



**Decision Factors Affecting
Semiconductor Industry Location
and the Regional Advantages of
Kumamoto Prefecture, Japan**

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About the Author

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Abstract

The objective of this research is to pinpoint the key determining factors that managers in multinational semiconductor firms use to decide upon a location to expand their business. Interviews were conducted with seventeen executives at eight companies, at both the U.S. and Japanese headquarters. Based on these interviews, the author analyzed the data to determine the strengths and weaknesses of Japan's Kumamoto Prefecture, in particular, as a semiconductor investment location. One important research finding is an assessment of these strengths and weaknesses, their importance to foreign executives, and how Kumamoto can capitalize on them in order to attract more business to the region.

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Decision Factors Affecting Semiconductor Industry Location and the Regional Advantages of Kumamoto Prefecture, Japan

Kyoko Ii

As the global semiconductor industry matures and expands, local regions that rely on semiconductor business find it increasingly important to maintain a competitive edge over other economic regions. When contemplating the location of a new semiconductor or IT facility, executives consider many factors. **Every region has its own strengths and weaknesses. For long-term survival, potential semiconductor industry sites must first assess and build their core strengths, and then develop economic strategies and concrete policies to attract and retain the desired mix of companies.**

This paper arose from research conducted to determine the key decision factors that semiconductor executives consider in selecting the location for a new global facility. I carried out the research in order to assess Japan's Kumamoto Prefecture as a location for semiconductor and other IT businesses. This paper first details the particular strengths and weaknesses of Kumamoto, considers the implications that such development would have on the region, and offers recommendations for local officials to help retain and attract global semiconductor and emerging tech companies to Kumamoto Prefecture.

Kumamoto's Semiconductor Industry

As of 2004, the fifty-year-old global semiconductor industry enjoyed a high 17 percent average annual growth rate for fifty years. At the same time, 2004 revenues of global semiconductor-related industries represented to ¥25 trillion (approximately US\$ 217 billion).¹

The Kyushu region, in southwestern Japan, has come to be known as Japan's "Silicon Island." Kumamoto Prefecture is one of the prefectures located within this island region. Historically a semiconductor manufacturing region, Kyushu accounts for about 30 percent of Japanese semiconductor manufacturing and 8 percent of global semiconductor manufacturing. Kumamoto Prefecture's semiconductor manufacturing accounts for more than 30 percent of Kyushu's output, 10 percent of Japan's output, and 3 percent of the world's semiconductor manufacturing output.²

Since the mid-1990s, Kumamoto Prefecture has actively promoted the semiconductor industry. In 2003, the Prefecture introduced the so-called "Semiconductor Forest Concept," and revised it in 2005. It is a strategic plan, with a key objective to promote and develop Kumamoto as a globally attractive semiconductor and IT manufacturing, and research and development (R&D) region. Kumamoto's "Semiconductor Forest Concept" maps out five key goals for the prefecture to pursue in developing itself as a global semiconductor and IT hub: (1) to nurture human resources; (2) to encourage sophistication of local industries; (3) to create new industries; (4) to foster R&D; and (5) to engage in follow-up services and strategic recruitment of companies.³

This paper focuses on the fifth goal, the strategic recruitment of companies. In 2003, as a follow-up to the "Semiconductor Forest Concept," Kumamoto Prefecture officials announced a plan to position the semiconductor technology as the driving force for their strategy to attract companies—both those already in Japan and those abroad—to establish Kumamoto facilities.⁴ Even before this announcement, Prefecture officials had begun activities to demonstrate a commitment to the semiconductor industry. For example, the Prefecture has exhibited at SEMICON trade shows in Japan since 1998, and at SEMICON West, North America's largest semiconductor and microelectronics event, since 1999. Since 2002, the Prefecture has posted personnel to Silicon Valley to strengthen connections with U.S. semiconductor companies and to promote Kumamoto as a strong location for semiconductor companies.

Between 1999 and 2005, eighty-eight companies signed agreements to establish or expand business in Kumamoto. Of these, fifty-two were semiconductor-related, and six were foreign companies.⁵ Kumamoto Prefecture has a good track record of recruiting foreign companies, including Teradyne, Inc., a leading automatic test equipment (ATE) company, in 1992 (the prefecture's first 100 percent foreign-capital company); WaferMasters Inc., a Silicon Valley start-up, in 2000; and Greene, Tweed & Co., a well-established company on the east coast of the United States, in 2004.

Research Objective and Methodology

The research objective for this paper was to assess the key factors—both positive and negative—that semiconductor management use to decide upon a global location for semiconductor expansion.

The research methodology included a mix of in-depth interviews and a paper questionnaire. In early 2006, I conducted in-person interviews with seventeen executives at eight companies, representing two types of semiconductor-related companies: (1) companies that have already established Kumamoto operations (five companies); and (2) companies that have not set up Kumamoto operations (three companies). All

interviews were conducted in confidentiality, and the names and companies of some interviewees have been withheld in this paper by mutual agreement.

