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**Top Incomes in Korea, 1933-2010:
Evidence from Income Tax Statistics**

Nak Nyeon Kim and Jongil Kim

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Evidence from Income Tax Statistics**

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Abstract

This paper constructs the long-term series of top income shares in Korea using income tax statistics. Top income shares dropped sharply after WWII, remained low during industrialization periods, and has ascended since the mid-1990s. We suggest that the fall in the top income shares after WWII can be explained by the economic collapse and political disruption after liberation. The rising income concentration in the last 15 years could be attributable to the drastic shift in industrial structure and the institutional factors such as the reduction in the marginal tax rate and the post-crisis changes in the corporate governance system.

Key words: Top income shares, Income tax statistics, Inequality, Korea
JEL Classification: N10, O15

I. Introduction

The indices of income inequality such as Gini coefficients and poverty rates are constructed based on the Household Income and Expenditure Survey by the Korea Statistical Office.¹ Although the household survey is a suitable source to compute the indices of income inequality, it does not allow us to study the long-run trend in income inequality. The raw data of the household survey are available only since 1990 and do not cover single-person households prior to 2006.² Moreover, they provide household income data only for wage and salaried workers in the earlier years by excluding self-employed and family workers in the survey. In addition, Kim and Kim (2013) found that the household survey leaves out a considerable number of top income households in the sample and also severely understates household financial income. Due to the problem of under-coverage and under-reporting, the existing indices of income inequality do not allow us to study the evolution in income inequality in Korea because the homogeneous data are available only for a small number of recent years and even the available data may not adequately reflect the actual situation of income inequality.

Instead of using the indices based on the household survey, this paper constructs the long-term series of top income shares in order to study the evolution of income concentration in Korea. We estimate income shares for the top income groups, such as the top 1% of the income distribution, by using income tax statistics. Although the top income shares do not provide information about the income distribution of lower income groups, they allow us to construct a homogeneous long-term indicator of income concentration. They also enable us to study the evolution of income concentration in Korea in a comparative perspective as the top income shares have been constructed for many countries such as France (Piketty, 2003), the U.S. (Piketty and Saez, 2003), the U.K. (Atkinson, 2005), and Japan (Moriguchi and Saez, 2008).³

¹ To be exact, income inequality indices such as Gini Coefficients and income decile distributions are currently computed based on the Household Income and Expenditure Survey by the Korea Statistical Office and the Farm Household Economy Survey by the Ministry of Agriculture and Forestry.

² The Gini coefficients, decile income distributions, and poverty rates since 1990 are reported on the website (<http://kostat.go.kr>) of the Korea Statistical Office.

³ Top income shares series of various countries can be obtained from Alvaredo, Atkinson, Piketty and Saez, the

Income tax statistics in Korea go back to the colonial period. The global income tax system which taxes the aggregate income from various income sources of a taxpayer was introduced in 1934 for the first time in Korea.⁴ Since then, there have been three major changes in tax system in addition to numerous minor revisions. Thus, available information from income tax statistics varies over time. Notwithstanding missing periods due to limited information from the data source, this paper investigates the long-term trend in income inequality in Korea from 1933 to 2010.

During this period, Korea underwent several different regimes. Korea was under Japanese colonial rule from 1910 to 1945 and experienced a wartime control system after 1937. After liberation in 1945, the Korean Peninsula was divided into two nations, the South and the North. Subsequently, the Korean War broke out in 1950 lasting for three years. After the war, South Korea achieved long and rapid economic growth although its growth rate subsided after the economic crisis in 1997. This paper will provide a starting point to discuss how income inequality has evolved under these different regimes.

The paper is organized as follows. Section II describes the data and outlines the estimation methods. Section III presents the findings from the construction of top income shares. Section IV explores the plausible causes for the changes in income concentration and section V provides the conclusion.

II. Data and Methodology

In this section, we will briefly introduce the nature of data and the methods of estimation and provide a detailed description as well as a complete set of results in Appendix.

Top income shares are computed by dividing the amount of income accruing to the specified top

World Top Income Database(<http://topincomes.g-mond.parisschoolofeconomics.eu>). Top income shares series seem to become an alternative measure of income inequality as they are accumulated. The OECD report on income inequality paid attention to top income shares along with traditional indices of income inequality (OECD, 2011).

⁴ The terminology of global income tax came from the English translation of *Chonghap Soduk Sae* in the Statistical Yearbook of National Tax published by National Tax Service of Korea.

income groups by total income. We define income as a gross income earned by individuals before tax deductions and exemptions. It includes all types of income such as salaries, wages, bonuses, interest, dividends, rents, business income including self-employment income, and pension. However, earnings from capital gains are not included in income.

