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The Semiconductor Industry in the Year 2000: A Global Case Study Examining Michael Porter's Industry Related Clusters and the Impact of Government Intervention

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THE SEMICONDUCTOR INDUSTRY IN THE YEAR 2000: A GLOBAL CASE STUDY EXAMINING MICHAEL PORTER'S INDUSTRY RELATED CLUSTERS AND THE IMPACT OF GOVERNMENT INTERVENTION

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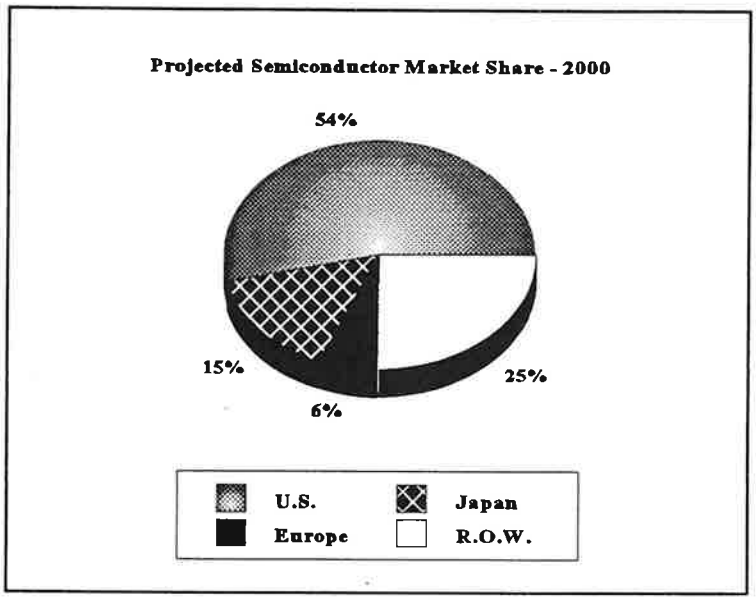
ABSTRACT

The semiconductor industry has attracted considerable attention during the last twenty years as a major high stakes entrepreneurial battlefield between American corporations and Japanese society. Recently, other Asian countries have made inroads into this industry. Consistent with Michael Porter's thesis on the importance of national industry related clusters (Porter 1990), this paper predicts that between now and the year 2000, the entrepreneurial characteristics of American companies will lead them to significant market share increases and that Japanese businesses will lose market share to other Asian companies, particularly in South Korea. Beyond the year 2000, the industry may evolve to the point where geographic areas concentrate on specific dimensions of the industry, with the United States strong in innovation and Asia emphasizing manufacturing efficiencies. Or perhaps deep cultural roots will enable Asia to assume overall global leadership encompassing partnerships developed with American companies. This paper acknowledges the importance of government intervention both in the United States and Japan in the early stages of the industry, but argues that the current maturity of the semiconductor industry no longer requires major government intervention.

INTRODUCTION

The semiconductor industry has attracted considerable attention during the last twenty years as a major high stakes business battlefield between American corporations and Japanese society. Recently, developments in South Korea and Taiwan suggest a global widening of this competition. Consistent with Michael Porter's thesis on the importance of national industry related clusters (Porter 1990), this paper predicts that between now and the year 2000, the innovative characteristics of American companies will lead to significant increases in their market share for key segments such as FLASH memory, microprocessors, and successful niches in specialized Random Access Memory segments. Japan will still be strong in commodity memory markets, but will yield market share to other Asian countries, particularly South Korea and Taiwan. Beyond the year 2000, the industry may evolve to the point where geographic areas concentrate on specific dimensions of the industry, or perhaps Asia will assume overall world leadership encompassing strong partnerships developed with American companies.

