The Standard of Living in the Chosŏn Dynasty Korea in the 17th to the 19th Centuries

Ki-Joo Park and Donghyu Yang*

With the aid of official statistics published by the Kingdom's administration, and newly available indices of output, acreage, wages, population, and the price level, constructed from various other sources, this study establishes almost for the first time the long-term trends in the standard of living in the late Chosŏn, from the 17th to the 19th centuries. We then put the Korean trends to a larger picture of East Asia, including China and Japan. We investigate the tilled acreage *per capita* and the land productivity which together determine the agricultural product *per capita*, hence the *per capita* rural income. Alongside, we examine the long-term trends in real wages of rural and urban laborers. The comparative look at the three East Asian countries showed that Korea had the lowest and deteriorating living standards in the 17-19th centuries. This may be explained by poor irrigation system, natural disasters caused by deforestation, and the shortage of fertilizers.

Keywords: Standard of living, Chosŏn (Korea), China, Land productivity, Acreage *per capita*, Wage, Prices

JEL Classification: N15, N35, N55, O10, O53

* Assistant Professor (First Author), Department of Economics, Sungshin Women's University, 249-1, Dongseon-dong 3-ga, Seongbuk-gu, Seoul 136-742, Korea, (Tel) +82-2-920-7742, (E-mail) kjpark@sungshin.ac.kr; Professor, School of Economics, Seoul National University, 599 Gwanakno, Gwanak-gu, Seoul 151-746, Korea. (Tel) +82-2-880-6375, (E-mail) dyang@snu.ac.kr, respectively. The earlier version of this paper was presented at the conference 'Contemplating Chosŏn Society-Historical Aspect of Its Economc System,' Asia Pacific Research Center, Stanford University, October 14, 2005. Authors thank John Duncan, Cameron Campbell, conference participants, and a referee for comments and suggestions.
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I. Introduction

Discussions about the standard of living have widened their sphere of interests to the period before the 19th century, and to the comparative studies among nations or regions. For example, the world economic-historical statistics almost annually updated by Maddison (2003) provide good time series data for such comparative studies. However, it is very difficult to obtain pre-20th century data for most of the non-European countries.

No wonder studies on the living standards of East Asian countries appeared only recently, and for Korea, almost non-exisistent. This article is an attempt to fill the void. We try to establish the long term trends in the standard of living in the late Chosŏn, from the 17th to 19th centuries. We then compare the Korean trends to those of China and Japan.

Interregional comparison is yet to wait for the reliable conclusion, but there exist quite a number of studies comparing Britain and China, earliest developed nations at the either end of the Eurasia.[1] The traditional interpretation is that Europe had higher standard of living than Asia before the industrialization; many 'revisionist' studies, among others, by Pomeranz and by Allen argue that Asian standard of living did not fall below European level, although without consensus.

Allen (2001) and Williamson (2000a) trace the gap between the center and the periphery in Europe back to the preindustrial 16-18th centuries. Pomeranz (2000, 2002) states that the standard of living in 18th century Yangtze Delta, China was about the level of England or the Netherlands, the most developed countries in Europe, and that the European lead began with the industrialization (and coal, and colonies). Parthasarathi (1998) sees the gap between Europe and India as a 19th century phenomenon.

Williamson (2000b) locates the timing of widening gap between Europe and Asia at the globalization process after 1870, with the estimates of the real wages in Bangkok and in India falling from 2/5 and 1/3 of London laborers' wage level to 1/7 and 1/6 respectively by the turn of the century. If the standards of living in China and

[1] They have coined many interesting concepts such as divergence, involution, and industrious revolution, whose counterparts are convergence, development, and industrial revolution.

India were similar to that of England in the mid-18th century as argued by Pomeranz and by Parthasaraihi, Indian wage level relative to English one has plummeted to 1/3 by circa 1870, and to 1/6 in the early 20th century.

China and Japan have been main objects of comparison with Europe; then how high was the standard of living in Korea during the late Chosŏn Dynasty in the 17th to the 19th century, which located between the two countries geographically and have been in close economic relationship with them? We have some data for the end period, *i.e.*, the beginning of the 20th century. According to Maddison (2003)'s estimates, *per capita* GDP in 1913 of Korea was $820, Japan $1,387, the Philippines $1,053, Taiwan $747, and China $552. However, Yuan, Fukao, and Ma (2002)'s Purchasing Power Parity adjusted real consumption *per capita* in 1915 of Korea was 66% of Japanese level, while that of Taiwan was higher at 84%. Real wage estimates by Williamson (2000b) of Japan, the Philippines, and Korea for the early 20th century were the highest among Asian countries, about 1/4 of the London laborer's level at the time.

If we accept the above estimates, the standard of living in Korea at the beginning of the 20th century was relatively high in Asia. Was it because the economy kept improving? Besides the official statistics published by the Kingdom's administration, we have available now new indices of output, wages, population, and the price level collected from various other sources, to be published with the title, *Historical Statistics of Korea*,[2] which enable us to discuss to a certain extent about the standard of living of Koreans in the 17th to the 19th centuries. Since there accumulated studies comparing China and Japan to Europe, once we put Korea relative to China and Japan, comparative interpretation of Korean living standard with other countries follows.

The rest of this paper is organized as below. In Sections II and III we investigate tilled acreage *per capita* and the land productivity, which together determine the agricultural income *per capita* in the

[2] Long-term statistics from the late 17th century to the present will be published by Naksungdae Institute of Economic Research (933-6, Bongchon bon-dong, Gwanak-gu, Seoul, Korea). It contains statistics of population, labor, agriculture, forestry and fishery, mining and manufacturing, construction, utilities, service, public finance, prices, money and finance, consumption and living standards, capital stock, balance of payment, and national accounts.

three East Asian countries in the 17th to the 19th centuries. Next come the discussion of real wages, prices, and the development of the market (Sections IV and V), and finally the concluding remarks.

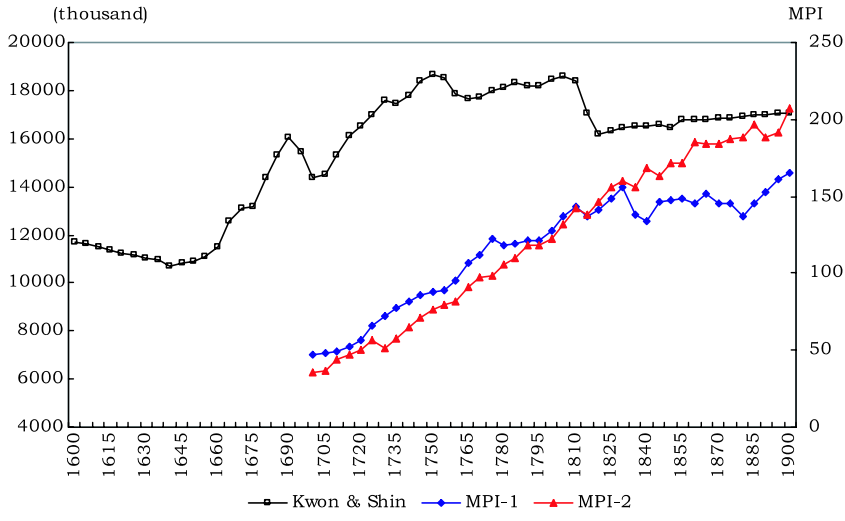
II. Tilled Acreage *Per Capita*

Population in the late Chosŏn was estimated by Kwon and Shin (1977), based on the dynastic Household Survey (*Hogu Josa*). The series, approximately 2.5 times the official records, show a rapid growth from about 1650 to 1750, stagnation around 1800, and a sharp fall from 18.5 million to 16.2 million in the 1810s, probably due to flood and starvation (Figure 1). If we believe this statistics, Chosŏn encountered the worst demographic crisis in the early 19th century since between the late 16th and the early 17th century, when the invasions from Japan and China have severely diminished the population.

But the reliability of the *Household Survey of the Chosŏn Dynasty* has been negatively evaluated: The purpose of the survey was nothing but to enumerate the duty of the population to the kingdom; the labor service amounts could easily be manipulated by the officials in charge and powerful civilians. However, even accepting the opinion of the critiques, can we just ignore the pictures that the official statistics give?

A recent study by Park and Cha has investigated the Household Register (*Chockbo*), to compute the 'Male Population Index' and propose a new view of the Chosŏn demography (Rhee 2004, ch.1). The Figure 1 shows the results: MPI-1 for the resident literati (*Yangban*), MPI-2 for the more superior royal families. The period of the demographic stagnation differs but the overall picture of the "growth in the 18th century and stagnation in the 19th century" still holds, which supports the implication of the official *Household Survey*. It may be interpreted that the Household Register has captured the behavior of the higher society than the *Household Survey* would have within the population map.[3]

[3] Not only there were in the Household Register such 'estate biases' but we have found no references about death of female, nor of the pre-adult male. Furthermore, the birth and the death records have reasons to doubt their completeness. This is why Cha has experimented with a model Life Table to include the 'hidden population' and has come up with a different result, without any consensus.