We utilize information on the self-assessed income in the tabulation of the global income tax. Self-assessed income filed for global income tax returns includes various types of personal income, such as interest, dividends, rents, and pension, as well as wage and business income. The global income tax system was first introduced in 1934 by the colonial government. The data on the number of taxpayers, the amount of income, tax paid, and tax rate by income brackets for the colonial period can be obtained from *Chōsen Zeimu Tōkeisho* [Statistical Tables of Public Revenue of Colonial Korea] and *Chōsen Sōtokufu Tōkei Nenpō* [Statistical Yearbook of the Government of Colonial Korea]. After liberation in 1945, the global income tax system was abolished. Instead, separate taxes were imposed at source on labor income, business income, rental income from real estate, and interest and dividends until 1975, when the global income tax system was reintroduced. Thus, the data on the total income earned by taxpayers are not available for this period of the separate tax system, although statistics on the amount of tax paid for each source of income are reported. The data after 1957 can be obtained from *Kuksae Tonggae Yonbo* [Statistical Yearbook of National Tax]. Unfortunately, our data source does not provide separate statistics on the tax withheld at source such as wage income for the period of 1976-1994. However, the data on wage income tax for 1979-85 can be obtained from an internal source of the National Tax Service.

Table 1 displays the major changes in the tax system since the colonial periods. During the period of 1933-1953, household's total amount of income (class III income following the terminology at that time, which is close to the current definition of global income) was taxed if a household, the tax unit at that time, earns more than the exemption point. For the period of 1954-1975, earnings from different sources were taxed separately because Korea did not adopt the global income tax system. Therefore, it is not possible to construct top income shares for this period because the tabulation of income tax does not allow us to extract data on the total amount of income of taxpayers. The global income tax system was reintroduced in 1975. However, a fraction of the top income groups are

exempt from filing global income tax returns. Taxpayers with a wage income which includes wages, salaries and bonuses do not have to file global income tax returns if the amount of income from sources other than wage income does not exceed a certain level. Thus, income accruing to this group of top income earners is not counted in the tables of global income tax returns. Therefore, we have to combine the tabulations of global income tax and wage income tax to make up for these missing top wage earners.⁵ We also need to take into account other types of income taxes withheld at source. However, these types of income do not affect our estimate of top income shares as much. Our data source allows us to estimate top income shares including other income items in addition to the wage income since 2009. However, we found that it does not make any significant difference. It is due to the fact that the income levels of taxpayers who have income tax withheld at source for these items are not high enough to be included in the top income groups.

< Insert Table 1 here >

Top income groups are defined relative to the total number of adults, defined as 20 years old and above, which can be computed from population statistics. Other candidates for the control total for the population could be the total number of taxpayers or total employment. Due to the tax exemption and withholding tax system, only a small fraction of individuals file income tax returns. Therefore, the total number of taxpayers is not a consistent control total for time-series and cross-section comparison because its scope varies among different tax systems. Total employment is too narrow as it excludes individuals relying on non-labor sources such as pension and capital income. Although the adult population, our control total, includes the economically inactive population, it provides a relatively proper reference for comparison over time and across countries.⁶ We obtain the total number of adults from population statistics published by the Korea Statistical Office. For the period before 1945, we interpolate the data for missing years by using the rate of change between the population census in

⁵ For the detail method, see Appendix A.3.3.

⁶ Our definition is the same as that of Moriguchi and Saez(2008) who constructed the top income shares series for Japan.

1930, 1935, 1940 and 1944. The number of adults is presented in Table A1 in Appendix.

We cannot compute the control total for income from income tax statistics because the income tax statistics do not count the taxpayers who do not file income tax returns. Thus, we rely on National Accounts. We obtain the total amount of income after subtracting those items which do not belong to personal earnings from the income of households in the table of income account by institutional sectors. For the colonial period, we use the data constructed by Kim ed. (2012). Due to the fact that the income account by institutional sectors was not constructed in this study, we compute household income by subtracting imputed rents from the sum of compensation to employees and operating surplus. Our control total for income is presented in Table A1 in Appendix.

We estimate the top income shares by using the number of taxpayers and the amount of income by income brackets obtained from income tax statistics. To estimate the income shares of the top fractiles such as top 10%, 1%, 0.1%, and 0.01%, we use the same Pareto interpolation method as Piketty and Saez (2001: 39). The Pareto distribution has a cumulative distribution function specified as $F(y)=1-(k/y)^a$ in which k and a are constants and a is called the Pareto coefficient. The distribution has a property that the average income of taxpayers with income level above a threshold income, y , is proportional to y by the factor of b and $b=a/(a-1)$.

Table 2 shows the raw data from income tax statistics in 2010 which provide the number of taxpayers and their income by income brackets. Table 2 also presents the control totals for population and income as well as the cumulative rates for each income bracket. In 2010, the taxpayers earning more than 117 million won account for 0.68% of adult population and their income takes 9.72% of total personal income. Taxpayers earning more than 96 million won account for 1.24% of adults and their income accounts for 13.20% of total personal income. From this, we know that the top 1% income share in 2010 is in between 9.72% and 13.20%. By using the property of Pareto distribution as mentioned above, we can compute b and a for each income bracket from Table 2. To compute the top 1% income share, we use the Pareto coefficient for the income bracket with a cumulative rate of the population closest to 1%, which is 2.16 in Table 2. Once we get the Pareto coefficient, we can compute the threshold income for the top 1% by using the cumulative distribution function specified above. The average income for the top 1% income earners can be computed by multiplying the

threshold income by b. The income shares for upper and lower income fractiles can be computed similarly by using the Pareto interpolation. According to Table 2, the estimated Pareto coefficient decreases as the income level increases for the top income groups. It implies that the increase in the income level is accelerated in the top income group. However, it is not the case for the income groups lower than the top 10%. Thus, we cannot apply this method to these lower income groups. Thus, we do not report the income shares for lower income group similar to other studies.

