Microeconomics of Competitiveness

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The Video Games Cluster in Japan

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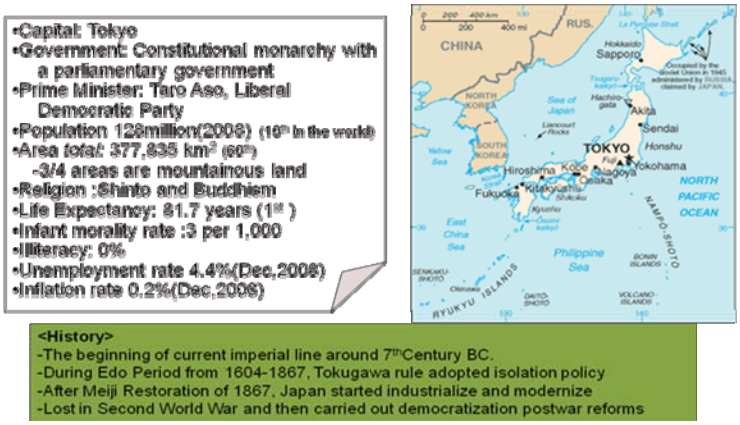
1.1 Brief overview of Japan

Overall picture of Japan :

Fig. 1 Overall picture of Japan



Japan has a population of 128 million (10^{th} in the world) with among the highest level of literacy in the developed world (Figure 1), dating back to the "Terakoya-system[1]" in the Edo-Era, Japan had an excellent education system. Today primary school literacy rate is around 100% and in secondary school around 99%. These factors contributed to create one of the strongest manufacturing industries in the world by in supplying highly educated engineers and high skilled factory workers to the market.

Japan is ranked second in GDP rankings by size with 8% of the World GDP (World Bank, 2007). However, in terms of GDP per capita, Japan's ranking has been on the slide since 2002, in 2007 Japan was ranked 14^{th} in the World (World Bank, 2007) (fig2 and fig3). This is due to the low economic growth and stagnation of the Japanese economy after the burst of the bubble economy in 1990.

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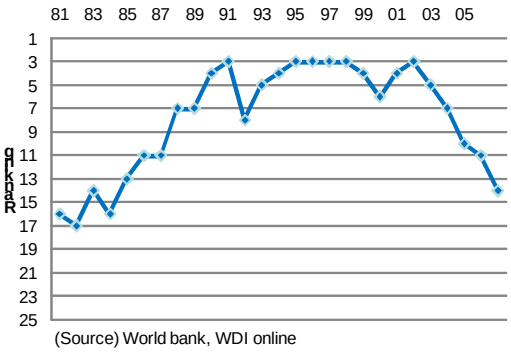
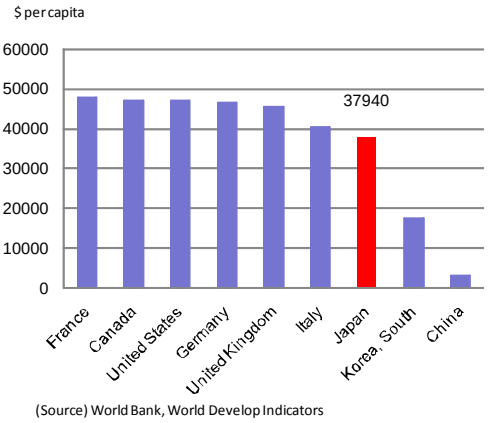
[1] Terakoya means temple schools. In the Edo era (1604-1867), 70-80% of children in Edo (Tokyo) went to these schools for basic reading, writing and calculation
Source: "Web Japan, 2009" (http://web-japan.org/tokyo/know/terakoya/tera.html)

Fig. 2 Ranking of Japan in GDP per capita



(Source) World bank, WDI online

Fig. 3 GDP per capita in 2007

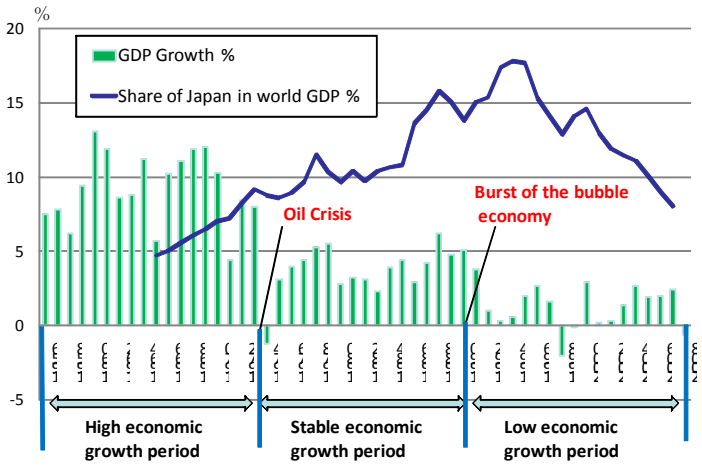


(Source) World Bank, World Develop Indicators

Economic Growth in Japan (History):

Ten years after World War II, thanks to successful policies Japan entered a high economic growth period (1956-1973). During this time, Japan experienced economic growth between 5%-13% (except for 1971)[2]. In 1973, the Oil crisis ended the growth period, and Japan sustained stable economic growth from 1973 to 1990. In 1990, after the burst of an economic bubble Japan faced a low economic growth period (1990-present) with GDP growth rates bellow 4% and even today Japan has still not recovered to its former levels.

Fig. 4 GDP growth rate and Share of Japan in the world economy

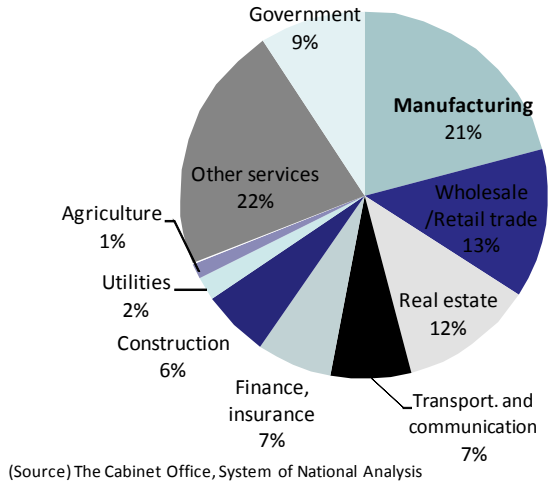


(Source) World Bank, World Develop Indicators, Japanese Cabinet Office, System of National Analysis

[2] World Bank, World Develop Indicators, Japanese Cabinet Office, System of National Analysis

The economy today:

Fig. 5 GDP by industry in Japan

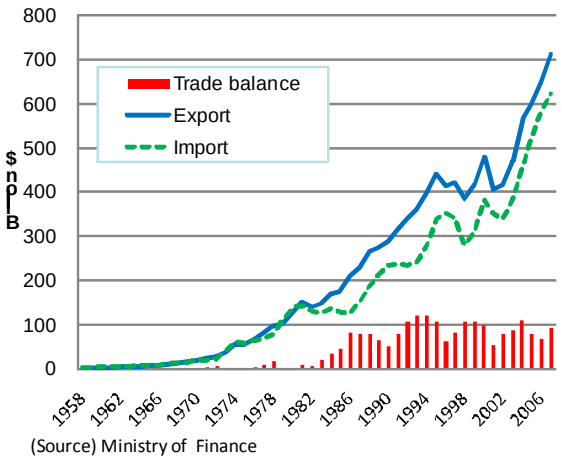


(Source) The Cabinet Office, System of National Analysis

As a legacy of the high growth years manufacturing still occupies the largest portion in the Japanese economy (Figure 5) [3] . The manufacturing sector is still world class and among other important sectors in the 1980's it led to the development of one of the world's most advanced electronics industry. The strength of the electronics cluster was a key factor condition enabling the development of the Japanese video industry in turn.

Trade Patterns:

Fig. 6 The historical trend in trade



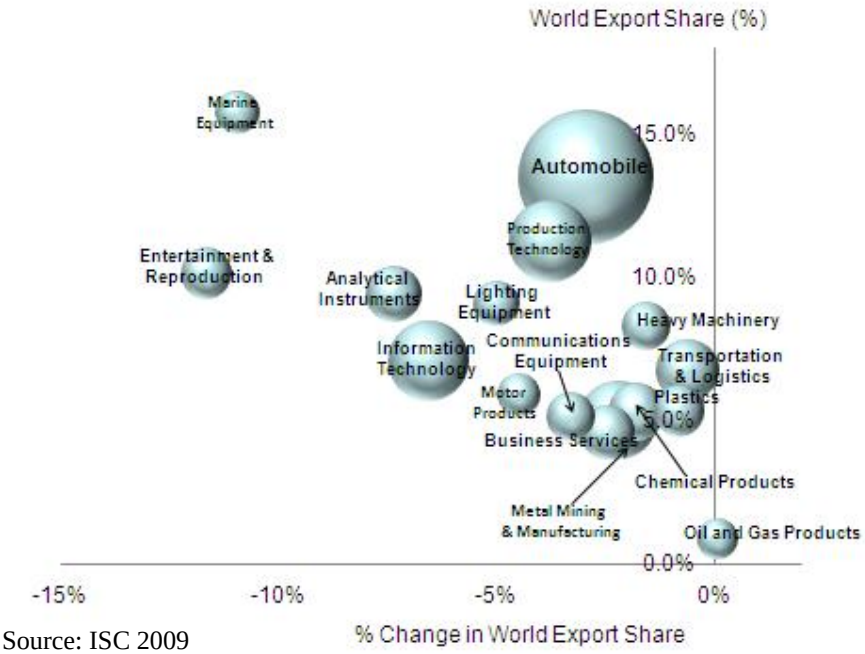
(Source) Ministry of Finance

Due to the strength in the manufacturing industry, Japan has enjoyed a trade surplus since early '70s (Ministry of Finance, 2008) (Figure 6). In the '80s, many economic conflicts occurred between Japan and Western countries (especially

[3] The Cabinet Office, System of National Analysis, 2008

US), and for this reason Japanese manufacturing companies started to localize their factories. This trend increased Japan's decrease in world export share[4] (Figure 7).

Fig. 7 Export Portfolio by Clusters, 1997 - 2007



Source: ISC 2009

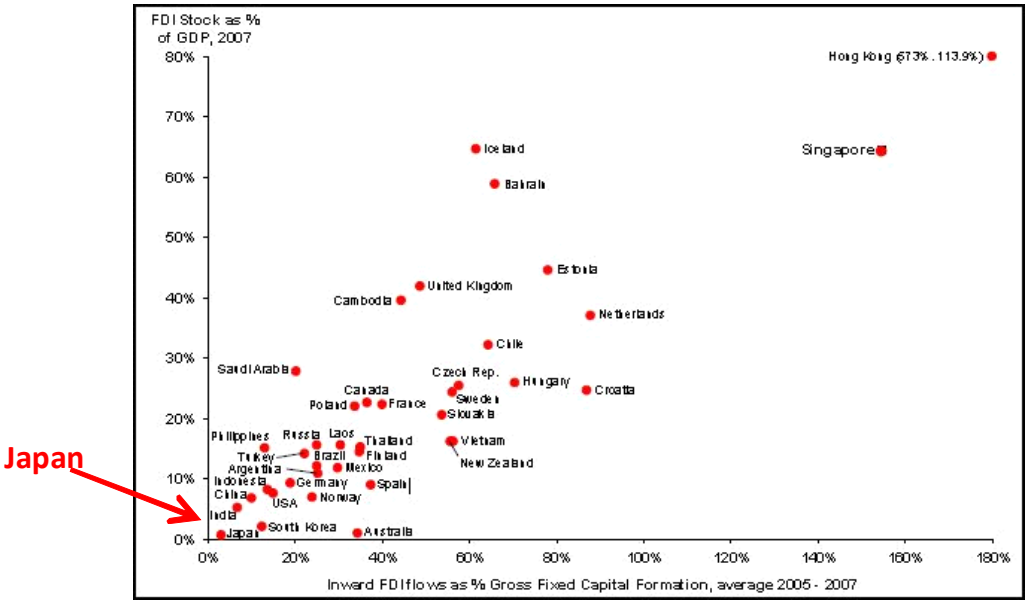
Foreign Direct Investment:

FDI has played a very limited role in Japan (Figure8) (HBS case, 2009). First, the Japanese consumer is very sophisticated and has unique taste in many products. Japan's buyer sophistication is 3rd in the world and is especially focused on new products and quality of goods & services. This provides a barrier to entry to non-Japanese companies who have to create new market strategies or products just for

[4] ISC 2009

Japan[5].

Fig. 8 Foreign Direct Investment Stock and Flows, 2005 to 2007



(Source) MOC class case "Remaking Singapore"

Second, Japanese business culture has a very unique system that non-Japanese companies find difficult to do business in. One example is the "Keiretsu" which is a business group of companies with shared history roots. A bank is typically at the center of the business group and there is a large amount of cross equity holdings between Keiretsu members cementing their shared incentives to stick together. After the 1990s' low economic growth period, "Keiretsu" groups got weaker because companies started to focus more on short term profit rather than the strategy of the entire group. For non-Japanese companies, it was difficult to understand and operate in this kind of culture limiting their ability to enter the market.

