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LIVING STANDARDS AND INCOME DISTRIBUTION
IN KOREA'S FIRST INDUSTRIAL REVOLUTION, 1910-42

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Abstract

We estimate wages of different types of workers in colonial Korea from 1910-42. Real wages of unskilled workers rose, although at a rate slower than per capita output. While gender wage gap contracted, skill premium stagnated, increasing until the early 1930s and then collapsing in the following decade. Korean laborers enjoyed faster wage increase than Japanese working in Korea. While southern inferiority in unskilled wages persisted, northern lead in skilled wages was being eroded. In sum, all income groups benefitted from colonial growth, although income inequality worsened, primarily because capitalists and landlords enjoyed faster income growth than workers.

Keywords: colonial Korea, wage, skill premium, gender and ethnic wage gap

Different estimates of output and population indicated that Korea embarked on modern economic growth under Japanese occupation from 1910-45. Nevertheless, many remain skeptical as to whether living standards improved for ordinary Koreans during the colonial period, one of the most important reasons being that real wages of Korean peasants and workers did not appear to improve. As the anti-colonialist interpretation surfacing in post-colonial Korea goes, the absence of an upward trend in unskilled wages shows that the colonial growth was designed and engineered by the colonial government with a view to benefitting Japanese only.¹ In this article, we estimate wages of Korean unskilled male workers drawing on a substantially larger number of observations than in existing studies to refute the conventional wisdom saying that the poorest income group failed to benefit from the colonial growth. Our estimate of unskilled wages increased at a pace substantially slower than per capita output growth, indicating that income distribution became increasingly unequal under Japanese rule. We explore the causes of the rising inequality by comparing the unskilled wages with wages earned by other types of workers including Korean unskilled female and skilled male workers and Japanese working in Korea. Also wages in the northern and southern half of colonial Korea are estimated separately to see how the two regions with significantly different factor endowment fared during the industrial revolution. These comparisons indicate the tendency for income gaps among different types of workers in

¹ For different estimates of per capita output for colonial Korea, see Suh(1978), Mizoguchi and Umemura(1988), and Kim(2006). Wage estimates for colonial Korea include Odaka(1975) and Heo(1981). Heo(2005) embodies the latest version of Marxist-nationalist interpretation. Casting Japanese rule of Korea in a favorable light, Kimura(1993) and Chung(2006) expressed pessimism on living standards for the poorest income group.

different places to contract, implying that the rising income inequality should be attributed to growth of non-wage incomes.

We begin in the following section by reviewing existing wage estimates to justify our efforts to produce yet another set of wage estimates for colonial Korea. The second section explains the procedure used to derive wage series representing the colonial economy from a large number of wage observations made in different occupations and locations. The third section presents estimation results and discusses their implication for living standards and income distribution during Korea's first industrial revolution, as well as for growth theory, economic integration among East Asian countries, and historical origins of North and South Korean divergence. The final section summarizes and concludes.

Motivation

The wage observations as published in the wage section of the Statistical Yearbook of the Colonial Government of Korea (*Chōsensotokufu tōkei nempō*, the Statistical Yearbook hereafter) remains by far the most important source of wage data for colonial Korea. Drawing on the official publication, previous studies produced conflicting evidence on the level and structure of wages in colonial Korea, leaving key issues unresolved. One concerns whether the industrial revolution occurring under Japanese rule benefited Japanese and rich Koreans only or Korean peasants and workers as well. Having calculated real wages for coolies and rural workers, Odaka(1975: 154) stated that it is “exaggerated to say that unskilled real wage in the late 1930s fell below than that in the 1910s.” However, Heo(1981: 234) derived a real wage series from wages in five unskilled occupations to find that the level of unskilled real wage “after the mid-

