LUND UNIVERSITY
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Master programme in International Economics
With A Focus on China

Comparing Industrialization between Japan and China
Why China Chose a Different Way

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Abstract: Via comparing the processes of Japan's and China's industrialization, we work out the reasons why China chose a different way from Japan to conduct industrialization. Generally speaking, the different time they embarked on industrialization, their relationship with advanced industrialized countries, the industrial policies they adopted, amount & structure of FDI and expenditure on R&D are main factors that decided their different way. Of course there are only three elements included in this thesis: industrial policies, amount & structure of FDI and expenditure on R&D.

Key words: Industrialization, industrial policy, FDI, R&D expenditure

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1. Introduction

1.1 Background

Michael Porter (1985) divided the economy into three categories: element-driven, investment-driven and innovation-driven. He emphasized the ultimate competitive advantage comes from the competitiveness of innovative products. That is to say, technological innovation will inevitably become an imperative strategy for a country to deal with issues such as economic globalization, structural imbalance and so on. And technological innovation is also the engine to drive economic growth, more importantly, it is a key part of industrialization.

In China, industrialization is generally defined as a process that the proportion of industry output in the gross national product increase. It is not only a process of economic change, but also a course of social revolution. Industrialization connects social changes and economic developments with technological innovation, which is considered as a part of modernizing procedure whereby a society evolved from a relatively lower tier to a higher level. No matter in China or in other industrialized nations, the essence of industrialization is a sort of replacement and substitution— the replacement of physical labor by capital and technology. Industrialization stands for change and progress, which plays a very prominent role in the process of social development and renovation.

To a large extent, industrialization is an inevitable choice for countries to go further and countries no matter how powerful or how vulnerable would struggle for it within a long period in order to step into a so-called “higher level of civilization”. And in fact, countries such as Great Britain, The United States and Japan have benefited from their pioneer behavior related to industrialization. Their improvements and advancements also give hints to other continuators. Thereby, the varied processes of industrialization and the achievements each country obtained are excellent samples for economists and analysts to research on.

Countries have made their choices, even the same country may chose different strategies in different period. For example, Great Britain made their maiden trip in 18th century and brought a big revolution to the whole human history. Japan started industrialization ahead of the other Asian nations and post-war period is significant in the history of its road of industrialization. And when it comes to China, the time after 1978 is the golden period for industrialization and it really has made a big step during this period. Therefore, if we want to compare the processes of industrialization between China and Japan, we have to chose a certain period and compare the industrialization of the two countries in the chosen period.

Japan in post-war period, especially during 1945 to 1973 and China after 1978, have been picked out to be studied in this paper for reasons that will be given in the next section. The two countries have very different populations, political structures, economic systems, social morals and cultures. And they also chose very different strategies in the two periods mentioned above. Table 1 displayed the population, personal income and GDP of modern Japan and China respectively. Having a population of 1.326 billion, China is the most populated country, and Japan ranks tenth with a population of 0.128 billion. And Japan's GNI ranks 30 among all 210 countries around the world, while China ranks 130. When it comes to GDP growth, we found that China's circumstance is better than Japan's: 11.4% to 2.2% in 2007 and 9.4% to 2% in 2008.

TABLE 1 Population, income, and GDP of China and Japan

	Population (thousands)	GNI per capita ($ millions)	Real GDP growth (average annual growth percent)	
	2008	2008	2006 - 2007	2007 - 2008
China	1,318,640	2,770	11.4	9.4
Japan	127,704	38,210	2.2	2

Source: World Bank, Key Development Data & Statistics, 2008

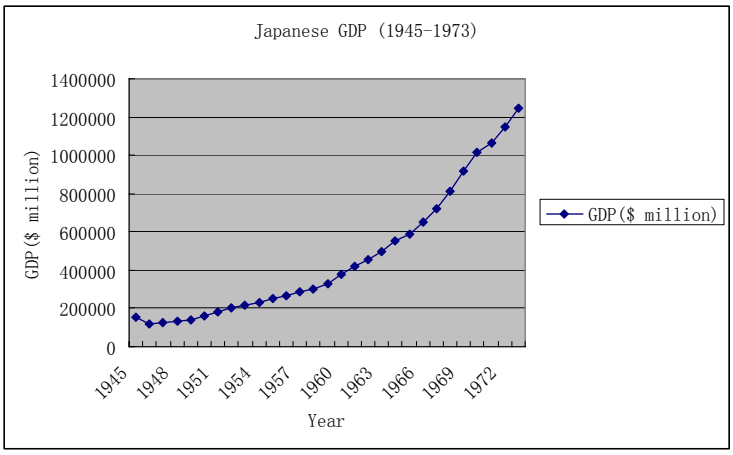
Looking back to the history of Japan, it is not hard to uncover that Japan is a magic with the consequences of success industrialization. As everyone knows that Japan is a small island country with a relatively large population and less resources, even worse, it endured unbelievable pain and soreness as one of the defeated nations of World War II. However, within several decades, Japan has grown into one of the leading power in the world. The incredible rising speed of Japan has caught much attention of economists and analysts. Most of them attributed Japan's prosperity to the correct path of industrialization. Masayuki Tanimoto (2004) admitted that "technology transfer" from the advanced western countries played an important role in directing Japan's early industrialization process. He discussed the impact of technology transfer on Japan's technology growth at the early stage. And when Sarosh Kuruvilla and Christopher L. Erickson (2002) were researching the change and transformation in some Asian industrial countries, they categorized these countries according to their industrial relation systems that Japan is the only one to attribute as an advanced industrialized country while South Korea and Singapore are in the "newly industrialized club". South Korea Malaysia and the Philippines are categorized to newly emerging industrial nations, while China as well as India just recently open their door. Undeniably, as a member in the first-tier industrialized group, Japan set a good example for others to follow and catch up.

Being different from Japan, China belongs to the third-tier industrialized nations and it is in the early process of industrialization. However, it still catches worldwide attention and the emerging of it becomes a serious issue to be studied. Owned the largest population, China was, still is an agricultural nation and due to the long-term wars, the Cultural Revolution, and three-year Natural Disaster, etc. China started industrialization far behind Japan, let alone the advanced western countries. Actually, it started after the establishment of People's Republic of China, yet some scholars argued that "there a short period after establishment was not a real industrialized revolution", which is called "Great Leap". Even though there are some obstacles and hindrances, China is one of fastest-moving countries

with astonishing growth rate. Since the enforcement of reforming and opening-up in 1978, China's GDP increased from 362.41 billion RMB to 30,067.00 billion RMB[1] in 2008. And from Chart 1, it is not difficult to see that not only GDP rose, but also GDP growth rate increased in the last thirty years.

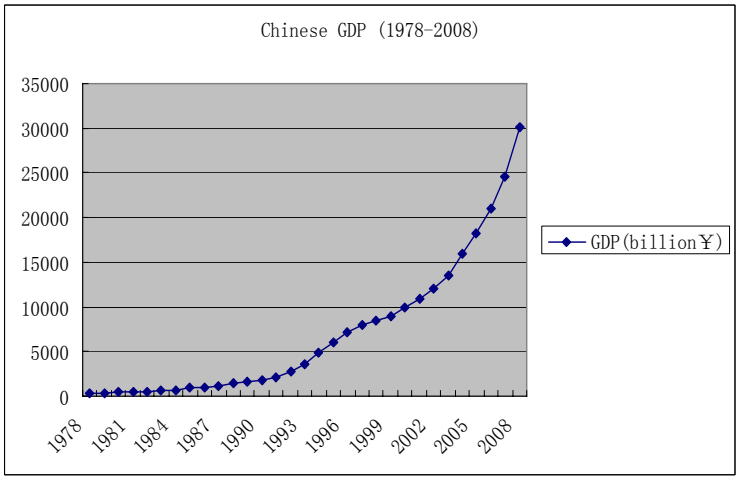
Chart 1 and Chart 2 (both showed in constant prices and PPP) respectively showed GDP of Japan from 1945 to 1973 and GDP of China from 1978 to 2008. They can tell that both of Japan and China have achieved a big improvement during their catching-up era. And both of the growth rates are large.

