Competitiveness of Japan: Opportunities and Issues with Focus on Software Industry

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Abstract

Japan was a competitiveness leader in 1980s with many competitive firms in traditional as well as emerging industries. Recent views on competitiveness of Japan and emerging industries in Japan were often pessimistic. Our exploratory research aimed at taking a factual view. Systematic problem structure was developed as a starting point for detailed research. An attempt has been made in this paper to identify key competitiveness-related issues in context of emerging industries in Japan by taking case of software industry. While the vibrant competitiveness of 1970s and 1980s is certainly not there, the situation is not that bad was often portrayed in popular global business media and competitiveness ranking during 2000-2003. Global competitiveness of the Japanese software industry is low, however some globally competitive related and supporting industries exist. Human capital with attitudes and skills needed for emerging world and technological capabilities are quite vibrant to lay foundations for competitive Japan. Glimpse of facts, gathered from diverse sources, hint at the need for different approach, frameworks and matrices to evaluate competitiveness of Japan and her emerging industries.
**INTRODUCTION**

Japan was a competitiveness leader in 1980s with many competitive firms and has made efforts to contribute to competitiveness in many countries. Japanese firms were among top leading players in industry tables in global benchmarks such as Global500 (Fortune). For instance, significant number of firms in industry tables for automobiles, banking, trading and electronics were Japanese in 1990. Japan was ranked among top ranks in the World Competitiveness Report (WCR) in 1991. In 2004, the United States remains the most competitive economy in the world (next to Finland), while Japan ranks in top 10 countries (9th) after an interval of 10 years. Asian success is increasingly driven by China now (Mandel, 2003). Europe is making considerable efforts to become the most competitive economy in the world by 2010 (Rapid, 2003). Japan has played a crucial role in enhancing competitiveness of the Asian region by providing leadership, investments and technology transfer and Japan’s relations with other Asian countries have been deepening and broadening quite faster.

Views on competitiveness of Japan over last few years are divergent. While Japan is quite competitive in some industries such as automobiles and electronics, competitiveness of many other industries in Japan is considered low. Japan emerged as the strongest player among India, Korea and the USA in our research (Momaya, 2001) about competitiveness of select industries such as auto components, engineering/construction and telecom. At the same, scores of highly uncompetitive industries were identified by team of researchers (Porter, et al., 2000) in a major study on competitiveness of Japan and Japanese industries. As time passed, uncompetitive Japan remained obscure and often hidden, and it never showed signs of improvement.

Even competitiveness of some large and important industries, such as information and communication (IC) is questionable. IC industry, with its potential to contribute to competitiveness of many other industries, is
often mentioned as the most important sector (Fransman, 1995). For instance, information technology (IT) has accounted for approximately 30 percent of exports, 50 percent of production and 80 percent of plant investment during recent recovery process in Japan. Some of the largest companies in the world in the three main segments that constitute the IC industry—computers, telecom and semiconductor—were Japanese in early 1990s. However, today the industry is considered to be less competitive globally as compared to automobile and consumer electronics industries of Japan. Fransman (1995) has provided a detailed account of competitiveness of the industry and major firms in a comprehensive book based on research of about a decade.

Software is an important industry of future and has been playing increasingly critical role in many other industries, but research and publication on international competitiveness of the Japanese software industry are rare. One reason may be that competitiveness of the industry is not well evaluated. Our small attempt at research is focused on this problem. The Japanese software industry here refers to software firms incorporated in Japan. Sustained competitiveness (as mentioned by almost all popular country competitiveness ranking) of leading countries such as the USA can be attributed partly to software industry. Competitive software industry can contribute to competitiveness of many other industries as software technologies and associated soft-dimensions of organization (e.g. culture) are likely to be important sources of competitiveness, specifically in knowledge era (Hayashi, 2002). Software has always been of great interest in Japan also and numerous mega-initiatives have been taken up in the past. Popular books on the topic such as “Japan's Software Factories” (Cusumano, 1991) raised lot of expectations about the industry, but there were not realized. While Japanese game software industry is famous worldwide, other segments are less visible.

An attempt has been made in this paper to evolve key competitiveness-related issues for Japan and its emerging industries by taking case of software industry. Problem structure is evolved to identify the unwanted symptoms and goals blocked and the reasons thereof. Although there is room for improvement in macroeconomic policy, the most fundamental problems are microeconomic (Porter et al., 2000). Hence, the focus of the research will be on microeconomic issues of competitiveness after defining competitiveness, brief literature review and analyzing problems through
Defining Competitiveness

Defining what we mean by “competitiveness” is a useful preliminary step in making sense of the subject. Competitiveness is a relative, context-specific concept (Li, Ishii and Kameoka, 2002) with many dimensions and can be discussed at many levels. The most relevant levels for our research are: country, industry and firm. There is little consensus on definition of competitiveness. Popular definition of country competitiveness by Porter (2002) often focuses on environment for business and productivity: “Nations compete in offering the most productive environment for business.” Competitiveness is determined by the productivity with which a nation uses its human, capital and natural resources. He has also been emphasizing innovation capacity. The “official” definition of OECD is “the degree to which a country can, under free and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long term”. This definition is balanced and considered more relevant for our research.