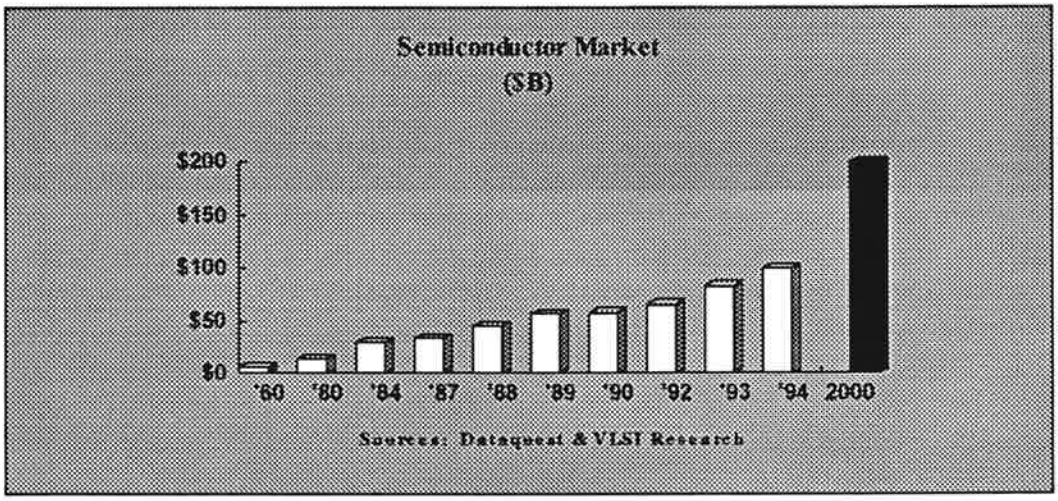


Source: VLSI Research (Hayes 1993)

This paper will briefly review the history of the semiconductor industry, concentrating on three major segments: the Dynamic Random Access Memory (DRAM), the microprocessor, and the FLASH memory segments. This historical review acknowledges the importance of government intervention both in the United States and Japan in the early stages of the industry, but argues that the current maturity of the industry no longer requires major intervention by these governments and that the inherent differences among the industry related clusters around the world will lead for the near future to a natural global market structure with the United States strong in innovation, Asia emphasizing manufacturing efficiencies, and Europe struggling to compete in this industry.

HISTORICAL DEVELOPMENTS

The chart below shows the explosive growth of semiconductors from 1960 and the projected doubling of industry sales from 1994 to the year 2000. The early stages of the industry in the 1960s and 1970s were characterized by American innovation in all segments of the industry



(Butler 1993)

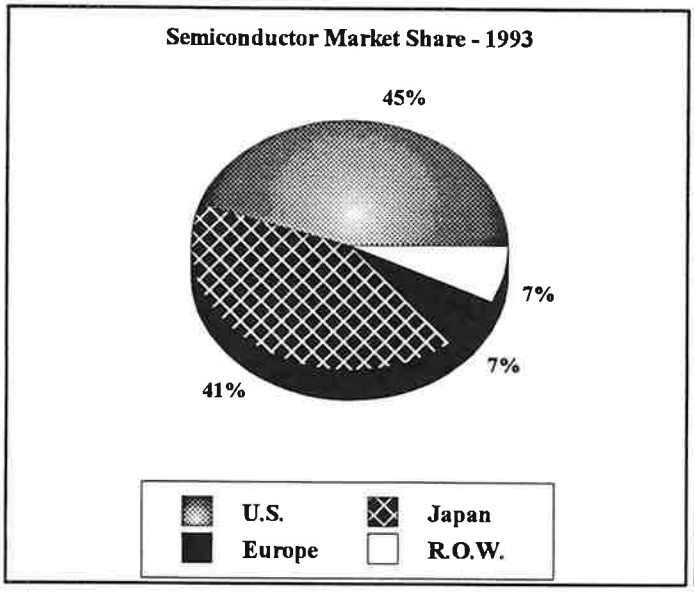
and by aggressive actions of the Japanese government to protect its market by restricting the activities of American companies; and subsidizing the growth of local companies. By the late 1970s, American companies began to complain about Japanese dumping practices. The impact of Japanese industrial policy is reflected in the dramatic shift in market share from 1978 to 1986, when the Japanese share in DRAMs went from only 25 percent to over 75 percent. At this time many American companies were forced to withdraw from this segment of the industry. To counteract Japanese competition, American semiconductor companies created the Semiconductor Research Corporation in 1982 to fund cooperative industry research and to enhance curriculum development in American universities. Another part of the response by the American government was the creation of the Defense Advanced Research Agency (DARPA) by the Department of Defense. Sematech, a research consortium of fourteen American semiconductor manufacturers was also formed in 1987 and received half of its annual budget from the government. Government funding for Sematech continued until 1994, at which time it was funded purely from industry participants. The battle between the United States and Japan reached a crescendo in 1986 when the Japanese government agreed to a target of 20 percent foreign market share in Japan by 1991 (Tonelson 1994).