Chart 1 GDP of Japan from 1945 to 1973



Data source: http://dx.doi.org/10.1787/486663055853

Chart 2 GDP of China from 1978 to 2008



Data source: National Bureau of Statistics of China

[1] RMB: Chinese Currency, symbolized by￥

What are the driving engines of the two biggest economies in Asia? The answers are complicated, yet no doubt that industrialization can be the respond to a degree. Thanks to industrialization carried out in Japan, it recovered from depression and moved into a brand new era. And after years' industrialization, China is converting from an agricultural country to an industrial economy. The second industry accounted for almost half of GDP, which is much higher than the ratio of developed countries in 2000, latter ratio is only 28.6%.[2] Since 2000, radical demand for automotives, houses and infrastructures leads to demand for steel, machinery and chemical intermediate, finally, it transfer into demand for industrial progress. In order to push industrialization, economists and scholars carry out in-depth analysis of China's industrialization circumstance, characteristics, problems, strategies and so on, and compare them with those of other industrialized nations.

1.2 Purpose

The aim of this article is to discuss the industrialization process of Japan and China in comparative perspective. And then answer the question – why they underwent different paths to realize industrialization from each other.

In addition, as a member in the third-tier, China has lagged behind Japan in the process of industrialization. How to catch up with Japan? How to left it behind? These could be two major missions that China is shouldering. Conducted industrialization much earlier than China did, Japan's model might influent China more or less. The roles they played in China's contemporary industrialization process are also analyzed in this study.

1.3 Problem discussion

In this study, I will compare between the post-war Japan and post-1978 China in terms of their industrialized path and progress. It makes sense to compare them for three reasons. First of all, both of Japan and China are in

[2] Information gained from "The Report on Chinese Industrialization". Written in Chinese by Cheng

Asia and they share something, especially the root of their cultures in common. This kind of geographic connection makes the comparison more logical. Secondly, they represent two different levels of industrialization – Japan is a representative of the first-tier industrialized nations while China is a member in the third-tier, which is very symbolic and meaningful for their counterparts, and their way to industrialize could be lively lessons for the apprentice-countries, let alone that watching back to their way to industrialize could be a fortune for themselves. Last but not the least, both of the countries was once in difficulties in different periods, being a defeated country of World War II, Japan involved in a plight of chaos and poverty. When it comes to China, Sino-Japanese War, Cultural Revolution, and Three-year Natural Disaster made irreparable wound to China and once upon a time, it was there in dark. However, both of them have achieved success to varying degree after experienced the harsh time and devoted effort. Japan has grown into a developed country, and obtained the "first-class membership". China, so-called emerging economy, becomes a focus that a dozen of professions from varied nations and different fields are interested in as a rapid emerging country. In that case, the path and phases of industrialization taken by the two countries and why they chose different ways are worthy to research on.

1.4 Limitation

Industrialization could be reflected by varied aspects and the causes for different levels of industrialization could be ample. But due to too many aspects are related to weigh the circumstances of industrialization, it seems impossible to include them all.

And there are some problems with the period I chose to compare. The period after the World War II is the period in which Japanese industrialization developed rapidly, but China was in a position which is far away from industrialization. And while the engine of Chinese industrialization started after 1978, when reforming and opening-up strategy

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Jiagui, Huang qunhui, Zhong Hongwu and Wang Yanzhong, 2006. Social Science Academic Press.

was carried out, Japan had stepped into a relatively stable stage. Thus, there exists time gap between Japan and China, which is ignored in this article. In addition, this paper suffers from a lack of historical data and theories are not that complete as expected.

1.5 Solution

It is not possible to display all the elements that affect the process of industrialization. And the paper is going to discuss the Japanese and the Chinese way of industrialization in three main aspects: 1) industrial policies – the essence of industrial revolution; 2) inflow foreign direct investment – as financial support is the basic driving power of progress; 3) expenditures on R&D – the source of technology.

And in order to make a clear picture of process of industrialization, the paper is not only focusing on Japan's and China's best period devoted to industrialization, but also going to display the circumstances of industrialization from three aspects listed above in the modern society of Japan and China respectively.

1.6 Structure

The structures of the paper will be arranged into seven parts as follows. Section 2 is literature review and it is sub-divided into two parts: literatures of Japan's and China's industrialization respectively. Section 3 gives out the hypothesis of this article. And next to it, brief descriptions of two different processes of industrializing will be illustrated in Section 4. After that, section 5 discussed the circumstances of industrialization from views of industrial policies, FDI and expenditures on R&D of Japan and China respectively in the modern society. And section 6 compares the industrialization process between Japan in post-war period and China after reforming and opening-up, and also emphasized the lessons that China can learn from Japan in the process of industrialization. Conclusion will be drawn in the last section.

2. Literature review

As it mentioned is the first section, this part is going to review the previous literature, which based on individual process of industrialization took place in the two countries mentioned above.

2.1 Literature of Japan's industrialization

Only inferior to the United States, Japan is the world's second largest economy. Not only has Japan's strong economic strength, its technological competitiveness is also ranking in the top list of the world. However, just like Rome was not built in a day, Japan has paid a lot of time and effort to achieve today's accomplishment.

In fact, before the Meiji Restoration, Japan was a feudal country and most of income came from agriculture gains. After finished the Meiji Restoration, Japan embarked on the path of capitalism and happened to catch up with the second Industrial Revolution. Some modern industrial enterprises, such as Mitsui and Mitsubishi, were supported by government (Karan and Gilbreath 2005). That is the beginning of Japan's "robust". According to Ichirō Nakayama (1964), Japan's industry developed gradually after Meiji Restoration, but its industrialized level was low compared with western pioneers. After introduced textile machines in 1880, Japan's light industry soared and then, with the support and help offered by government, industrialization revolution came into "stage". And due to its geographic specialist and particular international economic environment, Japan chose to dependent on "export-oriented" industries, and set up a model for other industries. Tuvia Blumenthal (1970) has analyzed the historical issues that contribute to speedy development of the shipping industry. Actually, Japan partly owns its genuine growth of economy and success of transformation to technology transfer. As Masayuki Tanimoto (2004) emphasized in his article that technology transfer from industrialized western countries such as the United Kingdom and France has played foremost role in directing Japan's early industrialization process. And Mark Mason (1987) mentioned that in the early times, many foreign or multinational firms set up in Japan

and they provided the host country not only advanced technologies but also the way and approach of management, which be named as knowledge transfer. Some economists, like Mikio Sumiya (2000), divided the process of Japanese industrialization into four phases. It began to industrialize around 1945, and grew at a high speed from then on. And almost in the mid-1950s, there emerged trade friction with the US, Japan's main source of supporting. Then, by the beginning of 1970s, Japan's situation changed and Japanese technology & industrial organization caught worldwide attention, especially its heavy industry like steel. It exceeded the US and its steel industry hit the highest level of the world. Without specifying details about period, Edward J. Lincoln (1988) classified 1945-1973 as a whole period. And this period is also called "golden age" in Europe.

At the very beginning of Japan's industrialization, trade-protection played a prominent role in order to provide its fragile industry an opportunity to grow and prosper. Many economists and critics have paid attention into this filed and they have achieved certain accomplishment. Michio Morishima (1982) argued that in order to shelter incompetent industries from outside competition especially threats from western competitors and, Japan prevented itself from cross-border trade. G. C. Allen (1981) wrote in his book that the main industrial policy for Japan is protectionism, he further explained it as "carefully chose industries, prevent ruinous competition at the infancy stage, and nurse them up to a competition status and then expose them to outside competition". However, there are some opposite voices. When supporters of Japan's industrial policies are praising the adopted policies and admiring the contribution they made to the success of Japan's industrialization, the opponent pointed out the congenital limitations. According to Ali M. El-Agraa (1997), the major purpose of state intervention in economic activities (making industrial policies is one of which) is to affect allocation of resources, rather than to provide a friendly environment and make all industries to flourish.

