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**IT Revolution and Structural  
Reform of the Japanese Economy**  
**Perspectives from Northern Europe  
and New Economic Theories**

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## **INSTITUTE FOR INTERNATIONAL POLICY STUDIES**

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**IT Revolution and Structural Reform of Japanese Economy**  
**-- Perspective from Northern Europe and New Economic Theories --**

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**[Abstract]**

**This paper discusses which way Japanese economy should reform itself in a new framework about the types of the economy, by revisiting the New economy argument and a productivity rise of the U.S. by Information Technology (IT) revolution and from the actual experience of structural reform in Scandinavian countries.**

**Although comparisons with the U.S. are frequently quoted when IT revolution is discussed, Finland, that is in top class by the rankings of international competition in recent years not only in the area of the IT but also in allover competitiveness, can be a good example to learn. The country's minus growth for consecutive three years and the process of subsequent forcible recovery have shown the importance of structural reform, through which "true internationalization" and the change about "the role of government" have permeated the people of the Finland.**

**Next, analysis based on the framework of "the two types of the economy" is explained and its application to Japanese economy in near future will be extended. This new framework is developed from the theory about the causes of the Asian financial crisis and also upgraded through the arguments of IT revolution and its productivity rise. The final conclusion is in one sentence that Japanese economy needs to shift from the "Integral-type" economy that has been its own favorite style until now, to "Neoclassical-type" one. Under the current situation of extra easy monetary condition, it is necessary to turn a rudder drastically to the economy of the "Neoclassical-type", where the principle of competition and free entry and easy exit from industries are important. Thus, it is required to carry out privatization of and the deregulation by the government and bold reform in the big companies is asked. Although an immediate measure for economic recovery has been discussed loud in many cases, rather showing the direction of mid-term Japanese economy may be more important, after responding to a productivity rise of the U.S. by IT revolution calmly.**

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## **1. Introduction**

Since what has been referred to as the “lost 90’s”, Japan’s economy has gone through a long period of sluggishness. Calls have long echoed for the need for structural reform. At one point in Japan, there were high hopes for the IT (Information Technology) revolution, but there is a sense that the subsequent IT depression has dashed those hopes. Can Japan overcome its economic problems by continuing on the current path? This paper will first discuss the author’s view of the implication from the experience of the leading IT countries of Northern Europe during their “structural reform” of the 1990’s. In recent years, Finland (the home of the top cell phone manufacturer Nokia) has been able to achieve an extremely high international competitive strength rankings of No. 1 and No. 3 in overall country competitiveness. This comes in spite of the fact that the country had experienced three consecutive minus growth years with a total GDP (Gross Domestic Product) contraction of 10% for the period. In the 1980s, when Japan was being hailed as “Number One” (to coin the title of the book by the American scholar, Erza Vogel) the Japanese way of doing things came under considerable scrutiny. Now, as Japan has a comparative rankings of 26 and 21 in overall competitiveness, there are only a few who analyze the current situation of Japanese competitiveness and show the way forward for the Japanese economy.

For this purpose, this paper attempts to propose a basic theoretical framework as to what direction the Japanese economy should take over the span of at least the next four to five years. This span of time is still shorter compared with the 10 years during the 1990’s over which much of the economic slump occurred. The argument starts with the relationship between the “New economy” theory related to the productivity growth in the U.S. economy during the latter half of the 1990’s and neoclassical economics. Then the paper expands the issue by highlighting the concepts behind the “New growth theory” and its difference from neoclassical economics. Further, it introduces an analysis of the Asian Crisis that attempts to expand the framework of neoclassical economics by taking account of corporate governance and related legal systems, and from there further introduces the frameworks of “two models of economies”. These two models are the “Neoclassical-type” and the “Integral-type”, and this paper explains that there is a need to make a sweeping course change away from the “Integral-type” of Japan toward the “Neoclassical-type” in this current climate of extra monetary easing.

## **2. Lessons Learned from Northern Europe**

When considering the relationship between IT (Information Technology) and the Japanese economy, comparisons with the economy of the United States are often discussed. However, among those corporations with major market capitalizations in the United States, one can point to many corporations such as Microsoft, Cisco Systems and Intel—all relatively new companies that grew to their current size based on their IT-related business. In contrast, the majority of the Japanese economy consists of giant corporations with long histories, and even though NTT DoCoMo has become an IT-related corporation in Japan that has grown a significant market capitalization, it began as a spin-off from the formerly state-owned Nippon Telegraph and Telephone (NTT). In this context, we can see that the Japanese economy may have more in common with the countries in Northern Europe. For example, one of Sweden's largest corporations is Ericsson, and Nokia of Finland performs a central role in the economy of that country. Both companies have long histories going back to the early days of the 19<sup>th</sup> Century. In other words, we can adapt many of the lessons learned from Northern Europe as Japan attempts to restructure its economy through IT and IT-related business models—lessons that may prove more relevant than examples of IT growth in the United States.

As the IT revolution continues in Japan, the issues of how our major corporations will change and the role the government should play in the process have become crucial. As the experiences of Northern Europe may hold valuable clues, in July 2001, I traveled to Sweden, Norway and Finland to discuss the future of the IT revolution and economics with a wide variety of authorities ranging from government economic ministries and central bank staff to researchers in national technology agencies and economists working in the private sector. The following is a compilation of my research with some added observations.

### **(1) The Experience of Structural Reform**

Since the beginning of the administration of Prime Minister Koizumi, there has been a strong recognition that “without structural reform there will be no economic recovery.” At the same time, however, there remains a large contingent that seeks economic recovery through policies of the past such as the supplementary budget. Unfortunately, it has been difficult to escape this sluggish economy under the economic stimulus policies tried heretofore, and many among the citizens of our country have come to believe that these policies could never lead to

long-term economic growth for the nation. In other words, these policies may have in fact contributed to building the “lost 90’s”, as they were only short-term and temporary in nature. Now, we may be able to uncover issues and solutions by looking to Northern Europe, whose countries have successfully experienced their respective structural reforms. This is where I wish to begin.

Over the 10 years from 1990 to 2000, Japan’s Gross Domestic Product (GDP) only grew at an average 1.3% annually. During the same time period, the growth rates for the GDP of Finland, Sweden, and Norway were all higher than Japan, at 2.2%, 1.8% and 3.4%, respectively (See Table 1). Not only was Japan’s low growth rate half of the 3.3% experienced in the United States over the same time period, it was the lowest rate of growth among any of the G7 countries. Further, Japan’s 2000 GDP growth of 1.9% is less than half that of Finland (5.7%) and Sweden (4.0%).

**( Table 1 ) Annual growth rate of real GDP(Gross Domestic Product) ( % )**

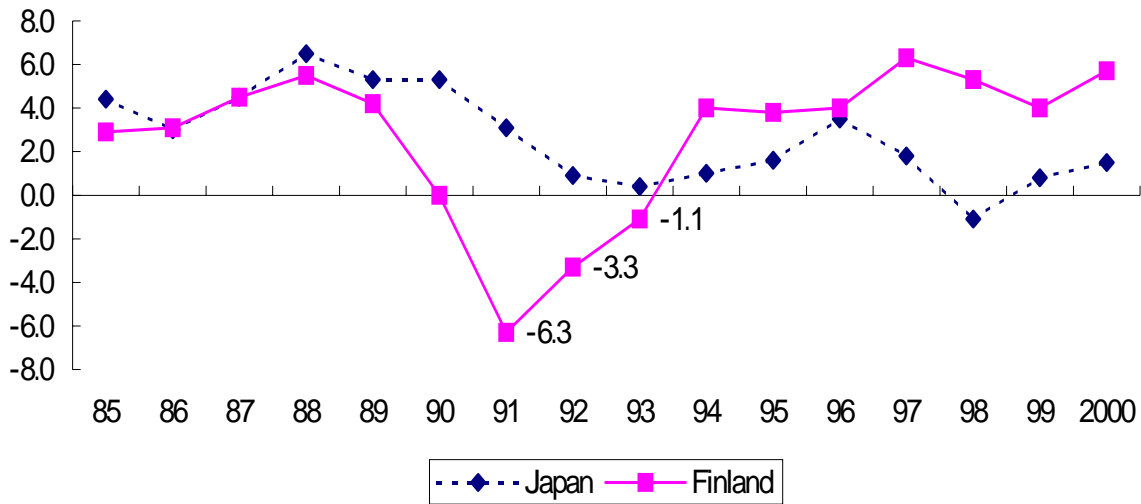
	<b>Real GDP growth rate ( average )</b>	
	<b>1990 - 2000</b>	<b>1999 - 2000</b>
<b>Japan</b>	<b>1.3</b>	<b>1.5</b>
<b>Finland</b>	<b>2.2</b>	<b>5.7</b>
<b>Sweden</b>	<b>1.8</b>	<b>4.0</b>
<b>Norway</b>	<b>3.4</b>	<b>3.1</b>
US	3.3	5.2
G 7	2.3	3.7

( Source ) OECD ( 2001 ) Cabinet office of Japan

In Japan the phrase, “lost 90’s” has found wide usage as applied to various issues, but we first need to look at the trends during the 1990’s in terms of economic growth. Here, we will make a comparison with Finland, an advanced IT nation, which has Nokia, the world’s leading mobile device (at present, mobile devices are evolving from cellular telephones into devices fully incorporating PC and Internet functionality) manufacturer. Both Japan and Finland enjoyed high GDP rates, as they experienced a period of excessive investment and amplified bank loans reflecting an economic boom—a so-called “Bubble economy” at the end of the 1980’s (one also sees the term “Casino Economy” used to characterize Finnish economy of the period).

Although Finland's economic bubble burst earlier than that in Japan (due to factors explained below in the section on internationalization), what stands out in Figure 1 below as the biggest difference between the two economies is Finland's steep fall in the early 90's followed by a strong recovery. In detail, Finland's GDP growth hit zero in 1990, after which it went through three years of minus growth, beginning with an enormous negative growth rate of -6.3% in 1991. In contrast, Japan recorded a -1.1% growth in 1998; the first minus growth since the Oil Shock, but the year ended with only this 1% economic contraction. Japan's GDP downturn has been completely different than Finland's three-year span of negative growth and total 10% drop in GDP.