Where possible, I interviewed executives at both the **U.S. and Japanese headquarters**. Except for one component manufacturer, most of the executives whom I interviewed were from semiconductor manufacturing equipment companies. Of these, their Kumamoto operations could be classified into three types: **manufacturing facilities, technical/engineering centers, and service and support facilities for the Japanese market.**⁶

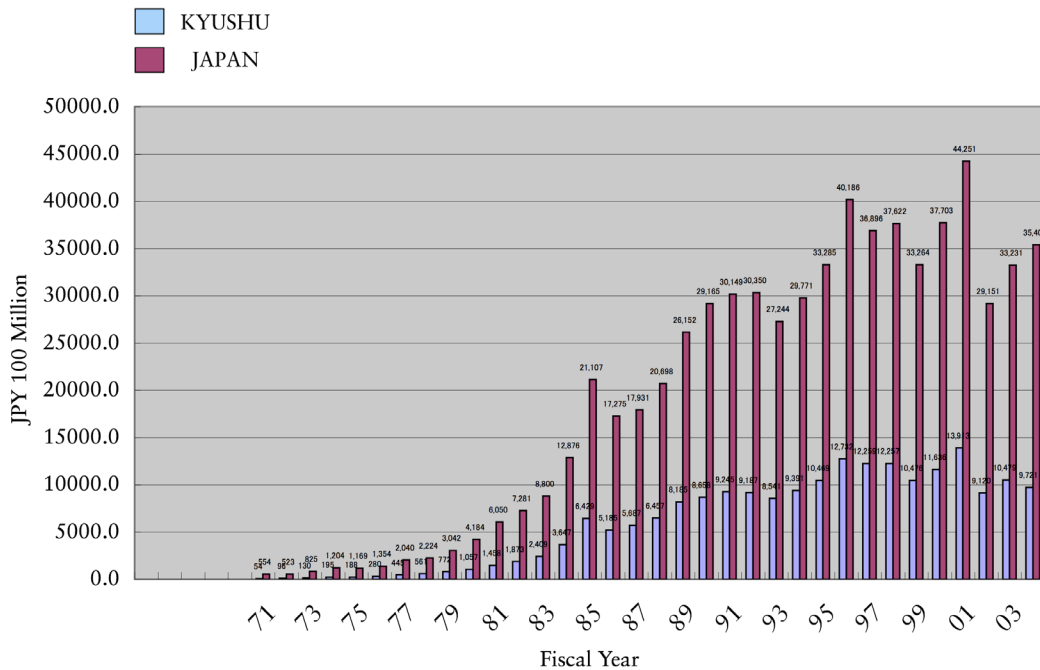
In conducting the interviews, I used an interview discussion guide (see Appendix 2), and also asked each executive to complete a paper questionnaire (see Appendix 3) during the interview about the factors that influenced their decision to locate their companies where they did, and their expectations of local government when establishing a new operation. After completing the interviews, I analyzed the both primary and secondary data to determine **Kumamoto’s strengths and weaknesses as a semiconductor investment location.**

Overview of Kyushu (“Silicon Island”) and Kumamoto (“Semiconductor Forest”)

Within Japan, Kyushu is known as the “10 percent economy,” since its land area, population, and gross domestic product (GDP) make up about 10 percent of all of Japan. Kyushu is also called the Silicon Island, because of the many semiconductor-related companies located there. Kyushu accounts for 25–30 percent of Japan’s total semiconductor production, as Figure 1 shows.



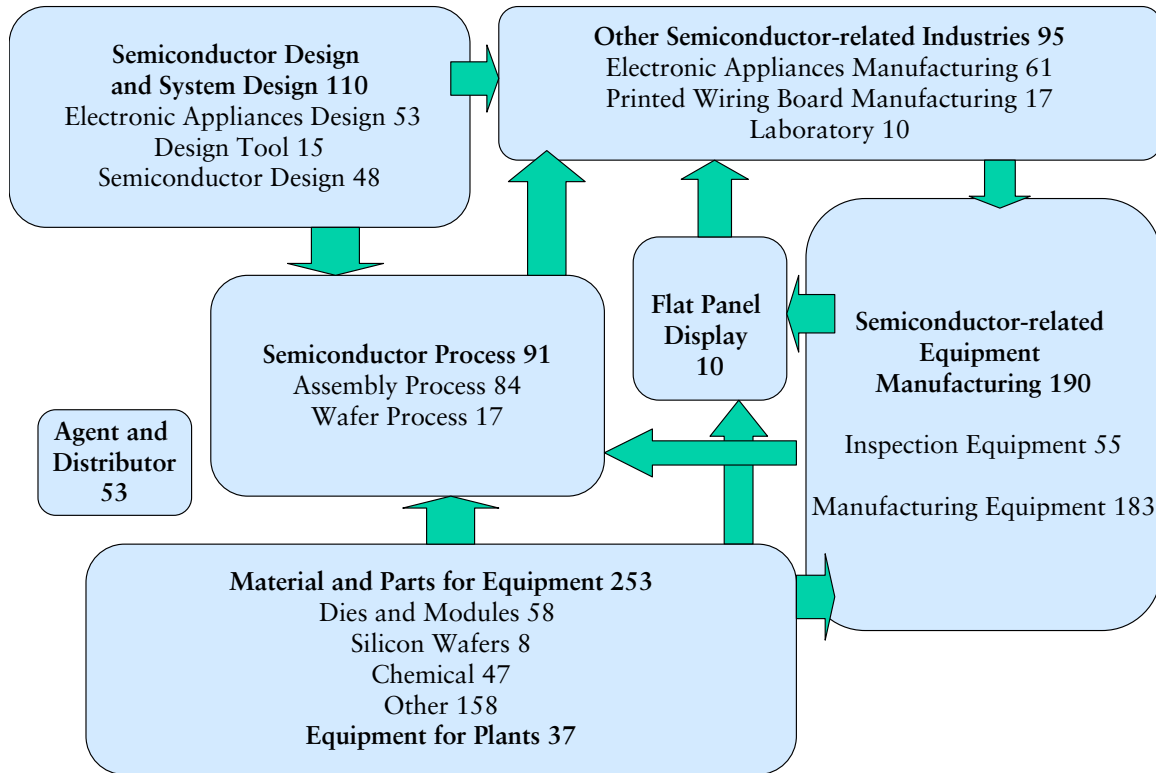
Figure 1. Integrated Circuit (IC) Production of Kyushu



Source. Kyushu Bureau of Economy, Trade and Industry.