Competitiveness at the industry level is an important but more difficult concept due to poorly defined and rapidly changing boundaries of industries. Competitiveness at industry level is adapted from (Momaya, 2001): Collective ability of firms in an industry to compete internationally while balancing growth, returns and human resource development.

As per this definition, competitiveness of an industry can be quickly evaluated on criteria such as size, growth rate, exports, trade balance, if comparative data are available. Here competitiveness of software industry of Japan means collective competitiveness of software firms from Japan.

Literature Review

The key objective of our research is to learn from ground-reality in Japan, hence literature review is limited and focused on only very essential one to support the points in “Problem Structure”. Plenty of literature is available on competitiveness at different levels and their various dimen-
sions. Attempts have been made to systematically classify them by Banwet et al. (2002), and Ajitabh and Momaya (2004). Literature on Japan and its practices such as quality practices is extensive, but literature on competitiveness and related subjects in context of Japan is still limited, much less in case of software and in English language. One of the most extensive is the work done by Porter, Takeuchi and Sakakibara as published in the book “Can Japan Compete (2000)”. In parallel to some of the Japan’s most formidable and competitive industries, they discovered other industries that were highly uncompetitive (apparel, chemical, civil aircraft, detergent, etc.). Software was also identified as an uncompetitive industry. The authors have attempted to explain Japanese competitiveness based on factual inputs (macro and micro) to draw change agenda for government as well as companies. They conclude that Japan can compete, if it can rapidly bring necessary changes. Li, Ishii and Kameoka (2002) have offered an alternative perspective blending competition and cooperation to examine nature of competitiveness. “Is Japan changing fast enough?” this is a question that was hotly debated across the world.

Japanese industries emerged quite competitive in our own research about competitiveness of select industries. Competitiveness of auto components, engineering construction and telecom industries was evaluated in context of select countries—India, Japan and Korea. The summary results in context of telecom industry are given in Table 1 as example. Japan emerged as the strongest player in all the three industries. The results are just a preliminary evaluation on performance criteria and may not be considered representative of the Japanese economy, but they do hint at competitiveness capabilities of Japanese firms across sectors.

Table 1: Summary Results of Competitiveness Evaluation of Telecom Industries Standardised Scores Table