(Figure 1) Real GDP growth rate (%)



(Source) Cabinet office of Japan, Statistics Finland

One should be careful not to come to the hasty conclusion that Japan would have been better off with three years of negative growth. 1998 is such a year for Japanese economy that financial uneasiness reached to its height. Coupled with the bankruptcies of the Hokkaido Takushoku Bank and Yamaichi Securities, and the special administrative management (temporary nationalization) of the Long-Term Credit Bank of Japan and the Nippon Credit Bank, there was concern about triggering a worldwide panic if handled incorrectly. In response to these circumstances, the Bank of Japan adopted so-called zero interest rate policy in February 1999. In the comparison with Finland, Japan had put off taking drastic measures in the name of creating a so-called “soft landing” during the first half of 1990 subsequent to the bursting of the bubble economy, resulting in delaying structural reform needed.

Here, I will briefly explain the structural economic reform that occurred in Finland during the 1990's, and its relationship with the IT revolution during the same period. To begin with, the mention of IT in connection with the Finnish economy is a relatively recent occurrence. In the past, industries based on lumber resources such as pulp and other products manufactured from wood were more representative of the image one had of the Finnish economy. In fact, wood products represented fully 27 percent of Finnish exports in 1960, and in 1970, exports were still heavily dependent on pulp and paper products, which made up 40 percent of the total. However, over the years the export levels of these products have greatly declined to a point where paper and pulp makes up 22% of exports, and wood products only 5%. In addition, the construction and several other industries underwent sweeping rationalization in the 1990's. As mentioned above, Finland underwent three years of negative growth beginning in 1991, and during the structural reforms unemployment reached amazingly high levels, especially among construction workers who suffered industry-wide layoffs.<sup>1</sup> Overall unemployment was 3.2% in 1990, but the numbers grew rapidly to 6.6% in 1991, 11.7% in 1992, and 16.3% in 1993.

As a result of this crisis and being a north European welfare state, Finland's unemployment insurance payments increased as did welfare-related expenditures. However, the country was burdened with a burgeoning deficit and from 1994, began to decrease the deficit by increasing pension and health insurance premiums, limiting unemployment payments, and raising the requirements for unemployment benefits. Similar measures were also taken in Sweden at this time. The only budget that the Finnish government increased during this period of tough administrative cuts was that for research and development (R&D). This strategic support of technology during the latter half of the 1990s saw a direct link with the blossoming of the IT industry in Finland. I will address this issue later in the section, The proper role of government, but the important question here is how was Finland (and Sweden) able to lay the groundwork for structural reform in the late 1990s in order to become an advanced IT nation, all the while struggling with severe unemployment and financial reform.

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<sup>1</sup> Concerning the scale of unemployment in Finland during this structural adjustment, the JETRO Helsinki Office (1999) reports, "The effects were first seen in the manufacturing sector, where one-quarter of all workers were laid off between 1990 and 1993. However, the construction industry

## **(2) True Internationalization**

Overinvestment and excessive loans were major factors contributing to Finland's economic bubble, and the subsequent downturn during the 1990's. This was also the case for Japan and Sweden. Another contributing factor unique to Finland's situation had been the enormous drop in trade with the Eastern Bloc because of the 1991 collapse of the former Soviet Union. While Finnish industry had been moving along at a measured but steady pace, the new reality forced drastic changes. Further, Finland's population was about 5 million (less than one-twenty fourth of Japan's 120 million), and GDP was only just over US\$120 billion, somewhere between one-thirtieth and one-fortieth of Japan's more than \$4 trillion GDP. Willing or not, the country was in a position where it had to make structural changes in its economy to respond to a new environment. Despite being faced with this difficult situation, the strategy adopted was to have private, educational and governmental cooperation to support investment in the IT sector, increasing R&D spending in the latter half of the 1990s (see figure 4 below). At the same time, unprofitable companies were weeded out without mercy, creating large-scale unemployment.

During my travels to Finland, both government policymakers and private citizens pointed out that being a small country, Finland cannot be self-sufficient and domestic industries are constantly under attack from international competition. One Ministry of Trade and Industry official confided in me that the 1980s had been the era of technology, while the 1990s had been that of deregulation. Deregulation in communications and other markets had forced companies to pay very close attention to IT in order to weather international competition. In other words, even government policies had to acknowledge the influence of internationalization, and as the fierce competition in the domestic private sector was similarly reflected in the international markets, these competitive pressures affected domestic industries, particularly the construction industry, causing the aforementioned increases in unemployment and other economic crises during the first half of the 1990s.

This same view of internationalization was held in Sweden as well. Sweden was larger than Finland in terms of both population (8.8 million, or about one-fourteenth of Japan) and GDP (\$240 billion, or about one-eighteenth of Japan). Even so, many in Sweden told me they had decided that complete transparency in their markets was the only way to meet the challenges

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was the hardest-hit, with over 40% of the jobs disappearing in the matter of a few years." (p 26-27).

of international competition. For example, a staff member at Sweden's central bank described how increasing transparency had allowed the IT revolution to stimulate a strong economic recovery: "If the IT revolution was going to have an effect on increasing economic growth, we were going to have to create an economy that was open internationally, which meant that we needed to ensure enough deregulation to make such a thing possible. During the 1990s we did just that."

In addition, the framework of a large, united Europe was another factor in Finland's accelerating internationalization. According to Teraoka (2001) about Finland's economic reconstruction, "After joining the EU during the middle of the 1990's, Finland began issuing English translations of its policy announcements and documents, which had only been published in Finnish before that. Now it is much easier to obtain current information about Finnish law, policy, and systems. Furthermore, since Finland made its large-scale economic development through Internet technology and its expansion, it is providing much information on the Web." In meeting and speaking with government officials and researchers, I noted that every one of them, regardless of age, spoke fluent, or rather clear and easily understandable, English. I found the same to be true in Sweden and Norway, which is to say that their view of the government's main role in assuring transparency of their laws and systems from a perspective of internationalization requires the ability to clearly and concisely communicate this information in English.

When visiting Finland's economic research institutes and technology agencies, I felt their Northern European pride as they made it clear that while internationalization required the ability to present information in English, this did not mean an acceptance of all things American. As one member told me: "First of all, Finland is not a litigious society like America. We don't have someone suing McDonald's in court because his or her coffee was too hot. On the contrary, we are a country trying to become a welfare society based on consensus building. There is a large sector in which public institutions are involved in implementing IT for the benefit of society." Further, many individuals pointed to the fact that venture capital has been a necessary and valuable part of developing IT industry, but at the same time in Finland, major corporations like Nokia exerted a profound influence on technology, after a company-initiated transformation.

Through internationalization, Finland and Sweden have been able to strengthen their economic positions not just in IT area, but as a country overall. As one measure of this achievement, we can look to rankings of comparative international competitive strength. Looking at the Swiss IMD “World Competitiveness Yearbook,” which is the source most often quoted in this context, Finland was ranked 3rd in 2001, up from 7th in 1997. Similarly, Sweden rose from 19th to 8th (see Table 2). In comparison, Japan dropped from 17th in 1997 to 26th in 2001, indicating the continuing decline of international evaluations of her overall economic strength.

**(Table 2) IMD international competitive ranking**

	2001	1999	1997
<b>Finland</b>	<b>3</b>	5	7
<b>Sweden</b>	<b>8</b>	14	19
<b>Norway</b>	<b>20</b>	16	5
<b>US</b>	<b>1</b>	1	1
<b>Japan</b>	<b>26</b>	24	17

(Source) IMD (International Institute for Management Development ) website  
 ( <http://www.imd.ch/wcy/ranking/pastresults.html> )

Rankings published by the World Economic Forum, a source that together with IMD make up the two most quoted figures related to world competitiveness rankings, provide an even clearer picture of the differences between Japan and the countries of Northern Europe. Based in Geneva, Switzerland, the Forum published their “2001 Global Competitiveness Report”, which included contributions such as Harvard University’s Professor Michael Porter and Professor Jeffrey Sachs. According to this report it is Finland, not the US, that is at the top (see table 3). Norway and Sweden raised their respective positions, both landing in the top ten, but Japan fell one more place, falling to twenty-one. One must note that although the World Economic Forum’s competitiveness rankings are based on the most recent information available, it still reflects a basic analysis of pre-September 11 figures. However, even allowing for the impact of the September 11 terrorist acts, the writers of this report have stated publicly that their mid-range evaluations in the report would remain the same. In other words, regardless of the effects of September 11, the creators of the report have determined that Finland deserves the number one ranking, citing the strength of Finland’s post-structural reform economy and the

role of the government (to be addressed further below), which all point to a bright future for the Finnish economy.

**(Table 3) WEF international competitive ranking**

	2001	2000
<b>Finland</b>	<b>1</b>	6
<b>Sweden</b>	<b>9</b>	12
<b>Norway</b>	<b>6</b>	15
<b>US</b>	<b>2</b>	1
<b>Japan</b>	<b>21</b>	20

(Source) WEF (World Economic Forum ) website  
 ( [http://www.weforum.org/pdf/gcr/Launch\\_Press\\_Release.pdf](http://www.weforum.org/pdf/gcr/Launch_Press_Release.pdf) )

Once again comparing the trends of Japan’s and Finland’s growth during the 1990’s (Figure 2), it is clear that Finland successfully implemented basic structural reform during the first half of that decade. And in this context, for example, Nokia management made a tough decision to undergo a major restructuring, necessitated by internationalization. The company boldly invested in strategic R&D projects to transform their main business lines. In Japan, calls for “global management” have been heard since the beginning of the 1990’s. But the major Japanese corporations, especially the non-manufacturing segment, still need to address true internationalization before they will be able to fully complete internal restructuring.

**(3) The Proper Role of the Government**

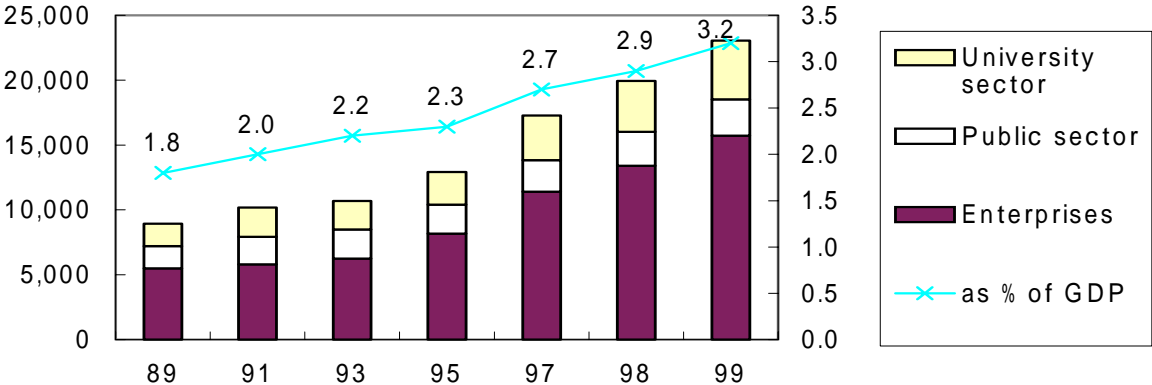
Having visited the countries of Northern Europe, I learned first hand about the vital role that government policy plays in the development of the IT revolution. First, the government avoid controlling private sector through regulations and administrative guidance as much as possible, and is willingly taking risks, by providing funding and credit as beneficiary of the IT revolution. Second, central ministries and agencies play the role of stagehand, while local governments compete to offer administrative services in order to promote business within their boundaries. As a result, fiscal deficit has not become an issue.