Following the recent semiconductor market expansion in East Asia, Kyushu facilities have increased their production of system LSIs (Large Scale Integration) for games and information appliances.⁷ Since the 1960s, Kyushu’s semiconductor and IT industries have shown continuous growth and increasing technological sophistication. Today, Kyushu’s semiconductor industry cluster continues to grow, as Figure 2 illustrates.

Figure 2. Kyushu’s Silicon Cluster



Source. Kyushu Bureau of Economy, Trade and Industry, “Kyushu Silicon Cluster New Development Strategy,” March 2006, 46. Available in Japanese at <<http://ik0166.i-kyushu.or.jp/strategy/silicon.pdf>>.

With respect to Kumamoto, semiconductor-related companies such as Mitsubishi, NEC, Sony, and others have established operations in the prefecture since the 1960s. In addition, since the 1990s, foreign companies such as Teradyne, WaferMasters, and Greene Tweed, which manufacture semiconductor equipment or components, have established Kumamoto operations. Kumamoto now accounts for about 30 percent of Kyushu’s semiconductor production. Kumamoto Prefecture promotes this industrial concentration “the Semiconductor Forest of Kumamoto.”

Key Location Decision Factors

Detailed analysis of quantitative survey data and company interview transcripts pointed to seven key factors that influence executives in selecting a semiconductor facility location.

Of these factors, **workforce was far and away the most important**. As for other factors, the importance depended on the company and their stage of involvement in business in Asia. Using a seven-point scale, with one being “important” and seven being “less important” for each location decision factor, **companies with established Kumamoto operations rated infrastructure and transportation high**. Companies not yet in Kumamoto weighted proximity to customers and cost more heavily than infrastructure. **It is possible that companies not yet in Kumamoto might be focused on customers, rather than infrastructure issues**. Among all of the key factors, living environment was rated the lowest. **This low rating does not imply that this factor is not important, but rather that companies need to examine business-related issues first.**

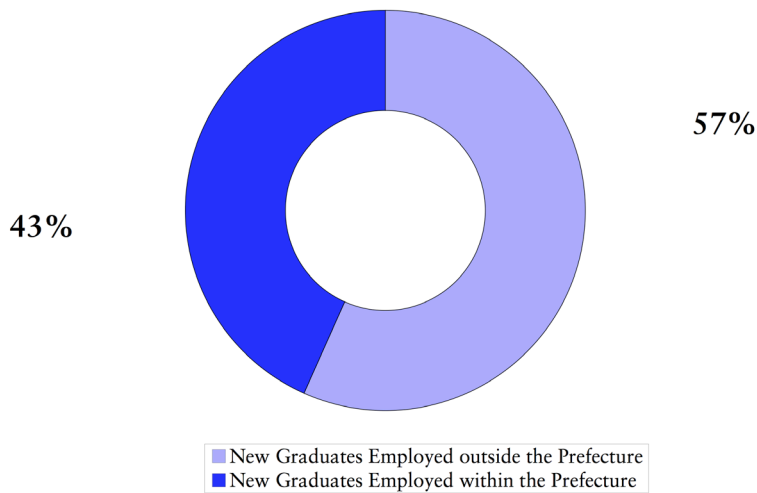
Workforce

In both the quantitative survey and qualitative interviews, participants rated workforce issues, such as recruiting, as **their number one location decision factor**.

Teradyne provides an excellent example of a company focused on workforce issues. A leading semiconductor automatic test equipment manufacturer, Teradyne was the first 100 percent foreign-owned company in Kumamoto. **In the early 1990s, the company chose Kumamoto as the location for its first plant outside the United States**. According to **Richard Dyck, the former representative director of Teradyne Japan**, “The primary reason why we chose Kumamoto was that we felt we could hire engineers there. One of the advantages of Kyushu as an area is that each of the prefectures in Kyushu has a first-rate national university, and each of the national universities has a first-rate engineering faculty.”⁸ Dyck’s successors have made similar statements.⁹

In fact, Kyushu has a large pool of local workers. **The region boasts seventy universities, fifty-two colleges, and nine technology colleges. About 40 percent (or roughly 90,000) of Kyushu’s university students major in science and technology.**¹⁰ However, due to limited job opportunities in Kyushu, many graduates are forced to relocate to Tokyo or Osaka. **Figure 3 shows that with respect to Kumamoto, 57 percent of graduates are employed outside the prefecture.**

Figure 3. Job Placement Outside Kumamoto
(Graduates of universities and technical colleges in March 2005)