Sources: Kwon and Shin (1977, pp. 324-8), Rhee (2004, p. 15).

FIGURE 1
THE TREND OF POPULATION IN THE LATE CHOSŎN

What about the demographic dynamics of the three East Asian countries then, similarities and differences? The early 17th century China had to go through a change of the dynasty. The population went down with it. It was estimated that the total population of China was 70 million in 1657.[4] Computing from that figure and the official statistics of 268 million for 1776, the growth rate was 1.13% per year (Chao 1986, pp. 37-41). The population growth temporarily stopped in the late 18th century, but continued until the mid-19th century.

On the other side, the Japanese population grew rapidly (threefold in the 17th century only) in the early Edo period, but stagnated during the 18th and the 19th centuries. The statistics show the highest point at the start of the 18th century and the lowest point at the end of it. Of course there were regional differences, and the Japanese experienced other demographic crises in the 1830s (Hayami 2003, pp. 248-52).

[4] 70 million came from the 19 million adult male numbers multiplied by the ratio of 3.77. The Chinese official statistics changed from the adult male to the total population in 1741.

The early modern period had the three East Asian countries going through wars, dynastic changes, which accompanied the population recession, followed by its explosion almost simultaneously. Differences appear in Japan's stop in the 18th century in contrast to the Chinese growth until the mid-19th century. Chosŏn's population has gone up to the peak in the mid-18th century and then stagnated.

Edo Japan's demographic foibles were often interpreted as results of the artificial abortion, selective infanticide (*Mabiki*), and the recently acknowledged preventive checks such as late marriages and the regulation of the marital fertility (Kitō 1994, pp. 202-3). Likewise, the stagnation of the Chinese population in the late 18th century has been explained not only by the conventional thesis of the positive check but also by the preventive check more than Malthus would have expected. Q'ing China's sustained population growth may have been due to the higher standard of living (Campbell and Lee 2004, p. 295).

The 19th century demographic stagnation of Chosŏn poses the similar question, whether it was the preventive check. Park and Cha concluded to the contrary (Rhee 2004, ch. 1). The life expectancy at ages 20-24, estimated from the Household Register, amounted to 35.2 in the late 18th century, 32.6 in the 19th century, and 38.3 in the early 20th century, indicating extremely higher mortality in the 19th century. The average birth interval between the first son and the second fluctuated around a certain level in the 18th century, lengthened with some variations in the 19th century, and then dramatically fell in the 20th century. If the age at the first marriage of women in the 18-19th centuries remained stable, the longer birth interval may be interpreted as a sign of the rise of the infant mortality rate.

These discussions on the population lead us to the central theme of this section, the acreage *per capita*. The Chosŏn Dynasty has established a land survey from the start for the purpose of the land tax, with the result of the increase of the taxable land records from 800 thousand *kyŏl* to 1.5 million *kyŏl*. The land survey was supposed to be carried out every 20 years, but it was physically impossible. The Kyŏngja yangjŏn (1720 land survey) was almost a hundred years later than the previous Kapsul yangjŏn (1634 land survey). The unit of the Chosŏn Dynasty survey was the '*kyŏl*', which differentiated lands according to the fertility of the land investigated. The absolute area of the land in question disperses from the most

fertile to the least about one to four.[5] Nevertheless, the '*kyŏl*' records serve well in the long-term investigation of the acreage tilled.

The cultivated acreage expanded with the 'development age' of the 16th century. For example the southern region increased her soil by 10 per cent. The two invasions from Japan and Q'ing China reduced the acreage but the expansion continued until the early 18th century to recover the area to the previous level.

Now we consider the *per capita* tilled acreage. If we believe the Household Survey of the Kingdom, and the statistics of the amount of the taxable lands, we have this picture: The *per capita* acreage decreased when the population grew, from 17th to mid-18th centuries, and was stabilized when the population stagnated or fell during the 19th century.

The Land Register (*Yang-an*), composed at about the same time of the Kyŏngja yangjŏn leaves us a good record, as it reports information about the landowners of the Kapsul yangjŏn, a century earlier. We can compare those two to examine the change of the land ownership over the century: The tilled acreage did not grow, the population grew.

As we see from the Table 1, Sangju and Daegu of the Kyŏngbuk Province witness the decline of the average scale of ownership to almost two thirds or a half.

In addition, we could easily confirm that the management scale as well as the ownership structure went down. The following are our findings from the various cases of the royal and military lands (Table 2). The acreage of the tenants continued to decline, especially during the centuries 17th to the early 18th century, as the cases (1) and (2) indicate. The cases (3) and (4) were from the 18th century, but they had been already diminished to tiny squats. The rest are for the 19th century that showed only a little decline except (8).

Another case we have noticed is the 18th century Chilgok, Kyŏngbuk Province (Figure 2). The average scale of the rented acreage of the tenants fell from 6 '*durak*' to 4 '*durak*' and the size of a lot declined as well (Kim 2004). But we have found that the rented acreage of the tenants in Yechŏn, Kyŏngbuk Province was stable around 4-5

[5] Nōshōmushō (1906, p. 295) calculated as follows: The first class 1'*kyŏl*' = 2,610 '*pyŏng*', the second class 3,062.7 *pyŏng*, the third, 3,722.7 *pyŏng*, the fourth, 4,741.8 *pyŏng*, the fifth, 6,514.5 *pyŏng*, and the sixth, 11,400 *pyŏng*. Kato (1904, p. 84) assumes that 1 '*kyŏl*' was equivalent to 1.7 '*jŏngbo*' (approximately, 5,000 *pyŏng*).

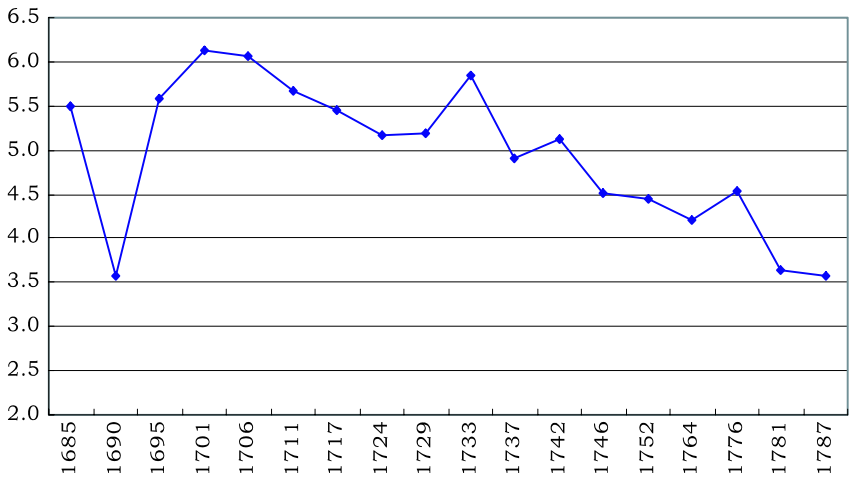
TABLE 1

THE CHANGE OF THE LAND OWNERSHIP BETWEEN 1634-1720

Range of acreage	Dandong, Sangju				Choam, Daegu			
	1634		1720		1634		1720	
	No. of person	Total of acreage (*bu*)	No. of person	Total of acreage (*bu*)	No. of person	Total of acreage (*bu*)	No. of person	Total of acreage (*bu*)
over 5 *kyŏl*	1	607	1	505	1	563	0	0
2-5 *kyŏl*	22	5,618	8	2091	36	9,995	10	2,552
1-2 *kyŏl*	73	9,961	55	7,825	44	6,502	48	6,647
75-100 *bu*	28	2,360	48	4,151	24	2,001	29	2,491
50-75 *bu*	60	3,685	57	3,490	34	2,131	53	3,261
25-50 *bu*	107	3,818	149	5,327	64	2,360	143	4,986
0-25 *bu*	176	2,158	363	4,391	135	1,849	550	6,006
Total	467	28,207	681	27,781	338	25,401	833	25,942
Average		60.4		40.8		75.2		31.1

Note: 1 *kyŏl* equals 100 *bu*.

Sources: *Sangjumok Kyŏngja Kai-Yangjŏnan* (Revised land survey book of 1720, Sangju), *Daegu Kyŏngja Yangjŏnan* (Land survey book of 1720, Daegu). Both are quoted from Rhee (forthcoming).