[5] For example, Nokia is known as providing cheap mobile phones to the emerging market, however for Japanese market, in 2009, Nokia announced to launch $60,000 mobile handset and opened a store in Ginza.
http://www.ft.com/cms/s/0/778caf0a-bcec-11dd-af5a-0000779fd18c.html

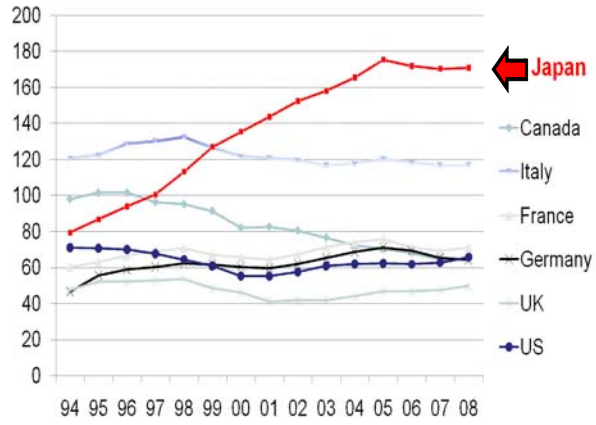
Third reason for low FDI was the protectionist government policies after WWII that aimed to spur Japanese industrial growth. For example, the government restricted foreign ownership rules limiting the ability for outsiders to acquire Japanese companies through M&A. This policy has changed since 80's and currently there are almost no barriers. Also, compared to other countries, the government has not promoted FDI with any sort of incentives.

Government Debt/ Change in Japanese Population:

There are two other important issues to understand Japanese competitiveness (Figure 9, 10).[6] First, the Japanese government debt has ballooned during the recession in 1990's and early 2000's and this still has an impact on the macro economy today. Second, due to low birth rates, Japan is facing decline in population and shifting toward an aging society. This will affect the customer base for may products including Video Games.

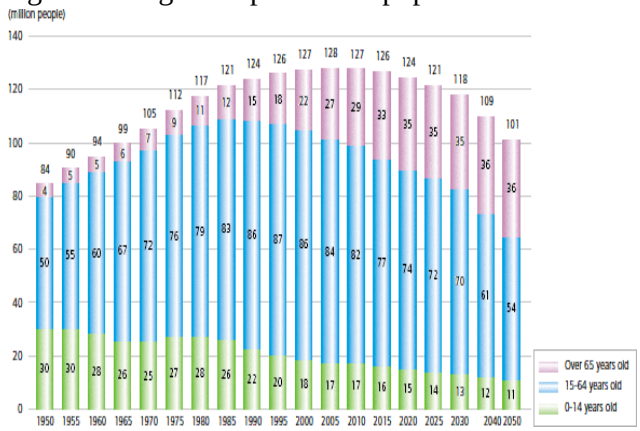
[6] : Japanese Ministry of Finance, OECD, Economic Outlook (July 2008).
"Japan in Figures 2006," "Population Census 2005," Ministry of Internal Affairs and Communications

Fig. 9 Government bonding outstanding



Source : Japanese Ministry of Finance
OECD, Economic Outlook (July 2008).

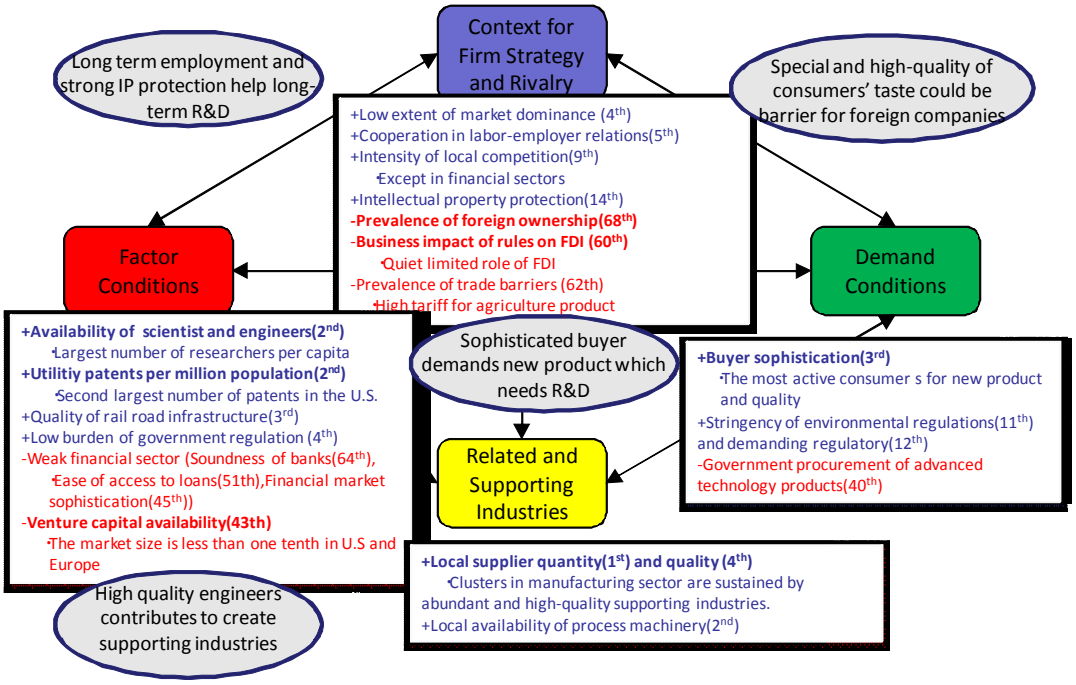
Fig. 10 Change in Japan's total population



(Source) „Japan in Figures 2006," „Population Census 2005," Ministry of Internal Affairs and Communications

1.2 The Diamond Analysis of Japan

Fig. 11 The summary of country diamond



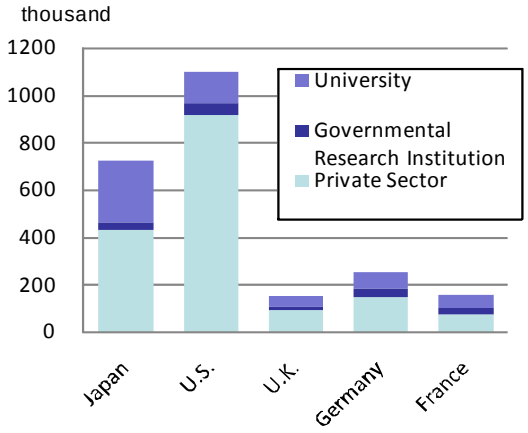
<u>Factor conditions</u>:

Japan has a very large talent pool of scientist; it is ranked number two just after the U.S and ahead of Europe (Fig.12). However, considering the number of researchers per

GDP, Japan is the leader (Fig.13). This helped the development of supporting industries for Video Games especially in the manufacturing sector. One of the reasons of this advantage is that Japanese education focuses on math and science subjects. Another reason is that as described in previous section, the portion of manufacturing sector is relatively large in the economy, so the private sector is hiring large number of researchers.