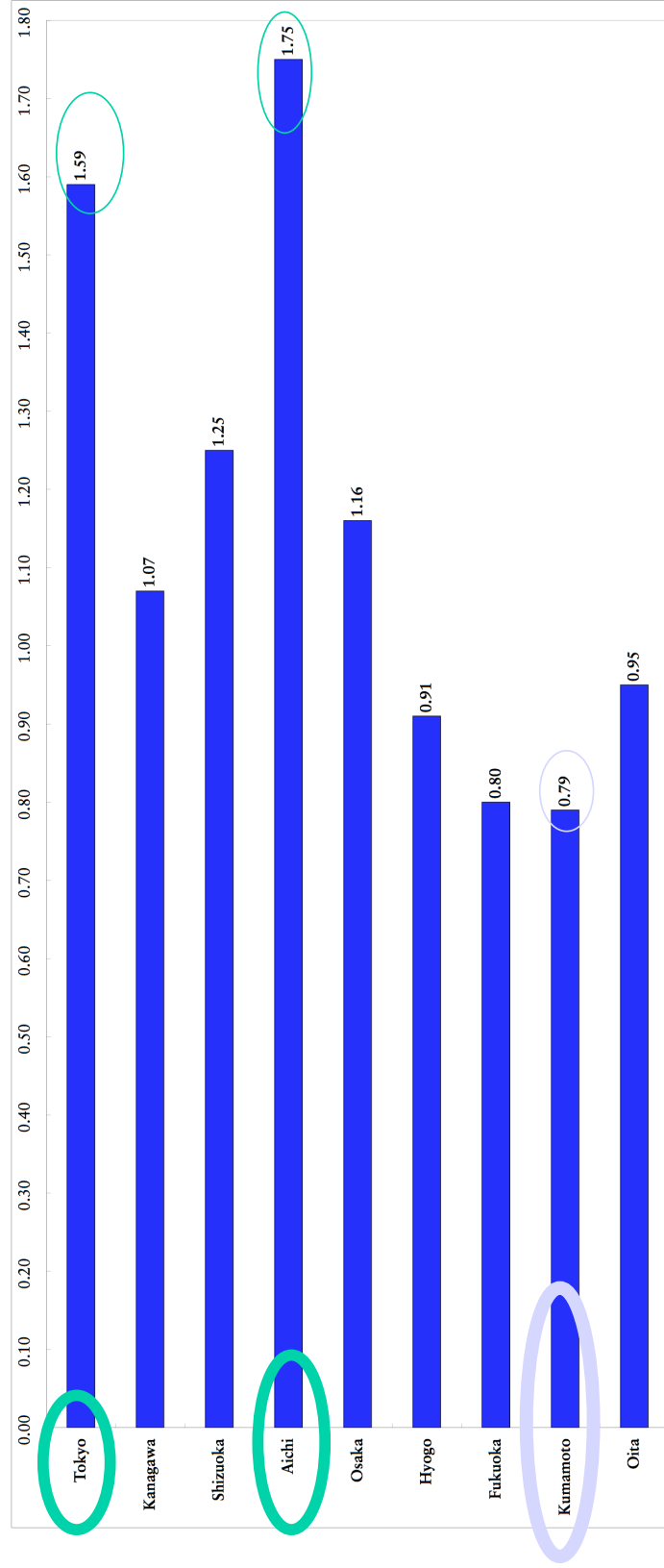
Source. Kumamoto Prefectural Government, *Site Selection Prospectus for Enterprises*, (August 2005).

As Figure 4 shows, Kumamoto’s ratio of job offers to job seekers is low, compared to other regions such as Tokyo or Aichi, where the Toyota Headquarters are located. This low ratio is a positive point for companies looking for local workers, as many people want to live and work in Kumamoto.¹¹

Those executives interviewed for this paper rated workforce issues, such as workers’ technical skills and the availability of local recruiting as highly important in their location decision factors. In particular, Japanese workers were highly valued for their morality, integrity, and precision. With respect to challenging workforce issues, some interviewees mentioned that some local Japanese business people “lack international business skills, such as communication in English, logical thinking, and business methodology.”¹²

In the course of my research for this paper, a San Francisco Bay Area-based semiconductor-related company contacted me, as that company was looking for a location in Japan. To begin with, the company’s Japanese management regarded Kumamoto as a likely potential location. However, after further analysis by the company’s U.S. management team, Kumamoto became a less attractive option for two reasons. First, company executives were concerned about their ability to recruit lead project engineers with good ability in English. The prefecture has taken steps to address this concern through its so-called U-Turn System, which matches mid-career people who want to work in Kumamoto with local employers. Teradyne has used this system and recommends it highly.¹³ Second, U.S. executives are sometimes wary of Kumamoto because they question the English-speaking skills of local workers. To be sure, there may be more people in Tokyo who speak English for their job, but several interviewees mentioned that it is not easy, even in Tokyo, to find qualified engineers with English ability.

Figure 4. Job Offer-to-Seeker Ratio
(National average in March 2006 was 1.01)



Source. Kumamoto Labour Bureau <<http://www.kumamoto.plb.go.jp/search/tokei/sijo/0603/sijo07.xls>>.