With regard to the first point made above, a prime example of this policy can be seen in the role of Finland’s National Technology Agency, TEKES, and the National Fund for Research and Development, SITRA. TEKES provides funding for research and development projects, as

well as facilitating domestic and international networking. SITRA can be thought of as an independent publicly funded organization founded under Finland's parliament. Both organizations provide venture capital funding focused on IT ventures and, more recently, biotechnology. Funding takes the form of investment, loans and grants, but TEKES also offers project consulting as well as publishing information on developing fields and technology trends. SITRA appears to act somewhat like a venture capital firm, providing equity funding to promising young companies, even during this time where raising private equity funds is most difficult. As one would expect, these organizations publish audited annual reports disclosing financing and operating results.

As can be seen in Figure 2, the increase in government investment in R&D beginning in the early 1990's, both directly and through the types of public organizations discussed above, primed the pump for increased technology investment by universities and private companies. Public spending on R&D was 1.7 billion Finnish marks in 1989. In 1991, during the economic crisis, spending had increased to 2.1 billion Finnish marks, and continued to steadily increase, even when the government was battling its deficit problem. Not only did R&D investment increase in terms of currency, it also increased as a percentage of GDP throughout the 1990's. In 1989, R&D spending made up 1.8% of GDP. This figure increased to 3.2% by 1999, clearly indicating how important the IT revolution became to the economy of Finland.

(Figure 2) Finland's R & D investment (FIM million)



(Source) Statistics Finland

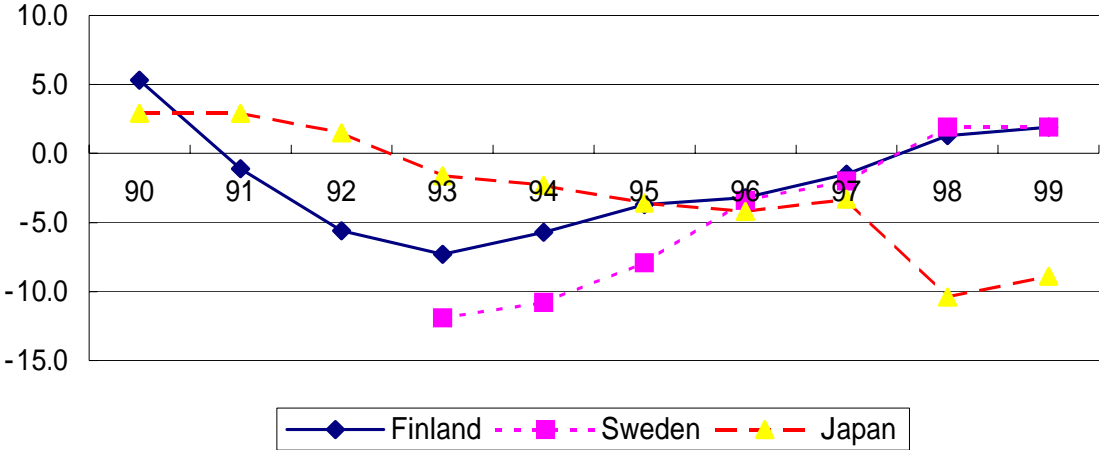
Concerning the second point made above, it was not the central governments, but the local governments in Sweden, Finland, and Norway that played the bigger roles in conducting

policies that promoted IT. During the latter half of the 1990's many governments with local universities built science parks (many science parks were built in and around local universities), focusing on IT, and now on biotechnology.

Norway has adopted an “e Norway “ initiative, announcing specific action plans beginning in June 2000 regarding what department of what government office is to perform what duties by when. These action plans are updated every six months. According to one official, “The theory behind this initiative is that the central government acts as a partner, without any enforcement authority, while local governments take the lead role in defining specific action plans.” In addition, I was told that final decisions regarding budgeting, and responsibility for dealing with deficits all lay with the local governments.

One expects that this type of active R&D spending on the part of public organizations leads to budget deficits. Figure 3 shows an overview of fiscal balance trends using a common measurement for Finland, Sweden, and Japan.

(Figure 3) Fiscal balance per GDP (%)



(Source) European Commission “The EU Economy: 2000 Review”

After the burst of its economic bubble, Finland was faced with a grave fiscal imbalance. As mentioned above, the government made a strategic decision to increase spending on research and development, resulting in large budget cuts in other areas. The government and people were forced to make certain sacrifices in 1997 in order to meet European Union admission requirements of having a budget deficit of less than 3% of GDP, and by 1998 coupled with

economic stimulus of the IT industry, Finland was operating in fiscal surplus. In 1993 Sweden's budget deficit accounted for more than 10% of GDP, but just like Finland, Sweden was able to erase their entire budget deficit by 1998.

In contrast, Japan experienced continued fiscal balance problems throughout the 1990's, reaching an enormous deficit amounting to 10% of GDP in 1998 and 1999. At present, the budget deficit is over ¥40 trillion, much of which is believed to be amounts generated by local governments (annual expenditure rates for local governments has grown to twice that of the national government). However, of the 47 prefectures and 3,229 cities and towns in Japan, only one, Akaike-cho in Fukuoka Prefecture, has been declared an "Organization subject to financial reform" (as of June 2001). The overall budget deficit for all local governments combined exceed ¥20 trillion under special accounting for the Local Government Finance Act, which is considered the responsibility of the entire group.

Of course, the local governments in Northern Europe did not devote all of their administrative resources to the promotion of IT, but the policy of having the central government act as a partner with local governments having more independent authority appears to have led to a discipline that prevented increases in budget deficits for the government as a whole. One of the regrets of the 1990's was that Japan lacked the kind of fiscal discipline and foresight necessary to make the type of public investment for the promotion of the IT revolution in Japan that could have brought about the same type of economic strength demonstrated by the countries of Northern Europe.<sup>2</sup>

### **3. From the Concept of New Economic Theories**

What direction must the Japanese economy take to implement structural reform under the catalyst of the IT revolution? What public policies need to be adopted for this reform to take place? In the following paragraphs I will try to answer these questions by discussing the development of economic theories on the IT revolution and economic growth, and the new theoretical experiments related to the causes of the Asian financial crisis in 1997 and 1998, and what policy implications these theories hold for the future of the Japanese economy.

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<sup>2</sup> See Nakagawa (2001) for a more detailed discussion of the current problems of local government.

The opening paragraph of the 2001 “White Paper: Information and Communications in Japan” (Ministry of Public Management, Home Affairs, Posts and Telecommunications 2001) claims to sum up Japan’s recognition of the IT revolution saying, “That the IT revolution will bring about a major historical transformation on the scale of the Industrial Revolution that began in 18<sup>th</sup> Century England is mostly a foregone conclusion in our country.” However, Professor Itami of the Hitotsubashi University, in his book comparing the extent of the progress of the IT revolution between Japan and the rest of the world, particularly the United States (Itami 2001), says, “It is difficult to conceive that the IT Revolution will bring about the same type of dramatic changes that were experienced with the Industrial Revolution. I do not believe that the IT Revolution is a revolution that will allow people to break through fundamental barriers the same way that the Industrial Revolution did.” Even in the United States, the birthplace of the IT Revolution, the Department of Commerce, famous for its government publications, predicts in their “Digital Economy 2000” report (United States Department of Commerce 2000), “...confidence has increased among experts and the American public that the new, proliferating forms of e-business and the extraordinary dynamism of the industries that produce information-technology products and services are harbingers of a new economic era. For most economists, the key measure of our new condition is the exceptional increase in productivity of the last five years...” However, even some experts express a strong pessimism as to how large of an impact the IT Revolution and the New economy has had on US productivity.<sup>3</sup>

In this section, I clarify the thinking behind the economic theories on the IT revolution and the new economy that have developed to such an extent over the last several years, without going deeply into the technical details of empirical analysis. Next, I present a framework for Japanese structural reforms utilizing these new economic theories, as well as presenting a fundamental view of the policy implications for the future.

### **(1) The “New Economy” Theory and Neoclassical Economics**

The long-term economic stability in the U.S. during the 1990’s gave rise to adherents of the

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<sup>3</sup> Gordon (2000, 2001) is representative. To see the real effect on economic growth, the extent of an item’s decrease in price must also be included. The definition of this price change (deflator argument) is also important. This type of empirical analysis is of itself important to the development of the study of economics, but quickly leads to detailed arguments of econometrics and statistics, and therefore will not be discussed in this paper in any detail.

“New economy” theory, claiming the birth of “a new economy, where there are no worries of inflation or recession.” Now, having entered the current “IT Recession”, one sees that these ultra-optimistic economic views were clearly mistaken. However, there has also been contemporary analysis performed by many objective economists pointing to indications that the current IT Revolution has accelerated economic growth. I will provide a simple summarization of the essence of the development of such theories.

The oft-cited argument was first made by Robert Solow, the winner of the 1987 Nobel Prize for economics. In the year that he won the prize, he said, “We see computers just about everywhere we look. We just don’t see them show up in productivity statistics (in form and contribution).” The “Solow Paradox” as it came to be known, and theories on the new economy became prevalent as the US economy continued to expand with no signs of abating in the latter half of the 1990s. But arguments about productivity began to surface as economists tried to measure the factors behind the economic growth. Reflecting the “productivity statistics” mentioned by Solow, who won his Nobel Prize for his contributions to the new growth theory, economic research began to once again turn to empirical analysis.

While the “New economy” theory began with the strong notions that traditional business cycles had become extinct, we see a remarkable pendulum swing in the opposite direction now, where some express the extremist argument that “the burst of the IT bubble showed that the IT Revolution was only an illusion.” Thus, I would like to first address actual U.S. productivity data.