1930s to be lower than that in the early 1910s,” a claim in line with Kimura(1993: 637)’s conclusion that real wages of agricultural workers followed a declining trend. Another point in dispute is skill premium, a variable highlighted in recent growth models as a proximate cause of fertility transition, a key aspect of the transition from Malthusian stagnation to sustained growth: while the ratio of Heo(1981)’s skilled to unskilled wage rose up to the early 1930 and stagnated thereafter, in Cha(2006: 10)’s index of skill premium -- ratio of bricklayers’ to agricultural wages – are found short run fluctuations devoid of either a downward or upward trend. Finally, evidence remains mixed as to whether integrated labor markets evolved in colonial Korea. Odaka(1975, p. 150, figure 3)’s coefficient of variation for wages in construction and machine and metal industry in seven cities neither fell or rose as a matter of trend. In contrast, coefficients of variation for servants’ wages in four cities and bricklayers’ wage in two cities fell during the colonial period (Cha (2000)).

The mutually contradictory findings reflect the fact that in the existing studies were used different portions of the wage records found in the Statistical Yearbook. Sizes of the selected data varied significantly from one study to another, with some of them appearing as too small as samples representing the labor market of colonial Korea. Perhaps more importantly, the selections were made in a way that might have created biases in estimated wage series pertaining to the aggregate economy. The colonial authorities published wage data for 25 cities and 51 occupations from 1910-42, which is not to say that two separate *balanced* panel datasets – defined in terms of cross section of the cities and the occupations over the thirty-three year period -- can be constructed from the Statistical Yearbook. Instead, the observations remain unbalanced with wage records for some of the cities and the occupations unavailable for a part of the thirty-

three year period. Therefore, to derive wage series representing colonial Korea from the Statistical Yearbook, previous studies followed the procedure of selecting occupations and cities, for which time series observations spanning the best part of the colonial period can be obtained, and then calculating weighted averages of the wages in the selected occupations and cities. This amounts to throwing away a large number of wage observations made in other cities and occupations only for a smaller number of years, which might result in biased estimates of national averages. To see why, consider a country with two sectors (or cities), and suppose that sector (or city) A suffers relative decline vis-à-vis B during a period. In the absence of perfect integration of labor markets, wage growth would be slower in A than in B. As A wanes in importance, assume that the government decides to stop collecting wage data in A in the middle of the period. Then the national wage growth rate over the period as represented by wage growth rate in B only would be an overestimate. Wage data in A being unavailable for the second half of the period, growth rate of the average of wages in A and B would still overstate the true wage growth. but to a smaller extent than the growth rate of wage in B.

In this article, we chose to estimate wage series representing colonial Korea using all the wage observations as found in the Statistical Yearbook. In taking this approach, we assume that the statistical authorities' dropped some cities and occupations from their wage survey while bringing others into their attention over the colonial period to emulate shifts occurring in the distribution of employment among different locations and occupations. We justify this assumption in the following section by showing that shifting distribution of wage observations among different locations and occupations as found in the Statistical Yearbook corresponded roughly with the structural change

actually taking place in colonial Korea.

Exhaustive use of available wage data brings an additional benefit of being able to estimate more reliably wage gap between genders, different occupations, different regions, and ethnic groups: by taking the approach adopted by existing studies, one may be able to secure a sufficiently large number of observations for estimating wages on relatively high levels of aggregation, but not necessarily for estimating wages on more disaggregated levels. Finally, to use the unbalanced wage observations in the Statistical Yearbook fully, we resorted to dummy variable regressions, a technique which allowed us to take advantage of qualitative information on remuneration provided in the official publication along with wage figures. As explained in the following section, the non-numerical information concerns whether meals were provided in addition to wages paid in cash and whether wages were paid on a daily or monthly or annual basis.

Data and Method

In 1910, the colonial government started out by publishing wages in 23 cities (12 in the north and 11 in the south), a number which fell to 9 (4 in the north and 5 in the south) in 1942.² Similarly, in 1910 the Statistical Yearbook recorded wage observations for 49 occupations (35 skilled and 14 unskilled), a number which was reduced to 31 (23 skilled and 8 unskilled) in 1942.³ The decline occurred neither in a gradual nor in a consistent

² Although wage data exist from 1905-09, when Korea remained Japan's protectorate, we chose not to use the pre-1910 data, both because the pre-1910 data appeared unreliable, and because a cost-of-living index is unavailable before 1910.