Source: Kim (2004, p. 306).

FIGURE 2

THE CHANGE OF THE AVERAGE ACREAGE OF THE TENANTS, CHILGOK, KYŎNGBUK (UNIT: *DURAK*)

TABLE 2
THE CHANGE OF THE ACREAGE OF THE TENANTS, 17-19TH CENTURIES

	Year	No. of persons	Acreage	*Per capita*
(1) Konyang, Kyŏngnam	1634	7	512.8 *bu*	73.3
	1717	24	550.7 *bu*	22.9
(2) Namhae, Kyŏngnam	1681	265	13,926.4 *bu*	52.6
	1720	379	14,103.3 *bu*	37.2
	1845	246	8,558.5 *bu*	34.8
	1905	399	8,590.1 *bu*	21.5
(3) Kimje, Chŏnbuk	1720	46	955.8 *bu*	20.8
	1746	46	955.8 *bu*	20.8
	1783	51	955.8 *bu*	18.7
(4) Jŏngŏb, Chŏnbuk	1755	85	1,238.4 *bu*	14.6
	1783	77	1,247.8 *bu*	16.2
(5) Buan, Chŏnbuk	1851	23	251 *durak*	10.9
	1896	28	235 *durak*	8.4
(6) Yŏnsan, Chungnam	1797	31	239 *durak*	7.7
	1882	40	239 *durak*	6.0
(7) Shinchŏn, Hwanghae	1801	151	3,096 *bu*	20.5
	1904	155	3,011 *bu*	19.4
(8) Pŏngsan, Hwanghae	1824	62	1,575 *bu*	25.4
	1865	83	1,479.8 *bu*	17.8
	1896	83	1,140 *bu*	13.7

Source: Rhee (1988, ch. 8).

durak in the late 19th century. The Yŏngkwang, Chŏlla Province peasants did not suffer from the decline of the land during the early 19th to the early 20th century. They maintained their land (4-5 *durak* for the lower, 9-10 *durak* for the higher). In short, the acreage went down until the mid-18th century, with a slower speed thereafter. The population change may have been an important factor.

China offers a somewhat different comparison. Chao (1986, pp. 86-7) suggested that the acreage has expanded toward the mid-19th century after the Sung Dynasty started clearing. But the population grew faster, so that the *per capita* area declined. The increased population was accommodated by the spread of the small family management established in the Yangtze paddy area about the 12-13th centuries. As a result, the *per capita* acreage was lowered to two-thirds by the 17th - mid-18th centuries, as shown in the Table 3.

Japan's cultivated area has doubled with the development of the

TABLE 3
COMPARISON OF THE POPULATION AND ACREAGE IN 3 EAST ASIAN COUNTRIES

China				
Year	Population (million)	Year	Acreage (million *mou*)	*Per capita* (hectare)
1592	200	1581	701	0.23
1657	72	1662	548	0.51
1776	268	1784	761	0.19
1800	295	1812	789	0.18
1848	426	1887	925	0.14
Japan				
Year	Population (thousand)	Year	Acreage (thousand *chō*)	*Per capita* (hectare)
1600	12,270	1600	2,200	0.18
1721	31,280	1721	2,960	0.09
1834	32,480	1843	3,060	0.09
1870	35,380	1872	3,590	0.10
Chosŏn (South 3 provinces)				
Year	Population (thousand)	Year	Acreage (thousand *kyŏl*)	*Per capita* (hectare)
1648	2,576	1634	895.9	0.58
1717	10,056	1720	969.1	0.16
1777	9,074	1777	931.0	0.17
1807	9,377	1808	932.4	0.17
1852	8,711	1852	933.0	0.18

Notes: 1. The population of Chosŏn is calculated as 2.5 times of the official data and 1 *kyŏl* is assumed to be 5 thousand *pyŏng*.
2. 3 provinces of Chosŏn are Chŏlla, Kyŏngsang, and Chungchŏng.
3. Acreage of each country is converted to hectare, according to the appendix.

Sources: Chao (1986, pp. 87-9); Kitō (1994); Zenshō Eisuke (1925, pp. 21-31); Chūsūin Chōsaka (1940, pp. 309, 331, Appendix).

clearing (*Shindenkaihatsu*) in the Edo era. The acreage in 1598, when the national land survey (*Taikōkenchi*) was completed, was 1.8 million *jŏngbo*, and that of the early Meiji, 4.4 million. Even considering the former figure as inaccurate, it implies at least two-fold rise (Hayami 2003, p. 118). Again, the expansion of the acreage fell short of the population growth, three-fold in the 17^{th} century. The *per capita* acreage has plummeted to one half in the century and remained at the level for a time because of the

population stagnation.

From about 1600 to the mid-19th century, the three countries experienced the significant decline in the acreage per person. But peasants of Chosŏn had twice as large acreage *per capita* as the Japanese, and about the same as the Chinese. The Chinese, however, has a tremendous amount of land so as to make national statistics unreliable. The figure comes down when we talk about the Yangtze rice paddy only.

Having in mind that the Chosŏn's relatively higher population density especially in the southern region, we could conclude the agricultural activities were more extensive in Korea than China or Japan. The *per capita* acreage has declined from 0.51 hectares to 0.14 in China, 1657-1848, from 0.18 hectares to 0.10 in Japan, 1600-1870 and from 0.58 hectares to 0.18 in Chosŏn, 1648-1852.

The questions would arise. The simple division of the tilled acreage by the number of the peasants would not imply the scale of the farming. The double cropping, for example, completely changes the story. Moreover, the urbanization and the growth of non-agricultural population in the rural region complicate the picture more.

For example, Jiangnan, a Chinese paddy region, had reported the per household acreage of 15 *mou* in the early 17th century, and 9 *mou* in the mid-19th century. However, they also reported the improved land-utilization rate increased from about 140% to 170%, so that the per household acreage did not decrease as much. Furthermore, if the female labor was recruited substantially to cotton and silk, the decline of the number may well have been reversed (Li 1998, pp. 136-8).

Comparing to China and Japan, the double cropping was not widespread in Chosŏn, and the opportunity of nonagricultural rural employment was limited. The scale of management may not have been larger in Chosŏn as the *per capita* acreage may have indicated.[6]

[6] Li (1998) and Brenner and Isett (2002) argue that the proportion of the double cropping in Chinese paddies has already reached 40% in circa 1600, and 70% in 1800. The proportion in Chosŏn in 1914 amounted to the highest 41% in Kyŏngbuk, and 31% in Kyŏngnam, and 12%, 17% in Chŏnbuk and Chŏnnam, respectively. With almost the same climatic condition Kyŏngbuk province has achieved far higher rate of the double cropping, probably because not only of the better water supply but of the Confucian order that encouraged labor discipline among the laboring people.

III. Land Productivity

The land productivity naturally is a component with the acreage *per capita* that determines the agricultural income per person.[7] The index for the land productivity in the late Chosŏn was the rent per *durak*, the amount landowners charge tenants for lands. One *durak* implies the area on which people can sow a *du* of seeds. On average rice paddy, a *durak* equals 120-180 *pyŏng*, with regional variance. But in the same region, it is safe to assume that the *durak* represents the equal land area. The rent per *durak* can be computed by dividing the total amount of rents by the total area of the land which were collected by the individuals, communities (here *Kye*), and institutions (here *Sŏwon*) from tenants. This can be done by investigating the rent records. Transfer of ownership by purchase and sale may have clouded the rent per the unit of land, but as long as the figure belonged to the same county (*Kun*), it would not cause problems.

The oldest case we could find is one for Ulsan, 1660-1695 (see Figure 3). Reliability is not quite good: Observations for 18 years out of 36 years are missing. However, it shows that the rent per *durak* fell from 16 *du* to 7-8 *du* (Rhee 2004, p. 210). The next case is for Chilgok, Kyŏngbuk, which indicates the rent declined in the 17^{th} century but was stable around the level of 10-15 *du* in the 18^{th} century, as other cases for Sŏngju and Koryŏng implied (Kim 2004).

We have more cases for 18-19^{th} centuries. Among them are relatively long time series for Kyŏngju, Kyŏngbuk and Yŏng-am, Chŏnnam starting from the mid-18^{th} century. Others include comparatively shorter series for the 19^{th} century (Rhee 2004, ch. 6). These cases indicate the long run downward trend of the rent per *durak*, except a few which do not show any strong trend like Sŏsan, Chungnam and Kwachŏn, Kyŏnggi.

Of course regional differences in the behavior of the rent series, and the level of the rent per *durak* were found. The differences may be explained by the fertility of land, the rate of rent, the size of *durak*, and the measurement unit, *du*. Especially the regional difference of the measuring devices posed problems in constructing

[7] $Y/L=(Y/T) \cdot (T/L)$, where Y, L, and T denote income, number of person, and acreage, respectively.

