

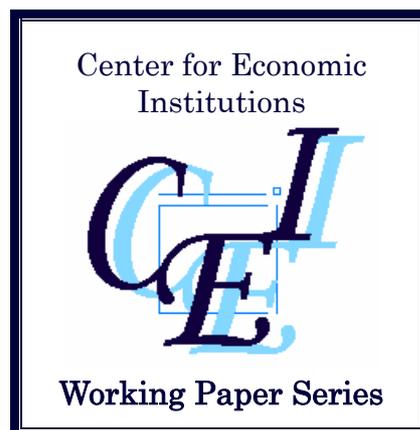
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***"When and how did Japan catch up with
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***—A comparative study of the pre-industrial economies of
Korea and Japan"***

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When and how did Japan catch up with Korea? – A comparative study of the pre-industrial economies of Korea and Japan

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Abstract

This paper compares the economic development of Korea and Japan during the past three millennia. In particular, it examines why, although the Korean economy was more advanced from around the six century B.C. to around the sixth century A.D., Japan subsequently surpassed Korea in terms of economic development and the gap continued to widen during the Tokugawa period (1603–1867). It is argued that until the eleventh century, the economic gap between Korea and Japan can be largely explained by geography, while from the twelfth to the seventeenth century, differences in institutions, systems of economic integration, and human capabilities – all shaped by a divergence in political systems – played a key role in Japan's catch-up with Korea.

Key words: pre-modern Korea, pre-modern Japan, per capita GDP, catch-up, geography, institutions, human capabilities, system of economic integration, “small world economy”.

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I. Introduction

The economic development of a country is determined by many factors, including geography, trade, culture, institutions, and so on. There has been considerable debate on what are the primary determinants of growth, with various hypotheses put forward based on new growth theory and cross-country evidence (see, e.g., Sachs 2003; Rodrik, Subramanian, and Trebbi 2004; Acemoglu, Johnson and Robinson 2001-2005). The debate goes on and so far makes it difficult to draw any firm conclusions. One reason seems to be that cross-country studies covering dozens of countries face difficulties in satisfactorily taking regional and historical contexts into account. I believe that a comparative historical study of a few well-chosen countries can help to break the impasse in this debate. A good subject for such an approach is a comparison of Korea and Japan, because the two countries are similar in size, ecology, and culture, but differ in terms of their history.

Of course, as geographically close neighbors, Korea and Japan also share many historical features. For example, they both developed pre-modern civilizations and agricultural societies, and now belong to the group of industrialized countries. However, there are also many ways in which their historical developments differ. For example, the political systems of the two countries diverged following the disintegration of the Japanese *ritsuryo* (律令) state¹ around the tenth century, which influenced economic institutions and performance. The Japanese economy grew faster than the Korean economy from the third century B.C. and caught up with it during the medieval period. In 1910 Japan colonized Korea. The extent to which the histories of two countries differ may come as a surprise, considering their close proximity and similar ecology, the active exchange between the two countries since pre-historical times, and the deep influence of pre-modern Chinese civilization on both countries.

The Japanese economy has achieved three catch-ups. It first caught up with Korea, then China, and finally the Western countries. In this paper, I focus on the first stage of Japanese catch-up, which laid the foundation for the second and third stages. During the Tokugawa period, the Japanese economy surpassed the Korean economy, drew level with the economically

¹ The *ritsuryo* state had been established in the seventh century based on the adoption of Chinese system of laws and administration.

advanced regions of China, and laid the foundations for catching up with the Western countries during the twentieth century. The aim of this study is to elucidate this process and examine the underlying factors.

The great divergence between East and West during the early modern period has attracted much academic attention (see, e.g., Landes 1998; Frank 1998; Pomeranz 2000; Acemoglu, Johnson and Robinson, 2005). Studying the divergence between Korea and Japan may shed some light on this subject, because Korea's civilization during the Joseon² dynasty (1392-1910) resembled Chinese civilization more closely than that of any other country, while Japan shares certain characteristics with England, i.e., both are island countries located at the periphery of a continent with high levels of civilization.

II. Trends in the economic gap between Korea and Japan

1. A widening gap during the Tokugawa Period

How can we measure the economic gap between Korea and Japan? The most commonly accepted yardstick is per capita GDP. Maddison (2003) provides per capita GDP statistics for many countries over a long time span. His and other estimates for Japan and Korea are shown in Table 1.

Table 1: Korea's and Japan's per capita GDP (1990 international Geary-Khamis dollars)

Year	East Asian average	Japan	Korea	Japan/Korea
1800 (L)		700	600	(1.3)
1820	581	669	600	1.2
1911	670	1,356	777 (650)	1.7 (2.1)
1934-6	1,208	2,154	1,224	1.8
1934-6 (FMY)		1,745	662 (1,024)	2.6 (1.7)
1953	775	2,474	966	2.6
1962	972	4,777	1,122	4.3
1970	1,420	9,714	1,954	5.0
2000	3,794	21,069	14,673	1.4

Sources: Maddison (2003, p.184); 1800 (L) from Lee (1999, p.64);
1934-6 (FMY) from Fukao, Ma and Yuan (2006), Fig 1.

Note: 1. Confined to South Korea for the period after 1950.

2. The figures in parentheses are explained in the text.

In an earlier study, I estimated that Japan's per capita GDP around 1800 was about 30% higher than that of Korea (Lee 1999). My estimates put rice output in Korea and Japan around 1800 at about 10 million *koku* (1 *koku*=4.96 bushels) and 24 million *koku*, and the population at

² The Korean government made changes to the romanization of Korean words in 2000, for example Goryeo for Koryō and Joseon for Chosōn. The present study employs the new romanization method.

about 16.5 million and 30.7million, respectively.³ In that study, I assumed that the proportion of rice output value in GDP during that period was similar in both countries, because the proportion of rice in agricultural output was lower in Korea than in Japan, but the proportion of agricultural output in GDP was higher.⁴

I assume that Korea's per capita GDP in 1800 was about 600 dollars in 1800, for the following reasons. First, considering Korea's level of economic development, its per-capita GDP in 1800 is unlikely to have differed much from the Asian average. Second, this seems a reasonable figure in light of the trend in per capita GDP since 1800, which will be discussed below.

The economic gap between Korea and Japan widened during the nineteenth century. It is highly probable that the productivity of paddy land in Korea declined in the early and mid-nineteenth century, while that in Japan increased, as shown in Table 2. Since farm output, measured in units of *koku* of rice (實收石高), came mostly from the land, its trend provides a good reflection of land productivity. The downturn or stagnation of the Korean economy was reversed by the end of the nineteenth century following the opening of the economy to trade with the Western world and Japan, which had opened the door to the West earlier. However, the Japanese economy took off in the late nineteenth century. Ohkawa and Miyoehei (1979) have argued that modern economic growth in Japan began in the late 1880s.

Table 2: Economic trends in the Tokugawa period

Year	Population (10,000 persons)	Arable Land (1000 ha)	Farm Output (實收石高) (1,000 <i>koku</i>)	Farm Output /Person (<i>koku</i>)	Farm Output /ha (<i>koku</i>)
1600	1,200	2,048	19,731	1.644	0.947
1700	2,769	2,818	30,630	1.106	1.069
1750	3,110	2,966	34,130	1.098	1.132
1800	3,065	3,007	37,650	1.228	1.232
1872	3,311	3,207	46,812	1.414	1.465

Source: Hayami and Miyamoto (1988, p.44).

By how much did the gap widen during the period 1800-1911? According to recent estimates

³ It now seems to me that my earlier estimates slightly understate the rice output of Korea and Japan, and slightly overstate Korea's population (Lee, forthcoming). However, my estimate of the gap in per capita GDP between Japan and Korea around 1800 remains unchanged.