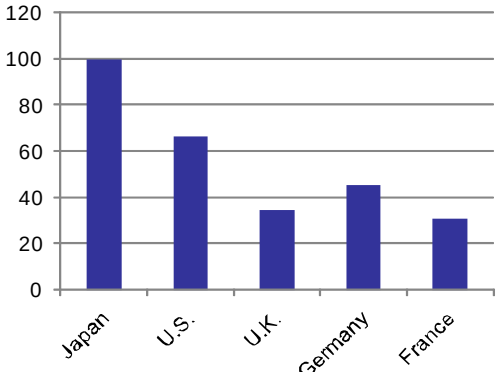
The number of patents is another strong point (2nd). Taking the number of utility patents registered in United States Patent and Trademark Office, Japanese number is

Fig. 12 The comparison of the number of researchers



(Source)OECD, "Main Science and Technology Indicators"

Fig. 13 The number of researchers per GDP ($billion)



(Source)OECD, "Main Science and Technology Indicators"

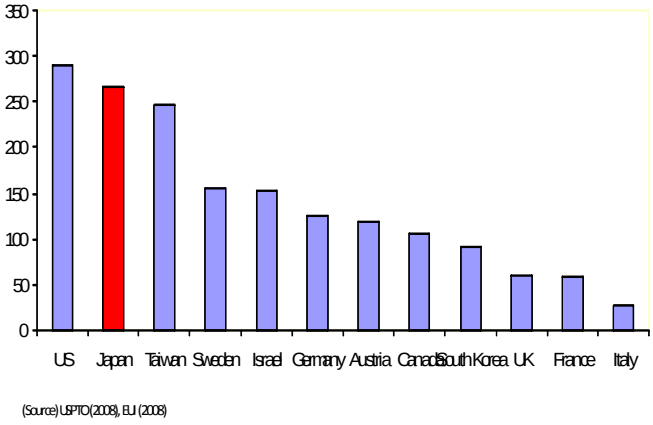
almost same as U.S and larger than any other countries (Fig14). One of the reasons of high patents rate is the rapid product cycles fueled by the sophisticated Japanese demand. Another reason is the long term employment practices that can enable technicians or researchers to focus on R&D which takes a long time.

In addition, the quality of rail road infrastructure (3rd) and low burden of

government regulations (4th) are strong points, too.

However, the weak financial sector is big disadvantage. Soundness of banks (64th), ease of access to loans (51st), financial market sophistications (45th) are all weak. The biggest reason is government policies. Japanese capital market regulation was designed to protect share-holders' by ensuring that securities firms stayed in business (Porter, 2000). The Japanese government did not let financial organizations compete, and tried to avoid bankruptcy by providing all sorts of measures, it took the "escort fleet system" to protect and advance the whole of financial organizations (Kishimoto,2000). Since 90's, the government relaxed these policies, but the speed of the reform was relatively slow compared to other countries such as Singapore and Hong Kong. Also during 90's when foreign financial companies developed new business models and financial technology, Japanese companies were slow to clear their books of nonperforming loans, a left over from the burst of the bubble economy.

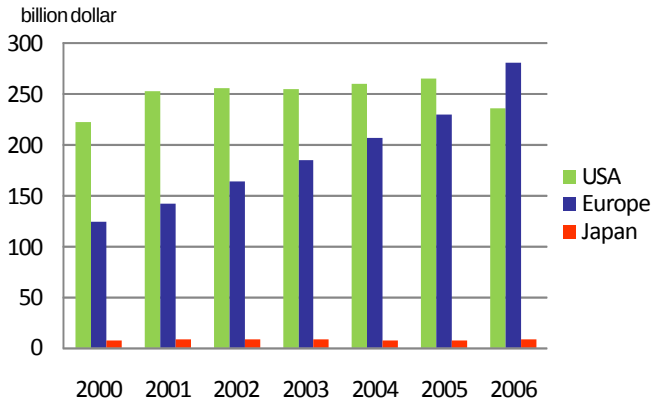
Fig. 14 The number of patents per population (million)



(Source) USPTO(2008), EU (2008)

With respect to venture capital (43rd), Japanese market size is very small compared to U.S and Europe (Fig.15). One reason is the small number of entrepreneurs. Most young people prefer to work in big corporations rather than in start-up companies. Among the adult population (18-64years) only 26% consider entrepreneurship as a desirable career choice, while the number is 69%, 63% and 56% in Korea, U.S and Germany respectively (Global Entrepreneurship Research Consortium, 2009). Also Japanese banks often demand personal guaranties from entrepreneurs for loans, and they do not lend money again to entrepreneurs who have failed. These lending practices discourage would be entrepreneurs. The Japanese government took several measures to help foster entrepreneurship. For instance, the government revised the company laws in order to relax the capital regulations regarding opening business in 2006[7], little capital is required to open a businesses while more than hundred thousand dollars was necessary in the past.

Fig. 15 The comparison of the size of venture capital



(Source) Venture enterprise center "Research on venture capital investment, NVCA Yearbook 2007, EVCA Yearbook 2007

[7] The site of Ministry of Justice (http://www.moj.go.jp/HOUAN/houan33.html)

Context for firm strategy and rivalry:

Highlights here are low market dominance (4^{th}), cooperation in labor-employer relationship (5^{th}), intense local competition (9^{th}), and IP protection(14^{th}). The IP protection is especially important for the technologically intensive manufacturing/electronics sector that relies on R&D breakthroughs for its new products. As for labor-employer relationship, Japan has traditionally had lifetime employment, which helps good relationship between management and employees but limit competitiveness of the human capital, although this practice is changing.

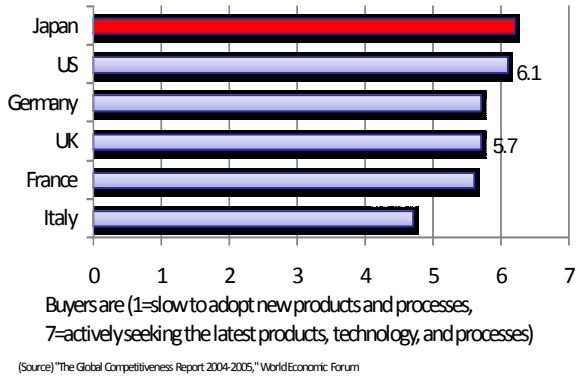
Overall competition is very strong, there are large number of companies in both manufacturing and service sectors. For example, in the auto industry, there are eight big competitors in Japan. The strong IP protection contributes to the development of software or other contents industry, and R&D activities. However, the problem is the lack of foreign company presence and FDI (68^{th}) as mentioned previously.