Note: Kyŏngbuk and Kyŏngnam were Kyŏngsang during Chosŏn dynasty, while Chŏnbuk and Chŏnnam, Chŏlla.

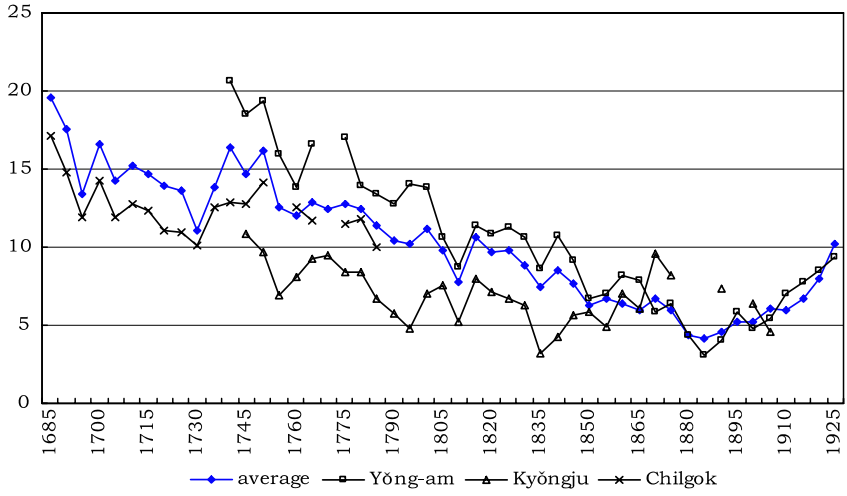
FIGURE 3
KOREAN PENNINSULAR

statistics for the Chosŏn era. The following regression equation may help in this regard. It will sort out the trend of the rent, controlling for the regional differences. The place dummy was taken to differ for every owner, and even for the same owner, for the separate piece of lands in different counties. The year dummy was set by 5 year intervals.

$$\text{rent}_{ij} = c + \Sigma\alpha_i \text{place}_i + \Sigma\beta_j \text{year}_j + \varepsilon_{ij}$$

rent: rent per *durak*
place: county dummy
year: year dummy

The data cover 13 regions (counties). The regression shows a long period trend from the end of the 17^{th} century to the beginning of the 20^{th} century of the average rent per *durak*. The average rent continuously declined from 15 *du* around 1700, to 10 *du* circa 1800,



Sources: Rhee (2004, pp. 211, 262); Kim (2004, p. 317).

FIGURE 4
THE TREND OF RENTS PER *DURAK* (UNIT: *DU*)

and to 5 *du* in 1900. It turned around from the late 19th century. The Figure 4 depicts the average trend, together with the relatively long series from Chilgok, Kyŏngju, and Yŏng-am. In the special case of Yŏng-am, the speed of the decline was dramatic, from 20 *du* in the mid-18th century to 3-4 *du* in the late 19th century. Kyŏngju's rent per *durak* fell less and turned around earlier, with still another turning point later.

What was the reason for the decline of the rent per *durak*? Was it because of the fall of the rental rate or of the change in the method of expropriation? According to Kato (1904) who investigated Chosŏn's agricultural situation in 1898, by a decree of the Japanese government, the rent rate of the proportional contract was usually one half of the harvest. This implies that the old custom of the Chosŏn society to share the products half-to-half between owner and tenants still remained. If the tax incidence of landowner increasingly fell on tenants, then the rent per *durak* may have declined to compensate for the burden, which is not quite enough to explain such rapid drop of rent.

Therefore, the decline of the rent per *durak* was not due to the contraction of the rent rate but to the fall of the land productivity.

This is verified also by a case for Chilgok and Yechŏn, where owner-cultivated lands had similar decline in harvest products as in the tenant paddy.

Besides, the land price trend suggests the productivity demise in the 19th century. The result of the research into the more than ten thousand contract documents (*Munki*) written for the land sales reported the prices. The real land price in terms of unmilled rice went down from 6-7 *sŏk* per *durak* in the mid-18th century to 4-5 *sŏk* around the 19th century. The rent rates were stable as mentioned above, so were the interest rates although with regional variations (Rhee 2004, ch. 3). The sustenance of the rent rates and of the interest rates means that the fall of the land price reflected the decline of the land productivity at the time (Rhee 2004, ch. 4).

A famous scholar, Jung Hwan Lee (1690-?) wrote in his *Taekriji* in the mid-18th century like this: The best land could produce 60 *du* with the rice seed one *du* (*i.e.* in one *durak*), the next 40-50 *du*, and the land with products of less than 30 *du* could not feed people. Ha Young Woo (1741-1812) in the early 19th century wrote in his *Chŏnilok* that he had harvested 30-odd *sŏk* in 13 *durak* (*i.e.* 35 *du* per *durak*) about which neighbors regarded the land as fertile. About a century later, Kato wrote of the average return in one *durak* as 25-37 *du*.[8]

If we assume that the harvest was twice higher as the rent, we find products declining from 30 *du* to 10 *du* from Figure 4, whereas from 45 *du* to 31 *du* from descriptive records. The level and the speed of the fall of the latter are more favorable than those of the former. Both, however, indicate the productivity fall.

What is this land productivity decline compared to Japan and China? Japan and China have relatively less historical data on the land productivity. For Japan, we could locate only one case for the 18th century, and several for the 19th century, which indicate no downward trend of the land productivity. Cyclical fluctuations were there as well. Harvest per *tan* grew at the beginning of the 19th century but stagnated somewhat during 1820-1854 (Kusano 1996). Hayami (2003, pp. 222-3) argued that the product per *tan* rose from

[8] "the best land produced 1 *koku* 8 *to* - 2 *koku* 2 *to* in Japanese measure, but rare... on average 1 *tan* obtained raw rice 1 *koku* - 1 *koku* 5 *to*" (Kato 1904, p. 134). He counted the Japanese *to* as double the Chosŏn *du*, so that 1 *koku* - 1 *koku* 5 *to* amount to 10-15 *du* of rice per 1 *durak* (0.5 *tan*) of paddy, which is equivalent to 25-37 *du* of unmilled rice.

TABLE 4
RICE PRODUCT PER HECTARE IN 3 EAST ASIAN COUNTRIES

	Year	Harvest products	Products per hectare
Chosŏn	early 17th century	30 *du* per *durak*	1,712 kg
	end of 19th century	10 *du* per *durak*	571 kg
Japan	early Edo period	1 *koku* per *tan*	1,425 kg
	late Edo period	1.9 *koku* per *tan*	2,565 kg
China	mid-16th century	2.5 *shi* per *mou*	3,000 kg
	early 19th century	3 *shi* per *mou*	3,600 kg

Note: For Chosŏn, harvest product unit is in terms of unmilled rice which reduced to 40% if milled.

1 *koku* in the early Edo period to 1.8 *koku* in the late Edo, possibly increasing the likelihood of the rise over double, in consideration of various crop rotation. In the eastern part of Songjiang in China in the mid-16th century the rent per *mou* was 0.8 *shi* (harvest 1.5 *shi*); in the western part 1.6-1.7 *shi* (harvest 2.5 *shi*). The 17th century records report 1.5-1.6 *shi* (harvest 2.4 *shi*) for the western part. For the 19th century, the harvest amounted to no more than 1.4-1.5 *shi* in the eastern part, and 3 *shi* in the west. Other studies indicate the harvest of 2.5 *shi* in the mid-16th century, 2-3.2 *shi* in the end of the 17th, 3 *shi* in the early 19th century (Li 1998, pp. 120-31).

All in all, the produce per unit of cultivation may have declined in the early 17th century, but continuously grew from the mid-16th to the early 19th centuries.[9] Chao (1986) has a different opinion that the increasing productivity since the introduction of the intensive agriculture in the Sung Dynasty has reached its saturation by the 18th century.[10]

The three East Asian countries had different standards of the volume units.[11] And they changed a lot. To compare across the

[9] Li (1998, p. 125) must have exaggerated the growth of the produce per *mou*, who has calculated the production from the rice market.

[10] Unlike rice cultivation, the wheat productivity fell earlier. The Wen-shang region of China experienced the decline in productivity for the long period of time: 6.25 *shi* per *mou* in the 1650s, 4.25 *shi* in the 1730s, 2.25 *shi* in the 1770s, and further fall by 29-35% by the beginning of the 19th century (Chao 1986, pp. 212, 236-8). The intensive agriculture was limited to the rice paddy.