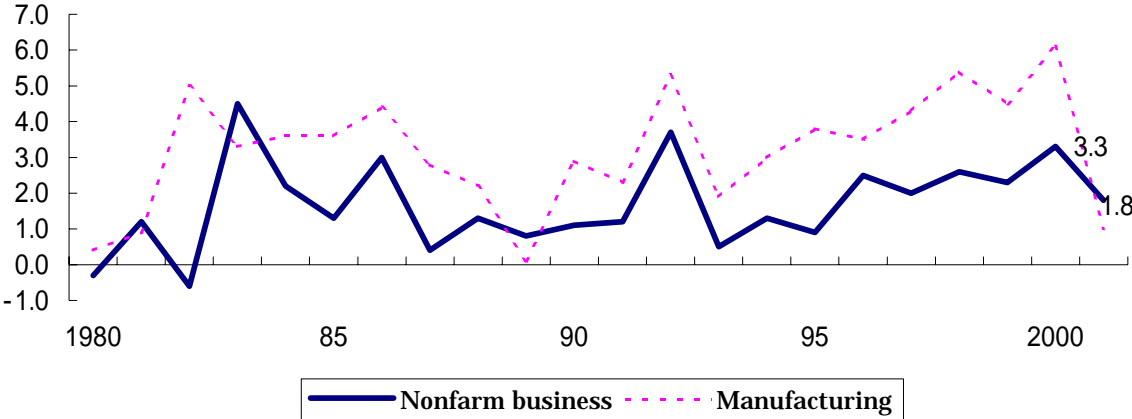
In Figure 4 the thicker line represents the annual growth rate of the often-studied labor productivity of the U.S. non-agricultural business sectors (output divided by total labor hours). Looking at this line, we can see a sluggish trend during the latter half of the 1980’s followed by a growth trend through the 1990’s, particularly strong growth for the years following 1995. However, growth trends peaked at 3.3% in 2000 and dropped significantly down to 1.8% for 2001. At the same time, or more accurately prior to that time, the U.S. economy began to decelerate, and together with it, the strength of the “New economy” theory. But there were many studies within the world of empirical economics, that recognized increases in U.S. productivity resulting from the so-called IT Revolution during the 1990’s<sup>4</sup>. A certain common

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<sup>4</sup> For example, recent papers on empirical analysis include Brynjolfsson and Hitt (2000),

acceptance has formed around the idea that it is highly probable that post-1995 technological innovations in connection with computers, software, and telecommunications, etc. increased growth in the U.S. economy. We cannot discount the effects of the so-called IT bubble and the ups and downs of the IT industry in America, but at the very least, we should objectively accept as fact that labor productivity in the United States shows high growth during the 1990's.

(Figure 4) Annual growth rate of US labour productivity



(Source) U.S. Department of Commerce ( <http://data.bls.gov/cgi-bin/dsrv> )

Another noteworthy implication for the Japanese economy that comes out of Figure 4 is that while United States showed high labor productivity increases for non-agricultural labor in the 1990's, there was an even greater record of continued productivity rate increases for the manufacturing sector. Of course, without the proper adoption of information technology in non-manufacturing sectors such as financial services, and the accompanying business restructuring, the IT Revolution would not have been able to foster changes in economic structure. In fact, in the 1990's the financial services industry (especially the banking and insurance fields) and the distribution sector spent enormous amounts of capital on the adoption of computer hardware, peripherals, and software. One point to bear in mind when

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Jorgenson and Stiroh (2000) and Oliner and Sichel (2000), among others. Other papers including an analysis of the growth in productivity of the U.S. economy during the 1990's based on a comparison with other G7 and European countries are Eriksson, Jonas and Martin Ådahl (2000) and Jalava and Pohjola (2001). Additionally, I will discuss in the next section an international comparison conducted by the OECD (2001) from a perspective of the New Economy, which, as expected, recognizes the productivity increases in the United States.

considering future structural reforms for Japan, is that productivity increases from manufacturing IT-related products, and efficiencies gained through the use of IT in the manufacturing process, fostered dramatic labor productivity increases in the United States during the 1990's (between 1995 and 2000, the labor productivity of US manufacturing increased an average of 4.6%, exactly twice the 2.3% rate for the non-agricultural sector).

In fact, Gordon (2000, 2001) has put forth well-known criticisms of the so-called "New economy" theory based on traditional economic empirical analysis. The essence of his claims dovetails with the arguments discussed above. Gordon concludes that empirical analysis of the data available shows that the impact of computers and the Internet on the economy was small compared to the "Great Inventions" of the past, such as "electricity" and the "internal combustion engine" of the second Industrial Revolution (period of technological progress between 1860 and 1900 in Europe and the US). This is not to deny, however, the actual increases in labor productivity that occurred in the United States during the latter half of the 1990's. Many other economists have conducted empirical analysis concluding that this increase in productivity owes much to the IT Revolution. Gordon, on the other hand, claims that these increases are no more than a reflection of the growth of computers, peripheral devices, and telecommunications equipment in a durable goods manufacturing sector that accounts for no more than 12% of the overall economy.<sup>5</sup>

Furthermore, as Gordon (2000) himself pointed out that the central technological innovations of the first Industrial Revolution (electricity, internal combustion engine) did not lead to the "golden era" of productivity improvement until after 1913, ten years later, we must wait for at least ten more years before quantitative analysis can tell us whether there will really be an actual productivity improvement in the non-IT sectors of the U.S. economy. The important point to remember here, in the context of the outlook for structural reforms in the future Japanese economy, is that there was an objectively observed productivity improvement spurred by the IT Revolution in the United States in the latter half of the 1990's, and such

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<sup>5</sup> Although minor differences exist among the papers, this summarization is valid from an overall perspective. For example, Gordon believes that the increases in productivity during the latter half of the 1990's is mainly cyclical; however, as Oliner and Sichel (2000) explain, as related to other factors. However, the data that Gordon used for his own analysis were taken from Oliner and Sichel's results (e.g. date related to capital deepening). Thus, I do not believe there is a large discrepancy in the recognition itself of the link between the IT Revolution and productivity gains in

should not be discounted just because of the current business cycle reflecting a so-called IT recession.

Up until now, in consideration of readability, I have used the word “productivity” in explaining empirical analysis related to the U.S. economy. I am sure many of the readers have already noticed that “productivity” means the term “total factor productivity” (or “multi-factor productivity”), also known by the abbreviation TFP, in the study of economics. Rather than delving into the details of econometrics, I want to emphasize in this paper that these analyses are based on neoclassical economics, currently recognized as the most orthodox approach of economic theory. Later on in this paper, I will present my own framework, which includes an analysis of the future of structural reform in the Japanese economy based on two models of “Neoclassical-type” on one hand and “Integral-type” on the other. Accordingly, the explanations offered here is a somewhat stereotyped version of how an economy should work theoretically, in order to convey an image related to a “Neoclassical” economy.

Under the neoclassical economics settings, all transactions of products and services are conducted through the market mechanism, and economic welfare is maximized amid short-term contractual relationships. In this world of “perfect competition”, wages and other products’ prices are paid for “elements of production” such as the capital and labor necessary for productive output. Increases in capital and labor hours bring about increases in production, and, the rest after factoring out these contributions of all or many of these elements of production is the contribution of technological innovations. This is why this kind of analysis is called that of “total factor productivity” or “multi-factor productivity”.<sup>6</sup>

This total factor productivity is the determinant of economic growth, and is treated as an exogenous factor in the model; in other words, the model itself cannot provide a complete explanation. Although this is somewhat of a paradox, the implications for public policy is that the best course of action is for the government to sit back and leave the economy up to the private market mechanism. This is not necessarily an explicit endorsement of the economic policies of the neoclassical model; however, the policy changes of the Thatcher administration

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the manufacturing sector of the United States.

<sup>6</sup> The numerical analysis for this type of productivity is called “Growth Accounting”, and this “total factor productivity” is also sometimes referred to as “Solow Residual”, named for Solow, who

of the United Kingdom during the 1980's to reduce national intervention, and the sweeping deregulatory policies of the Reagan administration in the United States, can be said to have been government responses that gave rise to the embodiment of Neoclassical-type economies.

Later in this paper I will offer a more detailed discussion about the general concepts of the Neoclassical-type economy. But before that, I will briefly summarize the ideas related to the development of the "New growth theory" area of economics, without going too deeply into the details of the mathematical theories themselves. At the same time, I will explain a discussion regarding new theoretical frameworks explaining the causes of the 1997/1998 Asian Currency/Financial Crisis that had been difficult to explain by previous economic theories.

## **(2) The Perspective of the New Growth Theory and the Economics of the Asian Crisis**

One thing that people find unnatural about the neoclassical growth theories is its assumption that "technological progress is an exogenous factor." As countries and individual companies struggle for competitive advantage, more research into technological development is performed, and the resulting new technology and know-how create new demand. More products are sold, resulting in actual economic growth. Before the acknowledged beginning of the IT Revolution, there was cases of wide-scale adoption of portable music listening devices such as the Sony Walkman, and spread-over of the Microsoft Windows software. Economists paid attention to these developments of greater importance of technological progress. The latter half of the 1980's throughout the 1990's saw significant development of the "New growth theory" or "Endogenous growth theory", where technological progress was incorporated within the model, rather than being treated as an exogenous parameter.

Most economists familiar with this field agree that the series of contributions by Paul Romer formed the origins of the "New growth theory". Romer (1986) theorized that "knowledge" plays an important role in economic growth, and built a model stating that marginal productivity gradually increases, proving the existence of a solution. As stated in the title of his thesis, "Increasing Returns and Long-Run Growth", the concept that increasing returns (as the scale of assets increases, the average return also increases) was antithesis to the neoclassical growth theories at the time.

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first conducted empirical analysis using this method

In the world of the neoclassical economics, constant or decreasing returns (as the scale of assets increase, average returns begin to diminish) is generally assumed, through which equilibrium is determined based on perfect competition. The repetition through this framework forms the basis of theories about economic growth. And in order for the people to realize the most benefit from the type of competition-based market mechanism, the government's role related to policy should be one of basic non-interference. Introducing this philosophy about "increasing returns" causes a drastic alteration in the neoclassic paradigm. More specifically, in Romer's case (1986), knowledge is treated as another factor of production just like fixed capital, and this "knowledge" is assumed to have characteristics of increasing returns.