⁴ The proportion of rice output valued at market prices to GNP was 24% in Japan during 1885-8 (Ohkawa and Miyoehei 1979, Table A7 and A16), and that to GDP 27% in Korea during 1911-4 (Kim 2006, Table I-1 and II-2). Relative to GDP, the proportion of rice output seems to have been similar in both countries around 1800, given that in the nineteenth century both GDP and rice output grew faster in Japan while the relative price of rice increased faster in Korea because of Korean rice exports to Japan.

by members of the *Naksungdae* Institute of Economic Research (Kim 2006, p. 320), Korea's per capita GDP in 1911 was 626 dollars. Based on their estimates (Kim 2006, pp. 353, 360), the growth rates of GDP and per capita GDP during 1912-4 were 6.1% and 4.3%, respectively. It is likely that these estimates are too high, however, because the Korean economy during this period appears to have been on the verge of entering into a stage of sustained growth. I therefore assume that the growth rate of Korea's per capita GDP during 1912-4 was about 3%, which yields a safer estimate of per capita GDP in 1911 of 650 dollars. If we accept Maddison's per capita GDP estimate for Japan of 1,356 dollars in 1911, then Japan's per-capita GDP was about 2.1 times that of Korea. The gap in per capita GDP between Korea and Japan thus seems to have widened by a factor of about 1.6 during 1800-1911.

Korea's per-capita GDP appears to have decreased during the first half of the nineteenth century and increased from the end of the nineteenth century, for the following reasons. First, the productivity of paddy land declined during the first half of the nineteenth century, but then increased from the end of the nineteenth century (Rhee 2004). Second, the real value of international trade increased more than ten-fold during 1876-1911, stimulating economic development (Lee 2006, p.236). The gap in per capita GDP between Japan and Korea appears to have widened by about 20% during the period 1800-1872 given that per capita farm output in Japan increased by 15% during this time, as shown in Table 2. The gap continued to widen until around 1910.

Maddison's estimates of per capita GDP in Korea during the colonial period (1910-45) must be too high because his estimate for 1911 was too high. Fukao, Ma and Yuan (2006) have tried to correct Maddison's estimates for 1934-36. However, they, in turn, seem to understate Korea's per capita GDP in those years, because it must be higher than that in 1953 according to other estimates. If we assume that Korea's per capita GDP in 1911 was 650 dollar and accept Maddison's estimate of the growth rate of per capita GDP, then per capita GDP in 1934-36 must have been 1,024 dollars. If we use this figure, we end up with a reasonable trend in Korea's per capita GDP during the mid-twentieth century, as shown in Table 3.

Table 3: Korea's per capita GDP before and after the Second World War

Year	Per capita net commodity product (1953 constant won)	Per capita GDP (1990 international Geary-Khamis dollar)	Per capita GDP (1934-36 constant yen)
1934-6		1,224 (1,024)	100
1940	2,411 won	1,442 (1,206)	
1953	1,362 won	966	90
1940/1953	1.49	1.77 (1.25)	
1934-6/1953		1.27 (1.06)	1.11

Sources: Per capita net commodity product is taken from Kim and Roemer (1979, p. 35,

Table 20); per capita GDP in 1990 dollars is from Maddison (2003); figures in parentheses are explained in the text; per capita GDP in 1934-36 yen is from Mizoguchi and Noguchi (1996).

Although it is difficult to exactly determine the gap in per capita GDP between Korea and Japan before 1950, trends in the gap can be inferred with some accuracy. The gap continued to widen during 1800-1910, did not change much during the colonial period, widened drastically after liberation from Japanese rule, and has narrowed sharply since 1970.

While it may be safe, for convenience's sake, to judge the level or performance of industrial economies solely in terms of per capita GDP, this is not the case when it comes to pre-industrial economies which rarely experienced sustained growth in per capita GDP due to population pressures. For instance, we should not infer that Japan's economy contracted in the seventeenth century solely on the basis of the decrease in per capita farm output shown in Table 2, because during this period, both the population and land productivity increased. We therefore need to utilize an auxiliary yardstick, namely population density. We also need to take development of technology and markets into account.

Table 4 provides a comparison of the Japanese and the Korean economies around 1800. The figures suggest that the former had overtaken the later at this period. Not only per capita GDP, but also population density was higher in Japan than in Korea. There were also considerable gaps in the urbanization rate and the per capita money stock, which is sufficient to show that markets were more advanced in Japan. However, it should not be overlooked that Korea developed rural markets, as is shown by the higher density of periodic markets, which were held every five days. And the dependence on foreign trade was low in both countries. In both countries, the proportion of agricultural households was high and a large share of such households also had incidental incomes from off-farm work. Not only was the proportion of agricultural households lower in Japan than in Korea, they also had more ample opportunities for off-farm by-employments in commerce and industry (Nishikawa 1987). As will be explained in detail below, agricultural technology became more advanced in Japan than in Korea by the eighteenth century. In addition, Japan achieved dramatic progress in education from the end of the seventeenth century onward and came to surpass Korea both in terms of the number of schools and the proportion of educated people during the nineteenth century. Curricula in Tokugawa Japan became increasingly diversified and pragmatic, while those in Joseon Korea remained virtually unchanged.

Table 4: Comparison of the Korean and Japanese economies around 1800

	Korea	Japan
Per capita GDP (1990 dollars)	600	700

Population (million persons) (persons/1 km ²)	16 (72)	31 (81)
Proportion of agricultural households (%)	85	80
Proportion of population living in cities of more than 10,000 (%)	2.5	13
Number of periodic market	1,000	Less than Korea
Money stock/GDP (%)	2-3	20
Trade volume/GDP (%)	1.5	Less than 1
Number of private elementary and middle schools	<i>Seodang</i> (書堂) 10,000	<i>Terakoya</i> (寺子屋) 5,000

Sources: Statistics for Korea are from Lee (2006), pp. 54, 112-4, 119, 140, 153, 162. The proportion of Japan's agricultural households is from Nishikawa (1987). The proportion of the Japanese city population is from Saito (2005).

Note: 1. The money ratio for Japan is calculated, based on Iwahashi's (2005) estimate that Japan's per capita money stock was about ten times that of Korea.

2. The trade ratios for Korea and Japan are explained in the text.

3. The number of *seodang* for Korea is estimated based on a number of 16,540 in 1911 (Kimura 1997) and the extent of the spread of education around 1800 (Lee 2006, p. 213).

4. The number of *terakoya* for Japan is estimated based on a number of 13,816 in 1875 and the trend in its growth (Ishikawa 1985, pp. 143-8, 194).

2. Japan's catch-up with Korea

Most advanced institutions and technologies in pre-modern East Asia originated in China. They spread eastward to Japan mainly via the Korean peninsula before the seventh century. Therefore, it is only natural that Korea developed an ancient civilization earlier than Japan. Both Korea and Japan were competent in absorbing Chinese civilization (Fairbank, Reischauer, and Craig 1978).

Elements of advanced civilization transferred from China and Korea to Japan include the elaborate technology of paddy land cultivation, bronze and iron metallurgy, silk manufacturing, political institutions, and high culture such as the Chinese writing system, Buddhism, Confucianism, etc. Because the key influences were multi-faceted and profound, it took a long time for Japan to catch up with Korea and then with China.

"The rice tillage-bronze-iron sequence was much more compressed in Korea than in China, and even more so in Japan." (Totman 2004, p.31) Korea absorbed paddy land culture around 600 B.C., entered into the Bronze period around 500 B.C., and arrived at the Iron period around 300 B.C. (Kito 1993, pp.14-7). Japan absorbed paddy land culture from the third century B.C. to the first century A.D., and saw the diffusion of iron farming tools from the second century. It introduced the new technology of irrigation from Korea and utilized animal power during the fifth and sixth centuries (Tsude 1989). It seems that following this period of transformation, Japanese agriculture had attained the same level as Korean agriculture and paddy land culture moved ahead of that in Korea. The fallow year for arable land disappeared around the fourteenth

century in Korea. Japan enhanced the stability of paddy land cultivation earlier than Korea and even saw the spread of double cropping through the development of irrigation during the thirteenth century, by when paddy land productivity was higher in Japan than in Korea.

It appears that before the introduction of paddy culture in Korea, Japan was more affluent and had a higher population density than Korea. This is suggested by the fact that in Korea, archaeologists have discovered “less variety in stone and pottery work and less elaboration of decorative” artifacts (Totman 2004, p.28). It is highly likely that Korea had a higher population density when paddy land culture took root in Korea. Japan’s population in the eighth century is estimated at around 5 to 6 million, while an estimate for Korea put the population at about 3 million in the twelfth century (Park 1996, pp.147-156). Though both estimates do not have a firm foundation, it is probable that by the eighth century, population density in Japan became higher again than that in Korea.