The semiconductor battlefield expanded globally in 1988 when the South Korean government initiated a five-year program aimed at catching up with the Japanese in memory technology. This effort was funded with $500 million from Korean companies and $270 million

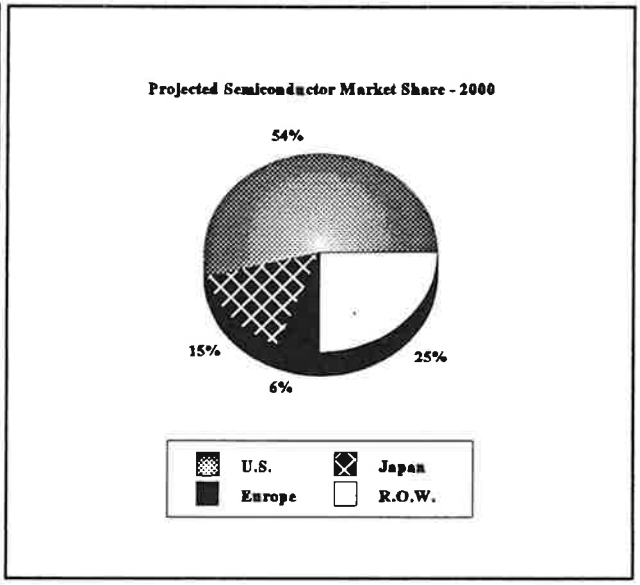
from the South Korean government. By 1992, South Korea had semiconductor exports of $6.7 billion (Kim Nak-Hieon 1993).

By 1993, as shown below, the efforts of governments and companies around the world led to the United States and Japan both having market shares of over 40 percent, with Europe having only 7 percent, and other Asian countries also at 7 percent, but experiencing rapid growth (Hayes 1993).

An indication of emerging Asian strength is that Samsung of South Korea was the first company in the world to market a 16 megabyte DRAM chip. The competition between Japan and



Source: VLSI Research (Hayes 1993)



Source: VLSI Research (Hayes 1993)

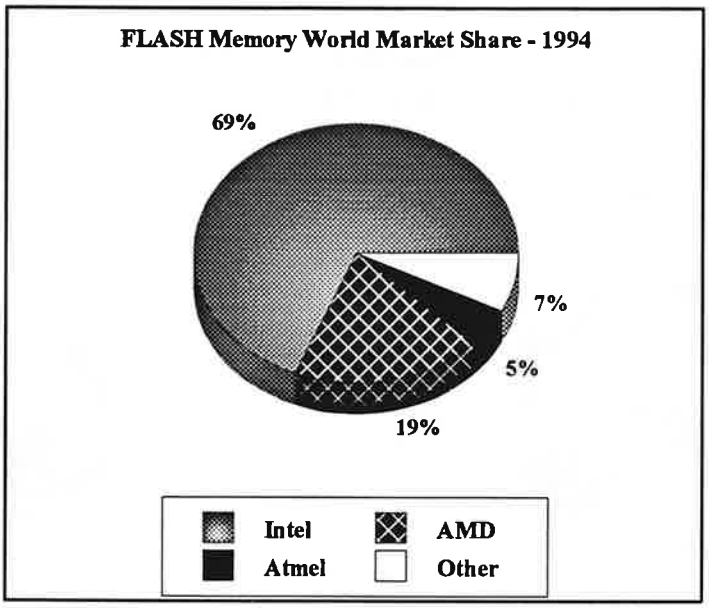
other Asian countries supported by government subsidies has resulted in major oversupply conditions and severe price cutting for commodity chips, while American companies have prospered in the newer, innovative segments of the semiconductor industry.