I relate this "knowledge" to the portion of wisdom of ideas and know-how collected by mankind that is utilized in production activities. Naturally, certain part of this type of "knowledge" may remain with the companies responsible for the invention and development of those ideas and know-how for a certain period of time. However, the resulting effect on expanding production capacity spreads outward to society, and this leads to "increasing returns". In the example cited above, Sony generated impressive revenues with its Walkman. Subsequently, other electronics manufacturers capitalized on this idea, bringing many other products related to portable music listening devices to the market. And not only were these ideas strictly related to the original concept of cassette tapes. Other media such as the CD and MD were developed, and more recently the advent of MP3 the music file format has allowed the development and spread of new portable music devices holding large amounts of music data transferred from computer hard disks.

In economics, the nature of this "knowledge" (knowledge that can be used by others) is referred to as a "non-rivalrous" goods<sup>7</sup>, and this kind of perspective has been more and more important in our age of the IT Revolution. In other words, the image of capital subject to historical neoclassic hypotheses about production consisted of such things as steel and machinery—physical goods normally owned and used by one person or company. One

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<sup>7</sup> An opposing concept is "rivalrous", and of course in the world of economics the concept of "excludable" goods is used conjunctively for analysis. For example, even "non-rivalrous" goods such as inventions are "excludable" from others for a certain period of time through patents and copyrights. However, in this IT era where goods can be taken and easily copied instantly and without damage, there are many legal and economic issues yet to be resolved.

characteristic of the IT era is the recent trend in digitalization of goods and services through electronic transactions conducted using computers, software, and the Internet. This recognition becomes even more important when considering that these digitized goods and services, such as computer software, can be easily copied and sent to a third party by electronic mail. Accordingly, the sudden rise of the “New Growth Theory” shows the need for other economic theories in addition to the neoclassical school of thought<sup>8</sup>

Another weakness in the neoclassical growth theory, and a question raised by Romer, is the difference in growth rates among countries, and whether these differences will continue to narrow (converge and ultimately disappear at some point in time. According to standard neoclassic growth theories, over the long term growth rates will converge around a fixed level, and the role of the government does not have extraordinary influence on the economic growth of the country. However, as I have explained in previous sections, even the governments of Finland and the other Northern European countries that have incorporated the IT Revolution into their economies still exert a certain influence on their markets. And the productivity increases in the U.S. during the 1990's not only clearly exceeded that of Japan during the same period, but also exceeded that of most advanced nations. And with the United States clearly in position as the most economically advanced country in the world, it is somewhat hard to conceive that the differences in growth rates around the world are converging.

In a separate paper, Romer (Romer 1990) concludes that knowledge in the form of research and development (R&D) conducted in a competitive environment among private sector companies, is the endogenous factor pushing technological innovations, and that the level of human resources used in this research and development is lower than preferable to come up with an equilibrium solution. Consequently, one would come to the conclusion that these circumstances would welcome government intervention in research and development market, in the form of grants and favorable tax treatments, etc.

However, empirical research regarding productivity increases in the United States during the

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<sup>8</sup> This paper mainly addresses the question of how the development of this IT Revolution is affecting economic society through “informatization” and “digitization” from a macro-economic standpoint. See Okuno and Nakaizumi (2001) for an analysis based on a mainly micro-economic

latter half of the 1990's was conducted on the framework of the neoclassical growth theories themselves. Looking at this research, one can draw the conclusion that models based on "New growth theory" have not yet been able to reach the stage where they can fully explain reality. Even a purely theoretical appreciation reveals a sincere criticism that, strictly speaking, Romer's model cannot be termed an "endogenous growth model" in the sense that growth rates are determined by exogenous assumptions<sup>9</sup>. For this very point, and perhaps now more than ever, we seek a theoretical development that overcomes the contemporary neoclassical growth theories and economics. The development of the ongoing IT Revolution in particular, emphasizes the need for analysis based on a new framework.

Like the increasing importance of knowledge in production system, or of development of IT Revolution, the currency and financial crisis swept through Asia in 1997-98 also provoked the arguments on shortage of theoretical explanations by neoclassical economics. So-called First-generation models of Asian crisis argue that expansive macroeconomic policy lies at the root of currency crises, when a government is not able to maintain currency values at either a fixed rate or pegged to a basket of currencies. Thus, in one sentence to be summarized, the more expansive the economic policy, the more foreign reserves decrease, until ultimately the foreign currency held by the central bank is depleted, forcing the government to abandon fixed exchange rates. To put it differently, the government must either make a downward adjustment in the exchange rate peg or move entirely to a floating exchange rate in the end.

The countries that experienced the Asian crisis, such as Thailand, Malaysia, and Korea, however, were in fact, not in serious budget deficit, and had a record of relatively low inflation rates among the developing nations. In such circumstances, it appears that a simple application of this model is not entirely appropriate when explaining the root causes of the crisis. Therefore, a concept appears that may be called the "implicit budget deficit." That is, let us consider a foreign exchange market situation where major participants anticipate future huge increases in government spending for bailouts of defaulting banks as a result of the tremendous problems associated with non-performing loans. In such a case, even though a government has nominal fiscal surplus, it may not be able to withstand the downward pressure on the foreign exchange markets brought on by intensive speculation, and ultimately,

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foundation.

<sup>9</sup> See Yoshikawa (2000) p177~189.

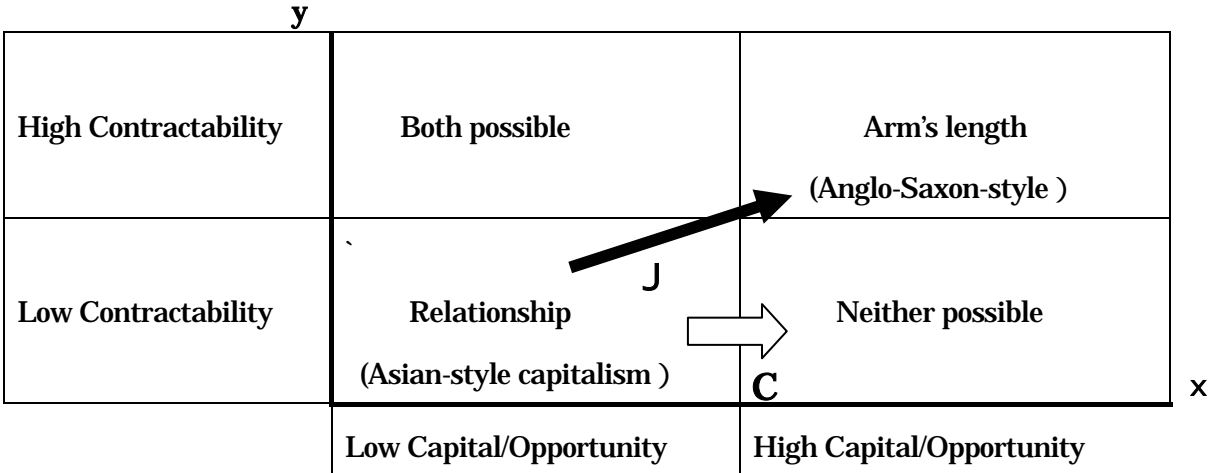
the government may have to abandon its fixed exchange rate. First-generation models identify a nation's fundamental economic structure as the determining factor in currency crises (even in the case of an implicit budget deficit).

However, the importance of individual actions in markets is obvious as can be seen by the famous or notorious incident of 1992 by George Soros' hedge fund's trading in British pounds that ultimately forced Great Britain to withdraw from the European Exchange Rate Mechanism (ERM). In second-generation models, the relationship between government policy and market participants' anticipation on economy can cause currency crises, theoretically as a result of self-fulfilling expectations. This model shows the possibility that speculators can trigger wild currency fluctuations through their strategic actions, even if there are no inherent weaknesses in the fundamentals of the economy in question<sup>10</sup>. While this model demonstrates that changes in investor expectations can cause exchange rate jumps between multiple equilibrium, it is difficult to draw direct implications from this model as to how to prevent such currency crises from happening in the first place. In other words, it is very difficult to use this model as a means to predict when and where a currency crisis will happen.

The first and second-generation models on Asian crisis have been based on neoclassical economics. In recent years, much attention, including quantitative analysis, has been given to the areas among economics, corporate governance and legal systems. Here I would like to introduce the model of two types of capitalism developed by Chicago University Professors Rajan and Zingales as a good theoretical starting point toward broader perspective than neoclassical economics. The origin of their argument is with the widely lauded, and subsequently widely criticized, "relationship-based economic system" that made possible the rapid growth of Asia's economy, and whether a fundamental problem existed within the transaction structure of Asian-style capitalism. The relationship-based model is defined as that in which the lender has some sort of influence over the entity to which it lends money. A typical image of the relationship-based model is that of Japanese banks which, during the course of rapid growth of the Japanese economy after the Second World War, provided credit to many small- and medium-sized corporations with whom they had close ties. This is in contrast with the "arm's length" model of the Anglo-Saxon system, where the lender's rights are protected by contract law.

The results of this analysis are summarized in Figure 5, in which the two axes measure two conditions of economic and social environments. The x-axis represents the ratio of capital to investment opportunities. It is divided into two parts, where one part represents a “low Capital/Opportunity” ratio, meaning a low level of available capital against investment opportunities, and the second part represents a “high Capital/Opportunity” ratio, where an abundance of capital exists in comparison to the investment opportunities available. The y-axis measures the reliability of transaction contracts. For example, when an economic society has well-developed laws, audit systems, regulations, etc. in relation to ownership rights, it is described as an environment of “high contractability.” In contrast, if such controls and regulations are not sufficient, it is in an environment of “low contractability.” The combination of these two factors create the four different parts as noted in Figure 5, each showing which type of capitalism works well in which circumstances.

**(Figure 5) Market economy models functioning in various environments  
(Japan (J) and countries affected by the crisis (C))**



( Source ) Rajan and Zingales ( 1998 ) with author additions

The postwar economy of Japan in the 1950's, 1960's and 1970's was one of “low Capital/Opportunity,” as the capital available was scarce in comparison to the abundant investment opportunities. This may be the very reason why the Bank of Japan adopted the supplementary monetary policy known as “window guidance” as a method of adjusting the

<sup>10</sup> Refer to Obstfeld (1995) as a work that incorporates game theory in a second-generation model.

credit supplies directly. The period was one of “low contractability” as Japan was still developing the necessary infrastructure to protect business contracts. Therefore, as can be seen in region 1 of Figure 5, the relationship-based model functioned effectively to create an environment conducive to high growth. In the following years, Japan put tremendous effort in increasing the Capital/Opportunity ratio beginning with the liberalization of capital, and in consolidating the legal and social structure related to business transactions. Japan followed the path represented by the black arrow of “J” over a long period of time. However, it is possible for two different models of capitalism to co-exist, and just as the relationship model co-exists within the US system, Japan has been adopting parts of the “arm’s length” model, whilst retaining large portions of the “relationship-based” model.