Turing to the use of money, Korea has a longer history in using a metal currency than Japan. China’s metal money began to circulate in northern Korea before the birth of Christ, while in the southern part, iron money circulated probably from the second to the fifth century. However, metal money seems to have disappeared during the formation period of territorial states from the fourth to the sixth century. Instead, cloth became the main currency. The policy of the Goryeo dynasty (918-1392) to circulate coins failed, but a small amount of silver money nevertheless circulated for more than two centuries during the dynasty. Repeated attempts to circulate paper money and coins during the early Joseon dynasty also met with failure. The Goryeo and Joseon governments thought the main obstacles to the policies were a fragile market, a shortage of copper, and the active use of cloth money. From the 1590s onward, the influx of silver from China and then Japan led to the circulation of silver money, but with the decrease in silver imports in the eighteenth century, the use of silver money also declined. In the end, the policy to circulate copper coins since 1678 bore fruit, and it spread to most of the country around 1700 (Lee 2006, chap 3).

By contrast, Japan saw steady progress toward the development of a market economy since the late twelfth century, as evidenced by the growth of urban centers, the specialization of merchants and artisans, and the spread of monetization (Yamamura 1990). China’s copper coins were in wide circulation and long distance trade flourished by the fifteenth century. The development of a market economy attained a higher level during the Tokugawa period. In sum, Japan’s lead over Korea was the most conspicuous in the development of a market economy from the thirteenth century onward.

Manufacturing in Japan took more time to catch up with Korea than agriculture and

commerce. The first manufacturing technology in which Japan caught up with Korea seems to be that of iron. Japan heavily depended upon iron imports from southern Korea until the fifth century and developed iron manufacture by introducing Korean technology from the middle of the fifth century to the early sixth century (Wada 1993, p.254). Japan's iron technology was more advanced than Korea's by the fourteenth century when Japan became famous for sword exports. However, the medieval Japan did not go beyond imitating Chinese porcelain, while Goryeo Korea absorbed Chinese technology and produced unique and high quality porcelains (Murai 1987).

When did the Japanese economy surpass the Korean economy? It is not easy to answer this question, because the time involved in the catch-up process varied across different spheres of economic activity, as mentioned above. Let us have a look at the sixteenth century. The most widely accepted population estimates for Korea and Japan in 1590 are 14 million (Kwon and Shin 1977) and 12 million, respectively. It seems likely that these figures represent an overestimate of Korea's population and an underestimate of Japan's population. But what is clear is that population density was higher in Korea than in Japan or was at least similar in both countries. If there was any century since the eighth in which population density in Korea was higher than in Japan, it would be the sixteenth century. Thanks to the development of agricultural technology and political stability, Korea's population increased rapidly during the fifteenth century. Korea achieved a gradual reclamation of lowlands, but did not experience huge reclamations comparable to those in sixteenth and seventeenth centuries Japan, which laid a firm foundation for the higher population density in Tokugawa Japan.

The higher paddy land productivity in Japan than in Korea can be largely attributed to the wetter and warmer climate and more fertile soil in Japan. Double cropping was practiced earlier in Japan than in Korea because of the warmer and wetter climate. Korean farmers were already aware of the practice of transplanting rice from seedbeds instead of direct seeding (田植法) in the fifteenth century, but the Korean government prohibited it because of the small amount of rain that fell at the time of transplanting rice. The natural environment could also explain a large part of Japan's lead over Korea in the development of irrigation. The Korean mission to Japan was impressed by Japanese water mills (水車), and the Korean government encouraged their use in 1431. Owing to the unavailability of adequate water, however, the Korean government decided to use the mill run only by water power, while dispensing with the mill that needed human labor.⁵ Korea published books on agronomics on its own in the fifteenth century, earlier

⁵ *Joseon wangjo silok (The Veritable Records of the Joseon Dynasty)*, King Sejong 11·12 eulhae; 13·gyeongjin; 13·6 eulmi; 13·10 sinyu; 13·11 byeongjin; 15·4 sinmyo (世宗實錄, 11年 12月 乙亥;

than in Japan. In addition, the speed of diffusion of cotton culture was not faster in Japan than in Korea. Cotton was first introduced to Korea in 1364, and cotton cloth became not only the main cloth but also the main commodity money in place of hemp cloth by the early fifteenth century. Korean cotton cloth came to Japan from 1406 onward, and it took almost a century from the end of the fifteenth century for cotton to diffuse widely (Nagahara 1990). Thus, it can be said that Japanese agriculture did not surpass Korean agriculture until the sixteenth century.

However, Japanese agriculture became more advanced than Korean agriculture following the active publication of books on agronomics, improvements of farm tool technology, and the increased input of commercial fertilizers. Surprisingly, the number and quality of books on agronomics published in Japan during 1680-1697 far surpassed that of those published in Korea until this period. Tokugawa Japan also produced farm tools that were superior to those in Korea. For example, the one-thousand-tooth thresher that began to be used in the late seventeenth century was reputed to be ten times as efficient as the threshing chopsticks that preceded it. Finally, in Tokugawa Japan, increased input of commercial fertilizers led to an increase in land productivity, something that did not happen in Korea until the nineteenth century.

In the sixteenth century, despite the higher labor productivity in Japan, it seems that Japanese peasants were not better off than Korean peasants.⁶ This is because Japanese peasants had to bear land taxes at a rate of about 60% of their output, which was far higher than that the rate applied to their Korean counterparts. During the Tokugawa period, not only per capita GDP but also disposable income increased. The growth rates of wages and per capita GDP in Japan were 0.10% and 0.15% respectively during 1700-1870 (Saito 2005), while wages in Korea remained stagnant throughout this period (Park 2004). As a result, not only per capita GDP but also living standards were higher in late Tokugawa Japan than in Korea during this period.

Turning to manufacturing technology and science, Japan caught up with Korea during the Tokugawa period. Japan achieved a notable development in iron manufacturing technology during the sixteenth and seventeenth centuries, which extended Japan's technological lead over Korea. This provided the basis for the development of the manufacture of agricultural implements and mining. Moreover, Japan was able to catch up with Korea in the technology of

13年 5月 庚辰; 13年 6月 乙未; 13年 10月 辛酉; 13年 12月 丙辰; 15年 4月 辛卯).

⁶ According to *Oamu Monogatari*, the daughter of a samurai that received 300 *koku* (石知行) only ate gruel morning and evening and had few clothes (Nagahara 1990, pp.2-4). The report (1600) of the Korean Confucian scholar Gang Hang (姜沆) who went to Japan as a captive of Hideyoshi's army told a similar story, i.e., that peasants worked very hard, paid all the surplus to the authorities, and only ate the hulls of grain and roots of plants (*Seoae Seonsaeng Byeoljip* (西厓先生別集, Vol. 4, Miscellaneous writings (雜著)).

ceramics and printing, by utilizing Korean technicians captured by Hideyoshi's army in 1590s. As a national market began to form in Japan from the late seventeenth century, the country's cotton industry moved ahead of its Korean counterpart. While Tokugawa Japan saw a significant improvement in looms, looms remained almost unchanged in Joseon Korea until the mid-nineteenth century (Hayashi 1983; Kwon 1989). Japan's overall manufacturing technologies surpassed those of Korea, based on successful import substitution of cotton cloth, high quality porcelain and silk, printing, etc., from the sixteenth to the eighteenth century (Kawakatsu 2003). Turning to science, Korea achieved remarkable scientific development from the thirteenth to the fifteenth century. For example, a rain gauge (測雨器) was invented and large scale printing by movable type was extensively used in the fifteenth century for the first time in the world (Fairbank, Reischauer, and Craig 1978, p. 310). Japan caught up with Korea in science through contact with European science introduced by Dutch traders (蘭學).