³ In determining whether an occupation uses skilled or unskilled workers, we followed the classification scheme found in *Chōsensotokufu chōsha geppo* (Monthly Survey

way: the reduction in the number of cities and occupations surveyed was made mostly from 1926-1930, while new cities (occupations) were added in the 1930s. The wage section of the official publication included 31,443 wage records for laborers in colonial Korea with three different ethnic origins, i.e. Chinese, Japanese, and Koreans, 97% of which being observations concerning Japanese and Korean workers. Although Japanese workers accounted for only a small fraction of labor force in colonial Korea, the colonial authorities were almost equally interested in collecting information on wages earned by Korean and Japanese workers: wage records of Japanese and Korean workers account for 51% and 49%, respectively, of total number of non-Chinese wage data points available from in the Statistical Yearbook from 1910-42.⁴ Over the period from 1910-42, the distribution shifted in favor of Koreans, whose share rose from 44% in 1910 to 55% in 1942.

The non-Chinese wage records in the Statistical Yearbook are primarily related to skilled occupations, with unskilled wage records accounting for only about 30% of wage records for Japanese and Korean workers combined. From 1910-42 the share of unskilled wage records fell from 39% to 22%, with wage observations for rural workers, accounting for a large majority of unskilled workers, declining from 13% to 2%. While skilled wage observations are more likely to be found in Japanese than in Korean

Report of the Colonial Government) issued in May and June 1930 and in February 1939. Fourteen of the fifty one occupations found in the Statistical Yearbook not being covered by the system, we used wage levels prevailing in each of the fourteen occupations as a criterion. The 35 skilled and 16 unskilled occupations thus grouped are listed in Appendix of this article.

⁴ According to the census of 1930, Japanese accounted for only 2.5% of population of colonial Korea.

dataset, share of skilled wage observations rose more rapidly in Korean than in Japanese wage data (from 56% to 75% in Korean vs. from 65% to 71% in Japanese wage records from 1910-42). Finally, wage observations made in northern and southern cities of Korea accounted for 45% and 55% of non-Chinese wage records from 1910-42, respectively, with the share of southern observations declining slowly over the period. Such re-allocation of survey resources over time among different occupations, locations, and ethnic groups appeared to reflect the statistical authorities' desire to prevent the composition of their wage dataset from becoming increasingly dissimilar to the structure of the labor market. In the first place, population of southern provinces as a share of total fell from 61% in 1910 to 59% in 1940.⁵ Second, as mass schooling spread and as Korean workers acquired skills at workplaces, number of skilled workers as a share of Korean labor force increased from 6% to 17% from 1910/12 to 1936/38 (Cha(2006: 312)). Third, Japanese workers in colonial Korea were far more likely to be skilled workers than Korean workers: as the 1930 census shows, 56% of Japanese laborers in Korea were skilled workers. Fourth, industrialization occurred in colonial Korea with the share of primary industry declining from 68.0% in 1911 to 40.7% in 1940 (Cha and Kim (2007)). Fifth, as population grew 1.3% per year, urbanization occurred, and population was being concentrated into a small number of large cities: share of people living in administrative areas with 20,000 and more inhabitants in population rose from 4.8% in 1925 to 16% in 1940, with larger cities growing at considerably faster rates than smaller cities (Kwon, et al. (1975: 63)). Finally, from the

⁵ The population shares are based on the end-of-year counts of Korean residents as reported in the Statistical Yearbook, which is considered by demographers as underestimates, particularly in the years before the first census taken in 1925.

late 1920s the survey authorities stopped collecting wage information on occupations that were rapidly becoming obsolete (such as rickshaw pullers, traditional clothes makers, and rice polishers), turning their attention to emerging activities (such as car drivers and steamship sailors).