While the countries affected by the Asian financial crisis had the same starting point as Japan, namely area 1 of Figure 5, in which a relationship-based system can create a high growth environment, a tremendous influx of foreign investment thrust these economies into a “high Capital/Opportunity” mode, before they had been able to attain an environment of high contractability. The countries that bore the brunt of the Asian financial crisis moved along the path represented by the white line of “C”. The countries affected by the Asian financial crisis entered a region where neither economic model could function effectively (as seen in area 2 of Figure 5), and as a result, these economies entered negative growth situation. In this situation of capital, the mechanism responsible for appropriate capital allocation did not work well with a relationship-based system, and the resulting excessive investments occurred. This drove the economies into a “bubble” expansion and subsequent collapse, inviting crisis conditions.

However, even if these economies had been based on the Anglo-Saxon model at the time, without the proper conditions for contractability, a low level of confidence regarding the binding value of contracts would have created uncertainty regarding investment returns, and in such a difficult investment environment, the economy would still not have functioned properly. It follows, then, that the Asian financial crisis may not have been caused by the inherent weaknesses in a relationship-based system, but that it was perhaps an inevitable function of “low contractability” and “high Capital/Opportunity.” In this sense, it is quite possible that even had these economies adopted the Anglo-Saxon-style arm’s length models at an earlier stage, the crisis would have still occurred. It is conceivable that the Asian financial crisis was not the result of any inherent fault in Asian-style capitalism, but was the result of

rapid capital inflow in economies that had not yet fully developed contractability addressing controls such as corporate governance in connection with transaction confidence and bankruptcy law, etc.

### **(3) Two types of economy: Neoclassical and Integral**

I have discussed causes of the Asian Crisis and a logical approach to a response, based on classifications of Asia-style Capitalism and Anglo-Saxon-style Capitalism. Such dichotomy dealt with the difference between the ways in the Asian region and the U.S. that have inherited a culture and social background from the United Kingdom. In the following sections, I wish to attempt a more pure theoretical classification of economic functions themselves. I will use this framework to consider guidelines for structural reform of Japanese economy in coming years.

First, in order to consolidate the concept of differences in corporate governance, I will use “contractability” as a representative measurement along one axis. This treatment is the same as I have used in the previous section, but for the other axis, I will introduce the concept of “macro financial availability” as the measure, rather than “Capital/Opportunity”. In short, this is a measure of whether there is enough capital available for use in terms of macroeconomics, and includes not only capital from traditional direct financing sources, but also all types of direct and indirect macro financing. Basically, this factor is determined by the central bank’s stance on credit squeezing or loosening, but it also encompasses the macroeconomic effect of the central bank on the lending policies at private banks, and the willingness of investors such as venture capitalists to make capital contributions.

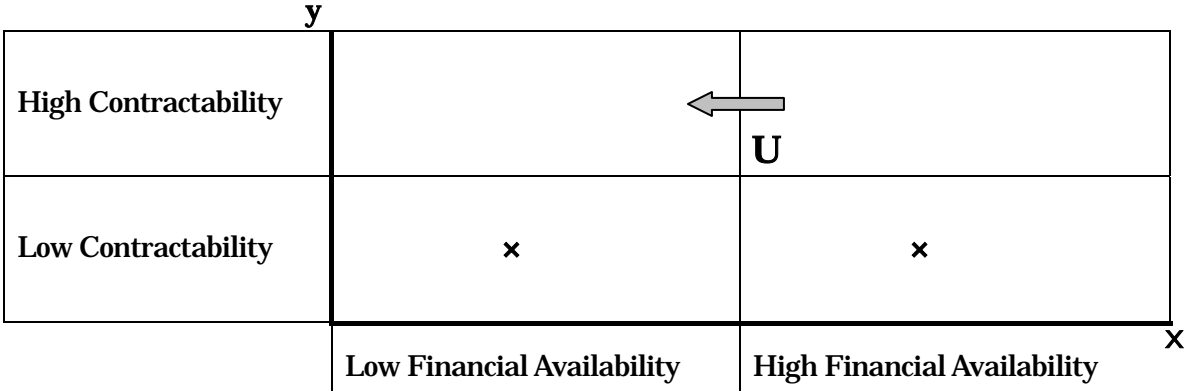
Fluctuations in the availability of capital investment are not only caused by short-term interest rate adjustments by the policy-making authorities, but also by the future perspective of the many players within an economic system. Because of this, the macro-financial index is affected by both the present economic condition, and by forecasts of future economic conditions. Generally speaking, “macro-financial availability” increases as an economy develops and financial markets stabilize. However, this does not necessarily mean that this index moves in only a positive direction. For example, “macro-financial availability” in the United States is considered to have declined after the terrorist attacks of September 11.

Of course, there may be some that view “interest rates” as a complete index of financial condition. However, in this paper, we will look at finance and economics from a somewhat wider vision, and by broadening the discussion, offer a new analytical point of view. After the terrorist attacks of September 11, the mass media, mainly in the United States, made comments that the attacks were an incident that divided world history into pre-September 11 and post-September 11; that the incident brought about a complete change in the way the world viewed itself. And while the attacks certainly caused an increased sense of wariness in people with respect to a trust in “safety” and the future, these circumstances not only affected the individual participants in the financial market, but also exerted a broader effect on the way the economy functions. The incident was a shock to the politics and security that form the foundation upon which economy and finance is built. This shock exerted an influence on the macroeconomic overall capital liquidity, independent of the level of “interest rates”, which are generally considered a strong economic indicator.

By considering whether these two measurements are in states of “high” or “low”, we can identify four different classifications. Figure 6 shows whether the economy assumed under the model of the neoclassical economics, namely a “Neoclassical-type economy”, functions well within each of the four classifications. Where “contractability”, the mechanism protecting contracts and transactions, is low, the presupposed conditions of neoclassical economics are not met, meaning that this model won’t function correctly.

**(Figure 6) Functioning of Neo-classical type economy**

[ =Well functioning, × (cross)=not functioning, (triangle)=middle ]



Accordingly, regions and are marked with an “X”. Under conditions of “high contractability” wherein lies sufficient capital liquidity (area in the Figure), a

Neoclassical-type economy functions properly; however, in situations where macro capital liquidity is not abundant, the market mechanism cannot facilitate perfect capital allocation, and the economy loses a portion of its functionality (area in the Figure 6 marked with a “ ”).

As mentioned above, after the terrorist attacks, the United States moved in the manner labeled as “U”. If that situation were to continue, this Neoclassical-type economy would not function sufficiently. Here, an “Integral-type economy” would demonstrate much higher functionality, and actually some portion of the U.S. economy seems to function in this manner. Furthermore, immediately following the terrorist attacks, the United States Federal Reserve Board decided to lower interest rates, in response to which the European central bank and the Bank of Japan also made steps toward financial easing. In addition, the U.S. government declared expansion of its spending program. Such action of the authorities not only led to lower interest rate levels, but also had a significant effect on market sentiment, possibly increasing the “macro-financial availability” levels we have been discussing. Accordingly, the U.S. economy may have returned to area , and at present sits in a position somewhere between areas and . Thus, it is my interpretation that the U.S. economy now is different than the extremely optimistic circumstances of the 1990’s (at that time, the economy was firmly in area , exemplifying a Neoclassical-type economy ).

Now, as another form of economy that is different from the Neoclassical-type economy, I will introduce the concept of the “Integral-type economy”, a model incorporating many of the characteristics of the Asian-style capitalism I have mentioned above. The conception behind this model stems from the so-called relationship banking system built around mid-sized company financing during Japan’s high-growth period, and the production structure incorporating the so-called “keiretsu”, “group company”, or “cooperative company” acting as subcontractor. Of course, these subcontractor relationships are not reflective of a pre-modern (feudalistic) ruling hierarchy, but rather serve to maintain a close-knit inter-corporate relationship to ensure a continued business relationship over a long-term perspective.

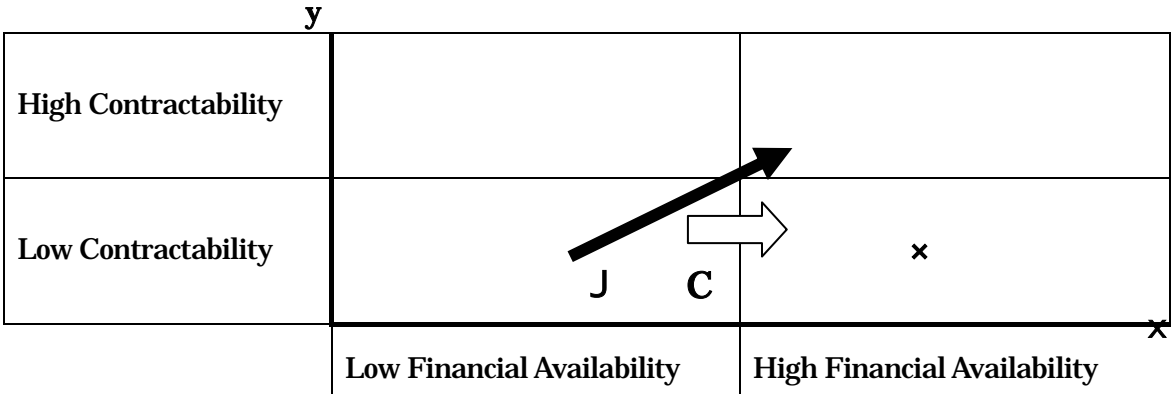
A specific instance of a model fitting the “Integral-type economy” that I present is the “Kanban System” and “Just-in-Time” production methods utilized by Toyota and its group of cooperative companies (see Ohno 1978 for more details). One interesting side-note is a statement made by

Taiichi Ohno, former vice president, Toyota Motor Corporation, and considered the founder of Toyota’s production system, about Henry Ford, Sr., the founder of the “Ford Method” of mass production. “I believe that if Henry Ford, Sr. was still alive today, he would surely have implemented the same type of Toyota production system that we have developed here.” In other words, whether one is talking about the Ford production system or Toyota’s now-famous “Kanban” system, and whether America, Japan or some other country, each of the methods employed best fit the time and circumstances surrounding them.