[11] Consult the glossary in the appendix.

nations, we offer a rule about the harvest products per hectare in terms of the weight unit (Table 4). Chosŏn's figure dropped from 1,680kg in the early 17th century to 569kg in the end of the 19th century. Japanese figure increased from 1,400kg in the early Edo period to 2,520kg in the mid-19th century. The land productivity of Chosŏn may well be about the same as that of Japan circa 1600, considering the estimation errors. But the Chinese Yangtze delta known to be advanced in rice farming has enjoyed a double level of productivity. That level, the Japanese agriculture achieved in the mid-19th century, but Chosŏn's performance lagged behind, to reveal less than one fifth of the standard.

Such dramatic contrast of the fall in the Chosŏn's land productivity relative to the Japanese and Chinese upward trend needs to be explained. The Chinese productivity growth owing to the labor intensity movement also came to a limit by the late Ming Dynasty. The land productivity remained strong, however, thanks to the capital intensification (higher fertilizer input). The cost of the fertilizer input during the 17-19th centuries amounted to 80-100% of the labor cost (Li 1998, pp. 85-8). This trend came to a halt in the mid-19th century to report a bare 1.3 *shi* per *mou* in the 1930s.

The Japanese progress in the land productivity can be explained in part by the population expansion followed by the rise in labor supply per unit of cultivated area exceeding the speed of the land clearing in the early Edo period. Additional factors include the escalation of the utilization rate of the land, increase of the fertilizer input (*e.g.* bean-cake), the deep plowing, and the improved breeds of the seeds (Sinbo, Hayami, and Nishikawa 1975, pp. 258-64; Hayami 2003, pp. 222-3). Tremendous amount of the labor force may have been required for that purpose, but the achievement the Japanese obtained by about 1880 through this 'industrious revolution' was great, paralleled to the land productivity of the 1920s China, and those of Korea and of Taiwan in the 1950s (Sugihara 2003, p. 86). The 'industrious revolution' of the Edo period is often interpreted that it was made possible by the market economy principle penetrating to the rural area through the commoditization of agricultural products and the sales of the fertilizer (Hayami 2003, pp. 312-9).

That reminds us of the agricultural methods of Chosŏn concerning the productivity decline. The prominent change in the late Chosŏn period is that the transplantation was introduced to the rice paddy.

The transplantation starts with the sowing of the rice seeds on a *mopan* (infant plants plate) which was especially designed so that the sprouts would grow in the water for a certain period (about a month and a half), and then would be transplanted to the paddy. It is a wonderful innovation in its capability to utilize the land, and was to increase the final harvest. Another advantage was that it would enable rice-barley double cropping and would heighten the rate of land-usage.

The problem lies elsewhere. You have to have an adequate supply of water when you transplant the sprouts. If you fail to get enough water in the time of transplantation, then you are destroying the year's agricultural business. It involves a high risk and it depends on the water control system. Ha Young Woo, who is renowned as a professional agriculturist, had warned that the advantage of the transplantation compared to the direct sowing differs according to the water situation. One of the most critical weaknesses of Chosŏn agriculture was the lack of appropriate water control. Likewise the transplantation was banned by law in King Sukjong 24^{th} (1698), and again 160 years later in King Hŏnjong 4^{th} (1838). The situation did not improve later either. Kato (1904) observed that Chosŏn was unable to practice transplantation unless she had enough precipitation. No water, no transplantation, then no harvest, then no rent. These were the factors in the decline of the average rents.

The rice paddy of Chosŏn was attacked by summer time flood of the rivers as well as the water supply problem during the transplantation. Both irrigation and flood management mattered. The late Chosŏn increasingly had a hard time with deforestation. The deforestation had deteriorated the capacity of the woods to maintain the soil fertility conservation. In turn the earths and sands flew down to the streams and rivers to heighten their levels, flood accompanying, and the reservoirs losing their function. The deforestation was, by some hypothesis, caused by the increased population and the introduction of the *ondol*, which is a way of burning firewoods both for cooking and heating, in the 17^{th} and 18^{th} centuries (Rhee 2004, ch. 8). This must have critical impacts on the rice paddy. We do not have evidence so far about how much we could attribute the productivity decline, to either the draught in the transplantation period or the flood in the summer. We would like to mention just that there appeared more cases of floods as disasters in the 19^{th} century official records of the Dynasty.

It is quite right to conclude at this moment that the Chosŏn agriculture was relatively underdeveloped among the three East Asian countries. The rice agriculture in Asia was told to have started in a Southern part of China (Sung Dynasty), in 12-13th centuries to spread to Japan and Korea in the late 16th century. The rice-cultivation has been the subject of fewer academicians than we would have wished. One thesis argues that it has stepped up by the three stages: 1) intensive rice cultivation in the mountainous plain, 2) expansion and movement to lower fields, 3) intensive rice agriculture in the wider, low area. The theory says that in Chosŏn the so-called 'mountainous plains' people and some others in the Southwestern Coast tried the rice cropping, without any good 'stepwise' graduation to the third stage. The same theory says, with some lessons, that the reason of Chosŏn's falling behind to China and Japan in the course of agricultural intensification was nothing but this: The lack of water supply to the transplanting apparatus which was the most important part of the irrigation-connected rice cultivation (Miyajima 1994, pp. 76-80).

Underdeveloped in using the fertilizer in Chosŏn, there were no mention of the bean-cake even until the 19th century. Furthermore, the transplantation was more harmful to the land than the direct sowing, with additional damage when the peasants adhere to the double cropping. That implies that Chosŏn needed a fertilizer revolution to prevent the long-run decline of the harvest per *durak*.[12] Agricultural professionals often emphasized the importance of the fertilizers. But the advanced fertilizing method (*i.e.* using bean-cake) was unfortunately not yet practiced by the pre-colonial Chosŏn peasants.[13]

To summarize, the decline in land productivity implied by the fall in the rent per *durak* was the result of first, natural disaster due to poor water control system and deforestation, including flood control and irrigation, and second, inadequate fertilizer input to compensate for the deteriorating soil quality. Of course the productivity decline was not uniform over all lands. There were cases where the rent per *durak* remained unchanged for the long period, usually starting at a

[12] The amount of fertilizer needs increased, as the fertilizer-efficiency remained unchanged. See Huang (2002, p. 508).

[13] "One of the most required agricultural capital, fertilizer, was very rare in Chosŏn, the categories including manure, hay, raw, and fresh vegetables, *etc*." (Kato 1904, pp. 128-9).

low level. The reason for widespread adoption of the transplantation in the southern parts of Chosŏn despite the high risk accompanying the inadequate irrigation system is that the labor requirement for weeding was lower than in case of direct sowing, and that the saved labor could be diverted to cotton growing. Farmers chose cotton cultivation in place of growing food crops. The expansion of cotton agriculture improved clothing from hemp to cotton textiles during the 18^{th} and 19^{th} centuries.

The influence of the agricultural productivity decline on the living standard of peasants can be approximated by following examples. In 1919, when the *Cadastral Survey* (1910-18) gave us more accurate figures for cultivated areas for the whole Chosŏn, the acreage per household was composed of 0.65 *jŏngbo* of rice paddy and 0.54 *jŏngbo* of other field in Kyŏngsang and Chŏlla Provinces. The acreage tenanted for paddy and field were 64% and 42% respectively. For the whole Chosŏn, the composition of households by tenure was: landlord 3%, owner 20%, tenant 38%, and owner-tenant 39%.[14] Since we don't have data of acreage per household, paddy *vs*. field, and the composition of households by tenure for the late Chosŏn, we just take the situation of the early 20^{th} century.

Suppose there was an owner-tenant household with 1 *jŏngbo* (20 *durak*) of land half owned half rented, half rice paddy and half other field, half of which again was assigned to grain crops like barley and wheat. If the rent per *durak* in the rice paddy fell from 15 *du* in 1700 to 10 *du* in 1800 as Figure 4 suggests, the real annual income of this peasant with his own and rented paddy respectively 5 *durak* each declined from 225 *du* to 150 *du*. 150 *du* of unmilled rice is equivalent to 60 *du* of milled rice. If we assume the same rate of appropriation with barley/wheat field of the half amount, then the additional grain receipt amounts to 30 *du*, which makes 90 *du* total.[15]

[14] We took only two provinces, Kyŏngsang and Chŏlla, because most of the rent data were reported for them, and because the North-South difference in agricultural activity was substantial. For the composition of households we took the whole country data, for the lack of them for the two provinces. This may have underrepresented the tenancy rate.