REASONS FOR AMERICAN RESURGENCE

American growth has been fueled by advances in the semiconductor equipment manufacturing industry, by software innovation, and by the creative design skills involved in developing new chips. This synergistic combination is exemplified by Intel, Microsoft, and the many software firms providing user friendly applications. American culture may be a strong competitive force in that, "Software is more of an art than effort; the best programs are written by talented individuals not by teams, which is why the U.S. still leads. Meanwhile, Japan spends

millions trying to find hidden patterns so as to reduce it from an art to a process." (Herbig and Palumbo 1994).

American strengths in design are also reflected in the FLASH Memory market.



Source: Dataquest (Electronic News 1994)

FLASH memory does not need power to retain its content and is the major breakthrough in enabling the rapid growth of portable, lap-top computers. Although Toshiba originally developed the technology, Intel and Advanced Micro Devices were the first to aggressively pursue this market; dominating it in 1994 with a combined market share of 85 percent (Electronic News 1994).

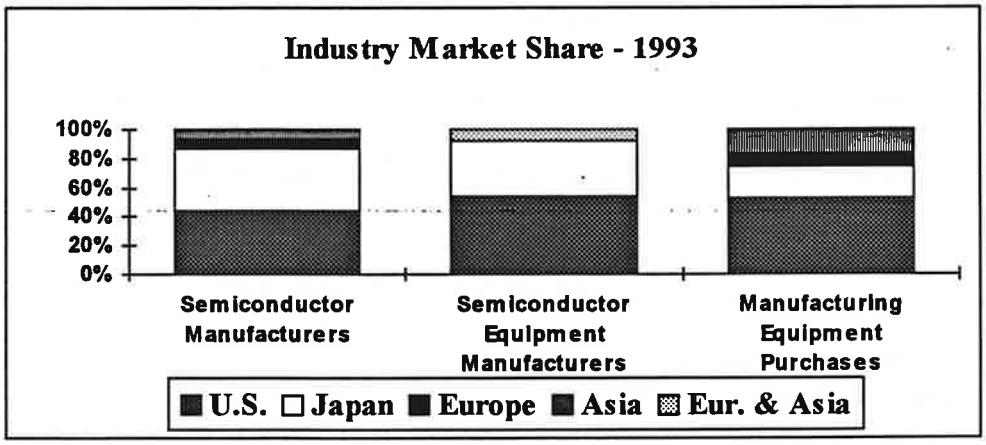
Advocates of timely government intervention to serve as a national catalyst for developing successful industry clusters can point to the 1987 formation of Sematech. The American government provided annual funding of $100 million which was matched by the consortium of fourteen American semiconductor manufacturers. The goal of Sematech was "to bring U.S. semiconductor manufacturing capability to equal or exceed the world's best. This includes the design for manufacture as much as the manufacturing process." This occurred at a time when American semiconductor manufacturers found key manufacturing equipment made in Japan was not made available to them in as timely a manner as it was to their Japanese counterparts. From 1987 through 1992, Sematech generated 51 patent applications, 1100 technical documents, and perhaps even more importantly, developed more than 300 industry standards. Sematech coordinated university research and provided an industry-wide forum to enhance the American

semiconductor industry cluster. The benefits of Sematech were initially made available to all consortium members and eventually to all U.S. companies within this cluster, to help promote overall American competitiveness in this industry. The General Accounting Office of the United States Government published a report on Sematech in 1992, concluding that it was a success and a model for similar consortia in the future (C. Richard Deininger 1994).