Additionally, foreign direct investment might be another significant element that could not be ignored when refers to the development of industrialization. However, there are few studies or related literature have

examined the development of foreign direct investment in Japan. Since FDI includes two parts: outflow and inflow, and in this paper, FDI only mentions inflow foreign direct investment. According to OECD (2003), Japan's inward FDI is extremely low compared to outward FDI. Ralph Paprzycki and Kyōji Fukao (2008) noted although industrialization of Japan grown fast, FDI played a negligible part before 1980s. They explained that because the industrial policies were designed to preserve "industrial order" during the post-war era, FDI produced a negligible impact at that time. And Masaru Yoshitomi & Edward Montgomery Graham (1996) noted the low level of participation of foreign direct investment in post-war Japan. They talked about although Japan-US relationship after the World War II was tight and US offered supporting for some political and economic purposes, the FDI provided by the US was far from enough and the authors described it as the "imbalance" between Japan and US. Mira Wilkins (1974) argued that although the majority of FDI was allocated to the natural resource industries, there was still substantial FDI in the manufacturing sector. And Yoshitomi and Graham (1996) also mentioned that from the end of the World War II, which is the start that Japan was occupied by Allied forces, the government followed a policy with which the foreign investors could set up business in Japan in terms of "joint approval of several official agencies". And after obtained the membership of OECD, Japan deregulated its FDI policies and made them in accordance with OECD's code. And in the early-1970s, Japan introduced serious measures to decontrol FDI. Just as Sanjaya Lall & Shūjirō Urata (2003) said in their book that FDI did not play a major role in post-war Japan in terms of technology transfer, but it played an important part to make the market more competitive and inspire the local development of technology.

According to OECD (2007), Japan owns the highest ratio of researchers to total employment. Being one of the advanced high-technology-oriented countries, Japan thinks much of the power of high-tech and invests a big sum of capital in this field. Many economists examined how expenditures on R&D influence the performance of industry. Merton J. Peck and Shuji Tamura (1976) emphasized the expenditures of Japan on R&D focused on

improving the quality and lessening the costs of products was more successful than that spend for developing new products. David B. Audretsch (2006) also analyzed the effect of expenditures on R&D caused for Japan's industrial trade, and concluded that expenditures on research and development is an effective instrument for extending the technologic market and benefit Japanese trade balance. R&D expenditure is considered as an important tool because it did push the rapid process of industrialization. Shigefumi Kurahashi (1979) researched the role R&D expenditures played. He noted that the introduction of foreign science and technology can explain why Japan's industrialization was possible in such a short time. Actually, Japan imported foreign technology at an early time, but it did not really invest in research and development itself before the WWII. After the WWII, Japan started to pay attention and attach importance to research and innovation, achieved an outstanding accomplishment in R&D expenditure.

2.2 Literature of China's industrialization

Industrialization is an "insurmountable" stage of human society. It is sort of a profound social revolution in China, and to some extent, it has very close relationship with the characteristics of the culture. In China, some socialist called it as a fight between conflict and harmony (Huang, 2004). In this battle, industrial policies have played a significant role in its economic development for the last decades. In point of fact, China tried to industrialize right after its establishment, but generally we define 1978 as the real initiation of industrialization (Su Jing 2002). Su analyzed China's economic development in terms of science and technology, and divided it into two periods – before 1978 and after 1978. And in this paper, Chinese circumstance and process of industrialization is discussed only during the period after 1978.

Arthur Kroeber (2006) discussed how successful China's industrial policies are. It described China's economic growth model and noted that industrial policies has been successful at creating revenue and assisting the adoption and diffusion of technology. According to Kroeber's analysis, China shared

a bit similar features with her Asian neighbors at an early stage. Her rapid economic growth was partly driven by rapid transfer from agriculture to manufacture and export-oriented industry. But that is not the whole story. Unlike Japan or Korea, China was weak in protecting its domestic enterprises. It does not say that China pay less attention to protect its domestic market nor has a higher openness of free market after 1978, but with less efficiency to get rid of foreign participation. Jianxun Chen and Huici Shi (2005) investigated the high-tech industries in China. They spent one chapter to discuss the industrial policy under institutional transformation. According to Chen and Shi, in 1980s, China focused on making the reform of science and technology catch up with the economic reform. And in 1990s, the industrial policy of Chinese government turned to regard technological progress and make economic development improved hand in hand. D. Lu and Z. Tang (1997) noted that industrial policy was only effective partially in changing China's industrial structure and driving industrialization. For sake of vast scope of Chinese territory, the complexity economic sectors and extreme imbalance in varied provinces and areas, the selected issues of industrial policy cannot be ignored in inspecting post-reform industrialization of China (Bajpai, Jian and Sachs, 1997). Greg Linden (2004) mentioned that although the material benefit brought by industrial policies was not significant as expected, it did lay a solid foundation for future improvements.

The theory of substitution effects of FDI on trade was put forward by Mundell in 1957. It effectively explained direct investment among advanced countries during the pre-war period. It pointed out that a commodity can enter another country through trade or investment way. If investment approach was chosen, trade approach would be replaced as a result. However, after 1960s, there came a phenomenon that total FDI increased as well as a significant upward trend occurred in international trade. The traditional theory has been challenged and which caught a widespread concern (Ren, 2008).

Many scholars and researchers believe that FDI affects China's economic development positively. They stressed that the promotion of FDI inflow was

crucial for economic reforming in China and argued that FDI can not only solve the capital shortage problems, but also can provide admission to advanced technologies. And the advantages brought by FDI added its charm. They "provided foreign exchange and savings needed for industrialization and basic facilities of social development", and there are "links between competitiveness and FDI and domestic technological effort" (Sanjaya Lall, Shūjirō Urata, 2003). While there are some economists doubts that FDI may cause unfavorable effects to China's industrialization in particular, over-depended on FDI inflow may endanger the stability of the host country. Stephen J. Kobrin (1976) investigated the relationship between foreign direct investment and social change in developing countries. He argued that FDI may limit access to varied technology and make host countries dependent on imported technology worse, further to inhibit their ability of innovating. K. C. Fung, Hitomi Iizaka and Sarah Tong (2002) believed the foreign capital in China laid in an important position in the process of economic development. And they noted that there was voice concerning that FDI may negatively influent China's industrialization by replacement of domestic savings. And there exists a third voice that FDI and industrialization are two factors to push social change (Stephen Jay Kobrin 1977). Kobrin did not investigate the relationship between process of industrialization and amount of inflow FDI. Instead, he used industrialization and FDI as a pair of dummy variables to estimate social change.

According to the synthesis report of OECD (2007), China increased its expenditure on research and development rapidly. The growth of expenditures is a signal that reveals the government recognized the close relationship between technology and industrialization, and also shows their determinations to improve the industrialized process. The industrialization is inextricably linked with technological development, and technology cannot be improved without input on R&D. Therefore, increased input on R&D can push industrialization logically. Some Chinese scholars noted that at different stages of industrialization, the structures of science and technology investment were varied. Generally in the first and second stage

of industrialization, enterprises cannot be the main source of R&D expenditure because the innovation capability of firms was in the initial and low stage. Namely, government played the major role at those stages. R&D expenditure, including capital and manpower, from government and state-owned institutions were accounting for more than 50% (Qi, Zhang and Zhou, 2006).

3. Hypothesis

Based on previous research on industrialization process of Japan and China correspondingly, there goes the following hypothesizes in the entire analysis.

Hypothesis 1: Industrial policies played significant role not only in Japan, but also in China.

Hypothesis 2: As to China, FDI plays a positive role in the initial process of industrialization, but the effect would be negative if it over-depends on FDI. But, the effect of FDI is not significant in Japan as its FDI inflows are quite low, compared with its outflows.

Hypothesis 3: Expenditure on R&D, as the main power drives scientific and technological revolution, could be an indispensable determinant for industrializing in both Japan and China.

4. Overview industrialized models

In this part, I am going to describe the two different processes of industrialization from the views of industrial polices, foreign direct investments and R&D expenditures.

As far as we know, Japan and China are two representative nations in Asia. They chose varied path to develop, however, they share something root in common. They are influenced by Confucian culture but chose different systems: Japan selected monarchy system while China stepped into the socialist road. Both of them once faced serious threats from outside and both of them survived and exist as independent countries (Douangngeune, Hayami and Godo, 2005). Since several reasons for that Japan and China made different selections and got varied positions in process of industrialization.