Proximity to Customers

Phil Paino, president of Greene Tweed, a company that recently set up an Asia engineering center in Kumamoto, said that one driver for Greene Tweed management's decision to locate their business in the prefecture was being close to many of their customers who are also based there. He emphasized the importance, for any business, of becoming part of that local customer community.¹⁴

In addition to the market in Kyushu, the growing Asian market is attracting companies to Kumamoto. Greene Tweed's engineering center is not only for Japanese customers, but also serves as an Asian business base:

The Center provides our customers in the Asian Pacific region, from Singapore and China to Korea and Taiwan, with local engineering support, allowing us to more quickly meet your needs.¹⁵

The term "Asian base" is a common phrase used to describe companies that establish operations in Kumamoto. After a signing ceremony sealing an agreement to set up a location in Kumamoto, Taro Yamazaki, Co-chairman and Founder of WaferMasters, a Silicon Valley-based company, remarked that, "We will make Kumamoto our service base to Asian countries."¹⁶ He added that, "One of the reasons we decided to locate the company in Kumamoto is that it has good accessibility for retaining customers and providing the best support."¹⁷

Kumamoto Prefectural Government officials have often spoken about the area's dense concentration of semiconductor companies, including their customers and suppliers. While admittedly important, such a strong industry focus, particularly for suppliers, may be less important today than in the past. The senior director of Global Facilities for a leading semiconductor equipment manufacturer underscored this fact, and stressed the sophistication of today's global supply chains:

We don't locate manufacturing next to our suppliers. I would say what we talked about ten years ago in having suppliers close to us is probably less important today than it was then. Now we're taking advantage of an increasingly sophisticated global supply chain, whether it's in Vietnam, China, or wherever.¹⁸

Cost

Another major factor in the location decision is **cost: of labor, operations and services**. In cases where cost is the main decision factor, there is little sense in Japan trying to attract such companies, since it cannot compete with neighboring countries in this arena.

Some companies have given up the idea of manufacturing in Japan. For example, Yasuo Mizokami, the former president of KLA-Tencor Japan, noted that, as recently as ten years ago, KLA-Tencor management had thought seriously about establishing a manufacturing base in Japan, but decided that it did not make sense due to cost issues.¹⁹ Another executive with whom I spoke, the controller of a leading

semiconductor equipment supplier, echoed the sentiment that manufacturing in Japan is not worth the cost.²⁰

However, some companies do manufacture in Japan, and these companies typically value other factors—such as quality manufacturing capabilities—more highly than costs. Put a different way, they consider Japan’s superior manufacturing capabilities to be worth the costs involved. One executive whom I interviewed states that, “We give greater importance to quality than to costs.”²¹ WaferMasters co-chairman and founder Yamazaki feels the same, declaring that, “Cost is not so important when you make quality products.” He elaborated on this point, noting that “The cost is one of the key factors . . . but our product strategy is to create high-performance products. It does mean we are focusing on the process quality first, how to fabricate uni-standard products. The quality is much more important to maintain in machine-to-machine repeatability, rather than to think about how it makes cheaper machines.”²² Phil Paino, of Greene Tweed, sums up this perspective: “In our product, labor is not the driver. You can pay an extra 10 or 15 or 20 percent in labor and it’s not essential.”²³

Financial Incentives and Subsidies

Kumamoto offers special financial incentives—as do most Japanese regional governments—when companies choose to locate within the prefecture. Kumamoto has raised the maximum subsidy for a newly established plant to a level comparable to other prefectures. Now, companies that employ at least ten new workers can receive up to ¥2 billion (about U.S. \$17 million), for an investment value of over ¥300 million (U.S. \$2.6 million).²⁴

Understanding that foreign companies typically do not make large initial investments, Kumamoto has a special subsidy to attract these companies. Unlike for Japanese companies, there are no requirements dictating investment amounts or the number of new employees. In addition, the subsidy rate is higher for foreign companies—5 percent of the investment, compared to 3 percent for Japanese companies.

Other regions of Japan, not to mention other countries, do have much higher subsidies. However, given that incentives are not the sole factor that influences a decision to establish a company location, Kumamoto’s prefectural government should avoid enter into a regional incentive race. Rather, the government must help companies to determine how the benefits of the local industry outweigh the costs and other challenging factors.

Transportation

Employees at Kyushu-based service/support centers highly value Kyushu’s land transportation system, because it allows them to drive easily to various customers in Kyushu in a reasonable time.

The companies that maintain offices in Kumamoto, including WaferMasters, highly value Kyushu’s flight accessibility to Korea and Taiwan. This is true even though flights are not always from Kumamoto Airport, and travelers sometimes have

to drive to Fukuoka Airport, ninety-minutes by car from Kumamoto. Kumamoto offers flights to and from Korea, while Fukuoka Airport provides flights to eighteen overseas destinations. These attributes notwithstanding, a director of one U.S. company, who considered Kumamoto as a potential location, mentioned the following transportation weakness: unlike other Japanese metropolitan areas, there is no direct international air flight between the United States and Kumamoto.²⁵

Other executives whom I interviewed mentioned a desire for international cargo flights to carry large and heavy products from Kyushu, especially given the high cost of land transportation.²⁶ Daily cargo flights within Kyushu would decrease the transportation cost for products traveling from Kyushu to Narita or Kansai airports.

Infrastructure

In Japan, basic infrastructure, such as water and electricity supply, is well developed and is taken for granted. Political and social stability are also given. Several interviewees mentioned that continued improvement of Japan's high-tech infrastructure, such as faster Internet access, was a desirable infrastructure factor. Several interviewees also pointed out that, compared to Tokyo, Kumamoto is home to fewer English-speaking professional advisors with international experience, such as lawyers, accountants, and management consultants. Such experienced professionals are often necessary during the initial establishment of a facility.