Demand Conditions:

A very high degree of consumer sophistication (3^{rd}) is a key characteristic of Japanese demand, consumers have strong preference for new products (Fig16), which create a need for rapid product cycles. Another character is Japanese are uptight about the quality of goods, a preference which can be linked to Japanese culture. Also

sophisticated demand is the result of customer's experience and learning in related industries. Consider the car audio industry. Because most Japanese households own high-quality audio systems, customers demanded the same sound quality in their cars. Meeting these challenges made Japanese car audio manufactures internationally competitive (Michel Porter, ,2000).

Fig. 16 Comparison of consumer's preference to new products



(Source) "The Global Competitiveness Report 2004-2005," World Economic Forum

In addition, stringent environmental regulations (11th) and demanding regulatory standards(12th) are considered to be good. However, government procurement of advanced technology products is relatively weak (40th).

Related and supporting industries:

The strength are local supplier quantity (1st) and quality (4th), especially in the manufacturing sector there are many related clusters such as transport, general and electrical machinery. In addition, the relationship between final product companies and supporting industries are traditionally strong, which help to sustain innovation in large companies.

The cluster policy of Japanese government:

Ministry of Economy, Trade and Industry (METI) has championed an "Industry Cluster Plan", that aimed at the development of the clusters in which innovations and new ventures are created. Currently there are 18 projects, which are carried out through collaboration between METI, about 10,700 private companies, and 290 universities (Industry Cluster Plan, 2000). The government supported the creation of a network among government, industry and academia by facilitating information sharing and providing limited financial support.

2. The analysis of the video game cluster

(1) The brief overview: History

The video game consoles appeared in the U.S. during early 1970s. The *Magnavox Odyssey* – the first video game console in the world – was released in 1972, followed by *Atari Pong* which became the first commercially successful video game in world.[8] *Atari 2600* released in 1977 recorded total sales of more than 25 million units.[9]

During early 1980s, however, video game business in the U.S. began to fade after what was called "video game crash of 1983". Meanwhile, *Nintendo Family Computer* released in 1983 became a huge success in Japan. Nintendo started to export it (named *Nintendo Entertainment System* (*NES*) with minor model change) to the U.S.

[8] Wikipedia: http://en.wikipedia.org/wiki/Pong
[9] Console Passion Retro Games: http://www.consolepassion.co.uk/atari-2600.htm

and European countries in 1985 and soon dominated the global market. In 1989, Nintendo released the first portable game console *Game Boy*.

The industry continued to grow through 1990s. Sony Computer Entertainment (SCE) was the first successful new entrant into the market in 1994 releasing *Play Station* which took the top spot away from Nintendo. New technologies such as optical discs enabled larger data capacity and improved graphics and sounds. In the late 1990s, online games appeared particularly in Korea.

In 2000s, the sales continued to grow due to the introduction of new consoles with better graphics, memory and capabilities. Microsoft was the first non-Japanese to enter the market releasing Xbox in 2002, and it has been stuck at third place ever since struggling to make profits. The market continues to expand in the last couple of years with the introduction of new consoles; *Nintendo Wii*, *Play Station 3* and *Xbox 360*.

Why did the U.S. fail?

The shift of the home base from the U.S. to Japan can be attributed to both Nintendo's corporate strategy and Japan's unique business environment. Since the major cause of the failure in the U.S. market was the flood of low-quality software, Nintendo introduced a tight quality-control policy over third party software makers by creating a licensing system where Nintendo checks the quality of software before being

released.[10] The difference in supporting industries was also critical. In particular, the presence of unique cartoon and animation cluster in Japan greatly contributed to the supply of high-quality software. For example, Shigeru Miyamoto – a legendary game developer who created many early hit titles including *Super Mario Brothers* and *the Legend of Zelda* – had once been an amateur cartoon artist and was hired by Nintendo not as a game developer but as a designer.

Japan retains this advantage over the U.S. even today. Other strengths of the Japanese cluster include the strong consumer electronics cluster and the quality of demand including high per capita consumption on video games. On the other hand, the U.S. has advantages in the strong entertainment industries including movies and professional sports and the strong entrepreneurship. These factors help U.S. companies to increase their presence in the software market but not in the hardware space.

Global Market

The video game market has grown and continues to grow rapidly. The annual sales of hardware and software grew at CAGR of 23% and 26% respectively since 1982, reaching some 100 million and 500 million units respectively in 2008.[11] The sales of home and portable game consoles today are roughly the same.[12]

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[10] The History of Nintendo: http://www.geocities.co.jp/Playtown/4007/phy07b.html (In Japanese)
[11] VideoGameCharts.com: http://www.vgcharts.com/index.html
[12] Ibid

Three companies – Nintendo, SCE and Microsoft – compete in the global hardware market today. Two Japanese companies dominate the hardware market accounting for 92% of the total unit sales in 2008.[13] On the other hand, numerous firms compete in the software market without any such dominant players.

Export-driven growth in Japan

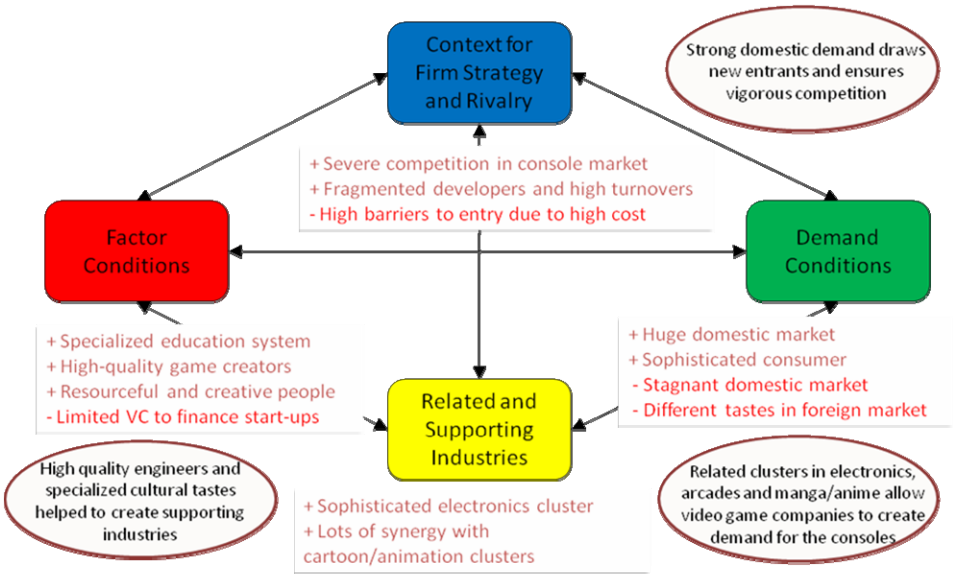
The sales of video games have expanded rapidly since early 1980s particularly after Nintendo launched *Nintendo Family Computer*. The total shipments by Japanese companies including both hardware and software reached a record-high level of 2.9 trillion yen in 2007 (CESA, 2008). The growth has been driven by exports to foreign markets – in particular, the U.S. and European countries – which accounted for nearly 80% of the total shipments in 2007 (CESA, 2008). Moreover, the recent growth was led by newly introduced hardware such as *Nintendo Wii*. Hardware accounted for more than 70% of the total shipments in 2007 (CESA, 2008).