<table>
<thead>
<tr>
<th>FACTOR / Criteria of Competitiveness</th>
<th>India</th>
<th>Japan</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTIVITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecom Revenue/employee ($ mill)</td>
<td>-0.84</td>
<td>1.11</td>
<td>-0.26</td>
</tr>
<tr>
<td>Annual Telecom Revenue as % of GDP</td>
<td>-1.12</td>
<td>0.80</td>
<td>0.32</td>
</tr>
<tr>
<td>Annual Telecom Expenditure as % of GDP</td>
<td>-0.79</td>
<td>-0.34</td>
<td>1.12</td>
</tr>
<tr>
<td>*Permit Process - Licensing, etc.(a) Basic</td>
<td>-1.06</td>
<td>0.92</td>
<td>0.14</td>
</tr>
<tr>
<td>(b) Cellular</td>
<td>-1.08</td>
<td>0.89</td>
<td>0.19</td>
</tr>
<tr>
<td>Factor</td>
<td>Factor 1</td>
<td>Factor 2</td>
<td>Factor 3</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>HUMAN RESOURCES</strong></td>
<td>1.15</td>
<td>-0.57</td>
<td>-0.58</td>
</tr>
<tr>
<td>Telecom Employees (per thousand lines)</td>
<td>1.15</td>
<td>-0.57</td>
<td>-0.58</td>
</tr>
<tr>
<td><strong>QUALITY/EFFECTIVENESS</strong></td>
<td>-4.57</td>
<td>5.01</td>
<td>-0.44</td>
</tr>
<tr>
<td>Tele-density (Basic phones per 100 inhabitants)</td>
<td>-1.14</td>
<td>0.73</td>
<td>0.41</td>
</tr>
<tr>
<td>Internet Hosts</td>
<td>-0.65</td>
<td>1.15</td>
<td>-0.50</td>
</tr>
<tr>
<td>*Customer satisfaction a) Products</td>
<td>-1.02</td>
<td>0.98</td>
<td>0.04</td>
</tr>
<tr>
<td>b) Services</td>
<td>-0.78</td>
<td>1.13</td>
<td>-0.35</td>
</tr>
<tr>
<td>* Timeliness of Delivery</td>
<td>-0.98</td>
<td>1.02</td>
<td>-0.04</td>
</tr>
<tr>
<td><strong>TECHNOLOGICAL</strong></td>
<td>-1.89</td>
<td>2.1</td>
<td>-0.21</td>
</tr>
<tr>
<td>Switching digitisation (%)</td>
<td>0.33</td>
<td>0.79</td>
<td>-1.12</td>
</tr>
<tr>
<td>Transmission digitisation (%)</td>
<td>-1.14</td>
<td>0.41</td>
<td>0.73</td>
</tr>
<tr>
<td>*Commercialisation</td>
<td>-1.08</td>
<td>0.90</td>
<td>0.18</td>
</tr>
<tr>
<td><strong>FINANCIAL</strong></td>
<td>-0.49</td>
<td>2.28</td>
<td>-1.81</td>
</tr>
<tr>
<td>Revenue per line</td>
<td>-0.71</td>
<td>1.14</td>
<td>-0.44</td>
</tr>
<tr>
<td>Return on Sales (RoS)</td>
<td>1.15</td>
<td>-0.46</td>
<td>-0.69</td>
</tr>
<tr>
<td>Return on Assets (RoA)</td>
<td>1.12</td>
<td>-0.33</td>
<td>-0.80</td>
</tr>
<tr>
<td>*Ability to generate finance a) Domestic market</td>
<td>-0.98</td>
<td>1.02</td>
<td>-0.04</td>
</tr>
<tr>
<td>b) International market</td>
<td>-1.07</td>
<td>0.91</td>
<td>0.16</td>
</tr>
<tr>
<td><strong>INTERNATIONAL</strong></td>
<td>-1.19</td>
<td>-0.51</td>
<td>1.7</td>
</tr>
<tr>
<td>Minutes per inhabitants (outgoing traffic) (1990-96)</td>
<td>-1.15</td>
<td>0.47</td>
<td>0.68</td>
</tr>
<tr>
<td>CAGR (%) of International Outgoing Traffic (1996)</td>
<td>-0.04</td>
<td>-0.98</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>OTHERS</strong></td>
<td>-1.14</td>
<td>0.75</td>
<td>0.39</td>
</tr>
<tr>
<td>*Extent of outsourcing</td>
<td>-1.14</td>
<td>0.75</td>
<td>0.39</td>
</tr>
<tr>
<td><strong>TOTAL SCORE</strong></td>
<td>-13.02</td>
<td>12.44</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Source: Momaya (2001)
Notes: 1. Competitiveness is measured for criteria and aggregated at **FACTOR** level
* denotes results from a questionnaire survey
2. The technique of Standardised score is used to normalise scores on each criterion

Emerging research on Asia hints that while there may be problems with Asian Management practices, these are being reformed and may become more relevant. Another decade or two and the weight of East Asia in the whole world economy could seriously eclipse that of the United States and of Europe (Dore, 2002). Practices of Asian companies led to growth in the past (1960-97) and in some situations could continue to permit short-term growth (Chen, 2002).
Ⅲ. PRELIMINARY COMPETITIVENESS EVALUATION

Objective evaluation of competitiveness that provides facts can aid to gain understanding of opportunities and problems. While detailed evaluation can take time and resources, an approximate evaluation is considered adequate for the purpose of the project. Here only international competitiveness of software industry in Japan is evaluated. While aggregate macro-economic data is also used, firm-level data is often aggregated for speed. National competitiveness is made the starting point, before venturing into industry and firm level competitiveness.

Competitiveness of Japan has declined since early 1990s and till recently has remained low relative to other developed countries as per popular global competitiveness benchmarks. Competitiveness ranking of Japan and select countries is given in Table 2. Not only Japan ranks low among G7 countries, but even lower than many newly industry economies. Japan ranked 17 in overall and 14 in terms of information technology in a research by Nihon Keizai Kenkyu Centre (Japan Economic Research Centre, 2002). The results of a quick approximate evaluation based on country aggregate of the World’s most valuable companies also shows weaknesses for Japan (Table 3).