[15] If the rent per *durak* of rice paddy was 15 *du*, then the produce was its double, 30 *du*, so that a peasant who owned 5 *durak* of his own land and rented another 5 *durak* earned 225 *du* (150 from his own land plus 75 from rented paddy). If the rent per *durak* was 10 *du*, then the produce was 20 *du*, so that the same peasant earned 150 *du* ($5\times20+5\times10$), which is equivalent to

What was the annual grain consumption of that household? As was commonly accounted by western visitors to the late Chosŏn, Koreans are known to have been big grain consumers. Assuming 3 *du* of monthly food requirement for 1 adult (5 *hop* per meal, 2 meals a day[16]), 90 *du* falls short of the need for 4-person household with 2 adults and 2 children (if we count 2 children as 1 adult).[17]

The above calculation is for a hypothetical owner-tenant household who cultivates 1 *jŏngbo* of paddy and field. The same implies that in order to keep the above consumption level, a pure tenant needs 1.5 *jŏngbo*. However, various cases previously quoted indicate that the rented acreage of most tenants seldom exceeded 10 *durak* (0.5 *jŏngbo*). Therefore, even if tenants have had the same amount of land for their own in addition to what they rented, they would have experienced difficulty in subsistence.

IV. Wage Level

The peasants facing the fall in agricultural income together with the productivity decline may have responded to make up for the loss either by searching for other employment opportunities or by accommodating actively to the developing market. However, judging by the level of social division of labor in the late Chosŏn, the employment opportunity in the non-agricultural sector seems to have been limited. The *Household Occupation Survey* of 1907 showed that farming households amounted to 86% of the total. Urban residents in the cities of population 10 thousands or more were barely 3.4%, with Seoul dwarfing others. Poor urbanization bred poor rural industry aimed at urban market. It was estimated that the proportion of full-time laboring households reached only 2.5% (Lee 1997).

The job opportunity remained low and did not improve until the late 19th century. Garments production was still in its infancy, meeting only neighboring demands, not to develop into full-fledged rural industry independent of agricultural activity.

60 *du* of milled rice (*i.e.* 40% of the unmilled). The same applies to other barly/wheat fields, with the produce of the half of the paddy, 30 *du*.

[16] It is based on what Dŏk Mu Lee (1741-1793) said in his book, *Chŏngjangkwanjŏnsŏ*.

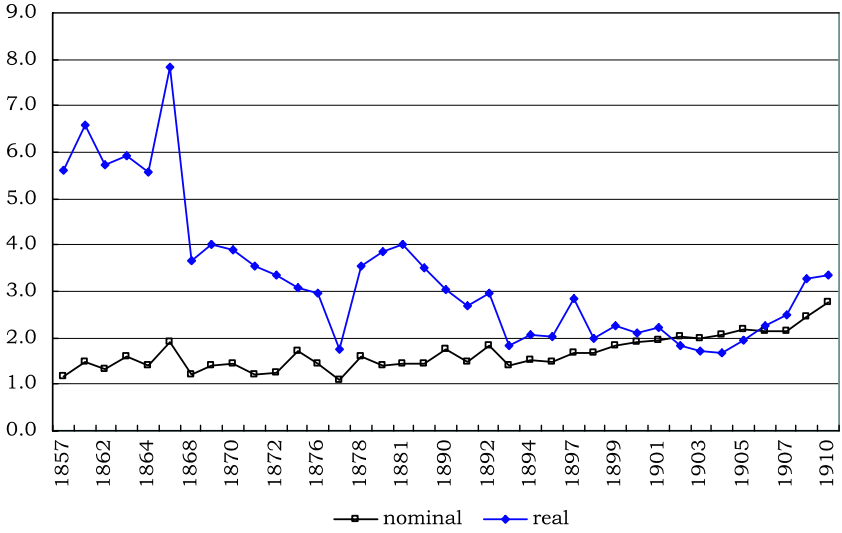
[17] We also have to allow for seeds.

Be limited as it may, the job opportunity in agricultural labor or sundry works had to be taken by the poorest peasants to alleviate their fear of starvation, regardless of it being irregular and seasonal, according to the needs of big landowners. Rice farming has seasonal peak labor demands for which landowners employed lower people as day laborers (*Ilgo*) (Choi 1992).

China and Japan had more agricultural and nonagricultural employments open than Chosŏn. China had also experienced a break in urbanization during the development period of the labor-intensive agriculture between the Sung Dynasty and the mid Q'ing Dynasty, leaving the urban population at 7% of the total in the 1820s. Excess population, especially women were absorbed into cotton and silk business, and other cash crops, so as to help sustain subsistence (Chao 1986). Japan shows the similar picture. The late Edo period saw the stop in the growth of urban population as the labor intensive agriculture reached its saturation point. But both by evading population pressure utilizing such immoral methods as selective infanticide or abortion, and by promoting non-rice commodity crop production and the cottage industry, they could achieve *per capita* income growth, so called 'intensive development' (Sinbo, Hayami, and Nishikawa 1975; Smith 1989; Sugihara 2003).

How was the wage level in the late Chosŏn? The first farm wage data series came from the investigation of day wages and annual payments paid by a certain *yangban* (literati) family in Yechŏn, Kyŏngbuk, and recorded in their diaries and household ledgers. The research has constructed a time series of agricultural wage rates for the second half of the 19^{th} century (Ahn and Rhee 2001, ch. 5). Day laborers were employed not only for the peak load agricultural activities such as transplantation and plowing but also in the slack time. They were usually compensated by money wages together with board and drink. The average daily money wage computed from remuneration for the various activities amounted to 1.4 *chŏn* in the mid-19^{th} century, which was about 1 *sŭng* of rice at the time. Adding the board, we can take the wage level at 3 *sŭng* a day. On the other hand, hiring by year (*Yŏngo*) was regarded as an important part of the labor force employed by the landowning household, with normal contracts on yearly basis. The compensation for the labor took the form of cloth in addition to wages on occasion, but that was also a part of the remuneration.

Rural daily wages stayed at almost the same level until the mid



Notes: 1. This is money wage, not including the board.
2. Nominal wage is deflated with the Yechon price index (1914-16= 100) of Figure 7.
Source: Ahn and Rhee (2001, pp. 175-7, 187).

FIGURE 5
THE RURAL WAGE OF THE DAY LABORERS (UNIT: *CHŎN*)

1890s, and then increased (Figure 5). Yearly wages were inflexible in the short run but rising in the late 19th for the long period. While we will discuss about the price level in detail in the next section, it moved upward rapidly since the mid-19th century. That means the agricultural real wages plummeted to one third by the beginning of the 1900s. Of course the magnitude of the wage fall should be lowered if we consider board. The upward turning point of the real wage series almost exactly matches that of the agricultural productivity.

For the period before the mid-19th century, we do not yet have agricultural wage data, but descriptive sources give us some light. In the first half of the 18th century in Chungchŏng Province, daily wage for peak time labor such as weeding, harvest, threshing was 3 *sŭng* of rice and 1.5 *chŏn* of money which translated to 1 *du* of unmilled rice. In the late 18th century it was either 1 *chŏn* with board or 3 *sŭng* of rice and 5 *chŏn*. In the mid-18th century day laborers were paid 1

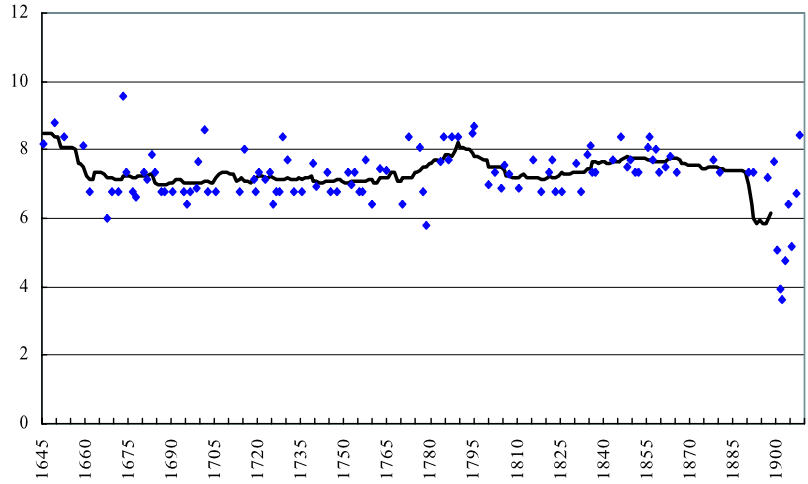
du of unmilled rice for transplantation or weeding. In the mid-19th century daily peasant wage was recorded as 1 *du* in Yean, Kyŏngbuk (Kim 2004, pp. 332-3). 1 *du* of unmilled rice was equivalent to 4 *sŭng* of milled rice and was different from 3 *sŭng* of mid-19th century Yechŏn but the latter included off-peak wages and may have reflected the high price level, so that the descriptive sources told almost the same story.