However, the gap in the development of a market economy between two countries was considerable already by the early fifteenth century, as mentioned above. It is unique that Korea attained a high level of development in technology, science, and culture but remained at a low level in terms of the development of a market economy in the fifteenth century.⁷

The above outline suggests that it is almost impossible to determine which economy was superior in the fifteenth and sixteenth century. If my evaluation is correct, the Japanese economy surpassed the Korean economy at some time during the Tokugawa period. Sengoku and Tokugawa Japan achieved dramatic economic development in a pre-modern sense, while Joseon Korea experienced slow development. In the early nineteenth century, the Korean economy seems to have reached the limits of its development or entered an equilibrium trap at a lower level than China's (Elvin 1973; Lee 2006), while the Japanese economy continued to develop. By the mid-nineteenth century, when Korea and Japan were about to open their doors to the modern world, the economic gap between the two countries was considerable.

However, one should also not overlook the achievements Korea and Japan have in common. Pre-modern Korea and Japan both managed to develop small peasant economies (Nakamura 2000). The distinguished American agronomist F. H. King, who traveled across eastern China, Korea, and Japan at the beginning of the twentieth century observed that "[...] in agricultural

⁷ In the early fifteenth century, the Ryukyu Kingdom declared that the principle of its foreign policy would be to learn from the superior culture of Korea, to put the relationship with China at the center, and to maintain friendly relations with Japan (Takara 1993, pp.85-6). This reveals Korea's lead over Japan in terms of cultural development. However, Japan caught up with Korea in terms of cultural development during the Tokugawa period.

methods and appliances the Koreans and Japanese are more closely similar than the Chinese and Koreans [...]” (Totman 2004, p.1). In the eighteenth century, both Korea and Japan were able to support high population densities by pre-modern standard. Although the urbanization rate was very low and long-distance trade did not flourish in Joseon Korea, the only place in the world outside Western Europe to have achieved the same density of rural periodic markets as Korea before 1800 seems to be the advanced regions of China. The development of agricultural technology in Korea led to a high population density by the eighteenth century, which in turn supported a high density of periodic markets. As in Japan, the diffusion of education in Korea was advanced. On the one hand, the economic gap between Japan and Korea is an important reason why Japan responded more effectively to the modernization process than Korea after opening up to the modern world. On the other hand, the common achievement of the two countries may explain why Korea subsequently managed to transform its economy and society rapidly relative to most of the other Asian countries.

III. Determinants of performance differences between Korea and Japan

The determinants of economic growth or catch-up fall into the following fields: geography; international economic relations; the nexus of culture, policy and institutions; and the accumulation of technological knowledge, capital, and human and social capabilities. These factors are interrelated. Among them, geography is the only exogenous variable. International economic relations encompass trade, capital flows, and transfers of technology and institutional knowledge. Culture and policy determine institutions. Economists and historians consider geography, trade, and institutions as key determinants of economic growth.

The term human capabilities (人的力量) has a wider meaning than human capital. It also implies economic rationality, industriousness, the motivation to achieve, deliberation, capabilities to respond to challenges, etc. Education and on-the-job training enhance human capabilities by increasing human capital. Human capabilities can also be enhanced by the upgrading of social capabilities, or by training and opportunities offered through historical change. In the context of East Asian history, salient examples of training and opportunities are the Warring States periods in China and Japan, which will be discussed in detail below. It is said that human capital is an important factor in determining economic growth, and social capabilities are an important factor in realizing catch-up (Abramovitz 1986). Here, I will argue that human capabilities provide a more comprehensive explanation for catch-up than social

capabilities. I believe that we need such a broad concept in order to understand Japan's catch-up.

What factors underlie the common economic development in Korea and Japan, and which are responsible for Japan's superior performance? Table 5 compares the two economies based on the exposition in the previous section and provides a summary of the determinants of economic performance, which will be discussed below.

Table 5: Comparison of the pre-industrial economies of Korea and Japan

Periods	Comparison of economies	Important factors of divergence
Before 600 B.C.	J more affluent than K	J: More gifts from forest and sea
6C B.C.–6C A.D.	K more advanced than J	Geographical location
8C–15C	Same level	J: Natural environment + Political system
16C	J>K in terms of per capita GDP	J: Political system + Human capabilities
18C	J more advanced than K	J: Institutions + Market environment + Human capabilities

Note: "J" stands for Japan and "K" for Korea. ">" means "surpasses."

Why does Japan seem to have been more affluent than Korea before the introduction of paddy cultivation? A likely explanation is that Japan had more gifts from the forest and the sea, in other words more resources for collecting, hunting, and fishing (Yasuda 1993). These were a critical advantage in a forager society. Japan's advantage in terms of resources from the forest and the sea continue to exist even to the present. Both countries developed primitive dry land agriculture before the introduction of paddy culture.

It is not difficult to find Korea's critical advantage in introducing paddy cultivation, bronze and iron metallurgy, other manufacturing technologies such as weaving and ceramics, and other aspects of high civilization such as the political system and culture. Korea had an advantage in geographical location to absorb the advanced civilizations of the Eurasian continent. People could move from China to Korea by land, while Japan had been isolated by sea from the continent since the final Pleistocene melt-off. Before the seventh century, high civilization that Japan absorbed from abroad made its way there mainly via the Korean peninsula. Even in the seventh century, the geographical isolation was still a considerable barrier as the vessels of Japanese missions to Tang China were often shipwrecked.

With regard to the rice tillage-bronze-iron sequence, it is only natural that this was much more compressed in Korea and Japan than in China, because the former two were able to enjoy the advantage of backwardness. The fact that both countries had developed primitive dry land agriculture before the introduction of paddy land culture provided the basis of the compression. However, we need to find reasons other than the advantage of backwardness to account for the fact that the sequence was even more compressed in Japan. One reason must be that the route

from the rice district in southern China to Korea was farther than the route from southern Korea to Japan. And if the primitive agriculture before paddy culture in Japan was more advanced than that in Korea as some Japanese scholars suggest, this would partly account for the more rapid compression.

It is interesting to note that the accumulation of technological knowledge played some role in the economic development or catch-up before the introduction of paddy land culture. As the accumulation of various factors progressed, their influence on economic development became stronger, weakening the binding force of geography.

How did Japan manage to catch up with Korea? Interestingly, geography or the natural environment provided the basis for the catch-up. In addition to advantages in gathering, hunting, and fishing since the pre-agricultural period, Japan was also in a favorable position vis-à-vis Korea in paddy land cultivation because of ample rain, warmer weather, and more fertile soil. Therefore, Japan was able to support a denser population than Korea already by around the eighth century. And the more varied climate and topology in Japan provided more favorable conditions for the development of internal trade than was the case in Korea (Hayami 2004).

Although Japan was isolated from the continent by sea, this geographical isolation did not prevent an active interchange between the Japanese islands and the Korean peninsula, which dates back to the prehistoric period (Okazaki 1993; Yoshino 2004). Hanihara (1987), for example, estimates that the number of immigrants to Japan amounted to more than one million from the third century B.C. to the eighth century A.D. Unlike many Oceanian islands, the geographical location of the Japanese archipelago did not result in a complete isolation from the advanced Eurasian civilizations, but did make contact with such civilizations more difficult when compared with the Korean peninsula.

Moreover, the Japanese devised methods to overcome the geographical disadvantage, while Korea's geographical advantage sometimes turned into a disadvantage in the country's economic development. Whereas the Japanese gradually developed technologies to sail the seas, the Koreans were passive in maritime affairs from the tenth century onward and early Joseon missions to China took the land route instead of the sea route because of frequent wreckages (Sukawa 1997). For Japan, on the other hand, a valuable means to overcome the geographical disadvantage was the active and efficient utilization of immigrant scholars and technicians (渡來人) from the third century B.C. to the eighth century (Wada 1993), which played an instrumental role in Japan's catch-up with Korea. Although Japan had little diplomatic contact with the continent from the ninth century onward, it was still able to develop technology and industry through the skilful utilization of foreign technicians. For example, in the seventeenth

century, Japan utilized ceramics and printing technicians from Korea captured by Hideyoshi's army, while the *Nishijin* silk industry absorbed the technologies of Chinese weavers in the late sixteenth century. Tokugawa Japan was more efficient in absorbing Western civilization through Dutch traders than China, not to speak of Korea, despite imposing more severe restrictions on exchanges with Westerners. Japan again showed a remarkable capability to utilize foreigners embodying advanced civilization since opening its doors to the West in the mid-nineteenth century. By contrast, Korean history since the Three Kingdoms period has few comparable anecdotes until 1882. I remember one significant case, a Chinese, *Ssang Gi* (雙冀), who contributed to establishing the state examination institution in 958.