Table 2: Trends in Competitiveness Ranking of Japan and Select Countries as per World Competitiveness Yearbook

<table>
<thead>
<tr>
<th>nations/year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Canada</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Australia</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Japan</td>
<td>24</td>
<td>24</td>
<td>26</td>
<td>30</td>
<td>25</td>
<td>23</td>
<td>21</td>
</tr>
<tr>
<td>Korea</td>
<td>41</td>
<td>28</td>
<td>28</td>
<td>27</td>
<td>37</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>Malaysia</td>
<td>28</td>
<td>27</td>
<td>29</td>
<td>26</td>
<td>21</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>China</td>
<td>29</td>
<td>30</td>
<td>33</td>
<td>31</td>
<td>29</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>India</td>
<td>42</td>
<td>39</td>
<td>41</td>
<td>42</td>
<td>50</td>
<td>34</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: Adapted from WCY.
Extensive research about competitiveness of Japan and her industries by Porter et al. (2000) provides one of the recent available accounts of competitiveness of many Japanese industries. Detailed account of macro-environment for competitiveness and conditions on four key dimensions (access to specialized inputs/factors, Japanese home demand, local Japanese rivalry and related and supporting industries) (Porter et al., 2000) for many competitive and less competitive Japanese industries is given as explanation. The software industry was considered to be highly uncompetitive by the authors. Key reasons for low competitiveness of the software industry, area of focus of our research, were listed under headings of rivalry, operating subsidies, technology, suppliers and demand. Overall conclusion was that, the efforts by government did not contribute much to competitiveness. Most of reasons given for non-competitiveness are quite old and no quantification of competitiveness is given.

Considering the scarcity of studies that evaluate competitiveness of Japanese software industry and published in English, a small attempt has been made to evaluate competitiveness of the industry approximately on select performance criteria.

### Table 3: Country Aggregate of World's Leaders by Market Value (2002)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Japan</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (U.S. $ billion)</td>
<td>2124.2</td>
<td>5740.0</td>
</tr>
<tr>
<td>No. of firms in Top 1000 (in top 100)</td>
<td>142 (7)</td>
<td>479 (57)</td>
</tr>
<tr>
<td>Assets (U.S. $ billion)</td>
<td>7265</td>
<td>18,282</td>
</tr>
<tr>
<td>Profits (U.S. $ million)</td>
<td>-507</td>
<td>227,215</td>
</tr>
<tr>
<td>Return on Equity (%)</td>
<td>7.1</td>
<td>19.9</td>
</tr>
<tr>
<td>Market Value (U.S. $ billion)</td>
<td>1824.4</td>
<td>10249</td>
</tr>
</tbody>
</table>

Source: BusinessWeek, 2002

The US players dominate global top ranks in software industry. Japanese players are rarely visible in products or services. For instance, Fujitsu and Hitachi were the only Japanese player that figured in the listing of the software industry (products and services) based on estimates in 1997 by McKinsey.
Market share

Detailed calculations of market shares in different segments require lot of proprietary data and hence is beyond the scope of this paper. However, a glance at the performance in the largest segment, information services (it accounted for 34% of the total 1.6 trillion dollar, world ICT market as per data and discussion with an ex-senior executive of Matsushita), hints at low competitiveness for Japan. This segment seems to be referred as Computer Services and Software in the survey of Global 500 by the business magazine “Fortune”. No Japanese firm figured in the Fortune 500 listing in 2005. The US firms (Microsoft, EDS, Computer Sciences and Accenture) dominate this segment completely.

Trade Balance

Japan seems to have persistent trade deficit in software. The imports in 2004 (364.6 billion yen) was almost eleven times the exports (32.0 billion yen) (www.jisa.or.jp/statistics/download/Findings2005.pdf). Most of popular application package (personal application packages such as word to enterprise packages such as Database, ERP and Supply Chain) need to be imported. The U.S.A. accounted for bulk of the imports (97% in 2004).1)

D. PROBLEM STRUCTURING AND LEARNING ISSUES

The background and approximate evaluation given above can be used to develop a better understanding of the competitiveness-related problems being faced (or opportunities being missed) by Japan and its software industry. Problem structuring can be of help in understanding key elements of a problem. Important elements were identified through brainstorming. Prior to brainstorming, review of relevant literature and secondary data was done to have some feel for many problems. That way, the problem structuring was integrated with secondary data. The reference to source is given for many views to help the reader. Expert feedback was also obtained on the ideas generated and their relevance. Detailed problem structure is given in the Appendix; learning issues are synthesized here.