Figure 7 shows how the “Integral-type economy” (epitomizing Asian-Style Capitalism) is perceived to function in each of the four categories discussed previously. Japan and the other Asian countries of the “Asian Miracle” period are classified in area J, where an “Integral-type economy” based on long-term relationships make high growth possible. I have shown in the previous section that this model does not work well in an environment of “high financial availability”. And while this model functions somewhat in area C, it will lack functionality due to the rigid relationships between companies involved in Integral model-based production and keiretsu members when capital is abundant.

(Figure 7) Functioning of Integral type economy

[ □ =Well functioning, × (cross)=not functioning, (triangle)=middle ]



One claim I wish to emphasize in this paper is that the best economic model for the future should not necessarily be interpreted as that of a Neoclassical-type economy. In other words, even having experienced the terrible effects of the Asian Crisis, there is no need to throw away the Integral-type economy that made possible the economic growth engine of the “Asian Miracle”. In fact, it is important that this model be utilized in the future. On the other hand, in Japan’s case, where a rare zero interest rate policy has been adopted, we must see the

complete permeation of a Neoclassical-type economy with the attendant deregulatory policies.

The form that Japan's structural reform should take from a perspective of these two economic models, and an analysis of the relationship with the IT Revolution will be dealt with in detail further on. In the final paragraphs of this section, I wish to briefly address the relationship between approaches based on the framework introduced here and results of research that has been conducted up to this point in time. First, in consideration of the differences in each country's systems, we have what is called "comparative system analysis", a rapidly developing field analyzing the diversity and dynamism of capitalist economic systems not limited to Neoclassical Economics. Recent representative work in this field includes the writings of Aoki and Okuno (1996) and Aoki (2001). Looking at these works reveals possibilities of an extremely broad analysis of the history and development of individual economies subject to "comparative system analysis". At the same time, one can also see that rigid mathematical models, mainly game theories, have been applied as well. While common in the basic stance that philosophies of Neoclassical Economics are not all-encompassing, the approach that I have selected for this paper really provides nothing so much as a large framework, with the intention of introducing a more macroeconomic analysis (as such, macro-financial conditions have been incorporated universally into one diagram). This is one point where there are differences between what I have been proposing and what is offered within the microeconomic framework of "comparative system analysis". However, I believe that both schools of thought have common ground in acknowledging the importance of identifying the differences in the legal systems and corporate governance models of different countries, and the necessity of incorporating such into economic analysis.

In recent years, a keyword or field that has been developing in the area of management theory, industrial studies and corporate strategy is "Business Architecture" (see Fujimoto, Takeishi and Aoshima (2001) and Kokuryou (1999), etc.). One analytical tool used in this new field is called "Integral Architecture", and as can be guessed by the name, this tool has quite a few areas that dovetail with the "Integral-type economy" of this writing. Here, I will explain the fundamental concepts related to the term "Modular" as used quite often in contrast to "Architecture" and "Integral" in this field according to Fujimoto (2001), and attempt to offer an extremely simplified evaluation of the differences in relation to the framework of this paper.

The word “architecture” is used generally to describe how things and systems are constructed (e.g. the post-Asian Crisis international financial architecture). However, Fujimoto (2001) states, “The ‘architecture’ of products and processes deals with the basic design conception of ‘how products are broken down into their component parts and processes, how the product function is distributed among these components, and how the interface between these parts and processes (the ‘coupling’ that converts information and energy) is designed and aligned”’. And further, “Modular Architecture” points to a “nearly 1-to-1, straight-forward relationship between functions and parts (modules)”, while “Integral Architecture” describes the “complicated relationship among collections of products and collections of parts.”<sup>11</sup>

An interesting point made in the same thesis is a comparison between Japanese and U.S. corporations saying, “After the war, Japanese manufacturers specialized in products using integral architecture—products that lent themselves to the strengths of a so-called connected relationship consisting of constant and deep communications, tightly-knit coordination, etc.”. In contrast, for modular products “Each corporation brings parts that they have developed and manufactured in their own individual way. Accordingly, the U.S. manufacturers’ ability to conceptualize systems and rapidly develop business lends itself to types of products that are comparatively easy to assemble.”<sup>12</sup> The opinion of Fujimoto that “U.S. companies have a competitive advantage in heavily ‘assembly’ oriented products, while the Japanese have an advantage in heavily ‘integrated’ products” appears to largely agree with the opinion put forth in this paper that the United States is most compatible with a “Neoclassical-type economy”, whereas Japan is most compatible with an “Integral-type economy”. As this paper seeks to define the proper structural reforms that will effectively tie the IT Revolution to economic growth, I have defined current Neoclassical Economics, and more particularly the workings of economic systems assumed under growth theories, as a “Neoclassical Model”. This Neoclassical Growth Theory has developed in the United States, and as the principles of modular architecture appear common in the U.S., the genesis of this analogous classification method

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<sup>11</sup>From Fujimoto (2001) p4 ~ 5.

<sup>12</sup> Fujimoto (2001) p10 ~ 11. More accurately, this thesis adds a “closed” and “open” axis to the “integral” and “modular” axis pairs in discussing architecture using four classifications. Here, U.S. corporations are characterized as being strong in a “modular model/ open model architecture”. Later, I briefly discuss the relationship between “open architecture” and the ideas in this paper, but have limited the scope in consideration of readability.

seems only natural.

However, Business architecture is something that can be defined and analyzed for each product or process, and in many cases analyses related to industries or product development, and can play a role in organizational behavior and management strategy phases. In contrast, the two models of economic analysis put forward in this paper is different in that it is wholly a framework related to the proper structure of a macroeconomic environment. When defining arguments about structural changes in the future Japanese economy as I will in the next section, one must also consider the state of corporate management in the same consideration of overall changes in the state of macroeconomics, and in this context, management theories related to the field of “Business Architecture” can provide profitable insight.

#### **4. Implications for the Future Japanese Economy**

Now, what types of policies and strategies can be devised related to structural reform in the future Japanese economy based on a framework of the two economic models of a “Neoclassical-type economy ” and an “Integral-type economy”? And what relationship does this new structure have with the IT (Information Technology) Revolution? From this point, I will introduce the conclusions of this paper focusing on the future economy of Japan and what transformation it should undergo, based on the theories related to the New economy in the United States and the experience of Finland and other Northern European countries.

First, let us look at an illustration that represents the analytical framework of the two models of economy, and use this to summarize the current circumstances and forward-looking structure of the Japanese economy. The high macro-financial availability shown on the X axis (horizontal axis) in Figure 8 illustrates Japan’s recent macroeconomic situation of the current financial environment reflecting a “zero interest rate”, an exception rather than the rule, historically speaking. As to the question of whether the circumstances of macro excess money are always beneficial to an economy, we see from the figure that in fact this was a high-risk environment. In other words, this is reflected in areas or of Figure 10, and in the situations where contractibility is low (area ), some investments are made in inefficient areas which would never otherwise receive funding, and this gives birth to a so-called “bubble economy” and a future severe crisis in the form of a “bubble collapse” (as discussed earlier in

connection with the Asian Crisis, future forecasts are made through investor expectations related to the international financial markets, which could manifest itself in a type of crisis where available capital dries up).

**(Figure 8) Functioning of Two types of economy**

[ □ =Well functioning, × (cross)=not functioning, (triangle)=middle ]

	y	
High Contractability	Neoclassical Integral	Neoclassical Integral
Low Contractability	Neoclassical × Integral	Neoclassical × Integral
	Low Financial Availability	High Financial Availability ×

Next, let us discuss reasons why the Integral-type economy functions insufficiently when in a state of extreme monetary easing such as area , which can be considered as Japan’s current economic circumstances. In a stage of low financial availability, where there are limits on the amount of capital available for use, tight-knit corporate groups, and the main bank system (banks and corporations maintain deep interrelationships) function favorably to make use of limited capital resources from a long-term perspective.

However, in a state of extreme financial easing, owing to the “Integral” effect on rigidity and continuity, some capital may continue to be used for the ineffective enterprises that should exit the market in normal circumstances. On the contrary, Neoclassical-type economy does not allow for the existence of such inefficient corporations and they should have been weeded out. Thus in this case, Integral-type economy limits the functionality of the overall macroeconomy (represented by the of area in the figure).

Of course an evaluation of the other measurement, contractability, is not so simple. Japan has built its current economy over the course of many years, from a state of low contractability and low financial availability after the end of the second world war (movement from area to area in the figure). However, even the United States, which is supposed to be the most

advanced capitalist economy in the world, is vulnerable to the significant problems of a capitalist contract society such as evidenced by the Enron bankruptcy<sup>13</sup>, which conversely shows just how important the perspective of contractability truly is. In this sense, improvements in business laws covering transparency and corporate governance are also important to Japan. This is especially true as long as circumstances of extreme financial easing continue, and such improvements must be made on an ongoing basis to prevent a tumble into a state represented by area     in the figure.

Now, given that the current state of Japan (represented by area     in Figure 10), what policy measures should the government enact? In short, the conclusion is Japan, heretofore a strongly Integral-type economy, must change its economic management to reflect an emphasis on “competition” as with the Neoclassical-type economy. In other words, advanced deregulation and privatization of the public sector will bring about a change in the mindset of the people in a visible way. For example, the circumstance of the recent rapid spread of broadband Internet is erasing the meaning of the traditional classifications segregating telephone, radio, television and Internet. The fence separating the telecom industry and the broadcast industry is gradually disappearing. And the information and content available over the Internet is not limited to news only. Even now, free and fee-based content, including games, concerts, etc., have ensured an intimate relationship between the Internet and the software, music and electronics industries. Japan does not have an independent regulation and oversight organization such as the FCC (Federal Communications Commission) in the United States. There are some that feel this type of official office should be introduced in Japan, but the prospect of further integration of “industry” as just explained requires consistent government policies that create a system recognizing a rigid distinction between industry promotion and regulation and oversight.

One useful example is the government role observed in Finland and other Northern European countries related to the IT Revolution (explained previously in Section 2 above), in which a

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<sup>13</sup> Enron Corporation applied for Chapter 11 bankruptcy in December 2001, as the largest business failure in U.S. history at that time. At one point in time, this company was held in high regard as a new energy company having the seventh highest level of sales in the United States. The failure revealed deficiencies in the structure of financial statement audits, as well as problems related to corporate disclosure and suspicion of fraud, resulting in congressional hearings, and the chairman

system was built to support the autonomy of local governments in promoting business in their areas, and in which each local government had a clear definition of their responsibility for any budget deficits (in contrast to Japan's current problems with local government taxation and financing). However, this paper also emphasizes a viewpoint allowing for the co-existence of both an "Integral-type economy" and a "Neoclassical-type economy", but showing the need for Japan, which has been a solely "Integral Model", to make a major course correction. In other words, the "Integral Model" has many strong points, including those that allowed for Japan to experience a long period of high economic growth. The current state of extreme financial easing, however, calls for taking factors of "Neoclassical-type economy", or in other words, structural reform to an economy emphasizing the principles of competition, featuring the free entrance in and exit from industry.