(2) The diamond analysis

Cluster diamond

Fig. 17 The summary of cluster diamond

[13] Ibid



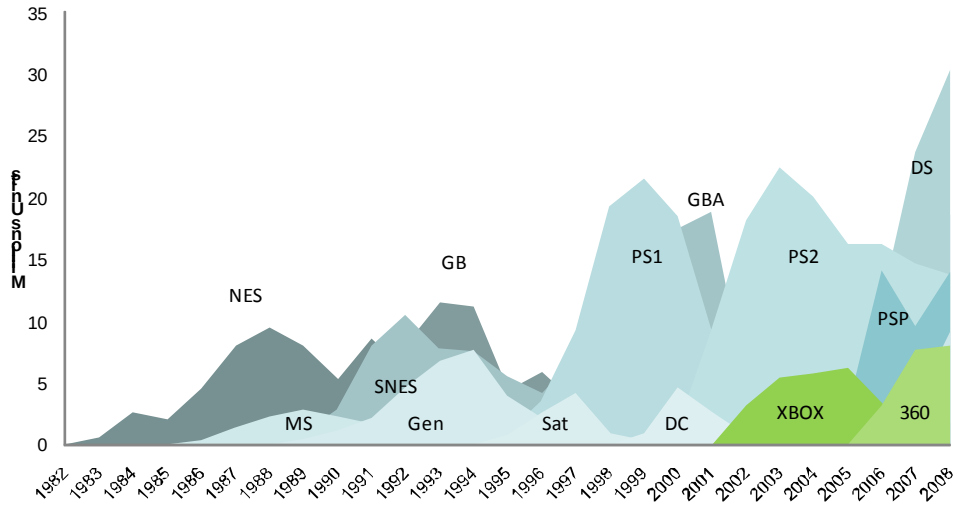
The figure above shows the cluster diamond. Among many factors that contributed to the development of the cluster, strong related and supporting clusters in electronics and cartoon/animation and huge domestic market with sophisticated consumers, we believe, are the key factors that enabled the tremendous success of the cluster up to date. We will discuss each corner of the diamond in turn.

Context for firm strategy and rivalry

Severe competition in the hardware market drove the innovation and contributed to the cluster development. Although there are only a few companies in the market, the short life-cycle of products put a lot of pressures on companies to introduce new models every several years by continuous innovation (Fig. 18). The notable exit of NEC and SEGA (once 2nd largest market share globally) as well as the failed entry of dozens of other manufactures underscores the intense competition in the market despite the limited number of current players. In addition, the entrance of Microsoft in 2002,

the first non-Japanese company since the 1980s further fuels competition.

Fig. 18 Hardware product cycles



(Source) VGchartz, NPD, firm annual reports

Severe competition also existed in the software market. Software market is much more fragmented including numerous start-ups firms (mostly outside Japan) and characterized by high turnovers and consolidation. This competition also helped the growth of the cluster.

Although hardware makers had strong controls over software developers in the early days, the power gradually shifted to the software side. While exclusive content was the main differentiation tool for hardware makers in the past, most software is sold for multiple platforms today. This change has mixed implications. On one hand, consumers benefit greatly from the broader choices of software that they can enjoy with their hardware. On the other hand, lack of exclusive contracts could be a threat to the sustainability of the hardware makers' "razor blade" business model, where they gain

profits from license fees based on the sales of software for their platforms rather than the sales of hardware which are very costly to develop and retail.

Demand conditions

The huge domestic market is a major advantage for the cluster. Especially in 1980s when the cluster started to grow, Japan was in the midst of an economic boom and the cluster took advantage of the large middle class population in Japan.

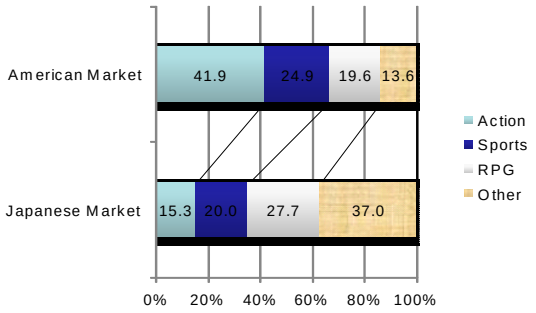
Japanese consumers also tend to spend more on video games. Per capita consumption on video games in Japan was 4,691 yen (approximately US$47), while that in the U.S. was only US$5.2 in 2007 (CESA, 2008). This is partly explained by the spread of video arcades (called "game centers" in Japan) that stimulates the demand for home video games. The number of video arcades per population in Japan was more than 4 times that in the U.S. in 2004.[14]

The cluster, however, faces new challenges today. While the global market is expanding, the domestic market has recently been stagnant. Japan was the largest software market in 2001, but by 2005 both North American and European market became nearly 2 times larger than the Japanese market (Fig. 19). A major cause of the stagnation is the declining birthrates since children have been the main customer for the cluster (Fig. 20). Although this is a big challenge in the short-run, this may enable the

[14] Calculated from data by White Paper on Police, BMI Gaming, Ministry of Internal Affairs and Communications, Japan and U.S. Bureau of the Census

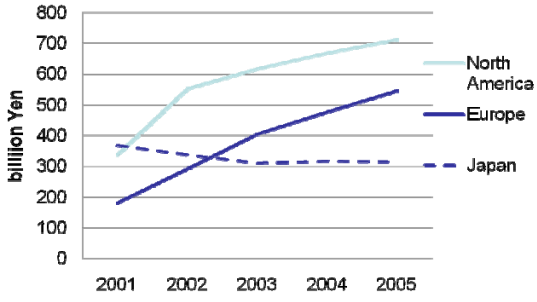
Japanese cluster to expand the consumer base from children to broader generations faster than its competitors. This is critical in the long-run considering that birthrate is declining in most developed countries. The spread of other types of entertainment such as internet and mobile phone also explains the flat domestic demand.

Fig. 21 Comparison of sales by major genre in Japan and the U.S.



