0.08790	0.11007
	AVERAGE	0.28729	0.48270	0.11208	0.11856
	CV:	0.41403	0.25107	0.78428	0.29837
Bureaucratic efficiency	STDEV:	0.12033	0.13095	0.07167	0.10488
	AVERAGE	0.22680	0.47549	0.11750	0.18021
	CV:	0.53055	0.27540	0.61001	0.58201

Table 8. AHP score analysis by factory location

Actual plant location (Taiwanese manufacturers, by region)	Statistical variables	Preferred regions			
		Southern	Eastern	Central	Northern
All	STDEV:	0.08094	0.07500	0.05149	0.07444
	AVERAGE:	0.20750	0.54078	0.10839	0.14333
	CV:	0.39008	0.13869	0.47507	0.51937
Southern	STDEV:	0.07815	0.07088	0.02171	0.06243
	AVERAGE:	0.25005	0.53782	0.08104	0.13109
	CV:	0.31255	0.13180	0.26794	0.47619
Eastern	STDEV:	0.06587	0.08269	0.05897	0.08596
	AVERAGE:	0.16968	0.54341	0.13270	0.15420
	CV:	0.38821	0.15217	0.44436	0.55749

Table 9. Economic criteria

	Sub-criteria					
	MKT	LDC	LBC	MLC	TAI	INI
STDEV:	0.17446	0.07421	0.08135	0.11970	0.06865	0.07364
AVERAGE	0.25688	0.12468	0.15524	0.15587	0.15726	0.15007
CV:	0.67915	0.59517	0.52406	0.76793	0.43653	0.49067

MKT, market; LDC, land costs; LBC, labour costs; MLC, material costs; TAI, tax incentives; INI, investment incentives.

from least to most important: materials, markets, land costs, labour costs, investment incentives and tax incentives. From the ranking, one of the interesting findings is related to markets. This lack of significance for markets is due to the fact that most Taiwanese electronic assembly manufacturers are export-orientated, Original Equipment/Design Manufacturer (OEM/ODM) companies. Even though China is a huge market, the demand from the USA and European markets still far exceeds that of the Chinese market.

To those high volume, low margin and labour-intensive businesses, a low labour cost is usually the most influential factor because it is the key to profits. In our analysis of the sample of 17 companies, however, we found that investment incentives and tax incentives are more important in decision making on location than low labour costs for Taiwanese assembly-type manufacturers. This is because more profits result in more tax if there are no tax incentives. In general terms, as shown in Table 10, China provides a significant tax advantage when comparing the corporate income tax policies of various Asian governments.

Most foreign manufacturing investments in China are eligible for tax exemption. The most popular tax exemption has allowed business income to be exempted from corporate income tax in the first and second years, and allows a 50% reduction in the third to fifth years. If a company has another technology-related investment during this period, it can enjoy another three years of 50% tax reduction when the fifth year

Table 10. Corporate income taxes in various Asian countries

Country	Corporate income tax (%)	Dividend withholding tax rate (%)
China	15	0
Taiwan	25	20
Hong Kong	16	0
Indonesia	< Rp50 000 000: 10 > Rp50 000 000 and < Rp100 000 000: 15 > Rp100 000 000: 20	0 ^a
Malaysia	28	0 ^a
Philippines	32	Branch 15 Subsidiary 32
Singapore	22	0 ^a
Thailand	30	10
Vietnam	28	0 ^a

^aDouble Taxation Relief Agreement.

Source: Investment Commission (2009).

ends. If the enterprise is located in an Economic Processing Zone or SEZ, and its exports amount to over 80% of total production, it is eligible to enjoy a 10% corporate income tax rate. Any foreign investor or enterprise with foreign investments that reinvests its share of profit obtained from the business directly into that enterprise by increasing its registered capital, or that uses the profit as capital investment to establish other enterprises with foreign investment to operate for a period of not less than five years can, upon approval of the tax authorities of an application filed by the investor, be refunded 40% of corporate income taxes paid. These tax incentives are very important to Taiwanese electronic-assembly businesses because Taiwan does not have this kind of tax incentive offering. The corporate income tax paid in China is also lower than Taiwan's.

Besides corporate income tax, local taxes and fees are also significant. Normally, tax is stable, but fees are variable depending on local requirements. As the southern region was the first open-door area, overall systems in the south are on trial. This environment gave local government an opportunity to develop and levy various local fees to be paid by foreign businesses, including flood-prevention fees, sewage treatment fees and so on. These kinds of local fees and charges were often a huge cost burden for foreign businesses. With the experience of the south, as other regions opened to foreign investors, local fees and charges were made more transparent and often competitive, meaning that the new regions became more attractive for foreign businesses when making investments. Local authorities also offered incentives to attract foreign businesses.

In assessing political variables, it was found that policy uncertainty is more important than information transparency (Table 11). Policy uncertainty means that: (a) policies may not be articulated, or clear policies may not exist; or (b) that policies may change suddenly, without advance warning. Although China has reformed and liberalised over the last two decades, the economic system and the supporting legal regulations remain fragile. There are many policies and regulations that are yet to be

established or fully embedded and many need to be revised, and each requires Communist Party and other bureaucratic approval. As a result, policy uncertainty remains a significant risk. However, it seems that investing companies can make locational choices that reduce uncertainty somewhat. For example, the eastern region – developed later and by specific central government policy and a comprehensive plan – appears to offer more certainty.