Living Environment

Most executives whom I interviewed did not rate living environment as a key factor influencing location decision. This does not imply, however, that it is not important, as one semiconductor equipment manufacturer observed:

Lifestyle considerations, which can mirror the cost of doing business, are important to us. Although such a factor may not be the top factor, that can be explained in part by the fact that we are not looking to relocate large numbers of employees from one region to another with perceived higher or "better" quality of life. With the exception of locating service centers close to customers, when we develop a "center of excellence," we tend to hire staff locally rather than relocate staff. Lifestyle choices tend to reflect those already embraced by the local workforce from which we will staff our operations. Nevertheless, widely held perceptions of the quality of both employee and family life considerations cannot be neglected as we strive to attract and retain top caliber talent.²⁷

The lack of available international schools was mentioned as weakness for Kumamoto, and it is one that the prefecture continues to address. One difficulty is that Kumamoto does not have a critical mass of foreign children to support the costly operation of an international school. Even so, international preschools and kindergartens are emerging; an increasing number of Japanese parents are also

interested in educating their children in an international school environment. Setting up international education at Japanese public schools in Kumamoto might be a potential solution.

Implications for Kumamoto Prefectural Government

Taken together, the executives I interviewed rated workforce issues, including the availability of excellent local human resources, as the number one motivation for choosing one location over another. Given the importance of workforce, regional governments must prioritize it in their thinking and planning in order to attract new companies to their districts.

Notably, companies already in Kumamoto rated “workforce issues” as the arena in which they expected the most significant assistance from regional governments. Several interviewees suggested that Kumamoto should develop a long-term strategy to nurture human resources, observing that a good education system attracts people who want a quality education, and people who possess an excellent education often attract companies. One interviewee, in describing his company’s internationally diversified structure, neatly summed up some of the key strategic issues that Kumamoto must face in moving to the next level in global business:

I’ve seen a lot of facilities development. I’ve seen the company’s progress. I’ve seen the evolution in our thinking about why we do things. Our strategies are becoming clearer and clearer today. R&D is here. Manufacturing is somewhere else. Sales and service is close to the customer. It seems to be a model that works for us.²⁸

Companies are changing their strategies to adapt to a globally competitive market. There is no one-size-fits-all approach. Regional governments must change their strategies accordingly and implement them effectively in order to stay competitive.

Companies not yet in Kumamoto rated government incentives as the highest factor with which they would expect to receive the greatest assistance from the regional government. Overall, the four most important factors with respect to the regional government were workforce, infrastructure, government incentives, and transportation.

All of these findings indicate that Kumamoto Prefectural Government can take proactive steps to further develop the semiconductor and IT industries within its borders. I propose a two-step process, which entails macro and micro actions. As a macro action, Kumamoto Prefectural Government needs to prepare a strategic overseas investment promotion plan, linked to a grand design for regional development. The interviews conducted for this research showed that Kumamoto has some key existing strengths. As a short-term strategy, the local government should capitalize on these strengths, and position Kumamoto Prefecture as a strong location for semiconductor and IT-related sales and support centers, technical/engineering centers, and high-value-added product manufacturing facilities.

With respect to micro actions to attract more businesses to the region, Kumamoto Prefecture might undertake two activities. First, it should create a list of target

companies that might potentially relocate to Kumamoto, based on the company type, the customer, and the strategy. This exercise would increase the possibility of being connected to companies that could potentially invest in Kumamoto. Second, the prefecture should promote itself more effectively and efficiently to prospective companies, by localizing its promotional media and tailoring it to enterprises looking to locate in Kumamoto.

Conclusion

This paper has outlined some of the strengths of Kumamoto Prefecture, the center of Kyushu's Silicon Island, as a prospective global business location. These strengths include: (1) the region's wealth of well-educated and talented engineers; (2) a concentration of industries that can provide customers and/or supporting companies for new companies to locate in the area; and (3) proximity to the rapidly growing greater Asian market. Kumamoto can capitalize on this third advantage by developing transportation systems to support global business. However, greater ease of transportation to other Asian countries also increases business risk, because it facilitates access to the inexpensive labor and favorable tax credits that some other Asian countries offer. To cope with such risk, Kumamoto should develop a strategy and implement policies to maximize its competitive edge. These policies should focus on innovation and human resource development, with the goal of generating more high-value-added products and services.

The semiconductor industry is rapidly changing and globalizing. The region's future is dependent upon all sectors—industry, local and regional government, and education—and regional strength must be maximized in order to successfully address challenges related to industry globalization.

By developing and then strongly communicating a global vision and strategy, Kumamoto Prefecture can become a better place, both for newcomers and for established residents. All of the region's stakeholders must take action to apply their resources in the implementation of a global vision and strategy.

Notes

1. See Wataru Izumiya, *An All-inclusive Guide to the Semiconductor Industry*, (Tokyo: Toyo Keizai, 2004), 2.
2. Izumiya, *An All-inclusive Guide to the Semiconductor Industry*, 154.
3. See Kumamoto Prefectural Government, *Kumamoto Semiconductor Forest Concept*, (Kumamoto: Kumamoto Prefectural Government, 2005), 6. Available in Japanese at <<http://www.pref.kumamoto.jp/promotion/forest/pdf/sall.pdf>>.
4. See Kumamoto Prefectural Government, *Blessed with an Advantageous Environment*, (Kumamoto: Kumamoto Prefectural Government, 2004), 7–8.
5. See Kumamoto Prefectural Government, *Lists of Recruited Companies 1999–2005*, (Kumamoto: Kumamoto Prefectural Government).