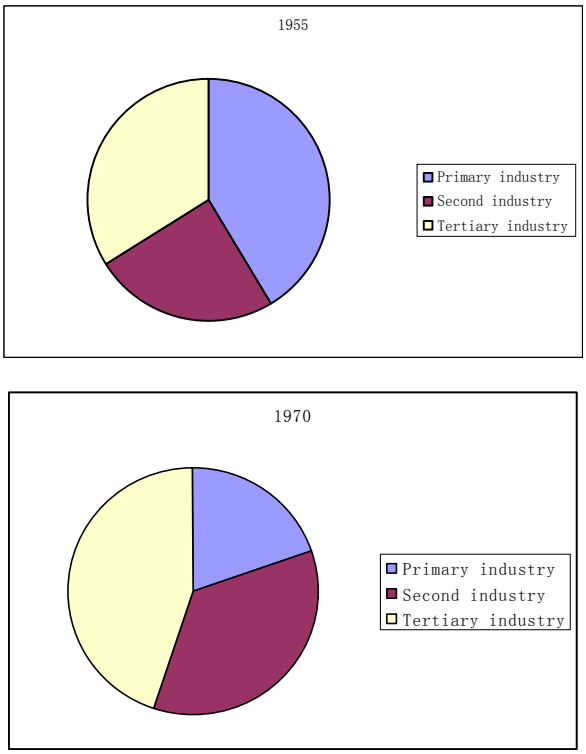
4.1 Process of Japan's industrialization

Being the first industrialized country in Asia, Japan has achieved a lot, in particular, the rise of Japan was a miracle and Japanese model become an important issue for economists all over the world to investigate.

Both Edward J. Lincoln (1988) and R. Keith Schoppa (2008) classified 1945-1973 as a period in which Japan took off and developed at a high speed. And Hiroyuki Odagiri (2007) divided Japan's post-war technology development into three periods. Among the three periods, 1945-1972 was classified as the first period, which is called the catch-up period. The period from 1945 to 1973 was also called golden age in Europe, just for convenience, I adopted "golden age" to mention Post-war Japan from 1945 to late-1970s.

Due to lack of data in 1945, chart 3 only illustrated the industrial structure change from 1955 to 1970. In 1955, the GDP proportion of tertiary industry was 33.8%, and it rose to 45.0% in 1970, which presents an improvement in industrial structure, even though the alteration is not as huge as we expected.

Chart 3
Industrial structure of Japan in 1955 and 1970



Data source: Shigeru T. Otsubo, 2007, "Post-war Development of the Japanese Economy".

During 1950s and 1960s, Japanese government promoted industrial organization in terms of oligopoly, which encouraged large-scale companies and strengthen the power of investment, and further became the foundation of Japan's economy. After the World War II, Japanese government had gradually turned their main policy from microeconomic-oriented to market approach by direct intervention (Ohmori Tatsuya, 1992). Japanese post-war government chose to foster large and technological enterprises.

Mikio Sumiya (2000) said in his book that Japan faced a severe challenge when it failed to be the defendant country after World War II, the policy-maker had to choose one strategy from two: to follow the pre-war industrial policy – importing raw material and focusing on industries development, or to emphasize on development of domestic resource and market. The former was called "trade first" while the latter was described as "development first" according to the author. Grown from an industrial latecomer into a leading high-tech model, the effects of the policy tends to "trade first" are quite significant. But according to Sumiya, not only the "trade first" strategy

worked, but also the consequence of “development first” policy cannot be ignored. It is more like a result of synergy.

In fact, Japan’s industrialization has its own characteristics and which cannot be copied easily: first of all, the supportive government played a prominent role in the procedure. Japan is an island country and it is lack of resource, in this case, external military aggression and outwards expansion seemed to be the leading strategy. It cannot be denied that also in western countries, the support provided by governments helped the development of industrialization process. However, these national influences are not as significant as the Japanese government’s. Via issuing bonds or establishing funds, Japanese governments supported, propped up and protected private capital, especially those businesses which had a very close relationship with the government.

Secondly, Japan conducted industrialization through the transplantation of technologies and equipments from western countries. That is to say, Japan avoided making huge mistakes from lessons of its ‘teachers’. However, at the moment that Japan started industrialization, western countries have passed the start-up phase and came into another stage. It is not sensible to adopt the most advanced technology or equipment or method of management as long as the country was weak in industry, especially the heavy industry sectors. Moreover, frailness of industrial foundation as well as malformation of industrial structure forced Japan dependent on western technologies more and more deeply.

The last but not the least, cultures and histories are other two elements referred to Japan’s industrialization process. David S. Landers (1999) once mentioned that the power of culture in the development of economics is beyond imagination. Be influenced by Confucianism and Japan’s national spirit, Japanese are good at learning and enterprising, which makes them efficient in institutional change.

After studies and researches carried out by thousands of economists and critics, we found that there exist numerous determinants and factors that could affect the process of industrialization. It is difficult and not realistic to cover all elements in this essay, therefore, I pick out three aspects to talk

about: industrial policies, foreign direct investment and expenditures on R&D.

4.1.1 Industrial polices do affect Japan's industrialization

After the Second World War, Japanese economy underwent a tough time, original industrial assets have been destructed badly, the importing channels have been cut down, as well as the unemployment rate and inflation rate have been kept in a high level. Japan's economy had once collapsed. The primary task at that moment was recovering and stabilising economy. Government determined to take effective measures to protect and foster national industries. The implementation of the basic policy guarded its industries from threat and unfair competitions of advanced nations, which laid the industrial foundation for rapid economic growth and optimization of economic structure.

In the whole operation of policy enforcement and economic revitalization, industrial policies played a noteworthy role as a guide. It is useful and well-organized when adjusting the structure of supply and demand, contributing to the balance of market, and it really does a good job to break regional blockades and market segmentation, and improved a country's international competitiveness. More or less, all countries can get some progress count on making suitable industrial policies especially countries with few natural resources such as Japan.

During the initial period after WWII, Japanese government chose auto industry as key protection. They set down a path that focused on capital-intensive sector, chemical industrialization-led industry and industries with ability to absorb large working force. Trade protection policy, on the one hand, has resisted the negative impacts imposed by foreign imports, on the other hand has created an environment for its young national industries to obtain international competitiveness.

From 1950s to 1970s, Japanese industrial policy has experienced a shift from the comprehensive protection to the selective protection, in line with the change of overall economic situation and international environment (G.

C. Allen, 1981). To put it in details, the changes in specific measures have transformed from tariff barriers to non-tariff barriers. More specifically, this period can be divided into three stages: Japan adopted a quota system as the main measure to control import in the early postwar period. The government formulated the Foreign Exchange and Foreign Trade Control Law in 1949 (WTO, 1952). In the process of implementation, Japan's Ministry of International Trade and Industry (MITI) did everything in their power to reduce imports of finished products, in particular those with potential to compete directly with Japanese manufactures. Since the second half of 1950s, Japan turned to spotlight on tariff-based trade protection policy. And in 1955, Japan was admitted to the International Monetary Fund, the General Agreement on Tariffs and Trade (GATT). Its tariff-based barriers faced enormous international pressure. In addition, its foreign trade surplus raised trade friction with other countries. Japan had no choice but to accelerate the implementation of so-called free trade or trade liberation. Nevertheless, Japanese government continued to take various measures and non-tariff barriers to protect its national industries. They deliberately delayed the time of enforcing liberation the trade, opened up competitive sectors in order to shield others. Since the second half of 1970s, the major competitive threat of Japan had gradually shifted from the developed countries to some of the developing countries which were in the process of catching-up, especially in labor-intensive industry and some traditional sectors.

In fact, Japan lacks of resources as an island country and it is difficult, even impossible to develop its exporting industry only dependent on exporting fabric commodities and other inexpensive primary products. On the contrary, it imported raw material massively, and sold overseas after manufacturing. In addition, Japan introduced advanced western technologies and put them into practice. After the introduction of trade liberalization, Japan did not completely abandoned industrial protection policies. Instead, it turned to improve health and quarantine standards, lift emission standards and strengthen industrial organizations, etc (Li, 2004).

After 1990s, Japan's strategy was furthermore focused on establishing knowledge intensive industries. And the details for Japanese industrialization in the modern society will be given in Section 5.

4.1.2 FDI is not a significant elements as to industrialization in Japan

Attracting and making a good use of foreign direct investment is a vital component to industrialization. But in stark contrast with most of the countries that encouraged FDI, Japanese government took restrictions and exclusion policies to limit foreign investments in Japan. Actually, this was a spreading of protection from field of commodities to capital market.