An industry cluster is a “geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, communications and dialogue that share specialised infrastructure, labour markets and services, and that are faced with common opportunities and threats” (Rosenfeld, 1997: 10). In terms of the industry cluster effect, the variables include position in the supply chain, resource sharing, transportation costs, and security. As Table 12 shows, this study found that the position in the supply chain has a relatively lower AHP coefficient of variation than the other three variables. From this, we can infer that the multiplicity of complementary business channels is a major factor to consider.

In terms of vertical integration, assembly-type manufacturers are in a “middle” position. They not only need a complete supply chain to support their manufacturing, but also need a fast delivery capability to bring their product to the market. From a geographical perspective, this makes the eastern region superior to the southern region because it is geographically near to Japan. Japan is the second largest consumer electronics product market in the world and Taiwan is the largest consumer electronics product OEM subcontractor to the Japanese market. This makes the east better than the south, from the position in the supply chain perspective, for Taiwanese assembly-type manufacturers.

Finally, we examined bureaucratic efficiency variables. As Table 13 shows, we found that the CV related to customs clearance efficiency and the ability of the local

Table 11. Political criteria

	Sub-criteria	
	POU (policy uncertainty)	INT (information transparency)
STDEV:	0.10074	0.10074
AVERAGE	0.32108	0.17892
CV:	0.31376	0.56304

Table 12. Cluster effect criteria

	Sub-criteria			
	PSC	RCS	TSC	SEC
STDEV:	0.20588	0.10212	0.17872	0.10623
AVERAGE	0.45878	0.14999	0.25903	0.13221
CV:	0.44875	0.68088	0.68998	0.80350

PSC, position in supply chain; RCS, resource sharing; TSC, transportation costs; SEC, security.

Table 13. Bureaucratic efficiency criteria

Sub-criteria	IFS	TAF	CCE	PUS	OFI	GQA	PCE
STDEV:	0.15370	0.08950	0.07869	0.07730	0.09419	0.06365	0.09150
AVERAGE	0.21876	0.12063	0.14069	0.11893	0.12742	0.12598	0.14758
CV:	0.70260	0.74200	0.55930	0.64996	0.73914	0.50519	0.62001

IFS, infrastructure readiness; TAF, tax audit fairness; CCE, customs clearance efficiency; PUS, public security; OFI, officer integrity; GQA, government's response ability; PCE, policy comprehension and execution ability.

government to respond rapidly to situations is relatively lower than the other five sub-criteria. This may be due to the fact that our surveyed companies are export-orientated. As incoming materials and outgoing end products are critical to these kinds of companies, the efficiency of customs clearance and local government quick response are regarded as extremely important.

The other five sub-criteria: infrastructure readiness, tax audit fairness, public security, officer integrity and policy comprehension and execution ability do not have consistency in this survey. This is because China has devoted huge amounts of resources and effort to enhancing and improving the investment environment in recent years, and has made substantial accomplishments. All of our surveyed companies are located in the developed industrial zone and have local government support. Therefore, the consensus of the remaining five sub-criteria is not obvious.

Conclusions

Our study provides insights into the criteria used to evaluate the preferred location of Taiwan's electronics assembly-type manufacturing investments in China. The research found the following to be key sub-criteria: tax incentives and investment incentives (economic criteria); policy uncertainty (political criteria); position in supply chain (the cluster effect); and customs clearance efficiency and the government's rapid response ability (bureaucratic efficiency). On the basis of our research, the preferred location for Taiwanese electronics assembly-type manufacturers is the eastern region, which includes Jiangsu, Zhejiang and Shanghai.

The eastern region, especially Shanghai, has been the focus of central government policy. Foreign enterprises located there undoubtedly enjoy certain policy and administrative advantages. In addition to enjoying government policies viewed as favourable to business, the eastern region has a vast plain of land that can meet a manufacturing enterprise's expansion requirements. Having enough territory has facilitated the formation of industry clusters. This has been important for Taiwanese electronic assembly manufacturing companies that have established manufacturing sites in the east. In our research, we have not made detailed comparisons of regional policy in the south and east, but it seems that differences in these policies could point to another possible reason Taiwanese manufacturing enterprises are choosing to move from the south to the east.

Future studies could clarify if local policies have had a role in this relocation of manufacturing. The policies adopted in the south and in the east show that a region

(or country) that supports foreign investments can stimulate economic growth. With such a vast territory, however, even the Chinese central government's extraordinary powers cannot guarantee that resources will be distributed equally. Local governments must then compete in their provision of local policies that attract foreign investors in order to meet their own local economic development needs. Further research into the influence of policies on investment attitudes could result in a better understanding of this phenomenon.

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Appendix A: Raw Survey Data (Companies 1-17)

Criteria	Sub-criteria	Frequency counts			
		V	I	O	N
Economic	Market	9	6	1	1
	Land costs	2	13	2	
	Labour costs	8	7	2	
	Material costs	10	4	2	1
	Tax incentives	7	10		
	Investment incentives	5	12		
Political	Policy uncertainty	7	7	2	1
	Information transparency	3	6	8	
Cluster effect	Position in supply chain	6	11		
	Resource sharing	6	6	4	1
	Transportation costs	5	10	1	1
	Security	6	8	3	
Bureaucratic efficiency	Infrastructure readiness	6	11		
	Tax audit fairness	7	8	1	1
	Customs clearance efficiency	10	6		1
	Officer integrity	5	8	4	
	Government's response ability	7	8	2	
	Policy comprehension and execution ability	3	12	1	1

V, very important; I, important; O, neither important nor unimportant; N, not important.