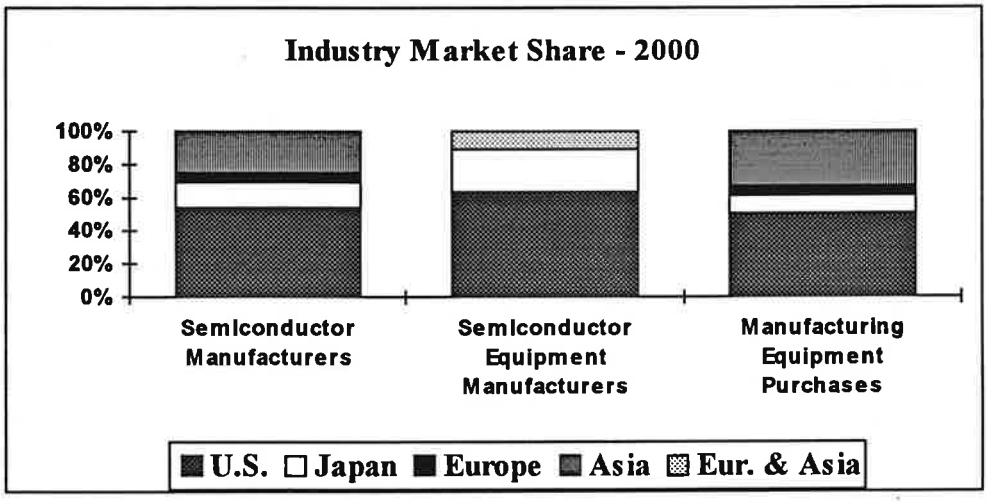
INDUSTRY RELATED CLUSTERS

Using Michael Porter's industry clusters as an analytical framework, the United States has exhibited several strengths, including a diversified group of companies located not only in Silicon Valley, but also in Texas, New Mexico, and Arizona. These companies maintain a close relationship with local universities and suppliers. In addition, American software companies are frequently nearby which facilitates close collaboration, particularly in developing new applications for hardware and software. This synergistic grouping of small and large companies has created a fertile entrepreneurial environment in contrast to Japan, whose efforts are concentrated within large bureaucratic companies with strong manufacturing roots and a pattern of incremental process and product improvement. This provides strengths for Japan in large volume markets such as memory chips, but has not been advantageous in entrepreneurial innovation.

Though competing for a number of years in this industry, the Europeans have not prospered. A primary reason for this may be the failure on their part to develop full industry clusters, as they lag considerably in the supplier and equipment manufacturing segments of the cluster. South Korea has the advantage of lower costs than Japan and the focused concentration of Samsung made it the world market leader in 1994 for memory chips. However, to date South Korea has not developed the full industry clusters prevalent in the U.S. and Japan. They need to do this to prevent the vulnerability the U.S. experienced in the mid-1980s when the Japanese semiconductor equipment manufacturers gave Japanese semiconductor manufacturers a significant advantage by selling to them first. If the South Koreans correct this vulnerability, then, to use a famous Michael Porter phrase, Japan may be stuck in the middle between Korea and the United States; unable to compete in either the price or the innovative segments of the market. Market share data for 1993 and a forecast for the year 2000 by VLSI Research is shown below (Hayes 1993):



Source: VLSI Research



Source: VLSI Research

FUTURE GOVERNMENT INTERVENTION

The 1970s and 1980s were decades when both the Japanese and American governments intervened to support national semiconductor efforts. Although American companies were initially savaged by Japanese targeting, the combined private and public restructuring efforts resulted in an American industry which is currently very healthy. The American media has emphasized the power of Japan, especially in high technology electronics, but the truth appears to be that the American industry is well positioned for future global competition and does not need major help from the federal government. The powerful Japanese companies have enormous resources and also do not need assistance from their government, which has been weakened by a series of political changes in the last five years (Wall Street Journal 11 July 1995). Additionally, the large trade surplus of Japan has resulted in sharp appreciation of the yen and decreased global