According to Sanjaya Lall and Shūjirō Urata (2003), FDI did not play a significant role in post-war Japan in terms of technology transfer, but it involved a lot to make the market more competitive and inspire the local development of technology. Just as Masaru Yoshitomi and Edward M. Graham (1996) mentioned that there were extremely few enterprises managed to obtain authorization to invest directly in Japan during the period of 1950s and 1960s.

Japan promulgated the Foreign Capital Investment Law in 1950.[3] It regulated that the introduction of foreign investment projects must pass rigorous review, and obliged those selected foreign capitals must meet the requirements as follows: will help to make progress on balance of international payments, will be in favor of the development of Japan's key industries and public welfare, and will not impose negative impact on domestic SMEs[4] nor disrupt industrial orders. In short, foreign capital will be authorized in Japan only if it is proved to be helpful in improving balance of payments or contribute to important industries.

In early 1950s, Japan was limited in capital accumulation, addition to acute shortage of foreign exchange, FDI would be helpful to resolve the difficulties at that time, let alone the introduction of foreign investment might also help to improve the technological level. However, Japanese

[3] Ministry of Finance Japan: http://www.mof.go.jp/
[4] SMEs: Small and medium sized enterprises.

government believed that temporary interests would bring long-term disadvantages, in terms of resource operating and distribution. In fact, there was almost no access to foreign investment approval in 1950s.

Since the mid-1960s, Japan's domestic industry enhanced, technology and international competitiveness have stepped into a higher level, and situation of international payment has been improved. Given the worldwide pressure, Japanese government gradually loosened limitation on FDI policy. Basic program for capital account liberalization was carried out in Japan, and the government implemented the program to stipulate inward FDI and by 1970, almost 80% of Japanese industries were allowed foreign ownership (Shigeru T. Otsubo, 2007). But it cannot be ignored that it was not unconditional for Japan to relax the restrictions on entrance of FDI. Protectionism was also a central theme in the process of opening, and the government did what they could to prevent technological dependence on advanced countries in order to keep industrial dominance of progress. Additionally, as a mono-ethnic country, the social culture of Japan was exclusive and with a mechanism of internal consultation. They believed that once a company involved interference of "foreign steak", its mechanism of internal consultation may be broken, thus the effect of industrial policy would be weakened.

Despite some efforts devoted and certain compromise made by the government, Japan still had an extraordinarily low level of inflow FDI, compared with other industrial countries. Via high-accumulation and small amount with multilateral concessional loans, Japan solved the problem of funds shortage in the process of industrialization.

4.1.3 R&D expenditure affected positively and significantly

We have already known that technological innovation is crucial for the process of industrialization.[5] Other researchers, such as Paul Romer and Robert Lucas, created endogenous growth theory. They thought that R&D, mainly from the perspective of innovation, can explain the reason why

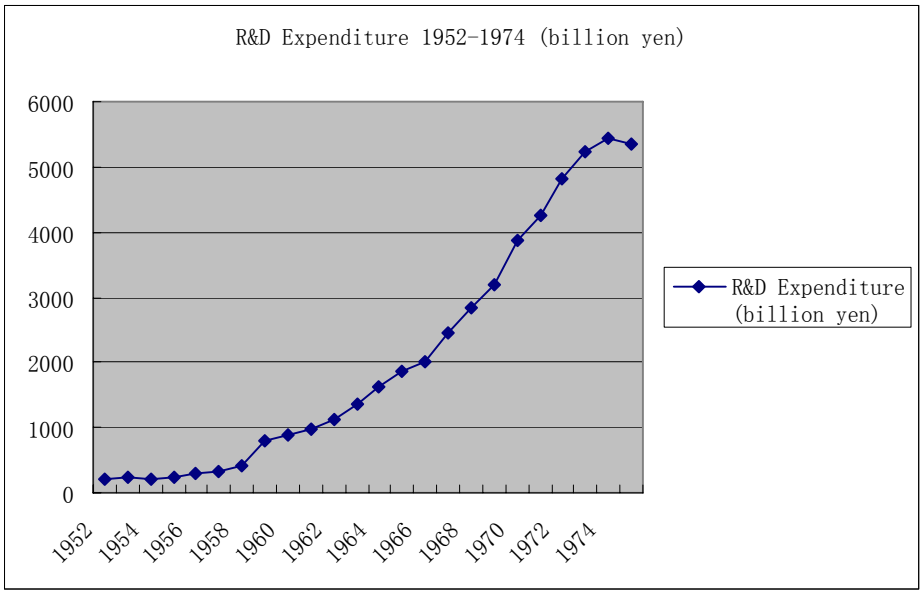
[5] Economists such as R. Solow and T. Swan, proved that technological progress is the engine of economic growth.

economy grows. Indeed, more and more countries start to attach importance to research and development input.

Through a series of programs, MITI funded technological research and made the central government recognized the importance of R&D. From the late-1950s, R&D expenditures in Japan rose rapidly. However, because of less development of domestic technology, Japan largely depended on adopting technology from western advanced countries. And this circumstance was labeled as "technological gap" according to Shigefumi Kurahashi (1979). Japanese post-war government tried to find out a new way to overcome this gap, moreover, the enterprises were also struggling to catch up with firms in advanced countries. As a result, both of the research funds and personnel engaged in research and development increased dramatically. Chart 5 illustrated Japan's R&D expenditures from 1952 to 1974, what is pity is that there is lack of data from 1945 to 1951.

Chart 4

R&D expenditure of Japan from 1952 to 1974



Data source: Hiroyuki Odagiri, 2007, "Thoughts on 'Establishing Benchmark for Global Innovation Ecosystem'"

We can see clearly that R&D expenditure was keeping increasing continually. Not only the funds increased, but also the number of personnel involved rose. In 1952, there were 95000 people engaged, including researchers, their assistants and other related people. And in 1975, there

were 490000 people involved, which is almost 5 times more than 1952 (Shigefumi Kurahashi, 1979).

Before the World War II broke out, government was the major funds source and nucleus for carrying out research and development in Japan. However, in the post-war era, especially since 1955, more and more private organizations and institutions engaged in R&D and they gradually got access to funds and crucial technologies. In addition, the profits brought by a successful production positively induced private sectors to initiate R&D.

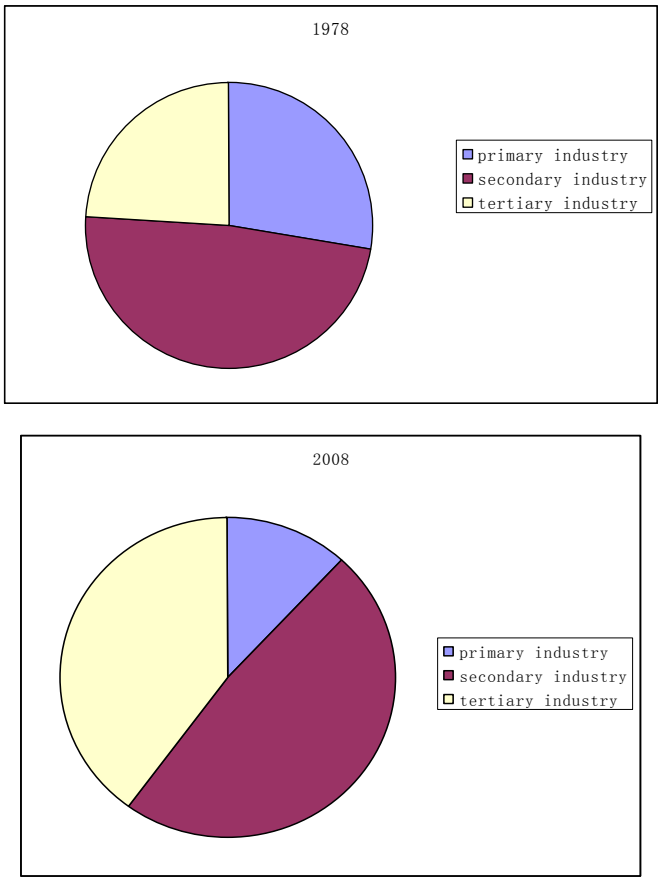
To a large extent, we can attribute Japan's economic miracle to its proper chosen of industrialization, and attribute its success of industrialization to expenditures on R&D. They seem to be different rings and put together to become a chain.

4.2 Process of China's industrialization

Although there are loads of difficulties and setbacks in the process of industrialization, China has made great achievements since the establishment of the country. Those improvements are not only shown by GDP growth but also explained by the change of industrial structure.