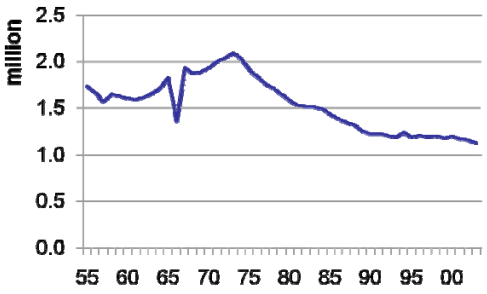
(Source) Shintaku, University of Tokyo (2002)

Fig. 19 Global trend in software retail sales



(Source) CESA Game White Paper

Fig. 20 Trend in the number of births



(Source) Ministry of Health, Labor and Welfare

Furthermore, Japanese software makers are decreasing their presence in the global market. This is mainly due to different consumer tastes in the US and European markets. While role-playing games are very popular in Japan, Western consumers prefer action and sports games to role-playing games (Fig. 21). Another reason for the struggle in foreign markets is the piracy issue in Asia. In 2004, 96% of video game software in China is pirated copy (IIPA, 2004).

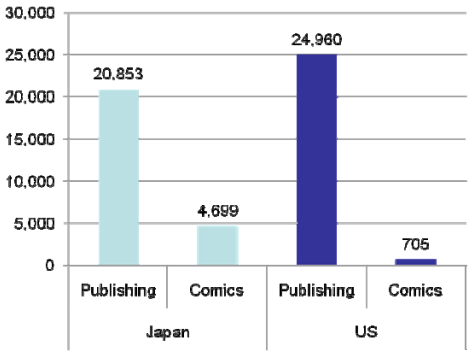
Related and Supporting Industries

Related and supporting industries played a critical role in the evolution of the Video Games industry on many different levels. First, the tie-ups between the hardware makers and the local availability of globally competitive electronics industry made the development and sourcing of technologically advanced components possible (Ministry of Finance, 2008).

Close relationships with the electronics industry, ensured that console manufacturers could design their systems based on chips or other components that were still in development to ensure when the consoles were released they boasted the latest features (Wikipedia, 2009). In fact as we have seen, these close relationship also led to focusing the competition among manufacturers on the technological specs of their hardware. The strength of the electronics industry, allowed some of the console makers to outsource most of the manufacturing and only keep assembly and some of the R&D in-house. Nintendo pursues this model successfully.

On the software side the Manga/Anime was an important related industry which helped the development of the cluster in Japan faster than in the rest of the world. Manga and Anime are an

Comics market in 2007 (Japan vs. US)



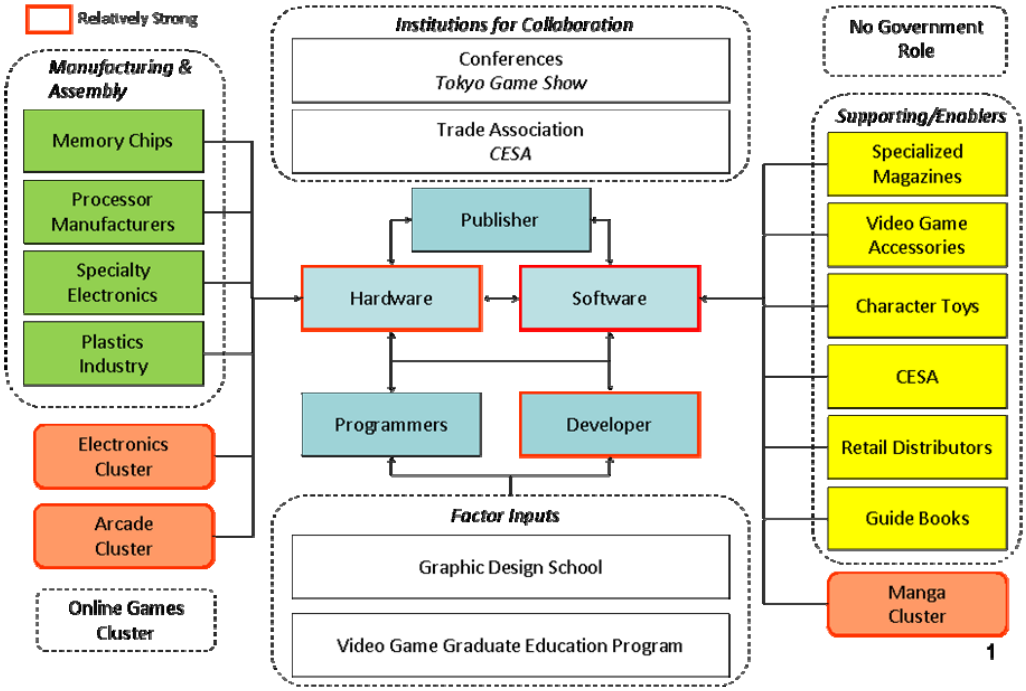
(Source) The Research Institute for Publications, Japan, The Association of American Publishers, ICv2 "Graphic Novel White Paper
Note: USD 1 = JPY 100

integral part of the Japanese socio-cultural environment, In Japan comics represent a much higher percentage of total published works than in the US, which mostly due to the cultural preferences between the two nations.

As such there were a lot of synergies in adapting comic book stories to video games, and in turn some video games spawned their own manga or anime series. While this helped stimulate demand, on the supply side, there is also a lot of overlap among the human resources. Artist, scenario writers, graphic designers and other creative talent trained in on of the nations many courses aimed for the Manga/Anime industry can easily transpose their skills to the creation of video game software.

Cluster Map

The cluster map tries to trace the major linkages among the key constituents of the Video Games cluster in Japan.



The following features are particularly worth highlighting:

- Japan's strong manufacturing sector, especially its world class electronics industry played a key role on the supply side.
- Thanks to the related industries and unique clusters, such as Manga/Anime, Arcade Centers, the demand side in Japan was very sophisticated.
- Hardware, Software and Developers are particularly strong drivers of this cluster. The strength of the games software industry in Japan is especially interesting given the weakness of Japanese software firms in other segments.

- The lack of government's role in the cluster is noteworthy. Historically the Japanese government has been very involved with the economic development of certain key industries, since the video games cluster came into existence during the downturn of the 80s and 90s, the government had little resources or interest in focusing on this new cluster. This non-interference we suspect actually helped the development of a very competitive industry. Instead of protectionist measures, it was the cultural preferences and sophisticate demand, coupled with the collapse of the overseas VG industry that acted as a natural barrier to outside competition. As the industry grew and expanded globally in the face of stagnant domestic demand, there were again no need for the government to introduce incentives to support exports which occurred naturally in this industry.

Institutions for Collaboration

Institution for collaborations have not played an important role in the cluster in general. The Computer Entertainment Supplier's Association is the only big and official such organization, it has 101 regular members (with the notable exception of Nintendo). The main output of CESA is the annual Tokyo Game show, which is among the most highly anticipated such events in the word, and it allows competitors to showcase their new console and games each year (CESA, 2008).