In sum, geography and the natural environment had been the main determinants of the economic gap between Korea and Japan until the eleventh century. As Reischauer (1982, p.41) noted, "Japan's location and natural endowments helped determine the path the Japanese took, but these physical features alone can scarcely account for what they are today." From the twelfth century, Japan "departed from the East Asian norm," as the power of the central government waned and the feudalism developed. "Japan's feudal culture was in many basic ways more like that of feudal Europe than China." (Reischauer 1982, pp. 52, 56).

The divergence between Korea and Japan in terms of political institutions was strongly influenced by geography, however. First, it was more difficult for Japan to sustain a centralized state compared to Korea because of its topography, namely the longer geographic spread of the land and the barriers created by high mountains. Second, geopolitics also mattered. Because Korea shared a border with China, Koreans had no choice other than to form a strong territorial state in order not to be ruled by China. The first territorial state of Korea, Goguryeo became strong enough to expel the Chinese commanderies by the fourth century, and the military pressure from Goguryeo necessitated the formation of two territorial states in the southern part of Korea. Japan did not face such strong external pressure, because it was isolated by the sea and almost safe from Chinese or nomadic invasions.

After the alliance of Tang China and Silla, a territorial state in southeast Korea, managed to destroy the other Korean states of Baekje and Goguryeo, the Tang rulers attempted to bring the entire Korean peninsula under their imperial control. Silla successfully repulsed the Tang invasion in 676. Since then, however, Korea enjoyed peaceful diplomatic relations with China for twelve centuries, as compensation for accepting an inferior position under the Chinese tribute system. And Joseon Korea became deeply incorporated into the Chinese world order. This was mainly because the Korean states shared common borders with their large neighbor. By contrast, Japan's geographic isolation helped it to free itself from the Chinese world order.

This difference in international relations is an important reason for the divergence between Korea and Japan in terms of political institutions.

Easy access to China provided a stimulus for Korea to learn from China's high civilization. Korea had been more ardent and successful in absorbing Chinese pre-modern civilization than any other country. At the same time, however, Joseon Korea's deep incorporation into the Chinese world order proved to be a disadvantage in absorbing Western civilization, while Japan's independent position was more favorable in this regard.

The divergence between Korea and Japan in terms of political institutions and the relationship with China may account for a large part of the fact that Japan's lead over Korea was most conspicuous in the development of a market economy from the thirteenth century onward. It influenced not only the development of internal markets but also the trend in foreign trade.

Let me explain the influence on foreign trade first. The pre-modern states in Korea were passive in pursuing gains from trade and restrictive on private trade. After becoming incorporated into the Chinese tributary system, they subordinated trade to diplomacy, and restricted private trade independent of tributary traffic. In addition, state rulers restricted private trade activities in order to monopolize the profits from trade and to prevent the rise of local centers of power that might threaten the authority of the state. The extension and consolidation of the Three Kingdoms around the fifth century shrunk external trade among local powers on the Korean peninsula, and transformed the open trade system into an administered trade system (Yi 1998). We find no evidence that private maritime trade independent of emissary traffic was allowed by the Three Kingdoms. During the ninth century, when the power of the state in unified Silla weakened, private trade by Koreans prospered and Silla traders dominated the East Asian seas. The lively maritime activity of Korean traders in this period is unique in the pre-modern history of Korea. In the tenth century, the new Goryeo government also came to prohibit private maritime trade independent of emissary traffic. The Joseon government that followed at first prohibited all private trade with China. Although the Joseon government eventually allowed private trade attendant on tribute missions and authorized border-market trade, it did not allow Koreans to go overseas for trade until 1882.

Korea's proportion of trade in GDP is estimated to have been about 2.5% during the late seventeenth and early eighteenth centuries. This proportion was the highest in Korea before the opening of the economy to trade with the modern world. The major reason for this was Korea's role as an entrepôt for transit trade between Japan and China based on the massive inflow of Japanese silver. However, trade contracted in the eighteenth century, mainly due to the interruption of silver imports from Japan, and the proportion dropped to an estimated 1.5% in

the nineteenth century before the opening of the economy (Lee 2004). This proportion was about 16% of the world average in 1870 estimated by Maddison (2001). The restrictive trade policies, such as maritime bans, are likely to have seriously hindered the development of market economy in Korea, given its geographic position as a peninsular country.

Turning to Japan, the *ritsuryo* state was as restrictive on private trade as the Korean states. As in ninth century Korea, the weakening of state authority and the rise of local rulers in eleventh century Japan brought about maritime advances (Tanaka 1975). Overseas trade grew steadily from the twelfth to the early seventeenth century. The proportion of trade in GDP is estimated to have been about 5% in the early seventeenth century. The gap in foreign trade activity was one important reason for Japan's lead over Korea in the development of a market economy until the early seventeenth century. However, after imposing severe restrictions on exchanges with Westerners in the 1630s and tight restrictions on the export of silver from the late seventeenth century, Japan's foreign trade declined drastically. The proportion of trade in GDP is estimated to have decreased to about 1% in the late seventeenth century, and further to about 0.3% in the early nineteenth century.⁸ Japan's proportion of trade in GDP seems to have been more than ten times that of the world average in the early seventeenth century, and less than one tenth of the world average in the early nineteenth century, considering the proportion of merchandise exports in GDP in 1870 and the growth rate in the volume of world trade during 1500-1870 estimated by Maddison (2001; 2005). From the late seventeenth to the early nineteenth century, Japan's proportion of trade in GDP was lower than that of Korea. Thus, the reasons for Tokugawa Japan's growing lead over Korea must lie in the role played by internal markets.

The divergence in political systems between Korea and Japan brought about differences in the evolution and speed of internal market development, because the political system governed the system of economic integration. Over the course of history, most economies in the world fall into one of three major allocation systems based on the principle of reciprocity, redistribution through public finances, or the market.⁹ Based on this categorization, a country's system of

⁸ Nishikawa (1985, p.45) estimated the proportion of exports in farm output (實收石高). The estimated farm output in 1872 was 1.8 times the rice output in 1874 estimated by the Meiji government. As the proportion of rice output valued at market prices in GNP was 24% in Japan during 1885-8, farm output in 1872 is computed to have been 43% of GDP. The Meiji government seems to have slightly underestimated the rice output in 1874, and the proportion of rice output to GNP seems to have slightly decreased during 1872-1888 because of industrialization. Thus, I estimate the proportion of farm output to GDP in 1872 as around 40%. It was higher in early Tokugawa Japan.

⁹ This categorization of major principles of economic allocation was first formulated by Polanyi (1944). North (1977) accepted this categorization, and explained changes in the system of economic

economic integration may be defined in terms of the composition of and relationship between the three allocation systems.

In general, redistribution plays a stronger role in integrating an pre-industrial economy in centralized states than in feudal societies. In Korea, the consolidation of the state from the Three Kingdoms period to the early Joseon period meant that redistribution came to play the dominant role in the system of economic integration. The early Joseon state consolidated and expanded the redistribution system and suppressed trade activities (Sukawa 2000). In sum, the centralized state in Korea did not provide favorable conditions for development of internal and external markets. From the fifteenth to the eighteenth century there was a growth in markets, mainly owing to population increase.

By contrast, the prolonged feudal period in Japan was not unfavorable to the development of the internal market (Reischauer 1970, pp.72-7; Ishii 2003, chaps. 3 and 4). As the *ritsuryo* state disintegrated, the allocational role of redistribution declined and feudal lords had greater freedom to sell peasants' surplus in their private estates, or *shoen* (莊園), that were gradually released from the taxing and administrative authority during the Heian period (794-1185). Trade between the private estates and in the capital region of Kyoto, Nara, and several satellite cities and port towns provided merchants and artisans with internal markets bigger than before and consequently than in medieval Korea (Sasaki 1972; Yamamura 1990).

It cannot be said that the formation of centralized states in Korea had only negative economic consequences. The Joseon government tried to stabilize the peasant economy and encourage agricultural activity by imposing a low tax rate, by improving irrigation, and by publishing and distributing books on agronomics. This role of the government may account in part for the rapid diffusion of cotton culture mentioned earlier. In addition, the government played a leading role in the remarkable scientific development in the fifteenth century.