Chart 5 illustrated the change of China's industry sectors in the last 30 years since Reforming and Opening-up policy was carried out. In 1978, the proportion of GDP in tertiary industry was 24.2%, and it rose to 40.1% in 2008.

Chart 5
Industrial structure of China in 1978 and 2008



Data source: National Bureau of Statistics of China

China conducted industrialization after 1949, the time that People's Republic of China founded. When China was born, it was blocked out by the western countries and economy development turned to be the urgent mission. Soviet model set China a good example. From then on, China introduced Soviet model and adopted planned-economy system. The absence of collaborated mechanism of heavy industry and light industry led to a serious structural defect – overdevelopment of heavy industry and underdevelopment of light industry. Due to the lagging of light industry, there was an acute shortage of consumption goods that restrained demand.

Although the relationships between heavy industry and light industry, between the accumulation and the consumption, and among primary industry, secondary industry and tertiary industry were extremely discord, it

has to be admitted that industrial growth was fast in that period and it set up a basement for further industrialized improvement.

1978 is a milestone in Chinese history, which is imperative for China's growth, in which the strategy of reforming and opening-up was carried out, and China steadily adopted market economic system. In addition, it was the beginning of second-phase of industrialization. During that period, consequences caused by market-oriented reforms are obvious and positive, China no longer closed its door to outsiders and developed light industry along with heavy industry, and moreover, it attracted and utilized foreign investment actively to create a miracle of economic growth.

Since reforming and opening-up, China's manufacturing industry has experienced rapid development and made considerable progress. In the early 1990s, light industry, especially the textile industry, developed at a high speed, which drawn an ending of the era with shortage of industrial products. Moreover, the overall strength of high-tech industry enhanced during this period. At present, China's manufacturing industry in the aggregate ranks third of the world, just after the United States and Japan.

In this part, it would focus on investigating the roles those industrial policies, FDI and expenditure on R&D play respectively in the process of China's industrialization since 1978, the second phase of industrialized process, and try to approve the hypotheses.

4.2.1 Industrial policies do affect China's industrialization

In order to improve the competitiveness of China's local enterprises and enhance the strength of its industries, Chinese government exerts the power of industrial policies to protect and favor its sunrise industries. And as Greg Linden (2004) described, the measurement is accepted as government intervention and played a positive role in promoting economic growth in the high-performing economies of East Asia.

Since 1978, China has stepped into a stage whereby building up socialism society with Chinese characteristics. The characteristics of industrialization in this period can be summarized as: the industrialization revolution aimed

at optimizing economic structure, improving economic growth and achieving people's prosperity, and it adopted the strategy of balanced develop agriculture, light industry as well as heavy industry, employ various kinds of economic ownership and actively utilize foreign capital (Li'an Li and Keyang Zheng, 1993).

In particular, the road of industrialization with Chinese characteristics can be divided into two phases: the first one focused on structure correcting, in order to make the light industry and heavy industry develop synchronously. And the second one took up with accelerating the development of heavy industry and advancing industrial structure. The first phase began in 1978 and continued until mid-1990s. Chinese government brought major adjustment strategy of industry into effect, with respect to severe structural contradictions caused by long-term implementation of priority to development of heavy industry. Early days after establishment of the country, China deviated from the normal track to devote all strength into maturity of heavy industry. But since 1978, it abandoned the strategy of simply develop heavy industry, and turned to a more comprehensive strategy, which put the task of improving living standards of citizens at the first place. In this phase, policymakers paid more attention to market demand and they attended to give priority to light industry. According to some specialists, this phase can be subdivided into two periods, a period during which that industrial growth was led by agricultural products as raw materials and a period dependent on non-agricultural products (Chen, 2009). It converted from the policy that granted precedence to the development of heavy industry to a measure that giving priority to develop light industry. During this period, the incentive mechanism of the state-owned enterprises has been improved by encouraging of developing multiple ownerships such as domestic private firms, foreign firms and MNCs. The rapid expansion of foreign trade brings new source of capital and market space and the force of varied ownership drives the upgrading of consuming structure, which leads the industrialization to a more sophisticated level. The implementation of "six priorities" policy promoted the development of light industry: light industry have priorities for supply of raw materials, fuel and electricity,

priorities for innovation and transformation, priorities for investment in infrastructure, priorities for mortgage, priorities for foreign exchange and importing technology, and priorities for transportation.

Roughly, the second phase began from mid and late 1990s. The basic characteristic of this stage was that heavy industry grew at a fast rate and it once again dominated the pattern. Actually, after the adjustment of industrial structure, light industry took off and expanded fast, the relationship between supply and demand was better off, even amply supplied, and market boomed. After people's basic needs such as food and clothes have been satisfied, they begin to pursuit other durable consuming goods, for instance, cars and houses. These demand changes led to the upgrading of industrial structure. That is why heavy industry grew rapidly, and became leading power again (Chen, et al. 2006).

In the process of industrialization, the reform of urbanization and decentralization improved incentive system of state-owned enterprises, liberated the productivity of state-owned enterprises. On the other hand the rural reform greatly inspired the vitality of rural areas and farmers, prospered TVEs,[6] which significantly promoted rural industrialization. Furthermore, the development of private and individual economies has also become an important force and accelerated the industrialization process. In addition, the entry of a large number of foreign capitals and rapid expansion of China's foreign trade has provided new sources of funding, technology, channels and market space for China's industrial development. And it cannot be ignored that favored policy for attracting FDI is also imperative for the improvement of China's industry sectors. And this will be mentioned in the following paragraph.

Until now, China experienced change and revolution, it is considered as a transforming economy in a general sense. Owning almost one fifth of world population and a large land area, it is not practical for the government to carry out the same policy in different areas and regions at the same time. Therefore, experimental method was adopted (Naughton, 2007). Based on the characteristics of each provinces and areas, central government

promulgated varied industry policies, which could promote the local economy. It firstly pick up some areas to be the “experimental zones”, and continue to move to other places if it successes. That is why there exist “economic special zones” and they are the first beneficiary of the industrial policy.

4.2.2 FDI

China started to attract foreign direct investment almost in 1979, although the achievement was not satisfied before 1984. In 2002, China’s ability of FDI absorption surpassed the United States as biggest FDI recipient of the world for the first time. With the accelerated pace of economic globalization and China's accession to WTO has emerged, China's utilization of foreign capital further increased and the impact of foreign investment on China's economy is further in-depth.

The inflow of foreign investment can produce lots of positive effects, for instance, filling the investment gap, bringing advanced technology and introducing competition mechanism, etc. As more and more countries realized the importance of FDI, the competition of absorbing foreign investment becomes tense and policies for attracting capital turn out to be a hot issue.

China has gradually opened the door to outside and started to attract foreign capitals. From then on, the inward FDI of China increased rapidly. According to OECD (2000), China has replaced the US to be the largest foreign direct investment recipient country. The chart below displayed FDI inward to China from 1984 to 2008, because FDI inflow to China almost nil before 1984.

In general bounded in 1992, before that year the inflow of foreign capital was comparatively poor in quality, and after that year the policy gained propensity to improve the utilization of foreign capital. Specifically, in 1980s, it was in a poor situation for China's use of foreign capital. Foreign direct investment was in the framework of industrial restructuring globally.

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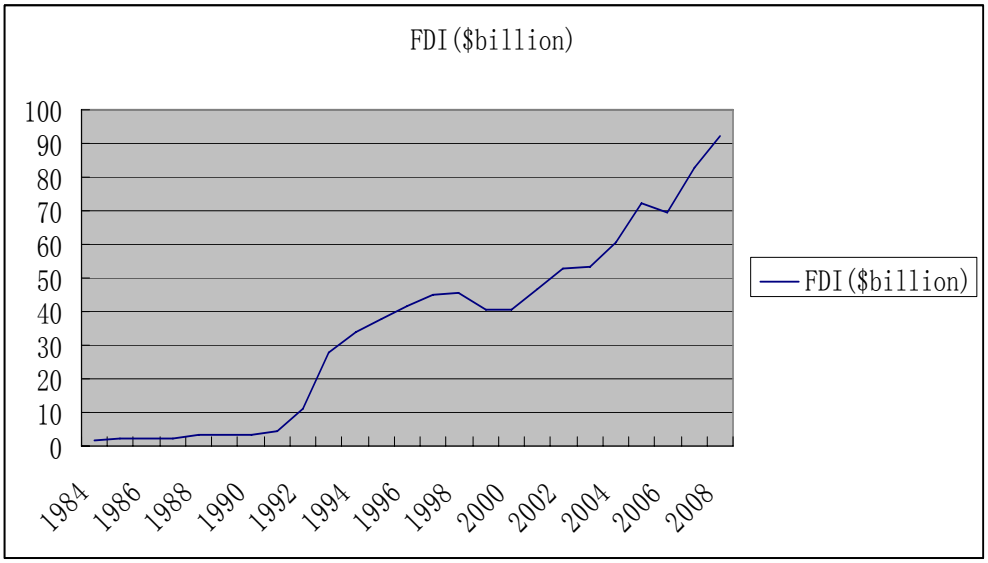
[6] TVEs: township and village enterprises.