As explained above, the wage data found in the Statistical Yearbook can be described as consisting of two unbalanced panel datasets, which are defined in terms of cross section of 25 cities and 52 occupations from 1910-42. The procedure we followed to derive wage series representing colonial Korea from such data is best explained using the example of estimating wage series for Korean unskilled workers. It started by dividing the records of Korean unskilled wages into six parts, separating northern and southern cities and merging sixteen unskilled occupations into three different unskilled job categories (agriculture and fishery, construction and manufacturing, and service).⁶ Second, using each of the six sets of observations the following equation was estimated by ordinary least squares method:

$$\log(\text{NWAGE}_i) = \alpha + \sum_t \beta_t \cdot \text{YEAR}_t + \gamma_1 \cdot \text{MEAL} + \gamma_2 \cdot \text{MONTHLY} + \gamma_3 \cdot \text{ANNUAL} + \varepsilon_i \quad (1).$$

Dependent variable, $\log(\text{NWAGE}_i)$, is log-transformed daily nominal wage as recorded in the Statistical Yearbook or as derived by dividing the amount of monthly and annual remuneration given in the source with 28 and 341, respectively, with the subscript i identifying individual wage observations.⁷ The intercept term (α) measures the level

⁶ For details on the grouping, see Appendix.

⁷ We set the number of working days per month equal to 28, because the 1931 survey on factories and mines reported that workers normally took two days off per month (Sun(2006: 54-5)). The number of working days per month was derived by deducting

of wage in the base year, which is 1910, and nominal wage in the year may be recovered by calculating $\exp(\alpha)$. $\sum_t \text{YEAR}_t$ represents a set of thirty two dummy variables indicating the year to which NWAGE_i is referred, with t running from 1911-1942, and β_t measures the percentage difference between the base year and year t . For instance, YEAR_{1927} is equal to 1, if NWAGE_i is an observation for 1927, and zero, if otherwise, with nominal wage in 1927 being equal to $\exp(\alpha + \beta_{1927})$. MEAL is a dummy variable, equal to 1, if meals are also provided, and zero, if otherwise. If wages are paid partly in the form of meals, wages paid in cash would be reduced, hence the coefficient associated with MEAL, γ_1 , would take a negative value, an expectation which was consistent with estimation results. MONTHLY and ANNUAL are dummy variables set equal to 1, if wage figures in the source refer to remuneration per month and year, respectively, and zero, if they are daily wages. The associated coefficients, γ_2 and γ_3 , would be influenced by the extent to which the assumed number of working days per month and per year – 28 and 341, respectively -- over- or understates true numbers. In γ_2 and γ_3 may also be reflected the impact of employment stability on wages: monthly and annual payment figures appeared to pertain to jobs where workers enjoyed long term employment contract, which would have led them to accept a lower level of wages. The wage estimates reported in the following section refer to wages as calculated with γ_1 , γ_2 , and γ_3 set equal to 0.

The third and final stage of estimation is to calculate wages earned by Korean unskilled workers in northern and southern Korea as weighted averages of the wages in the three

24 (=2*12) from 365 days. Chōng(1967) observed in 1965 that farm servants under long term employment contract (known as *mōsŭm*) enjoyed 24.4 holidays per year on average.

job categories in the two regions as obtained on the second stage. Weight-share indices used are 0.71 for agriculture and fishery, 0.1 for construction and manufacturing, and 0.19 for service, figures that were derived using employment data available from the reports of the census taken in 1930.

Wages of Unskilled Workers

To derive real wage, the nominal wage estimates of Korean unskilled male workers were deflated with an index of cost of living obtained by splicing Heo(1981)'s consumer price index (spanning from 1910-38) and Kim and Park(2007)'s index (spanning from 1936-56).