For the urban case, we have Yi Taek Park's long run series of Seoul's unskilled wage over the period between the beginning of the 17th and the early 19th centuries (Rhee 2004, ch. 2). It is based on the data from the royal record called *Ŭikue*, compiled during royal ceremonies, construction of tombs or memorials. The *Ŭikue* was compiled for the purpose of verifying the methods of procurement of the necessary resources and personnel, and the wage payments concerning the project in question, and of providing information later when the same project would be promoted again. They were mostly located in Seoul, so that the wages recorded should represent those of Seoul's construction laborers.

However, the recorded wages were not those actually paid to the laborers, but a standard level of wage payments schedule for the project implementation (recorded as a combination of rice, cloth, cotton, and coin). Actual payment may have been equal to the standard; occasionally the payment was in terms of money equivalent. The wage of the unskilled labor (*Mokun*) in the 19th century was usually paid in money equivalent, but earlier it was paid in kind. Figure 6 shows the wage series combined in terms of money equivalents.

The wage of *Mokun* ranged from 6.8 to 8.4 *nyang* between the mid-17th and the mid-19th centuries, and stayed at the constant level just above 7 *nyang* until the 1820s, except for the short aberration at the end of the 18th century. There were some increases in the 1830s and 1840s perhaps due to the population decline in the early 19th century. However, the figure dropped since the mid-19th century, with the gap between money equivalent and the market price widening as the price level went up rapidly. Especially in the end of the 1890s the wage was cut in half because of the inflation (White Copper Coin over-mint). The drop in the wage in the late 19th century synchronized the real agricultural wage trend.

The wage payment in the 19th century was mostly in money, 2.5 *chŏn* a day (8 *nyang* a month) (Lee 1983, p. 216). 8 *nyang* in kind



Note: Solid line represents 21-years moving average.
Source: Rhee (2004, pp. 103-7).

FIGURE 6
THE URBAN REAL WAGE OF THE SEOUL'S UNSKILLED CONSTRUCTION LABORERS (UNIT: *CHŎN*)

was equivalent to 3 *pil* of cotton and 6 *du* of rice, which was close to the standard level of *Mokun*'s wage. If the money equivalents comply to the market value and the relative prices stabilize, the method of payment does not affect the real income of the laborers. In fact, the money equivalent was fixed and the market prices vary, to the effect that the gap fluctuates between the two. In the 19th century, *Mokun*'s real wage declined compared to the previous century. The money equivalent of 1 *sŏk* of rice was 4 *nyang*, but the market price was 6 *nyang* in the early 19th century. The daily wage 2.5 *chŏn* could purchase only just over 6 *sŭng* of rice in the 19th century. Of course the money equivalent itself began to be adjusted upward from the mid-19th century indexed to the price level, but not enough to meet the market.

To summarize, the real wages of agricultural laborers remained at a certain level until the mid-19th century, when they began to fall. That certain level was 4 *sŭng* of rice per day or 3 *sŭng* in Yechŏn. In contrast, the monthly wages of *Mokun*, urban unskilled workers, averaged 6 *du* of rice and 3 *pil* of cotton exchanged for 1.5 *sŏk* of

TABLE 5

THE COMPARISON OF RICE WAGE LEVEL BETWEEN EAST ASIAN COUNTRIES

	Japan 1880-84		China 18th century		Korea early 19th centruy	
	yen	kg	*tael*	kg	*sŭng*	kg
Urban unskilled	0.2	3.01	0.074-0.08	3.08-3.33	9.3-9.7[a] 6.0[b]	6.63-6.92 4.28
Rural	0.1975	2.97	0.06	2.50	3.0-4.0	2.28-2.85

Notes: 1. [a] and [b] respectively represent the cases that payments are in-kind and money.

2. In case of Japan and China, rice wages calculated as money wages are divided by rice price, 0.09476 per 1 *shō* and 1.92 per 1 *shi*, respectively.

Sources: Allen (2005); Allen *et al.* (2005).

rice, so that *Mokun*'s daily wage was 9.3-9.7 *sŭng* of rice, more than twice the agricultural wage. However, if we consider the change in the payment system towards money from the early 19th century, the real wage of urban construction laborers declined to the level of 6 *sŭng* of rice per day.

The Japanese wage series indicate that the real wages of the urban laborers remained stable in the long run for the 18-19th centuries with some fluctuations. It contrasts to the pattern of those of London workers which had turned the 18th century declining pattern to the rising one in the beginning of the 19th, accelerating in the mid-19th century (Allen 2005). Table 5 compares the wage levels in the three East Asian countries in terms of rice. Chosŏn's rural wage seems to have been lower but her urban unskilled wage was higher than Japan's. According to Allen (2005), the real wages in China and Japan were about the same in the mid-18th century, which were a little lower than in England or Northern Italy. And if we convert the wage figures to the calorific intake, the result indicates that East Asian level approximates that of England, and double of Northern Italy. Likewise, it is probable that the real wages of 3 East Asian countries were similar to those of Europe, except that the urban unskilled wages of Chosŏn far exceeded her own agricultural wages as well as those of Japan and China.[18]

[18] Broadberry and Gupta (2006) argue that between 1500 and 1800 in the advanced parts of India and China grain wages were comparable to those in

What would have caused so greater difference between rural and urban wages in Chosŏn than either in China or Japan? Japan's real wage levels of city and country have already converged in the 18^{th} and 19^{th} centuries, indicating the integration of the urban and rural labor markets. This was also because of the lack of Japanese cities' dynamism compared to West European counterpart while her rural industry has been developing. The urban-rural wage gap in Chosŏn exceeded the cost of living premium of Seoul, indicating segmented labor markets.[19] Even without customary or legal barriers the labor would not have been so mobile; Seoul's free wage labor market was limited to the adjacent residents. Another reason was the inadequate development of the cottage industry despite the decline in the agricultural productivity.

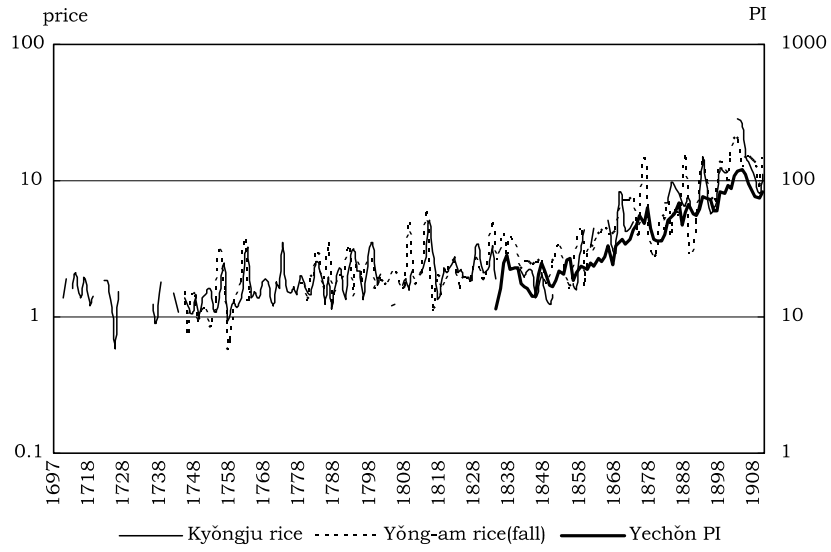
Chosŏn's average urban unskilled monthly wage was as mentioned 6 *du* of rice and 3 *pil* of cotton cloth, which equaled twice higher than that in China or Japan. The problem is the duration of such higher wage level. Besides the construction workers, monthly pay of servants belonged to the queen's palace (*Myŏngryekung*), another indication of urban wage level, did not change much until the mid-19^{th} century at 8-10 *du* of rice although with variance according to the occupational category. Of course the royal servants enjoyed room and board in addition. The fact the wage level of the recruited construction laborers and the royal servants was fixed for the long period implies that the wage was determined by custom rather than market. Thus the wage analysis is not free from the consideration of economic institutions and system. Here, we wish to investigate the wage trend more deeply in relation to the movement of the price level.

V. Movement of the Price Level

Figure 6 was constructed by converting in-kind payments to money wages by equivalency standards. Without allowing changes in the price level and the relative prices, this may well represent real

north-western Europe, but silver wages were substantially lower, reflecting lower productivity in the tradable sector. In other words, structural shift out of agricultural was far earlier in north-west European countries, such as Britain and the Netherlands.

[19] Higher urban wages in Chosŏn were just presumed as an institutional aspect, and at this stage need further research.



Sources: Ahn and Rhee (2001, p. 168); Rhee (2004. p. 180).