I mentioned in the previous section that the level of economic development in Korea was not so different from that of Japan around the fifteenth century. This was because the geographical and other advantages and disadvantages more or less offset each other. The tide was on the side of Japan, however, because the role of the market as an engine of economic growth was far stronger in Japan than in Korea. Moreover, from the late Warring States (Sengoku) period to the early Tokugawa period, Japan experienced important institutional changes that laid the foundation for dramatic economic development, which no one in Japan could conceive at the time.

During the Warring States period of Japan, "a new type of tightly organized feudal domains

integration by a theory of transaction cost.

grew.” Territorial lords, or *daimyo*, came to gain a firm control of clearly defined domains. The domains (領國) were autonomous political entities that resembled the nation state in early modern Europe. By the end of the sixteenth century, there formed a centralized feudal state. Under the Tokugawa state a supreme overlord, the *shogun*, maintained rule over hundreds of vassal lords, the *daimyo* (Reischauer 1982).

The fierce military struggles during the Warring States period from the mid-fifteenth to the early seventeenth century resulted in the development of an efficient tax system. Around 1600, the *daimyo* absorbed about half the farm output in the form of rice. Although the tax rate in Japan was far higher than in Korea, the tax structure was simpler and fairer. This, in effect, was the outcome of the need for the *daimyo* to devise an efficient system to extract the maximum amount of tax in order to fund their military campaigns.¹⁰ So they supported the self-reliance of small peasant economies and extracted all the peasants’ surplus (全剩餘收奪の年貢). Since tax reforms in the early eighteenth century, the amount of tax to be paid remained almost constant, providing peasants with an incentive to produce more (Iwahashi 1988).

Korea also created an efficient tax structure in the seventeenth century, but could not prevent the expansion of informal taxes and illegal usurpation in addition to formal and legal taxes. While increases in land productivity provided peasants with a growing surplus in Tokugawa Japan, any increases in productivity in Korea were accompanied by significant increases in informal taxes and illegal usurpation. Thus, the gap in the ratio of the total tax burden to farm output between Korea and Japan narrowed in the eighteenth and the early nineteenth century, because increases in land productivity were slower and increases in additional taxes larger in Korea.

“The central Tokugawa administration in Edo developed into a large bureaucracy, and the domains followed the same general pattern and trends of development.”(Reischauer 1982, p. 64) The Tokugawa administrative structure was never fully rationalized (Jansen and Rozman 1986, p.16), however, unlike those of Korea and China. Thus, how was Tokugawa Japan able to better manage the taxation issue than China and Korea? One important reason is that the socio-political system of Tokugawa Japan entailed fewer agency and free rider problems in taxation than those of Korea and China. The strict and efficient taxation levied on village communities (村請制) mitigated the free rider problem, because villagers knew the tax-bearing capacity of

¹⁰ During the Late Three Kingdoms period of Korea (901-935), one among their rulers enforced a 30% land tax. However, the founder of the Goryeo dynasty lowered this to 10%. The land tax rate of the early Joseon dynasty was lower than that of the former dynasty. The fierce military struggles in Korea brought forth a tax system similar to that of Sengoku Japan, while the advent of peace under a centralized state resulted in the adoption of the Chinese tax system.

their neighbors better than officials. In addition, the free rider problem was also lessened by the segregation of the ruling class (士) from rural villages. By contrast, in Korea, the privileged *yanban* (兩班) class was the major free rider in taxation. It was more difficult for officers in Tokugawa Japan to illegally extract peasants' surplus beyond the officially determined tax amount, because the *daimyo* with their relatively small territories were able to supervise their tax collectors more easily than Korean kings, and because the villages were allowed a considerable degree of autonomy in assigning and collecting taxes. Although Korean kings were very much concerned about the conduct of local officials, their ability to keep corruption in check was limited. And while the use of formal rules in the evaluation of bureaucrats was more widespread in Korea, dishonest officials were sometimes punished more severely in Japan. The institution of the *shori* (胥吏), an official charged with simple administrative duties, aggravated the agency problem in Korea and China, because they received no formal salaries.

As private economic relations and activities spread, various property rights came into being during late medieval Japan (Sakurai 1996). The early modern authorities of Japan suspended various property rights, but developed usufructuary rights (用益權). They denied the property right of land, but guaranteed the usufruct of peasants, unless peasants neglected their tax duties.¹¹ The effective guarantee of usufructs probably is an important factor in explaining the success in the huge reclamation of new land (Oishi 1977). Tokugawa Japan guaranteed mining usufructs more effectively than Joseon Korea and also enforced trade usufructs (場所請負制) in the late eighteenth century. Although Joseon Korea developed private property rights for land, the expansion of informal taxes and illegal usurpation encroached on it. And while Korea also had usufructs of land cultivation, mining, and trade, it did not institutionalize and guarantee them effectively. The usufructs seem to have formed with various contract systems (請負制) in feudal Japan. There appeared mandated official work such as tax farming by local elites (國務と徴税の請負) in the late ninth and early tenth century when the *ritsuryo* state in Japan began to disintegrate (Katsuyama 1995).

The Joseon centralized state was inefficient in promoting regional development because of the agency problem. Although increases in population and the prosperity of agriculture were included in the criteria based on which the performance of local officials was evaluated, it seems that it would have been a rational choice for local officials not to actively promote long-term policies for regional development. These policies often required the mobilization of rural

¹¹ Peasants in land registries who were obliged to pay taxes were called *naukenin* (名請人), which means “contractors to pay the taxes.”

resources and were therefore apt to collide with the Confucian ideal of economic policy, which emphasized the stability of peasant economies and rural society (安民). Moreover, most local officials did not like to promote long-term policies, because their term of office was usually short. By contrast, Japan's *daimyo* had a strong incentive to encourage regional development, because they were not agents but owners of the domains. Moreover, they were locked in competition with each other in the form of military competition during the Warring States period and in the form of economic competition during the Tokugawa period. Therefore, they supported the huge reclamation of new land and promoted local specialty production to enrich their domains. In the late eighteenth century, the domain governments introduced new products and encouraged production by improving technology and supplying raw materials and capital to producers.

The peace and political stability that Japan enjoyed for more than two centuries following the reestablishment of national unity by Tokugawa Ieyasu also provided favorable conditions for institutional stability and market expansion (Iwahashi 1988). It must not be overlooked, however, that the longer peace of Joseon dynasty did not engender a comparable economic development. This was because of differences in institutions and economic system, as mentioned above. Tokugawa Japan had another advantage in the form of a strong state (硬性國家) that had the ability to execute policies against the opposition of interest groups. Not only market conditions but also proactive policies by the Tokugawa *bakufu* ensured the unification of weights and measures in the seventeenth century. By contrast, the weaker Joseon state was unable to do the same and had difficulties in bringing copper coins into wide circulation.

Compared to Joseon Korea, institutional weaknesses in Tokugawa Japan were laws prohibiting land sales and limiting labor mobility, heavy tax rates, and the extravagant system of alternate residence which required the *daimyo* to spend alternate years in Edo (參觀交代制). As markets grew, however, land could be sold and people enjoyed a considerable degree of mobility (Hayami 1993). Surprisingly, the heavy tax and the system of alternate residence had significant positive effects in the historical context of Tokugawa Japan, as will be elaborated below.

Because the domains tended to be self-contained economic units, taxes were collected in rice instead of money, and overseas trade was severely restricted by the *bakufu*, the market economy contracted during the formation period of the centralized feudal system. However, these arrangements held one big advantage that more than offset the disadvantages: I would argue that the most significant determinant of the economic gap between Japan and Korea was

the market environment, and the greatest “gift” national unity bestowed on Tokugawa Japan is that it created a “small world economy” (縮小型 世界經濟) in which each domain behaved like a small state (Lee 1999). Not only did the military powers that united Japan abolish transit duties between domains and trade monopolies (Ishii 2003, pp.41-4), but the authority of the *bakufu* also guaranteed the safety of transactions between domains. Based on these institutional foundations, the “small world economy” could be well integrated by the Osaka market. While Japanese scholars used to characterize the development of markets in Tokugawa Japan as the formation of a national market from the viewpoint of a nation, I think we should pay attention to the market environment governed by the centralized feudal system.