[Figure 1 here]

Figure 1 conveys an impression that real wages of Korean unskilled male workers tended to rise in northern and southern Korea from 1910-42: fitting linear time trends to the real wage series, we obtained slope coefficients, which were positive and significantly different from zero at 1% level, and found the slope to be somewhat steeper in the north.⁸ One way to derive an unskilled real wage series representing colonial Korea is to calculate a weighted average of the unskilled wages in northern and southern Korea using fixed population shares (0.4 and 0.6 for the north and south, respectively) as weight-share indices. A linear trend fitted to the unskilled real wage series for colonial Korea implied a growth rate of 1.0% per year. Given that faster

⁸ This is consistent with Cha(2007)'s estimate of provincial domestic product indicating faster per capita output growth in the north.

population growth in the north resulted in the share of northern population rising from 0.39 in 1916 to 0.41 in 1941, and that real wage rose faster in the north than in the south, one may argue that unskilled real wage growth was somewhat faster than 1.0% per year.⁹

The traditional view has been that real wage of unskilled Korean workers stagnated under Japanese rule. Arguing that unskilled real wages of Korean workers in the late 1930s was exceeded by that in the early 1910s, Heo(1981: 237) eventually wrapped up by saying that “it is difficult to say whether real wages of Korean workers rose or fell as a matter of trend.” Similarly, refuting that unskilled real wage in the late 1930s was lower than that prevailing in the 1910s, Odaka(1975:157) delivered at the end of the article a verdict of real wages failing to improve in a “secular and general way.”

[Figure 2 here]

Despite the similarity in conclusions, there exist important differences between the two unskilled wage estimates, to which attention has not been drawn so far. Regressing Heo(1981)’s unskilled real wages (shown as a broken line in Figure 2) on a constant and time yielded a negative slope coefficient, which was insignificantly different from zero even at 10% level. In contrast, as with our estimate of unskilled wage, Odaka(1975)’s real wage for rural workers (shown as a dotted line in Figure 2) turned out to contain an upward time trend, which was significant at 5% level.¹⁰

⁹ The population shares are based on the number of end-of-year residents as reported in the Statistical Yearbook, which is known to underestimate population before the first census in 1925.

¹⁰ Besides the similarity in conclusions, the other reason why this important difference

From where does this disparity in trend between Heo(1981)'s estimate on the one hand and those by Odaka(1975) and us on the other come? It did not appear to have much to do with the method of aggregation employed, for both Odaka(1975) and Heo(1981) derived their unskilled wage estimates as averages of observations made in different cities. Neither is it explicable in terms of difference in sample periods: time trends fitted to unskilled wage estimates by us and Odaka(1975) for Heo(1981)'s period (i.e. 1910-38) are still positive and significant. One of the key reasons to explain Heo(1981)'s pessimism on the living standards of unskilled workers seems to be the large weight (0.69) he attributed to wages earned by coolies, which appeared neither to rise nor to fall: both Odaka(1975)'s outdoor workers' wage and our estimate of wages of unskilled service workers were found to be trendless. As Odaka(1975: 154-55) observed, coolies (or outdoor workers) were marginal workers who could equally be described as being in the state of latent unemployment. And the census of 1930 indicated that these workers eking out a precarious livelihood in urban informal sector accounted for at most 19% of Korean unskilled workers.

In colonial Korea, a large majority of unskilled workers could be found in the countryside, hence the unskilled wages are better represented by rural wages.

between the two estimates remained unknown is that Odaka(1975: 152) presented his real wage estimate for rural and outdoor workers only in a graphic form (panel B of Figure 3). The underlying data are available from an internal document of the Institute of Economic Research at Hitotsubashi University, titled *Nihon tōchika ni okeru chōsen no koyō to chingin*, Compiled Statistics Series 7. Derived using Mizoguchi(1975)'s consumer price index, the real wage presented in the chart differs somewhat from that shown in Figure 2, but was found to contain a positive and significant time trend.