The developed countries conducted business investment activities in order to roll out obsolete industries and technologies, and extended its product value chain. It means that if there is no change in the host country's investment environment, such as policy for attracting foreign investment, nor the improvement of host companies' technical level, management level, and the level of human resources, the multinational corporations will not bring the advanced technology transfer to developing countries. Consequently, foreign technology swarmed into China was generally not good in condition. However, in 1992, China's economic development embraced a giant step. Deng Xiaoping, the former leader of China, addressed "southern tour speech" (Nanxun Jianghua in Chinese) in 1992, which issued a far-reaching impact on China's economic development. Since then, there appeared the second climax in amount of inflow foreign capital. Chinese government attracted a large number of TNCs from developed countries to invest in China by adopting favorable policies. China's utilization of foreign capital structure began to be significantly improved.

Chart 6
Inward FDI (figures at current price) of China from 1984 to 2008



Data source: China Statistic Yearbook, 1984-2008

The inflow of FDI expands China's domestic investment scale and pushes the high-speed of GDP growth. It induced innovation via exporting and

importing of technology, exploring of new products and adopting of advanced management methods. Namely, it not only solves the capital problem for host country, but also provides the host country an opportunity to access new technology.

In order to attract more FDI, China has adopted different means. First of all, a variety of investment incentives have been approved. China, a developing country, neither its soft environment nor its hard environment can be compared with Japan. Therefore, it introduced various incentives and preferential policies such as favored tax rate, preferential duty-free period as well as preferential tariff concession and tax rebate to foreign investors. Secondly, the increasing of international investment agreements offered a high-quality external environment and rational mechanism. However, it cannot be ignored that as the largest recipient of FDI, China has an imbalance structure of FDI receiving. Some areas especial the eastern coastal provinces received more FDI, almost 88% of total FDI, while the central region took about 29%, and the rest were attracted by the western inland areas (China Statistic Yearbook, 2008). The circumstance got better with the process of "Western Development" strategy.

It has to be mentioned that Japan is also an investor for China. But compared to their trade relations, investment activity of Japan in China was comparatively not significant. According to data, Japanese investment in China started in 1979. Since 1979 to 1980s, Japan's direct investment in China was gradually growing, but from the overall perspective, the projects were relatively small-scale (Lin, 1990). After 1991, China attracted a substantial increase of FDI and it included capital from Japan. By 1995, Japan's investment in China hit the first peak, reaching 4.467 billion U.S. dollars, occupied 8.8% of Japan's total outflow investment. In 1996, the actual amount of investment reached 3.68 billion U.S. dollars, accounting for the amount of foreign capital actually used that year to 8.7%. Mainly due to the impact of the Asian financial crisis, Japanese investment in China slowed, even declined.

Nowadays, the concept that the world is flat is widely accepted. Economies between countries tie to each other tightly, which means that cooperation

among different nations is in the first place. Under this circumstance, the reach of international investment agreements can assure the transparency, stability and reliability of host country's FDI framework.

4.2.3 R&D expenditure

The ratio of R&D expenditures to GDP is an internationally accepted indicator to measure the scale of a country's science and technology activities and the intensity of investment in key science and technology, and to some extent reflected the potential for national economic growth and sustainable development capacity.

In 1985, Chinese government carried out reform regarding to science and technology system (Chen and Shi, 2005). According to the reform announcement, government increased the funding to support research and development. The source of funds varied in line with the type of research and areas. And government including central and local intended to establish institutions and organizations to provide assistance for researchers and R&D activities. And a contract system was employed, which assured the human capital input in R&D. Activities of research and development are proved to be important as to long-term economic growth. China increase investment in science and technology in the late 1990s. But there is still a big gap compared with developed countries.

With the improvement of R&D level, China input more on R&D than it did before. According to Kazuyuki Motohashi (2005), China is a country that easily attracted cheap but high quality human resource in science and technology.

Table 2
Total R&D expenditures (current price) and percent of GDP in China

	Total R&D (US dollar, billion)	Ratio of R&D to GDP (%)
2002	16.10	1.22
2003	19.25	1.31
2004	24.58	1.23
2005	29.91	1.34
2006	37.54	1.42
2007	48.79	1.49

Sourse: National Bureau of Statistics of China (http://www.stats.gov.cn/)

Table 2 displayed the total expenditures on R&D and percent of GDP in China from 2002 to 2007, due to the shortage of data from 1978 to 2001 in this field. Growth on R&D expenditures for almost 10 consecutive years, China is in the first place among developing countries. However, the distribution among varied provinces is imbalanced. In developed areas such as Beijing, Shanghai and Zhejiang, the expenditure on research and development is much larger than in less-developed areas. Also, the drive of increasing R&D expenditure is different from city to city. As Kazuyuki Motohashi (2005) said the chief motivation of R&D in coastal area of China, such as Shenzhen, was from the market because of its role as the world factory.

From the view of structure of R&D expenditure, there are three main modes: government-led mode, double-led mode and business-led mode (Science and Technology Indicators, 2000). Generally speaking, funds from enterprises invested in R&D was very limited in early stage of industrialization, oppositely, government played the major role to guide and support R&D activities, which can help enterprises grow rapidly on the one hand, on the other hand can be conducive to promote the progress of industrialization. Along with raising the degree of industrialization, the structure of R&D input transformed as well. Government-led mode can no longer meet the needs of technological innovation. As a replacement for that, R&D input became an important component of business strategy. Consequently, business-led investment in R&D surmounted government-led mode. However, the true achievement of business-led is not only reflected

in the dominant proportion of capital investment, but also reflected in the decision-making power imposed on R&D implementation, and the degree of government's activities involved.

From the perspective of proportion of capital investment, China has been attributed to group of government-led R&D input. However, the proportion of government investment was basically a downward trend. The proportion of R&D came from government declined from 54.9% in 1990 to 50% in 1995, and reached 33.4% in 2000.[7] It is still drop year by year. That is to say, China is transforming from government-led to business-led gradually although the actual value is comparatively small.

[7] Source from Registration of Scientific and Technological Achievements: www.nast.org.cn

5. Japanese Industrialization since 1990s

Not only in the old times, but also in present, industrial policies still helped Japan in improving its exports. In 1990s, Japan's manufacturing sectors transferred outwardly gradually. And under the pressure from US government, Japan had no choice but gave up protection for its market, which imposed a negative influence in its weak domestic industries. Many companies were in trouble and Japanese economy slowed down. Since the bubble economy burst, there added a log of bad debit and caused heavy burdens to financial institutions, and which was also a heavy blow to the industry at the same time. During this period, Japanese government adopted expansionary monetary policy, and promoted rearrangement of financial industry via some active policy measures (Wang et al., 2001; Lu, 2007).

In spite of some negative factors based on FDI in Japan, the investment environment has improved considerably. Having a higher level of technology, an information-rich channel, a maturity infrastructure and high quality of labor force, Japan is an ideal recipient of FDI. To some extent, Japan recovered and achieved its initial industrialization mainly dependent on the help offered by US when it embarked industrialization.

And in fact, Japan is not a country that favored foreign capital even nowadays. Instead, it tends to motivate domestic saving and restrict foreign direct investment. In order to fill the capital gap in the process of industrialization, Japan confined FDI by financial instruments and other encouraged measures. To accelerate capital accumulation, it implemented low-salary, low-tax and high depreciation rate. So that Japan has a high saving rate and is independent on FDI. After became a member of OECD in 1964, Japanese government adjusted FDI policies and it started to invest overseas largely, and became the largest foreign direct investor in 1989.