FIGURE 7
THE UNMILLED RICE PRICES (UNIT: *NYANG* PER *SŎK*) AND PRICE INDEX (1914-16 = 100)

wages. To investigate the gap between the money equivalent standard fixed until the mid-19th century and the market price, we should examine, among others, the long run trend of the price level.

Recent findings in this regard are highlighted by the two. One is the price series of Kyŏngju, Kyŏngbuk starting from the late 17th century. The other is the rice prices in Yŏng-am, Chŏnnam since the early 18th century. Other rice price data start mostly at the 19th century. Various price information from Yechŏn, Kyŏngbuk, starting from 1834 has made it possible for us to construct the first price index for pre-20th century period. Seeing together, the price level of Chosŏn has a long run slowly rising trend for about a hundred year since the short decline in the beginning of the 18th century, and then stalled for a moment before the steep rising began in the mid-19th century (Figure 7).

The Japanese price level had a slowly declining trend during the 18th century except abrupt short turmoils at the beginning and the end of the century. It turned around the 1820s to the rising trend,

accelerating after the port opening in the 1850s. The Chinese grain prices continued rising slowly between the time when the drop in the 17th century recovered in the late 17th century and the early 19th century. After some stagnating period in the mid-19th century, the price level resumed rising pace after the 1880s. Compared to the price rise in Europe in the second half of the 18th century by 2-2.5 fold, the 3 East Asian countries had milder movement of prices.

The relative price stability of the late Chosŏn was attributable partly to the official grain storage system (*Hwangok*) which had functioned both as a subsidy to the poor and a price adjustment mechanism. The state runned redistribution system, temporal and spatial, had at the time worked well. China tried the similar redistribution system to stabilize grain prices (Rawski and Li 1992), but did not succeed as much as in Chosŏn, because the state had less executive power over the significantly wider area.

The 19th century was the era of rising prices. Such 'price shock' is typical with the port opening and the integration into the global market, but in Chosŏn the rapid rise in prices started 20 years before the official opening of ports (1876). The price shock in the mid-19th century hit the poor harder, as did the sustained price inflation after the port opening, which implied a higher inequality to the grain exporting Chosŏn society. However, the degree of seasonal variation of the rice price went down to the level in Osaka, Japan during the opening. Then the rice price hike and the lowered seasonal variation may have had both negative and positive effects, respectively, on the living standard of the lower peasants.

The fixity of the wage payment standard for the royal recruits reflected the long run stability of the price level although with a slow rise. But even the low rate of price rise questions the validity of Figure 6 as a reliable picture of the real wage trend, which was computed by money equivalents. In short, it is safe to take the money equivalent to have represented the market in the early 18th century when the system began to establish.[20] But prices doubled during the next hundred years. Money wages in place of in-kind payment then implies a decline in real wages. Therefore, the 19th century part of Figure 6 was overestimated, and the real wage may well have been declined. The more so for the late 19th century when

[20] The equivalent count of 1 *sŏk* of rice was 4 *nyang*, which is close to the rice price level in the early 18th century.

the prices rapidly increased.

Finally, we would like to discuss the market development in relation to the commercial transformation of the agriculture and its implications for the living standard of peasants. The market gives peasants facing income decline due to excess population, an opportunity to enhance productivity through diversification into cash crops and the division of labor.

In Jiangnan, China, population increase and the resulting decline in the acreage per household were overcome by rationalization of agricultural capital (land and water) and market orientation, enabling sustained development until the mid-Q'ing Dynasty. The intensification of agriculture and the diversification to price-competitive cotton and silk raised productivity (Li 1998, pp. 10-2, 120-2). Female labor was absorbed by cotton and silk, thus relieving the population pressure on land.

In Japan, population growth in the 17^{th} century halted in the 18^{th} century, but development of agricultural production took the form not of rice cultivation but of other cash crops so that *per capita* income could grow substantially (Sinbo, Hayami, and Nishikawa 1975).

In other words, the development of the East Asian society since the late 16^{th} century was the combined result of widespread intensive rice cultivation and cash crop (cotton, silk, sugar) production (Sugihara 2003, p. 84). According to Hayami (2003, pp. 299-319), the choice of peasants in adjusting to the market economy and expanding production was the 'industrious revolution.' Likewise, the economic growth of the Edo era took a form quite different from the 'modern pattern' of labor productivity growth.

Such a growth is not easy. Commercialization of agriculture needs, among others, putting-out merchants. Development of the putting-out system and enlarged market raise the value of marginal product of cash crops and cottage handicrafts, and help allocate more labor input to them (Chao 1986). Unlike Japan or China, Korea has virtually no mention of putting-out merchants in the commercial history literature. When discussing the commercial development in the late Chosŏn, many researchers talk about periodic marketplaces (*jangsi*), but they do not imply much more than complementary function to peasants' reproduction of self-sufficiency (Britnell 1981). Marketplaces unrelated to long distance trade do not guarantee the commercial dynamism. The number of *jangsi* that kept increasing

since the issue of copper coin (*Sangpyŏngtongbo* 1678) diminished in the 19th century, as did the frequency of transactions. And the market even deteriorated back to barter trades (Rhee 2004, pp. 213-4).

What does the setback of the market economy in the 19th century mean? It implies that the allegedly growing market in the late Chosŏn was yet at a premature stage. In a developing market economy with various opportunities for higher income, most peasants would not have remained passive victims of the environment. But if the market was underdeveloped and gave a sign of collapse, it would not have given any hope to small peasants. Cash crop cultivation was a highly risky business, far riskier for most households who could not afford their own subsistence. Thus, the peasants were forced to choose the self-sufficient, unpleasant production strategy and would not plan commercialized agriculture, in order to minimize the avoidable risk (Bailey 1998).

The direction of influence of the underdeveloped markets on peasants' living standard is obvious. Most of the lower peasant households in the late Chosŏn were suffering from insufficient food, as explained in Section III with a hypothetical example. They could not choose the most profitable time of purchase or sale; they were limited in geographic mobility; they had to sell on harvest at the lowest price and had to become a buyer in the difficult spring season. If the market had reduced the seasonal price fluctuation, it would not have harmed the poor much, but the market did not grow that sufficiently. The commercialization of agriculture is very important in providing the peasants with opportunity to earn complementary income. However, the incomplete market in the late Chosŏn was probably polarizing the rural population economically.

VI. Concluding Remarks

The comparative look at the 3 East Asian countries showed that Chosŏn had the lowest level of living standard in the 17-19th centuries. Although the real wages were somewhat similar for the 3 countries, it does not imply that the living standards were as such. Because Chosŏn did not yet have a well integrated labor market, nor the wages in the 3 countries were determined by market principle until the early 19th century but by customs.[21]

Then the basic criteria should be agricultural production *per capita*. Chosŏn had the lowest productivity growth, even negative. Land productivity fell because she fell behind in absorbing capital and technology. Witness the lack of fertilizer and the inadequacy of irrigation system. In addition, peasants in Chosŏn may have worked shorter hours with less effort.

Chronologically, the 19th century was worse than the previous ones. The 18th century was relatively strong, with stable real wages and land price, and with improving shelter by the introduction of new heating system called *ondol*. Land productivity decline was not as severe as in the 19th century. In the first half of the 19th century, natural disasters and political instability lowered the real wage level, and land productivity even further. The rapid price rice, especially rice price hike, hurt the poor more.

How could Chosŏn people survive the plummeting land productivity to one third in two centuries since the end of the 17th century? If the data of falling amount of rental receipt were attributable to a decline in the rental rate, the productivity fall would have been partly explained. More consumption of clothes and shelter may have compensated for the less food. However, the land productivity fall has kept the Chosŏn society in the 'low-level equilibrium' trap.

It seems that the inflow of capital and technology in the colonial period put an end to the Malthusian degeneration. In addition, a new labor discipline took place. It is apparent from the fact that the rate of double cropping in the southern region increased from 17% in 1914, the early colonial period, to 41% in 1940. The rapid increase in double cropping indicates that the water control improved, fertilizer supply increased, and the peasants has adapted to the new, stricter labor discipline.

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Appendix

<Chosŏn>
1 *nyang* = 10 *chŏn*

[21] For example, nominal wages were long fixed for Japanese urban laborers as well as for Seoul construction worker.

1 *sŏk*=15 *du*=150 *sŭng*=1,500 *hop*=107kg
1 *durak*=150 *pyŏng*=1/20 hectare

<Japan>
1 *koku*=10 *to*=100 *shō*=142.5kg (Allen 2005)
1 *tan*= 300 *pyŏng*=1/10 hectare (Nōshōmushō 1906)
1 *chō*=10 *tan*

<China>
1 *shi*=100 *sheng*=80kg (Allen *et al.* 2005)
1 *mou*≒ 200 *pyŏng*=1/15 hectare (Perkins 1997)

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