1) Trade statistics cannot count the total amount/sum of export of ‘firmware’, with which Japanese manufactures have a competitive edge over foreign firms. Therefore, Japanese international competitiveness in software has tended to be under evaluated. Most of Automotives, electronics and precision products more or less contain ‘firmware’.
The preliminary evaluations and problem structuring provide an exciting glimpse of the competitiveness challenges ahead for Japan. While Japan faces many competitiveness challenges at macro-level, as viewed from data available in reports such as World Competitiveness Yearbook, foundations of competitiveness seems to be quite sound. Even macro-level weaknesses may be considered a lingering impact of bubble combined with structural transformation for a country that moves slowly on some fronts. Investments in human resources, science & technology infrastructure, learning for globalization of operations and many socio-cultural and environmental bases (Momaya, 2001) seem to be sound or undergoing change for better. However, international competitiveness of an emerging industry such as software is questionable. While investments in R&D are heavy and Japan ranks very high in terms of patents, economic benefits from commercialization may not be that high in light of factors such as tremendous reduction in period while R&D contribute to profits (Hayashi, 2003). This preliminary exploration helped evolve issues that may provide fertile ground for research in future. They are classified below in macro and micro context of software below.

Macro Issues

Major differences between the perspectives of globally popular competitiveness reports and ground reality in Japan is a major issue. Most of such reports have highly Europe-centric perspective that often fail to address Japan’s situation adequately. For instance, special circumstances of Japan such as rapidly aging population, culture and attributes such as long-term thinking, slow pace of change, employee-centric systems may have impact on key decisions about competitiveness. Japanese companies as well as the environment in which they operate have undergone a dramatic transformation (JCGC, 2001). Transformations are always painful and take time in Japan. Does the US/Europe-centric views consider such transformations? Not really. Hence, the picture that emerges from popular annual competitiveness ranking such as WCY may not be realistic. Comparatively, Japan’s ranks appear more realistic in the National Competitiveness Report (IPS, 2002). Their attempts to overcome limitations of the other models and factor people dimension innovatively might be a reason.

Professionals in Japan have different dimensions of competitiveness
in their mind, however many integrated frameworks and detailed evaluation were not available. Recovering international competitiveness is considered a major challenge for Japan and a medium-term problem (Watanabe, 2003). The recovery is linked to economic integration within East Asia and need has been expressed to attract greater inflows of high-level resources, including capital, technologies, know-how and human talent. Basic plans such as Science and Technology (GOJ, 2001) also consider competitiveness as a key concept. How current systems will transform rapidly to manage such flows remains a major challenge.

There are many such complex macro dimensions of competitiveness of Japan. For instance, which type of issues (industrial policy or corporate strategy) are more critical for future competitiveness in specific contexts? How can we determine that? To what extent the alternative perspectives (e.g. Li, Ishii and Kameoka, 2002) have been adapted in Japan? Are they bearing very positive results? What are the limits and potential of the Japan's Soft Power (Nye, 2004)? Can the crucial fiscal balance be achieved by relations of monetary policy (Shinpo, 2002)? Does Japan's competitiveness picture become much better if we focus on differentiation factors? What are the best indicators of competitiveness of Japan will depend on prioritization of key issues and then developing relevant scenarios and evaluation criteria.

Tokuda (2005) suggested that the main source of competitive advantage does not fall into the heterogeneity of resources and capabilities per se, but the heterogeneous perceptions of the entrepreneur. The abilities of the entrepreneur enable capabilities to be performed along the entrepreneur's vision or strategy, capabilities enable resources to begin to be utilized, and the potential for the creation of output arises. Unfortunately, Japan ranks quite low (e.g. 21st in terms of entrepreneurs, 24th in terms of personal competence and 40th in terms of social context in Competitiveness world ranking in 2003, NCR). How does Japan plans to improve on such important factors of competitiveness?

Many such crucial competitiveness issues can become more clear by systematic evaluation of different scenario. For instance, advanced human factors (that include professionals) may become critical for Japan at this stage. Ability to upgrade level or retrain for new needs, such as cross cultural management and integrate with global human resources, can have major impact on globalization of Japanese companies and their competi-
tiveness. A scenario of competitiveness positions of four large economies is given for example in Figure 1. Indicative positions and long-term trends in competitiveness for select countries are given in Figure 2 for illustration.

**Figure 1: Illustrative Example of Relative Competitiveness of Select Countries**

<table>
<thead>
<tr>
<th>High Physical Factors</th>
<th>Low Physical Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

USA

Japan

China

India

**Figure 2: Illustrative Example of Trends in Relative Competitiveness of Select Countries**

**Versus Developing Nations**

- Japan Tomorrow?
- China, India Pre-1990
- Korea
- China, India Ladder-Climbing

**Versus Advanced Nations**

- Division of Labor
- Jack of All Kinds

USA, Germany

Japan

**Micro Issues in Context of Software Industry**

Competitiveness issues in software industry are relatively simple as compared to macro issues. By contribution to competitiveness of the domestic industry, the Japanese industry seems to be quite competitive;
however it may not be globally competitive by external (e.g. a US) perspective. Like many service industries, the industry has been extremely focused on enormous domestic needs and the need has not been felt to compete in global markets. However detailed evaluations of competitiveness from different perspectives are not available. Here is just a glimpse of key issues:

The first set of issues are about the relevant framework, logic, classifications, levels and indicators. Which one is the best framework to understand the competitiveness of emerging industry such as software in context of specific country (e.g. Japan)? What are fundamental perspectives behind the framework? What generic industry classification best describes software industry in Japan (Emerging, Network,...) (Barney, 2001)? What may be the best level to view competitiveness: integrated ICT industry or segments such as software or sub-segments such as products and services? What are key indicators? How competitive is the industry in terms of productivity? Globally also? Is the structure of the Japanese industry more suitable for long-term competitiveness? Flexibility was considered a critical success factor for software business (Cusumano, 2004). Is the industry less flexible? Why? How to make it more flexible? What role linkages with other countries such as India can play for competitiveness? Can software industry in Japan be competitive when it is not even listed in some classifications in Japan?

The second set of issues concern competitiveness in relevant segments. Is Japanese software industry remains less competitive as mentioned in Porter et al. (2000) or has it been improving? Glimpse of trends in Japanese software services industry are given in Table 4 for a period of 10 years. Sales of the industry has improved by healthy 129 % over 1994-2003 to cross 14 chou yen (about 120 billion USD) in 2003. Employees has increased by 26 %, but employee productivity has (as measured in terms of revenue productivity) registered impressive gain of 82 % to reach 2644 man yen. This number is quite high by global benchmarks. How big are the markets (e.g. Game SW, mobile SW) where Japanese industry is competitive? Are technological competitiveness (incl. competencies) and size major source of sustainable competitive advantage in the software industry in general and in Japan in particular? Large Japanese IT firms seem quite competitive on productivity front. They emerged winners over large US IT firms that surged ahead during IT bubble, but couldn't sus-
tain (Rajasekera, 2003). What are real causes of high productivity and how sustainable are these? Is the Japanese software industry structurally very different from the US? What are major trends? What are implications of the trends for competitiveness of the industry? How can Japan play critical role in shaping next phase of the software industry in cooperation with other competitive countries in software such as India and China?

The third set of issues can be about the role of small and medium enterprises (SMEs), knowledge creation and other emerging industries. In Japan, SMEs have always played a major role in every area of the national economy (JSBC, 1997). How competitive are software SMEs? What role can they play in future? How much impact the new perspectives on firm such as “Dynamic theory of firm (Nonaka and Toyama, 2002) or ‘Firm as a Knowledge-creating Entity (Nonaka et al., 2000) have made on practices and competitiveness? Is Japan competitive in other emerging industries such as biotech? For instance, the medical and commercial rewards in biotech are now abundantly clear (Weintraub, 2003). Yet no Japanese firm was visible in global Top 5 biotech firms (Amgen, Genentech, Serono, Biogen, Ciron) and Top 5 pharma firms.

### Table: 4 Glimpse of Trends in Japanese Software Services Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Employees</th>
<th>Annual Sales Million Yen</th>
<th>Employees per firm</th>
<th>Sales per firm Man Yen</th>
<th>Sales per employee Man Yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>424,867</td>
<td>6,177,007</td>
<td>71</td>
<td>103,260</td>
<td>1,454</td>
</tr>
<tr>
<td>1995</td>
<td>407,396</td>
<td>6,362,183</td>
<td>70</td>
<td>109,466</td>
<td>1,562</td>
</tr>
<tr>
<td>1996</td>
<td>417,087</td>
<td>7,143,543</td>
<td>66</td>
<td>113,444</td>
<td>1,713</td>
</tr>
<tr>
<td>1997</td>
<td>426,935</td>
<td>7,587,959</td>
<td>70</td>
<td>124,556</td>
<td>1,777</td>
</tr>
<tr>
<td>1998</td>
<td>535,837</td>
<td>9,800,606</td>
<td>65</td>
<td>118,824</td>
<td>1,829</td>
</tr>
<tr>
<td>1999</td>
<td>534,751</td>
<td>10,151,890</td>
<td>67</td>
<td>127,584</td>
<td>1,898</td>
</tr>
<tr>
<td>2000</td>
<td>515,462</td>
<td>10,722,844</td>
<td>68</td>
<td>141,949</td>
<td>2,080</td>
</tr>
<tr>
<td>2001</td>
<td>526,318</td>
<td>13,703,868</td>
<td>67</td>
<td>175,017</td>
<td>2,604</td>
</tr>
<tr>
<td>2002</td>
<td>534,731</td>
<td>13,973,141</td>
<td>70</td>
<td>182,799</td>
<td>2,613</td>
</tr>
<tr>
<td>2003</td>
<td>535,892</td>
<td>14,170,633</td>
<td>73</td>
<td>192,014</td>
<td>2,644</td>
</tr>
</tbody>
</table>