Japan's R&D expenditure has remarkably improved over the last 25 years and occupied an increasing portion of GDP. The expenditure is still expanding in recent years. Table 3 illustrated the circumstance of R&D expenditure from 2002 to 2007. It can be found out that not only the increase speed rose, but also the percentage to GDP enlarged.

Table 3
Total R&D expenditures of Japan

	Total R&D (Billion $)	Increase from previous year (%)	Ratio of R&D to GDP (%)
2002	183.43	0.9	3.40
2003	184.85	0.9	3.40
2004	186.31	0.8	3.40
2005	196.30	5.4	3.55
2006	203.10	3.5	3.61
2007	208.39	2.6	3.67

Sourse: 2008 Survey on Research and Development in Japan
(Exchange rate: 100 Yen = 1.1 US dollar)

The expenditure on R&D is the input for knowledge and technology, which is essential to drive the process of industrialization. There was a period that Japan suffered from the hardship of long-term economic recession, it bear the highest unemployment rate. In order to acclimatize itself to new challenges, Japan embarked on technological innovation to varied levels. Japanese government once encouraged private enterprises invest in research and development by provided low-interest loans at certain proportion. Besides, there are almost 60% of scientific personnel and 80% of R&D expenditures held by firms, not universities or other institutions, which provided a good foundation for technical innovation. Therefore, it made a high output value to R&D.

6. Comparison and lessons

The role that Japanese model of industrialization played in the process of China's industrialization is sophisticated. On the one side, it seems that Japan acting as a guide and set up a good example to encourage China's transformation and industrialization. But on the other side, it is impossible for China to copy the Japanese way due to differences in economics and politics.

When China decided to pursue industrialization, it firstly adopted Soviet model and then turned toward to self-developed approaches. After reforming and opening-up in the late 1970s, it seems that Japanese model of industrialization did affect China's path in some ways, but which is not significant. Japan recovered from the tragic loss as a defeated nation and grew at a super fast speed from 1953 to mid-1970s. It finally became the second greatest power in the world, next to the US (Huang, 2006). One of the most important reasons for Japan's swift growth is reasonable industrial policies, which is what China should learn.

Improving foreign trade and attracting foreign direct investment played significant role in promoting China's reform and development. But it is undeniable that in recent years, China's foreign economic relations are also out of control to a certain degree, which may cause negative impact on the economic stability and healthy development of industrialization. Under such circumstance, Japan's story is fascinating to study. Studying and learning from the Japanese experience, further improving the industrial policy and foreign economic policy, protecting and nursing national infant industries is imperative.

In the first place, China has to pay attention to transition of economic growth mode from foreign trade-oriented to domestic demand-expanded. Since World War II, Japan promoted its economy rely on domestic demand especially from 1980s. Even nowadays, it realized trade liberalization, Japan has taken various policies to improve living standards and stimulate consumption. When it comes to China, it is obvious to find out that there is over-dependence on importing for economic development. From the view of

exporting, we found that there are more and more anti-dumping cases, which means the trade friction becomes more frequent and more serious. And from the view of domestic investment, overcapacity within industries is a huge problem. Owned a large potential domestic market and cheapest human resource, China might solve the problem by enlarging the domestic market government and making a series of conductive economic policies. Of course it does not mean developing blindly, but means to make right clear policy to protect and nurse national industries as soon as possible. However, some people argued that since China has chosen to open the door in 1978, it would be a backward step to protect backwards industries. They make allegation that domestic business should be push into international market and foster themselves in international competition. But the point is that there is a big gap between strength of national industry and power of industry in developed countries. It is not sensible to throw straws against the wind.

Secondly, one of Japan's most important experiences is taking an all-round and in-depth assessment of the policy actions and investigating its impact on the domestic economics before the action is taken. Meanwhile, Japanese government took the foreign economic policy as a basic means to implement national industry policy and macro-economic policy. It is good for China to learn from this experience. Strengthen the overall balance of foreign policy and prevent the divergence of domestic policy can better off domestic economic development and promote the progress of industrialization.

Then, further strengthen monitoring system and macro-controlling when introducing foreign investment. It is necessary to enhance operation and management on activities of multinational companies in China. China’s experience in recent years shows that over-dependence on foreign capital is not a fundamental solution to technology gap (Wei, Song, 2004). And when working for attracting FDI, refinement the project examination and approval system as well as encouragement of capital outflow cannot be ignored. Japan realized regular trade surplus in 1960s. Attributed to pressure of currency appreciation, Japan encouraged overseas investment, which can be

seen from the increase FDI outflow. China is encountering the same puzzle in recent years. Although it appreciated almost 2% in 2005, it is still under the pressure of appreciation. To avoid the scrape, it is necessary to encourage industries invest overseas.

Last but not the least, it would be a good idea to conduct structural transition and get a more rational division of resources. Looking at the process of Japan's industrialization, it upgraded and benefited industrial structure continually. More detailed, the pillar industry was light industry in 1950s, take textile as an example. Then it moved to coal and steel in the early 1960s, machinery and fiber in the late 1960s. After that, automobile occupied, which was followed by computer and high-tech productivities. Although China has made its steps in improving industrial structure and attached more importance to tertiary industry, measures taken are far away from enough. The speed of structural upgrading is slow and it makes money mainly depend on copies and OEM.[8] Therefore, it is in need to encourage the development of high-tech industries. And which is why increasing expenditure on R&D is at such an important position.

[8] OEM: the original manufacturer of a part or a whole for a product named by another enterprise.

7. Conclusion

As the world becomes flat, international competition gets tighter and fiercer, that every country tries to take a share of increasing economic market. Under this circumstance, industrialization is an eligible choice. Japan, the first industrialized nation of Asia, has started industrialization very early and experienced several difficulties after the World War II. It conquered these conundrums and kept ahead of other Asian countries. China, the most striking emerging country, stepped into industrialized club and is located in the third-tier. Not similar with Japan, China started industrialization very late, almost after its establishment in 1949 ostensibly but developed after reforming and opening-up in 1978 strictly. It is meaningful to compare Japan's industrialization process with China's for reasons. Both of them are in Asia, they share similar root of culture and be affected by Confucian to some extent. And they have certain connections not only in economics but also in politics. Also, they have a lot of dissimilarities includes geographically and economically. Via comparing the processes of Japan's and China's industrialization, we work out the reasons why China chose a different way from Japan to conduct industrialization.

First of all, Japan started industrialization at an early time when most of the countries were in an initial phase of economic development. But China set out later than most of the countries. The world is no longer what it used to be and the way to do business has changed already. Secondly, with help offered by the United States, Japan owned strong support. Besides, it introduced and learnt from the western advanced countries. At the very beginning of China's industrialization, it closed the door to outsiders, which led it to a long and inefficient way, and waste lots of time. And the Soviet model it followed was not worked as expected. Thirdly, Japan is a capitalistic country as well as China is a socialist country. They have different goals and it is meant to choose varied ways including industrial policies and trading terms to reach their goals. Besides, Japan is an island country with limited nature resource while China has the largest population, it is impossible to copy Japan's model and do it again in China. Thus, China chose an experimental approach to transform. And with an abundant of

work force, it is appropriate to develop manufacturing in China, which is partly affected the speed of innovation and tech-revolution. And another difference is that Japan is a big source of FDI to other countries while China is one of the main receivers of FDI. Although the effect of FDI is not significant on Japan's industrialization, we cannot deny it does help by introducing new technology and management techniques. China really gains from FDI, but it is not a good idea to over-dependent on FDI. It turns out that Japan rapidly emerged and is famous for its high-tech commodities while China is considered as the manufacturing factory of the world. Finally, although China improved recent years in its expenditure on R&D, it is far away from enough and is limited compared with Japan's expenses. If technology is called the drive of industrialization, R&D part is the fuel to start the engine. No pay, no gain, which is the same for industrialization. No investment in research and development, there is no improvement in technology and leads to a stop and retarded in industrializing.

China's process of industrialization is continuing. It is converting from a large agricultural country to industrial nation steadily. Encountering with trends to globalization and informatization, it needs a more sound and advanced industrial strategy to push forward the process of industrialization, admitting China to the second-tier, even the first-tier industrial countries group.

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