Here some of readers may have criticisms on this judgement of Japan's current financial condition. The Bank of Japan has cut the official discount rate to historically low levels, with short-term interest rates continuing at almost zero percent. Thus, saying that Japan has a "high macro-financial availability" when private banks are not lending money as they have in the past, hampered as they are by significant amounts of non-performing loans, may seem to be a mistake in the opinions of some. Certainly Japan's struggle with non-performing debt is casting a large shadow over the economy. But the definition of "Macro" is intended to encompass Japan's finances as a whole, and not just banking channels. Adding the word "availability" gives focus to the idea of capital that is available for use. In other words, the Bank of Japan, by not only setting the official discount rate at near zero percent levels, but also committing to the continued use of the variable method based on current volume targets until the consumer price index (national, excluding fresh food) year-on-year increases stabilize at over zero percent, is making clear their stance on the current policy vis-à-vis financial easing. Furthermore, Japan owns ¥1.4 trillion in personal financial capital, and maintain net external assets (even subtracting out the budget deficit), thus in reality Japan is currently in a state of "high macro-financial availability".

Rather, the problem lies in the fact that Japan is not fully utilizing its current state of high availability. Issues preventing full utilization include the lack of development in direct financing avenues, including venture capital, and the fact that banking institutions are not

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of the SEC calling for revisions in current audit methodology.

actively looking to make funds available through new loans. In a “Neoclassical-type economy”, as long as the playing field has been properly prepared, the market function will ensure that inferior companies and financial institutions are weeded out, clearing the way for economic growth. What the government should do is to require financial institutions to disclose their net worth based on strict asset valuations, and by consistently requiring all institutions to follow these rules, create an environment fostering the confidence of the private sector in Japan’s banking industry.

It is necessary to be able to break away from the current problems concerning non-performing loans and the belief that “all of Japan’s banks are failing”, and develop circumstances that allow for new entrants and a positive outlook for the future of Japan’s banking industry. As mentioned above in this context, one more policy that Japan’s government should enact in conjunction with deregulation is the privatization of government-run businesses. In a “Neoclassic Economy” it is most effective to let market transactions solve themselves, without government interference. Under this concept, the ideal government is one that ascribes to the philosophy of “small government”, providing the minimum services for the country such as conducting foreign relations, providing a police force, and ensuring national and personal security. Further, in order to resolve the issues currently facing Japan’s financial services industry, the postal business, including the postal savings activities, should be privatized as soon as possible. This measure is necessary for creating efficiencies in the financial services sector through the mechanism of freer competition.

Of course, government reform is only part of the equation. Just as in Northern Europe, the influence of major established corporations in Japanese economy is significant. That internal restructuring at these large corporations is vital to taking advantage of the IT Revolution has been well demonstrated by Nokia of Finland, who reconfigured its entire line of product offerings, generating growth during the latter half of the 1990’s and contributing to Finland’s overall economy (see Section 2 above for further discussion). And the effect was not limited to the company itself, but also includes the venture capital activities from the spin off of engineers and managers, creating a dynamic period of economic development in a climate of internationalization. In this climate, the “Neoclassical-type economy” functions extremely effectively. This is because of the free ability of corporations to enter and exit industries, and management ability to employ the most profitable means of capital and labor, regardless of

national affiliation.

Finally, Japan’s adoption of a “Neoclassical-type economy ” at this point of time is vitally important from a perspective of timing with the IT Revolution. First, in order to make an international comparison of Japan’s productivity growth rate, let us look at a comparison of Total Factor Productivity (TFP) growth rates during the 1980’s and 1990’s, irrespective of the theoretical problems and limits discussed previously.

Table 4 is an extract from results measured by four OECD researchers. As these researchers indicate in their own thesis, there are limits to the validity of international comparisons due to the data problems in the methods each country uses to collect and produces its statistics. Nonetheless, looking at the farthest right column shows the changes over the 1980’s and 1990’s (up to 1998) in growth rates among similar countries. This column confirms our earlier descriptions of the increases in Total Factor Productivity among the Northern European countries and the United States in the 1990’s, as well as the decline in Japan over the same time period. Another point to note is the increases in productivity in Australia over this period of time. The research results published by the OECD (2001) include a comparison of Japan and Australia, stating “why did growth languish in Japan, which has large and successful computer hardware industry, but soar in Australia, which virtually no such sector at all?”

**(Table 4) Average annual growth of Total Factor Productivity (%)**

	1980 - 90	1990 - 98	Change from 80’s to 90’s
Japan	1.6	0.7	-0.9
Finland	2.2	3.1	+0.9
Sweden	0.9	1.7	+0.8
Norway	0.7	1.9	+1.2
U.S.	0.8	1.1	+0.3
Germany	1.1	1.0	-0.1
France	1.6	0.9	-0.7
Italy	1.2	1.1	-0.1
Australia	0.8	2.1	+1.3

( Source ) Scarpetta, Stefano, Andrea Bassanini, Dirk Pilat and Paul Schreyer (2000) P36~38 Table 7

As we have already discussed several times, Total Factor Productivity as a measure is somewhat limited by the problems with the neoclassical growth theory upon which TFP is

based. However, setting this aside, the OECD report's interpretation of the Japan-Australia phenomenon says that together with rapid technological progress, growth is "influenced by the degree of competition, and factors influenced by the ease of market entry and exit, and market share changes." Further, this report goes on to show the correlation between growth in total factor productivity and the existence of administrative barriers to the creation of new business. The report states that administrative barriers in countries like Australia, the United States, and Sweden are low, where growth in total factor productivity is high, while countries like Japan, France, Italy and Germany have high administrative barriers and correspondingly low growth in total factor productivity. Another factor identified in the report as a primary factor for increasing productivity based on technological innovations, was Australia's high degree of openness to the outside. This openness appears to help spread knowledge, technology, and new business customs within the country.

We have seen the theoretical problems and limitations inherent in total factor productivity analysis with neoclassical economics; however, irrespective of those limitations, there are areas that seem to describe the comparison between Japan and Australia. The author wishes to make the point that the IT Revolution we have been talking about is not just a phenomenon limited to computers and the telecommunications industry. Indeed, when considering productivity increases in the Japanese economy as a whole, one should note that the non-manufacturing and services sectors account for a majority of its GDP, and the reaction to the IT Revolution as it affects Japan on an economy-wide scale and how the government should manage deregulation is important.

Earlier we took a brief look at the concepts of "Architecture" and "Module". Since these concepts come in handy when describing the relationship between the IT Revolution and the economy, we will take a moment here to briefly discuss their applicability in that context. When an economy fully embraces technology, or becomes "informaticized" or "digitized", an inevitable outcome is an acceleration of the pace and a globalization in the economy. At this point, many economists point out that it is more efficient to take this large system, and break it down into its component parts with a common interface (modules) (e.g. Okuno (1999), Kokuryou (1999), Okuno and Nakaizumi (2001)). Further, a policy of making these interfaces available to the public as the standard in their respective fields creates an open framework, accelerating the development and maturity of the economy as a whole. From an aspect of

business as well, “Open Architecture Strategy” (also the title of a book by Kokuryou (1999)) will inevitably be something required of Japanese businesses in the future, as long as the IT Revolution continues as predicted. An economy of competitive equilibrium brought about through this mechanism is just what we have already defined as a “Neoclassical-type economy”, and with the spread of the IT Revolution, this economic model should function efficiently, allowing for increased growth rates. It is this form of economy that is considered to have led to the increased levels of productivity in the United States during the 1990's, and in Japan as well this open format should facilitate inter-corporate competition in the various economic modules in the future.

Japan's current challenge is to convert to a Neoclassical-type economy through deregulation and privatization. One exception to this rule relates to investment in R&D (research and development). This is almost entirely a matter of timing. It is most likely counter-productive to have the current climate of extreme financial easing to continue for ten or more years. Accordingly, after this climate has continued for several years (say, after five or six), the period of “high macro-financial availability” will end, and once again it is likely that we will enter a period where an “Integral-type economy” will function more efficiently than a “Neoclassical-type economy”. Meanwhile, since the fruits of R&D investment take several years or more to develop, resource allocation to this field must be constant, looking from a long-term perspective.

This perspective coincides exactly with Finland's policies as an advanced IT nation to continue steadily increasing investment in R&D, all the while cutting other areas of public expenditure and implementing a financial reconstruction to take the government from a budget deficit to a surplus. In other words, Japan is grappling with a severe budget deficit problem with the radical revision in its budget formation, but R&D related spending should be treated as a separate matter, or rather we should ask how we can cut spending in all other areas but to R&D.

## **5. Conclusion**

By introducing two types of economic functioning, “Neoclassical-type” and “Integral-type”, we have explained the need for change of Japan to be able to adopt more of a “Neoclassical-type”

now. This is not to deny the validity of the “Integral-type economy”, and in truth, some fields should continue to employ this mechanism. For example, desktop computers may be a modular type of product; however, at the point that wearable computers have come into full acceptance, an Integral manufacturing process may become the norm.

However, the arguments set forth in this paper were from a comprehensive macro-level perspective, not on an individual product or industry level. Accordingly, I have explained my definitions using the somewhat obscure term “Neoclassical-type” and “Modular-type”. The point I wish to make is that while many people recognize the need for Japan to undergo structural reform, it is vital that we first logically clarify the direction and the form that the economy should take.

In this paper, I have cited the structural reforms of the Thatcher administration in the United Kingdom as a specific example of policies promoting a “Neoclassical-type economy”. Of course, political measures such as cabinet shakeouts were employed to weed out opposing opinions; however, of more impact was the aspect of having a strong background of policy ideals—“Thatcherism” and the “Thatcher Revolution”—making possible the realization of specific policies under a long-term administration. Removing government intervention as much as possible and allowing the market mechanism to work was the embodiment of the idea of a “Neoclassical-type” economy, and can also be considered as the tool used to move away from “big government.” In this current phase of extreme financial easing, Japan must make a course change, not to imitate England or America, but to chart its own course away from the familiar “Integral-type” to a “Neoclassical-type” at the moment. This reformation of Japan’s economic structure is what will beckon Japan into a brighter future.

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