Factor Conditions

As we have shown during the country analysis, of particular relevance to the VG clusters performance to date was the abundant availability of highly trained and specialized human resources. Because of the size of the related industries in electronics, there is a large body of engineering graduates each year, the importance in human resources is more relevant for the console manufacturers who tend to recruit local talent. Even today, Nintendo and Sony's headquarters are in Japan staffed with local talent (Nintendo, 2009). On the software side, interestingly Japanese VG firms have long helped an unusually competitive position. At first because Japan was the largest market and most hardware companies were focused on sales in the domestic market, many Japanese companies emerged and thrived in very competitive domestic environment. As the video games industry expanded globally, and many outside firms entered the fray, the importance of the Japanese software firms diminished, but they remain to this day some of the most innovative and well respected within the industry.

3. Recommendations and Threats

3.1 Threats

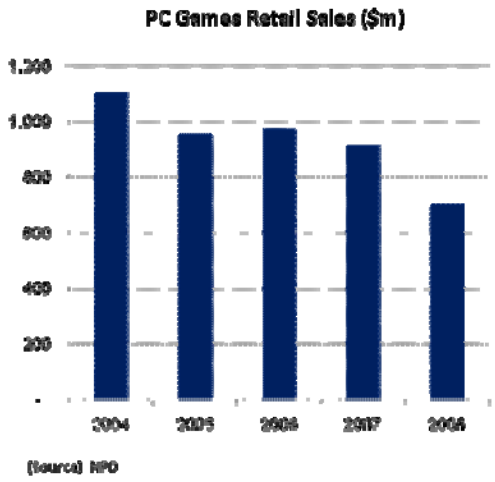
We will next examine in more detail some of the key competitive threats to

the cluster we identified and then make further recommendations on how to improve the cluster overall.

Due to technological advancements and the ease of adapting games to a computer based platforms, the video games cluster has been ling worried about computers stealing their customers. Indeed, the price of PCs has been steadily dropping (NPD, 2008), with Laptops become relatively cheaper in recent years. However, the price of entry level computers is still higher than top of the line video games consoles. Furthermore, entry level computers often lack the technological capability to support advanced games, and the price of a Gaming PC is almost double that of a regular one (Dell.com, 2009).

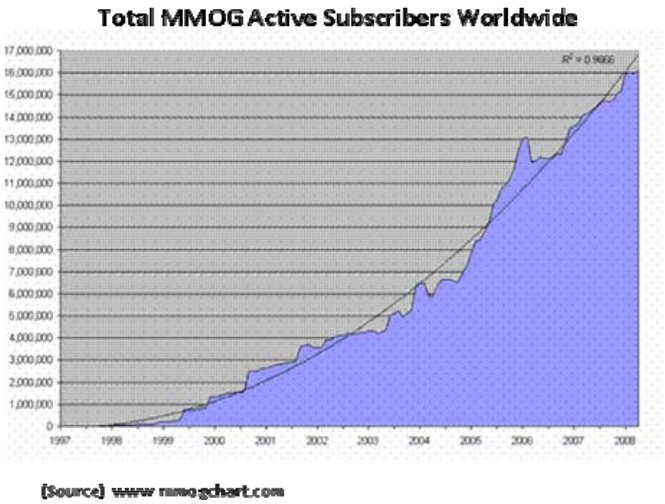
Furthermore, the sales in PC games have been in constant decline in recent years, dropping almost 50% since 2004.

Most experts attribute this decrease to the increasing popularity of on-line subscription based games, whose sales have grown to the point of overtaking PC games sales for the first time last year (NPD, 2008).



However, while online gaming is a promising medium that could in theory

revolutionize the delivery of software by eliminating the need for physical games, the market for such games is still small and fragmented, one game (World of Warcraft) account for over 11M subscribers, while its nearest competitor barely tops 1M subscribers (Mmogchart, 2008).



On the other side of the spectrum, the portable video games consoles are being increasingly threatened by the improvements and integration in portable communications devices such as smart phones. Over 4,000 games are available for the iPhone alone, and one can find titles familiar to the console versions (Fortune, 2008). While to date, these games tend to be aimed at casual gaming (play between the stops on a subway), as the devices get better, they will be able to encroach on the space now occupied by portable consoles. So far, it appears that the video game industry is responding by increasingly including multimedia capabilities into their gaming consoles to thwart the threat. For example the latest portable console form Nintendo, the DSi (Nintendo, 2008), boasts access to online downloads, a two way camera and an inbuilt on-line browser. The only thing it cannot do yet is make phone calls.

3.2 Recommendations

Stagnant domestic market: With the size of the traditional customer base (young males 12-25) shrinking in Japan, and the major shifts in the Japanese demographics, the video games cluster will have to look at non-traditional market segments or abroad for expansion. Nintendo has started this trend by developing its Wii console aimed at previously untapped customers such as women, younger and older people.

High barriers to entry: with the increased focus on technology and graphics, developing games has become very costly, limiting the possibility of start ups. As we have seen, in Japan the lack of a VC industry, financing for such start-ups is generally not available, limiting the opportunities for the emergence of new innovative firms in this space. This, is partly reflected in the rise of the foreign (mainly US) software companies, and by the fact that the only recent new entrant in this industry has been outside of Japan (Microsoft). Japan thus should focus on instilling an entrepreneurial culture by making access to venture capital easier. The government should further deregulate the financial sector, make it easier for foreign firms tto acquire Japanese ones and increase lending to young companies. Most importantly, there should be concerted effort in changing attitudes toward entrepreneurship, by making it easier for people to declare bankruptcy, teaching success stories of Japan's past great entrepreneurs in secondary schools to inspire the next generations, and make it more

socially acceptable not to work in a big company.

IP protection: The main reason PC software makers and video games have shun the broader Asian market has been due to low IP protection and piracy issues. The Japanese government in conjunction with other interested parties in the West, could press harder on China in particular for better IP protection laws to enable the Video Games cluster to tap another important new customer source.

Cultural barriers: The Japanese customers taste in games is very different form the west, which the reason why US software manufacturers have dominated the US market by large and vice versa in Japan. Two strategic steps should be taken to help the cluster. First, there should be a focus on exporting the Japanese culture to educate foreign customers and bridge the cultural gap. With promoting Anime/Manga abroad more broadly, Japan can hope to increase the sensitivity of US customers to Japanese style games and preferences. To some degree this has already happened with the use of popular show such as Naruto, available even on web-video sites such as Hulu.com. Second, Japanese firms could be encouraged to source development talent from abroad or acquire foreign firms outright, to mix cultures and develop games that are suitable across both sides of the Atlantic, instead of having two separate gaming division each focused on a specific region.

Human resource: While the availability of highly trained engineers is a plus for

manufacturers, in the software business there still seems to be a lack of international level talent. Lack of English does not only restrict labor mobility (and competitiveness), but because most programming languages were developed around English based systems, Japanese have a natural disadvantage in learning programming. The government and the cluster could increase incentives to include English learning as part of relevant curriculums, schools could require study abroad to help students gain immersive experiences. The cluster in general should develop closer ties with university that offer specific programs to train better talent for tomorrow, and encourage entrepreneurship.

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