Change 1994-03  26.13% 129.41% 2.82% 85.95% 81.84%

Source: METI (2004)
The research indicated gaps in many dimensions from concepts and theories to data that can help make sense of the competitiveness. For instance, there are fundamental differences in the way the Japanese and the other researchers have looked at industries, segments, structures and resources. This often results into incompatible sets of data and often makes it very difficult to draw meaningful conclusions. Big differences in size of the software segment emerged during evaluations. Many data sources in the US are highly US-centric and may miss important dimensions. For instance, an attempt to find comparative data in an online database had many leading Japanese firms missing. All these dimensions make the issue of Japan and competitiveness a very complex and difficult topic to research, but importance of the issue makes task challenging. It is difficult to draw firm conclusions at this point, but remarks may be useful.

**CONCLUDING REMARKS**

Let us synthesise key concluding remarks from the exploratory research. Competitiveness is essential to sustain economic, social and technological health of an advanced economy such as Japan. Preliminary exploration into competitiveness of Japan and its select industries presents a heterogeneous picture. While the country ranks quite low by some global competitiveness benchmarks, the exploration of ground reality presents a different picture. The country is certainly not at its best in macro-economic terms it was in the 1980s, but it does not fare that bad either in terms of competitiveness. If one goes by the spirit of OECD definition, the competitiveness of Japan seems quite high. It still has one of the highest per capita GNP among developed world. Directly or indirectly, it still has significant share of the world output and leading share in key industries such as automobile and electronics. However, an attempt to structure the problem with focus on software industry does hint at major challenges. While quite competitive in domestic market, international competitiveness of the software firms in Japan seems to be low except in some segments such as gaming and mobile communication contents. Detailed competitiveness evaluations, including innovation and technological dimensions are essential to understand whether Japan will be able to compete globally in software industry with innovative products and services. Considerable research is necessary to build understanding about
sound concepts, theories and even data sources.

Acknowledgments

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References


WCY, World Competitiveness Yearbook. IMD, Geneva, different years.
Appendix 1: Detailed Problem Structuring

Systematic approach of problem structuring that has been used quite often and found to be useful was followed. Desire to go for root causes is quite common in Japan. The elements are divided into country level and firm level wherever possible. Diverse facets of the problem are identified and grouped under following key elements of the structure:

1. Problem Statement
2. Unwanted symptoms of the problem or goals blocked
3. Reasons for the problem
4. Constraints
5. Ambiguities

Problem Statement (context: Competitiveness of Japan with focus on software)

Japan, a global economic leader, faced a major competitiveness crisis in 1990s. Numerous attempts to revive economy failed and the country remained in recession for almost long time. While some industries such as automotive and electronics sustained their exports, global competitiveness of an important industry of future, software remained a question mark. Develop a detailed problem structure to help get feel for diverse perspectives of the problems, their causes and ambiguities.

Unwanted Symptoms

Country Level

- Low competitiveness ranks of Japan compared to late 1980s
- High unemployment (e.g. less employment opportunities for educated youth)
- Sustained recession
- Growing misunderstandings about Japan response to the recession and capability to recover fast (e.g. become the growth engine of the world)
- Failure of many small and big companies (e.g. Resona holdings?)
- Uncompetitive service industries;
- Worker productivity is low in virtually every service industry? (Porter et al., 2000, p. 149): virtually out of the game in this important area?
Firm Level
Low returns as compared to their global counterparts (e.g. in Global ranking of Fortune 500) for many years
  • Reducing global market shares (e.g. less number of firms in Fortune Ranks: 4 in 1999 in top 10, 2 in 2000, Fortune 2001)
    ➢ e.g. Losing market share to European/Korean/Chinese competition in electronics market in India
  • Significant trade deficit in important industry such as software
  • While integrated players such as NTT Docomo, NTT and Sony do figure in top ranks in listing such as BusinessWeek (2002), firms that have software as a dominant business are hardly visible.