6. Appendix 1 contains detailed profiles of the companies interviewed.
7. See Kyushu Bureau of Economy, Trade and Industry, *Business Environment in Kyushu 2005*, (Fukuoka: Kyushu Bureau of Economy, Trade and Industry 2005), 14. Available at <<http://www.kyushu.meti.go.jp/invest/2005english.pdf>>.
8. Japan External Trade Organization (JETRO), Investment Promotion Seminar 2000, (Tokyo: JETRO, 2000), 13.
9. JETRO, *Success in Japan—Case Studies of Foreign Companies in Japan*, (Tokyo: JETRO, 1999), 28; and JETRO, *Setting Up A Business in Kyushu*, (Fukuoka: JETRO, 1999).
10. Kyushu Bureau of Economy, Trade and Industry, *The Business Environment in Kyushu*, (Fukuoka: Kyushu Bureau of Economy, Trade, and Industry, 2005), 26. Available at <<http://www.kyushu.meti.go.jp/invest/2005english.pdf>>.
11. *Recruit*, “Top Interview 2006: Kumamoto Governor Yoshiko Shiotani,” (January 2006), 25.
12. Interview with Yasuo Mizokami, former President of KLA-Tencor Japan, February 2006.
13. JETRO, Investment Promotion Seminar 2000, 13.
14. Interview with Phil Paino, president of Greene Tweed, April 2006.
15. Though no longer available online, this quote appeared on the Greene Tweed website shortly after they set up their Kumamoto operations. Accessed April 2006.
16. “Asia muke no kyoten ni” (Kumamoto as Base to Asian Countries), President of WaferMasters, Taro Yamazaki” Kumamoto Nichinichi Shimbun, March 3, 2000.
17. Interview with Taro Yamazaki, co-chairman and founder of WaferMasters, August 2006.
18. Interview with senior director of global facilities for a semiconductor equipment manufacturer, April 2006.
19. Interview with Yasuo Mizokami, former president of KLA-Tencor Japan, February 2006.
20. Interview with controller for a semiconductor equipment supplier, February 2006.
21. Interview with general manager for a semiconductor equipment manufacturer, February 2006.
22. Interview with Taro Yamazaki, August 2006.
23. Interview with Phil Paino, president of Greene Tweed, April 2006.
24. Kumamoto Prefectural Government, *Site Selection Prospectus for Enterprises*, (Kumamoto: Kumamoto Prefectural Government, 2005), 12.
25. Personal communication from a director of a semiconductor tool company, April 2006.
26. Interviews with senior executives—a general manager, a CEO, and a controller—at three different semiconductor companies. Names and companies withheld by mutual consent. Interviews conducted in February 2006.
27. Interview with senior director of global facilities for a semiconductor equipment manufacturer, April 2006.
28. Interview with senior director of global facilities for a semiconductor equipment manufacturer, April 2006.

Appendix 1. Selected Interviewed Companies Already Located in Kumamoto Prefecture

Teradyne Inc., ATE manufacturer

Company Name(s)	Location	Year Established	Key Business in this Location	Number of Employees
Teradyne, Inc.	Boston, MA	1960	Global Headquarters	5,900
Teradyne K.K.	Meguro, Tokyo, Japan	1978	Sales and Support	237
Teradyne K.K. Kumamoto Facility	Ozu, Kumamoto, Japan	1995	Development and Manufacturing	160

WaferMasters, Inc., equipment manufacturer

Company Name(s)	Location	Year Established	Key Business in this Location	Number of Employees
WaferMasters, Inc.	San Jose, CA	1999	Global Headquarters	20
WaferMasters Service Factory K.K.	Mashiki, Kumamoto, Japan	2001	Development and Manufacturing	8

Greene, Tweed & Co., seals manufacturer

Company Name(s)	Location	Year Established	Key Business in this Location	Number of Employees
Greene, Tweed & Co.	Kulpsville, PA	1863	Global Headquarters	1,200
Greene, Tweed & Co., Japan	Minato, Tokyo, Japan	1986	Sales	26
Greene, Tweed & Co. Asia Engineering Center	Koshi, Kumamoto, Japan	2005	Support and Engineering	3

KLA-Tencor, inspection systems manufacturer

Company Name(s)	Location	Year Established	Key Business in this Location	Number of Employees
KLA-Tencor	San Jose, CA	1976 (1997 merger)	Global Headquarters	5,400
KLA-Tencor Japan Ltd.	Yokohama, Kanagawa, Japan	1984 (1997 merger)	Sales and Support	400
KLA-Tencor Japan Ltd. Kumamoto Service Center	Kikuyo, Kumamoto, Japan	1992	Support	19

Appendix 2. Interview Discussion Guide

SURVEY: Locational Decisions of Companies in the Semiconductor Industry

A. LOCATIONAL DECISION-RELATED QUESTIONS

- 1) What is the most motivating factor when you make a decision on an overseas site location?
- 2) What other important factors do you take into consideration when deciding to locate to an overseas facility?

Please rank the factors most important to you, and rate them on the attached Ranking and Importance Form.