political changes in the last five years (Wall Street Journal; 11 July 1995). Additionally, the large trade surplus of Japan has resulted in sharp appreciation of the yen and decreased global competitiveness for all Japanese products including semiconductors. Despite the admiration for the Japanese Ministry of International Trade and Industry (MITI) and the Japanese semiconductor cluster expressed by Michael Porter in 1990, the original natural cluster developed in the U.S. now appears to be stronger than the heavily subsidized "artificial" cluster developed in Japan. The implication is that countries where clusters originate naturally can effectively compete with less government assistance than those copied and developed through government intervention. South Korea is still a developing country that may merit some targeted assistance for its semiconductor industry, especially in fully developing their industry cluster. However, the Korean semiconductor industry should be watched carefully by both the United States and Japan to prevent any further dumping incidents similar to those settled between Korea and the U.S. in 1993.

Perhaps the best global industrial policy for the semiconductor industry is to acknowledge that the world has several highly competitive industry clusters, each with their own strengths and weaknesses. *It is now time to allow uninhibited natural market forces to provide the benefits of enhanced technology to consumers all around the world.*

GLOBALIZATION OF INDUSTRY CLUSTERS

Today we are just beginning to evolve to the next phase of this global industry. In the coming phase over the next five years, the United States will be the major R&D and design center for the industry, while Asia will become the major fabrication center. Europe may continue to play a minor role as a fabrication center also. Companies such as Texas Instruments, Advanced Micro Devices, and Intel have major Japanese partners and perform substantial amounts of production in Asia. Texas Instruments moved all DRAM production out of the United States years ago. Intel enlisted a Japanese partner to do foundry work for their FLASH memory production. Advanced Micro Devices and NEC built a huge fabrication facility to produce FLASH memory, again in Japan. Additional support for Asia becoming the dominant manufacturing center for semiconductors is the fact that in 1994 there were forty-seven fabrication facilities under construction throughout the world, with two-thirds of these fabs being built in Asia (Economist 2 April 1994). Further evidence of the move to geographic specialization is the agreement between Cirrus Logic Inc. and Taiwan Semiconductor Manufacturing Company (TSMC). Cirrus is a design house without manufacturing capabilities, while TSMC is a fabrication facility without design capability. The deal calls for TSMC to produce chips designed by Cirrus (Jonah McLeod 1995).

In support of the United States becoming the primary R&D and design center we find Asian companies investing heavily in research facilities for college campuses in the United States. Toshiba and the University of California Irvine are an example of this partnering, Toshiba will provide the facility and will gain access to semiconductor technology research results. Samsung

The United States semiconductor manufacturing equipment industry has long been known for breakthrough technology, but with a relatively poor reliability rate in comparison to their Japanese competition. The combination of U.S. design, coupled with Asian process/manufacturing prowess, would benefit this global industry greatly. Beyond the year 2000, the industry clusters may further evolve. Of particular interest is the potential of Korea.

POTENTIAL SEMICONDUCTOR CAPABILITY OF KOREA AND ASIA IN THE YEAR 2005

For many years, most of the attention in the semiconductor industry has focused on the United States and Japan. But recently, media coverage has expanded to include other Asian countries. For example, in July 1995, a cover article in *Business Week* (31 July 1995) featured the growing potential of Korea, particularly in high technology fields including the semiconductor industry. These activities raise the issue of future Asian participation in the semiconductor industry. Will Asia in one form or another aggressively seek to take global leadership in the industry? If so, how? Will Japan, Korea, and Taiwan as nations strive to be full-fledged semiconductor industry players or will they concentrate on specific segments within the industry? Will the nations and companies of Asia pursue economic convergence so that an overall Asian industry cluster emerges rather than nation specific clusters?

To gain further insight into these issues, the exhibit below has been developed. Six major factors have been identified and ranked by the authors on a scale of one to ten for 1995 and 2005. This exhibit is not meant to be a definitive assessment or forecast (that would require more rigorous research and analysis), but has been formulated to explore future Asian possibilities. The exhibit reflects the common assessment that currently the United States is strong in entrepreneurial innovation and the Asians are the leaders in chip manufacturing. Will this pattern continue over the next ten years or will Asia, and Korea in particular, become even more ambitious and seek to create their own intellectual capabilities to become the global leader in developing and manufacturing new breakthrough products?