While the *daimyo* could integrate the economies of their domains mainly through redistribution, economic relations between the center and the domains, and between domains, had to depend on market exchange. As a result, there formed a national market that in the late seventeenth century depended mainly on rice taxes. This was in sharp contrast with Joseon Korea, where the government was able to integrate the whole country to a considerable degree through redistribution. Unlike Tokugawa Japan, Joseon Korea had a big and elaborate system of grain loans (還穀) which provided major funds for public relief in times of bad harvests, and an important financial source for many offices in times of good harvest. The amount of grain loans increased to about six million *koku* of unhulled rice in the late eighteenth century (Lee 1999).

The system of alternate residence forced the domains to be integrated into the “small world economy.” It required the domains to produce excess rice or specialized local crops for sale in order to provide materials for the residence of the *daimyo* and their families in Edo. By the end of the seventeenth century, rice taxes amounting to as much as 1–1.4 million *koku* entered Osaka, the center of this “small world economy.” The heavy tax and the extravagant system of alternate residence that might otherwise have been detrimental to economic development played a positive role in the formation of the “small world economy.”

As the market grew, villagers increasingly shifted to commercial farming. The increase in peasant households and the stabilization and commercialization of the peasant economies around the seventeenth century provided a firm foundation for the development of markets in Tokugawa Japan. By the late eighteenth century, the main impetus for market expansion came from commercial agriculture and rural industry instead of commodities converted from rice taxes. In other words, the predominance of markets over redistribution in the economic system became apparent.¹² The “small world economy” fostered great merchant houses. Competition

¹² Hayami (2004) characterizes “economic society” as one in which economic rationality prevails, and argues that the “economization of society” began from the fifteenth century and covered the

among domains in the “world economy” assured the relative autonomy of the merchant class from the political powers. The *daimyo* at first tried to establish self-contained economic units like the Joseon rulers, but under the alternate residence system and in the expanding national market had no choice other than to act in a fashion similar to the mercantile rulers of Europe. The *daimyo* contributed to the expansion of the market whose functioning was still immature by pouring the peasant surplus into the Osaka market, and subsequently, to the development of agricultural and industrial production by promoting production for import substitution and export. The varied climate and topology, and the commercial and industrial domain policies under the “small world economy” brought about the proliferation of local production centers and the flourishing trade between them.

Thanks to this “small world economy,” Tokugawa Japan achieved dramatic economic development despite the very restrictive trade policy which allowed little foreign trade. This internally competitive and externally protective market was favorable to successful import substitution of goods from other Asian countries. By contrast, the same restrictive trade policy and the consequent little foreign trade in Joseon Korea exerted a serious constraint not only on market expansion but also on technological development. Interestingly, the economic gap between Korea and China had narrowed until the Unified Silla period (668-918) when Korea promoted foreign exchange actively, but this trend did not continue during the Goryeo and Joseon periods when Korea became less active in foreign exchange. This is revealed in the technology for silk fabrics and porcelain, representative products in pre-modern East Asia (Lee 2003). Korea was not able to make good use of the opportunity to export cotton cloth to Japan in the fifteenth and sixteenth centuries, because the government monopolized the trade of cotton cloth that was collected as tax in order to utilize official trade for diplomatic purposes. Joseon Korea was not able to utilize the heritage of scientific development such as printing effectively because of low market development.

If Ieyasu had established a completely centralized state while maintaining the Tokugawa government’s restrictive trade policy, Japan’s economic evolution might have followed a similar course as that of Joseon Korea or Ming China. However, he was not able to establish a centralized state, because the warriors had taken root widely and firmly in Japan since the disintegration of the *ritsuryo* regime. Korea’s elites proposed and discussed changes in policy and institutions following the devastating invasion of Hideyoshi’s army. But radical proposals to foster commerce, increase government revenue, and strengthen the military met with strong

whole of Japan by the seventeenth century. I would define “economic society” as a system of economic integration where the market prevails and argue that it became established with the “small

opposition, because these proposals collided with Confucian ideals firmly rooted in Joseon society. Although the Korean government did implement some reforms, the basic policy principles remained unchanged until Korea opened its doors to the modern world. Thus, path dependency matters greatly in the history of both countries.

Korea's economic development faced exogenous disadvantages when compared with Japan, such as possessing a smaller territory, fewer resources, a less favorable climate, and less fertile soils for agriculture. These disadvantages would have been surmountable, if Korea had created more efficient institutions and more favorable market conditions. But Tokugawa Japan had more efficient institutions and more favorable market conditions than Korea. It is not surprising that the economic gap between them widened.

The late Tokugawa economy drew level with the economy of China's advanced regions, and Japan was more successful than China in introducing modern sciences and industries after opening its doors to the modern world (Ma and Zhong 1988). It is difficult to understand how Japan caught up with China which had a far bigger market and less restrictive class mobility.¹³ The benefits from the "small world economy" of Tokugawa Japan offset the disadvantage of the smaller market. This "small world economy" under the centralized feudal system stimulated trade and competition among domains and the central city as well as technology transfer between regions (Oka, Yamasaki, and Niwa, 1991). Although the feudalistic system of Tokugawa Japan imposed some limitations on the integration of the whole market, it brought forth the mercantile policy of the domains. The more rapid development of the market in Tokugawa Japan than in Qing China illustrates the significance of the latter advantage in the pre-industrial period when market functioning was immature.

Although people's occupations and aspirations were limited by hereditary class restrictions in Tokugawa Japan, an effective system of reward for merit and achievement did exist in the form of opportunities to move to a higher status within each class. If peasants worked and studied hard, they had the opportunity not only to become wealthy but also to move to a higher status such as *shoya* (庄屋), *kumigashira* (組頭), or *hyakushodai* (百姓代). As for merchants, they could find reward for merit and achievement thanks to large urban markets and the "small world economy." They developed not only commercial skills but also a culture distinct from that of the ruling samurai class. As a result of such upward mobility, by the late Tokugawa era, there were a large number of intellectuals even among the upper layer of merchants and

world economy."

¹³ China's bigger market should have been a distinct advantage, as suggested by Adam Smith's famous proposition "That the Division of Labour is limited by the Extent of the Market" (Smith 1776, title of Chapter III).

peasants and printing was in wide use (Yamaguchi 1993). By contrast, mobility between classes in Ming and Qing China was not necessarily favorable to economic development, because commercial capital tended to be invested in land purchases and cultural expenditure once the descendants of merchants became officials and then members of the aristocracy (Park 2002).

The “small world economy” and upward mobility in Tokugawa Japan were able to offset the disadvantage of smaller size of the market and the absence of mobility between classes when compared to Qing China. However, it is uncertain that these advantages exceeded the disadvantages. I would suggest that the missing element in Japan’s catch-up with China is human capabilities. Tokugawa Japan had achieved a dramatic development in education (Dore 1965), and came to surpass Korea and China in the spread of education. Human capabilities played a significant role in Japan’s superior performance in modernization (Minami and Makino 2002, pp. 11-3). Intellectuals displayed high capabilities in absorbing modern science, the *samurai* successfully created a modern government, competent entrepreneurs and technicians appeared to create modern industry, traditional small firms became competent exporters, and traditional agricultural made the transition to modern standards.

There are various sources for Japan’s catch-up in human capabilities. The reason why human capabilities in Tokugawa Japan surpassed those in Joseon Korea can be sufficiently explained simply by pointing to the differences in market opportunities. Because of the greater market opportunities in Japan, peasants and merchants had more incentive to acquire and develop professional skills. By contrast, a weaker market and a stronger Confucian culture in Korea meant that the role of economic rationality was weaker under the stronger emphasis on Confucian morals such as benevolence and justice.