- () Highly skilled workforce (what are the important factors?)
- () Volume of nearby companies
 - Which is more important, potential customers or suppliers?
 - What type of companies (chip, equipment, components, tools, materials)?
- () Geographical advantage
- () Proximity to market
 - Which market (mainly Japan, or Asian countries, which country)?
- () Infrastructure (e.g., water supply, electricity supply, telecommunications, etc.)
- () Transportation (e.g., proximity to highway interchange, airports, ports, etc.)
- () Costs
 - Which costs concern you most? (e.g., labor, tax, etc.)
- () Living environment
 - Which factors influence you most? (e.g., cost of living, education, amenities, etc.)
- () Governmental incentives
 - What do you value most? (e.g., tax incentives, subsidies, assistance for starting businesses, etc.)
- () Other (Please specify: _____)

B. REASONS FOR MAINTAINING OPERATIONS IN JAPAN

- 1) What would you say are the top five reasons for keeping your operations in Japan? Please rank the reasons and rate them on the attached sheet [see Ranking and Importance Form].
 - () Highly skilled workforce
 - () Volume of nearby companies
 - () Geographical advantage
 - () Proximity to market
 - () Infrastructure (water supply, electricity supply, telecommunications, etc.)
 - () Transportation
 - () Costs
 - () Living environment (cost of living, amenities, etc.)
 - () Governmental incentives (tax, subsidies, assistance, etc.)
 - () Other (Please specify: _____)

C. FUTURE PLANS

- 1) If you think of investment in Japan, what sector would you choose?
 - Research & Development
 - Manufacturing
 - Marketing
 - Sales and Support
 - Others (Please specify:_____)
- 2) Do you think of investment in other countries?
- 3) Which country(ies) and why?
- 4) In what kind of activity would you choose to invest?
 - Research & Development
 - Manufacturing
 - Marketing
 - Sales and Support
 - Others (Please specify:_____)

D. ISSUES TO BE EXPECTED FROM THE REGIONAL GOVERNMENT

How would you expect a regional government to assist you in any location decision?
Please rank 5 reasons and rate them on the attached Ranking and Importance Form.

- Workforce education/training program (any specific program?)
- Strong financial incentives/subsidies/tax benefits, etc. How many years would you expect?
- Infrastructure development
- Transportation development
- Regulation-related issues
- Provision of basic information about the region
- Assistance for starting business (one-stop office)
- Leveraging the semiconductor industry
- Others (Please specify:_____)

E. OTHER ISSUES

How important are these issues, when you think of relocation?

- International schools for employees' children
- English-speaking personnel/staff with global experience
- Transportation (availability of air cargo, etc.)
- Jobs for spouses
- Others (Please specify:_____)

F. GENERAL QUESTIONS

- 1) How does Japan compare with other Asian countries as far as locating facilities?
- 2) What do you think about the protection of intellectual property rights?
- 3) If you are familiar with Kumamoto, what do you think of Kumamoto as a business location?

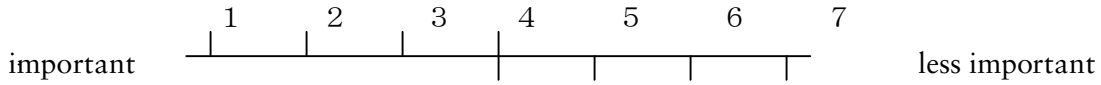
Thank you very much for your cooperation.

Appendix 3. Ranking and Importance Form

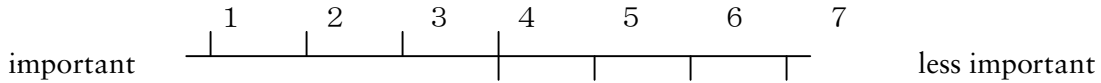
1. Most important factors when deciding to locate an overseas facility.

Please rank 5 of the most important factors and rate them.

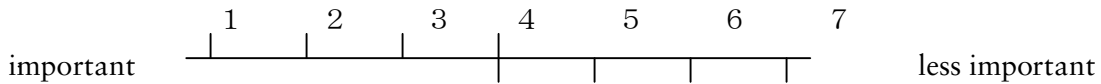
① Workforce



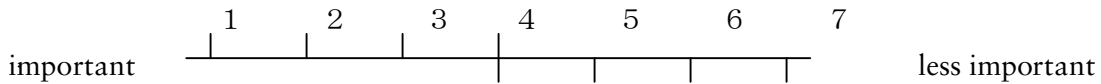
② Volume of nearby companies



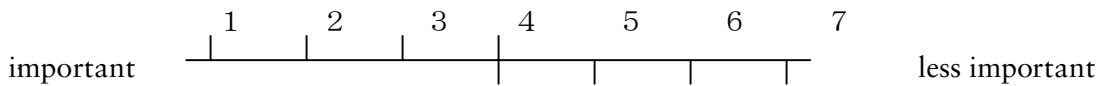
③ Geographical advantage



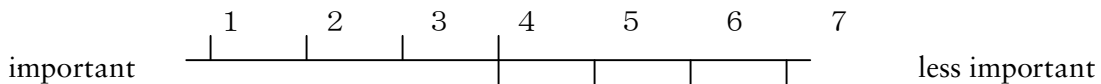
④ Proximity to market



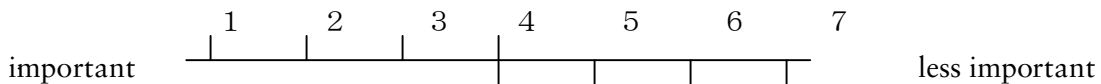
⑤ Infrastructure (Water supply, Electricity, Telecommunication, etc)



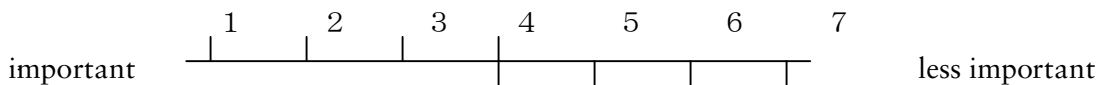
⑥ Transportation (Highway, Airport, Ports, etc)



⑦ Cost



⑧ Living environment



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