Goals Blocked
Country level
  • Grow and maintain its standard of living
  • Have sustainable economy to support ageing population
  • Become the “World’s most advanced IT nation” by year 2006

Firm Level
  • To grow profitably
    • Japanese firms had losses in country composite, whereas the US and most European countries had profits in the BusinessWeek Global 1000 rankings (BusinessWeek, 2002).
    • To become leaders in many industries
      • None of the Japanese firms figured in top 10 in the World’s most valuable companies ranked in terms of market value (BusinessWeek, 2002). All of the three (NTT Docomo-14, Toyota-28 and NTT-41) that found place in top 50 had their ranks lower than their 2001 ranks.
      • To become most admired global companies
        • No Japanese company found place Top 10 in 2003 Global Most Admired Companies (Fortune)
        • Only three Japanese companies (Ranks: Toyota-11, Sony-13 and Honda-26) in top 50 of the list, none having major revenue from software

Reasons for unwanted symptoms / goals blocked
There are many reasons for above mentioned symptoms or goals blocked. Important ones were identified and efforts were made to find supporting facts, whenever possible, given against the view (and detailed ref-
erence). Key reasons can be listed as:

- Many industries with low international competitiveness (Porter, 2000)
- Sustained recession (e.g. Balance-sheet recession, Koo, 2002)
- Poor university education, specifically in MBA and MOT (Li, Ishii and Kameoka, 2002)
- Uncertainty about soundness of the financial system
  e.g. Resona Failure may be repeated, as most Japanese banks routinely use deferred tax credits as part of their capital and deferred tax assets as percentage of total reserves is quite high (35-77%); it was 77 for Resona and is considered a key reason for its failure) (Bremner, 2003)
- Slow and less effective interventions for socio-economic restructuring
  • Women’s representation in leadership positions remains low (Usui et al., 2003)
  • the delay in the deregulation of the telecommunications industry (Mainichi, 2003)
  • The government seems perfectly willing to settle for half-baked restructuring (Bremner, 2003)
- Paradigm shifts in competitive environments (e.g. due to technological innovations and market globalization, Hayashi, 2003)
- Less effective R&D, low investments in basic research and low creativity (Li, Ishii and Kameoka, 2002)
- While number of employees dedicated to R&D /10,000 has increased from 1 to 67 in 1960 to 1 to 13 in 2000 (Hayashi, 2003), but returns still paltry? (Goto, 2003)
  • Pervasive distortions; e.g. in service sector (Porter et al., 2000)
  • Slow pace of change, esp. in governments, bureaucracy and large corporations
  • Whole chapter has been devoted to agenda for government in the book Can Japan Compete (Porter et al., 2000)
- Neglect of competitiveness and drivers of that such as productivity and innovation? Productivity growth rate has slowed down even within export sector (e.g. semiconductors).
- Inadequate investments and less supportive environment for technological business start-ups (Goto, 2003)
- limited efficiency of innovation linking new discoveries and technologies to product development, these have not boosted economic performance (Motohashi, 2003)
- Slow at leveraging IT to enhance competitiveness
- Slow pace of structural reform; while employment might have been maintained, renewal of industries and new business creation have been slow (Shinpo, 2002)
- Slow development of management consulting may also be a factor

Constraints

Japan faces numerous constraints in addressing important problems such as competitiveness. They can be broadly grouped into intellectual (e.g. mindsets, culture, history / traditions, limited and declining working age human resources) and physical constraints (e.g. limited land, natural resources).

Ambiguities

It is quite often that only a small part of the real problem is known and visible. It is no wonder that there are many ambiguities regarding the complex competitiveness-related problem of Japan and its industries. It may help to identify such ambiguities so that efforts can be focused to understand them. Important ones are listed below:

- Which type of theories of competitiveness, general (e.g. Global competitiveness report (GCR), World Competitiveness Yearbook (WCY), Resource-based View (RBV, Barney, Diamond,...) or specific one are more relevant for decision-makers?
- Can Asia take up the challenge to develop its own economies and societies—which it has largely done so far by becoming a ‘factory’ or industrial park for global enterprise—while taking heed of the need for sustainable development of which the developed economies were not aware at their equivalent stages of development (Hasegawa, 2002).
- Is there really a Japanese model of competitiveness (Porter, Takeuchi, Sakakibara, 2000)?
- Is Japan really slow to change (Takeuchi, 2003)?
- Clusters play and important role in competition, and these raise important implications for companies, governments, universities, and other institutions in an economy (Porter, 1998). How is health of past competitive clusters in Japan and how fast new clusters are
Emerging?

- Is firm level, one of the best level for action on competitiveness?
- Which is the best framework to understand the role of different levels in a given context?
- Is inadequate strategy a root cause of slow competitiveness enhancement of firms in Japan?
- Is research @competitiveness really inadequate in Japan?
- Alliances have been referred to as major source of advantage for Japanese firms and has been one of the major areas of research since 1990s. How Japanese firms are leveraging such sources in changed circumstances?
- Can culture (national, industry, organization) be a source of competitiveness?
- Today's competitive realities demand leadership (Porter, 1998). Leaders believe in change; they energize their organizations to innovate continuously. Is Japan nurturing such leaders in adequate number?
- Are real sources of competitiveness (e.g. why of competitiveness, Hamel and Prahalad, 1996) being considered in evaluations?