1995 SEMICONDUCTOR INDUSTRY FACTOR ASSESSMENT

The overall semiconductor industry capability scores in the 1995 assessment are consistent with the analysis by VLSI Research of 1993 data and their forecast for the year 2000. Their data shows the United States as not only the 1993 market share leader, but they forecast that American strengths will lead to more business at the expense of Japan. The 1995 assessment also shows South Korea as a significant player, particularly in chip fabrication. Europe is weak and Taiwan is a small player, although of growing importance, particularly in wafer manufacturing (Huang 1995). In terms of evaluating economic competitiveness, the *Business Week* (31 July 1995) article on Korea mentioned the combination of the strong yen and lower Korean labor costs as enhancing the competitiveness of Korean companies, particularly in market situations that are price sensitive. To take this into account, the exhibit includes a cost adjustment of a negative 15 percent for Japan and a positive 15 percent for South Korea and Taiwan. The exhibit thus has two overall scores: the first, an overall semiconductor industry *capability* score which shows the United States and Japan as the leaders for the next ten years, and second, an overall semiconductor industry *competitiveness* score including the cost adjustment factor which illustrates the economic potential of South Korea.

Semiconductor Industry Cluster Analysis
Future Possibilities in the Year 2005

Semiconductor Industry Factor	1995 Assessment				
	U.S.	Japan	Europe	Korea	Taiwan
Breakthrough R&D	10	7	3	7	3
University Resources	10	5	5	7	3
Software Development	10	3	5	2	2
Product & Process Design	10	10	5	6	4
Manufacturing Equipment	10	9	4	2	2
Chip Manufacturing	8	10	5	7	5
Overall Semiconductor Industry Capability	58	44	27	31	19
Cost Adjustment		-6		+5	+4
Overall Semiconductor Industry Competitiveness	58	38	27	36	23

2005 Possible Industry Competitiveness

	U.S.	Japan	Europe	Korea	Taiwan
Breakthrough R&D	10	6	4	8	4
University Resources	10	6	5	8	3
Software Development	10	5	6	6	3
Product & Process Design	10	10	6	8	7
Manufacturing Equipment	10	9	4	5	3
Chip Manufacturing	7	10	4	9	9
Overall Semiconductor Industry Capability	57	46	29	44	29
Cost Adjustment		-6		+3	+2
Overall Semiconductor Industry Competitiveness	57	40	29	47	31

2005 SEMICONDUCTOR INDUSTRY SPECULATION

Forecasting ten years from now in the dynamic semiconductor industry is very speculative, but the exhibit attempts to highlight future possibilities, particularly the potential of South Korea, who for several reasons may become the strongest competitor to Japan and possibly the United States as well. Korea has an unusual history, with important relationships to Japan and the United States. The Japanese occupation in the first half of this century has fueled strong Korean desires to surpass Japan. The Korean War led to extensive linkages between the United States and the people of South Korea. South Korea has a population of 45 million people with the potential to add 25 million more in North Korea if closer political and economic ties lead to an eventual reunion similar to Germany. Although North Korea could cause short-term burdens, a peaceful, unified Korea has the potential of becoming an economic powerhouse with 70 million people. Compared to Japan, Koreans place more emphasis on the English language and the pursuit of higher education in the United States. Many of the Ph.D.'s in South Korea attended American universities and Korean companies have aggressively hired long-term employees of American firms who want to return to their Korean roots.