The centralized feudal system and the “small world economy” in Tokugawa Japan provided a more favorable environment to develop human capabilities than the political arrangements and systems of economic integration in pre-modern Korea and China. This “small world economy” under the centralized feudal system contributed to the development of merchants’, artisans’, and peasants’ capabilities by stimulating economic competition and technology transfer between regions.¹⁴ As mentioned above, thanks to the “small world economy” and the reward system in

¹⁴ An illustration is provided by Uchida (1960), who, focusing on the development of the textile industry in Tokugawa Japan, showed that the learning of foreign technologies, growth of the market, competition between regions, promotion and support by governments, and the active response of technicians and producers all played an important part and that this accumulation of technology and human capabilities laid the foundation for the transformation of traditional textile manufacturing into a modern industry once Japan opened its ports. Moreover, Ahn (2004) has shown that the gap in the development of the cotton industry between Japan, China, and Korea before the opening to modern world significantly shaped the performance in the subsequent modernization of the cotton industry.

rural communities, Tokugawa Japan under the absence of class mobility saw a wider spread of education among merchants and peasants than Qing China or Joseon Korea. Bureaucrats under the centralized feudal system in Japan developed capabilities to reform institutions and respond to economic opportunities better than those under the loose administration of the centralized states in China and Korea. Bureaucrats' capabilities revealed themselves in the reforms after the opening of these three countries to the modern world. Tokugawa Japanese had more opportunities to practice not only cooperation through strong village communities and tightly-controlled domains, but also competition through the "small world economy."

I would argue that the Warring States (Sengoku) period of Japan laid the foundation for the remarkable accumulation of human capabilities in Tokugawa period. Table 2 shows that Japan achieved significant economic growth in the seventeenth century, before the national market was formed. The publication of many books on agronomics during 1680-1697 cannot simply be considered as a response to the market, because the national market had just formed in this period. The huge reclamation of new land began in the period of fierce strife between the Sengoku *daimyo*. Sengoku and early Tokugawa Japan made the impressive achievement of developing iron technology that provided the basis for agricultural development. Since the Warring States period, the *samurai* displayed their ability to reclaim new land and construct castle towns by developing skills in engineering and construction, and had accumulated agricultural knowledge that laid the foundation for the era of books on agronomics during 1680-1697 (Oishi 1977; Oka et. al., 1991, pp.48-52). Moreover, the *samurai*, familiar with competition in military terms, were better prepared for economic competition than the literati classes of Korea and China. Japanese peasants achieved high labor productivity already around 1600, not only because land per capita was relatively large, but also because they worked very hard in order to pay the heavy taxes to the ruthless Sengoku warriors. Tokugawa peasants not only worked very hard, but also enhanced work efficiency with the aid of agronomical books and the opportunities of a growing market (Saito 2005). Moreover, the opportunities of the "small world economy" instilled a sense of economic rationality in them.

The Warring States periods of both ancient China and medieval Japan offered both training and opportunity to develop human capabilities. These periods not only imposed a strong degree of strain in the fight for survival, but also provided people with opportunities to move to a higher social status. Military campaigns during both periods required high technological and organizational skills. The Warring States period of ancient China is well known for its great achievements in terms of economic growth, intellectual outburst, and political development. Although the enhancement of human capabilities in the Warring States period of medieval Japan

was not as great as that of ancient China, Japan continued to develop human capabilities more successfully than China after its Warring States period. Japan's success in import substitution of Asian goods before opening its doors to the modern world, and in import substitution and export competition with Western countries since then, were underpinned by the continued enhancement of human capabilities since the Warring States period.

This being said, however, differences in human capabilities among the three Northeast Asian countries should also not be exaggerated. The spread of education and the development of scholarship and science were also common in China and Korea. The development of science and education was impressive in Joseon Korea, considering the low level of market development.¹⁵ The fact that all three Northeast Asian countries developed human capabilities has something to do with common features in terms of the development of intensive agriculture, markets, the bureaucracy, and high culture, including Confucianism. The spread of Confucianism engendered an ethic of learning and achievement in all three countries. It stimulated the development of education and intellectual culture in Tokugawa Japan (Minamoto 1995, pp. 10-1). In sum, any factor alone is not sufficient to explain Tokugawa Japan's catch up with China.

IV. Concluding Remarks

Geography or the natural environment, either directly or indirectly, had mainly determined the economic gap between Korea and Japan until the eleventh century. Geography was more favorable for Korea in terms of access to the Agricultural Revolution and for Japan in terms of access to the Industrial Revolution. From the twelfth century, divergence in the political systems of Korea and Japan, a development that was influenced fundamentally by geography, brought forth differences in institutions and the system of economic integration. The influence of these differences on the economic gap became stronger, weakening the determining force of geography. And Tokugawa Japan increasingly enjoyed advantages not only in terms of the natural environment, but also in terms of institutions and the system of economic integration over Korea, which led to a persistent widening of the economic gap between the two countries. Korea was not able to overcome the disadvantages of its small size and poor resource endowments until the 1960s, when it successfully embarked on its export-driven growth. From the Warring States period onward, Japan developed human capabilities more successfully than

¹⁵ A study addressing this point is that by Kimura (1997), who regarded educational development as a pre-condition for Korea's take-off.

Korea and China. Japan was more successful in introducing modern civilization after opening its doors to the Western world, partly because it benefited from the historical heritage of market development and human capabilities.

Scholars have long argued that the feudal system was a common historical underpinning of modernization in both Europe and Japan. This paper finds that the political system played a significant role in the evolution of institutions and the system of economic integration. And it may be said that feudal societies needed a political or institutional transformation comparable to those of Japan and Western Europe around the sixteenth century in order to lay effective foundations for modern economic growth.¹⁶ I have argued that the “world economy” as a system of economic integration was a common favorable heritage that helped both Japan and Europe to achieve modern growth earlier than other regions.

Viewed from an alternative perspective, Japan and Korea seem to have trodden a similar path of economic development, owing to similar natural environments, their geographic proximity, and active exchange between them. The period in which the income gap between two countries reached a factor of two or more lasted only about a century in the long span of the whole of human history.¹⁷

Early modern Japan was economically backward relative to early modern Western Europe (Saito 2005). Reasons for this are that China, the major source of high civilization in pre-modern East Asia fell behind Western Europe in the early modern period and that the Japanese “world economy” was far smaller than the European “world economy” and Europeans actively searched for markets outside Europe. In sum, Japan had an advantage over Korea, but a disadvantage vis-à-vis Europe in terms of market environment.

Therefore, incorporation into the modern world economy provided a great opportunity for Japan as well as Korea. Foreign trade and markets developed rapidly, and modern technology and institutions were introduced widely both in Japan and Korea. Although Japan was more successful in modernization, Korea also experienced a significant transformation after opening its doors to the modern world. Two reliable estimates of colonial Korea’s regional account’s

¹⁶ Although the political system of Mughal India resembled the centralized feudal system of Tokugawa Japan, Mughal India did not achieve impressive economic development comparable to that of Tokugawa Japan. The history of Mughal India reveals that the political system such as a feudalist or centralized feudalist political system did not automatically guarantee success on the road to modernization. When compared to Tokugawa Japan, Mughal India had some weaknesses in institutions, its economy was not efficiently integrated by the market, and its culture and society were not favorable to the accumulation of human capabilities.

¹⁷ According to Maddison (2003), Japan’s per capita GDP was almost or more than twice as large as that of Korea or South Korea during 1939-91. However, estimates by Fukao, Ma and Yuan (2006)

(Mizoguchi and Umemura 1988; Kim 2006) have come to the similar conclusion that sustained growth of more than 3% began in the earliest years included in these estimates, i.e., around 1911-12. Although the two studies may overestimate the growth rate in the early 1910s, the results reveal that the time when sustained growth of more than 3% began is likely to be not far from 1910, the year of colonization. The historical heritage in Korea before colonization seems to have provided the foundation for the march to sustained growth led by the introduction of Japanese administration, capital, and technology.

In the late twentieth century, Japan caught up with Europe, while Korea and China became newly industrialized countries. The history of Northeast Asia shows that institutions, the market environment, and human capabilities have been important factors in determining economic development. These factors are interrelated and mutually supportive of each other. In addition, it seems that human capabilities have played an important role in the catch-up of the three Asian countries. What remains to be done is to explore the various sources of the development of human capabilities, such as human capital, social capabilities, and other factors more fully.

I hope this general survey will pave the way for more detailed and concrete studies on this subject.

suggest that the time when Japan's per capita GDP became more than twice as large as that of Korea goes back to the remoter past.

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