The forecast for the year 2005 reflects the potential of South Korea, particularly in the industry factor of university resources. Korean schools emphasize math and science skills. Moreover, many top Korean scientists have attended American universities and are familiar with the breakthrough approaches of American research. That strong American connection is the reason for the score of eight in 2005 compared to a six for Japan. As for the other countries in the 2005 forecast, the assumption is made that the United States will stay relatively the same, Japan will improve slightly in university education, R&D, design, and software; Taiwan will also make significant improvements, but may not reach Korean levels because Taiwan has a population of

only 20 million and a problematic relationship with China. Although Europe should also improve, they most likely will still be behind the United States and Asia. As for the 2005 cost adjustment factor, the exhibit makes the assumption that a high yen will continue, but that Korean and Taiwanese labor cost advantages will decline. As the exhibit indicates, Japan may still maintain a lead in semiconductor industry capability, but exchange rates and labor cost variables may make South Korea more economically competitive.

Another interesting question for the future is to what extent do the six semiconductor factors interact synergistically within a country to enhance overall competitiveness or will the combination of specific national strengths and market forces lead to specialization in different segments of the market, with America being the innovative, entrepreneurial leader and Asia, particularly Korea and Taiwan, being the center for semiconductor equipment manufacturing and chip fabrication?

APPLICABILITY OF MICHAEL PORTER'S INDUSTRY RELATED CLUSTERS AND THE IMPACT OF NATIONAL CLUSTERS

Michael Porter (1990) has argued that the innovative cultural strengths of the United States have led to world leadership in the industry clusters of entertainment, software, and telecommunications. An interesting question to pursue is the extent to which the cultural strengths of Asian countries in mathematics and science education as well as manufacturing engineering could eventually result in the leadership of the semiconductor industry shifting to Asia. Pertinent to this analysis is the question of whether Asian countries will pursue largely national identities or if their companies will develop ever-increasing convergent relationships across national boundaries. These corporate alliances could incorporate strong American companies such as Motorola, IBM, and Texas Instruments with major Asian operations.

The combination of society-wide educational achievements in math and science and the high savings rate of Asians will enable aggressive investments by Asian companies in high technology industries. As the world economy becomes increasingly global and interdependent, the potential exists for Asian companies, led by thousands of Asian and American educated executives to develop creative alliances with American companies and universities. It is possible that powerful cultural forces are underway whereby the huge size of Japanese, Korean, and Chinese markets could easily evolve into Asia becoming the geographic center of a global semiconductor industry encompassing world-wide technology and business alliances.

In *The End of History*, Francis Fukuyama (1992), an American of Asian descent, argues that the Western ideal of market freedom has triumphed around the world thanks to American leadership. That may or may not be true, but it is also possible that as Asia moves beyond the Cold War, resources previously constrained by military and ideological burdens will now be

liberated. Powerful forces may now become fully unleashed that will enable the huge Asian populations and their ancient cultures to pursue new economic histories.

REFERENCES

Butler, Steven (1993). "Winning Chip Shots: America Has Surged Ahead of Japan in the Global Semiconductor Wars." *U.S. News & World Report* 114(8): 53.

Deininger, Richard (1994). "Sematech: A Successful Collaboration Between Industry and Government." *Bulletin of American Society for Information Science* (June/July): 19.

Fukuyama, Francis (1992). *The End of History*. New York: Free Press.

Hayes, Mary (1993). "Japan's Role in Chips Shrinking." *The Business Journal* 11(34): 1.

Herbig, P.A., and Palumbo, F. (1994). "A Brief Examination of the Japanese Innovative Process: Part 2." *Marketing Intelligence & Planning* 12(2): 40.

Hitachi Targets Flash with Mitsubishi Pact (1998). *Electronic News* 40: 1.

Huang, Charlene (1995). "Building on Success: Taiwan Continues Rapid Semiconductor Expansion." *Industry Week* 244(14): 57-59.

McLeod, Jonah (1995). "U.S., Asian Chip Firms Solve Each Other's Problems." *Industry Week* 244(12): 65.

Nak-Hieon, Kim (1993). "Korean Semiconductor Giants Race to Produce 16M DRAM, FLASH Memory." *Electronics* (June 11): 9.

Porter, Michael (1990). *The Competitive Advantage of Nations*. New York: Free Press.

Tonelson, Alan (1994). "Beating Back Predatory Trade." *Foreign Affairs* 73(4): 123-135.

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