<Insert Table 2 here>

Table 3 presents the estimated threshold and average income levels for top income groups in 2010. The size of the top 0.01% income group in 2010 was 3,797 and one should earn more than 1.12 billion Korean won (US\$ 969,937) in order to belong to this group.⁷ The average income of the top 0.01% was 2.77 billion won. The top 5-1% denoted in the table is the top 5% income group excluding the top 1% income earners. The size of this group is 1.52 million and its average income is 73.2 million won (US\$ 63,354). Our estimates of the threshold and average income levels for the top income groups for other years are presented in Tables A2 and A3 in Appendix.

<Insert Table 3 here>

Because our estimates of top income shares rely on self-assessed income tax statistics which are based on the reported income, it is possible that the estimated top income shares based on global income tax statistics may be affected considerably by the trend in tax evasion. It is known that business income in general is quite subject to tax evasion.⁸ Since we do not have the reliable information about tax evasion, we cannot make any adjustment for this. Instead, we compute the top

⁷ The annual average market exchange rate in 2010 (1,156 Korean won per one US dollar) was used for conversion.

⁸ When we compare National Accounts and income tax statistics, we discovered that approximately 26% of business income may evade tax. Other types of income such as interest, dividends, and wage, taxes on which are usually withheld at source, may be fully detected by income tax statistics. See Kim and Kim(2013).

wage income shares as a supplement. Compared to business income, tax evasion may not be significant for wage income, tax for which is withheld at source.

Therefore, top wage income shares are computed by dividing the wage income accruing to the top wage income groups by total wage income, similarly to top income shares. Top wage income groups are defined relative to the total number of employment. Our control total for wage income earners is consistent with the definition of employment in official statistics which include regular, temporary and daily workers. Because the income tax statistics exclude a large proportion of workers earning below the exemption point, we cannot use the total sum of wage income in income tax statistics, except for that of recent years when the relevant information is provided. Therefore, we use the amount of wage and salaries in National Accounts in order to compute the control total for wage income. Thus, wage income in our definition includes wages, salaries, and bonuses. It allows us to compute the top wage income shares back to 1963, the earliest year for which the data for total employment are available. The data on the control total for total employment and wage income are presented in Table B1 in Appendix. We also used a Pareto interpolation method to estimate the threshold and average wage income levels, which are presented in Tables B2 and B3 in Appendix.

III. Empirical Results

Figure 1 displays three series of the top 1% income share; series 1 based on the global income tax statistics, series 2 based on wage income tax statistics, and finally, series 3 constructed after combining global income tax statistics and wage income tax statistics.⁹ Series 3 is the most comprehensive in coverage among the three series and could be considered as our final estimate of top income shares. The difference between series 3, which combines two income tax statistics and series 1, which is based on global income tax statistics, is the income share of the top 1% income group who earns wage income only and thus do not have to file global income tax returns.¹⁰ Although we cannot

⁹ For the pre-WWII period, this procedure is not needed because the global income tax covers all the wage income above the exemption point.

¹⁰ For income shares of smaller fractiles, such as the top 0.1% or 0.01%, the difference between the two

directly compare the estimate of top wage income shares (series 2) and other estimates of top income shares (series 1 and 3) due to different definitions of the control total, the trend in top income shares series does not look much different from that in top wage income shares series.¹¹ Thus, from Figure 1, we may conclude that income concentration in Korea was very high during the pre-WWII period, dropped sharply after WWII, stayed stable during the period of high growth, and increased noticeably after the mid-1990s.¹²

< Insert Figure 1 here >

We also compute the income shares of top fractiles other than top 1%, which are presented in Figure A1 in Appendix. The trends demonstrate that the income shares of upper income fractiles changed more in the long run. The top 1% income shares dropped sharply after WWII, whereas the top 5-1% income shares stayed with no significant change. In contrast, the top 1% income shares increased more rapidly than the top 5-1% income shares since the mid-1990s. It was also true when we decompose the top percentile into three subgroups, income shares series of the top 0.1%, the next 0.4% (top 0.5-0.1%), and the bottom half of the top 1% (top 1-0.5%). The higher income fractile within the top 1% experienced a bigger drop in income share after WWII. With the rising top 1% income share since the mid-1990s, a similar pattern is observed in the opposite direction among the subgroups. All three subgroups have been rising in income shares since the mid-1990s; yet, the higher income fractiles exhibited a more rapid rise. The trend indicates that the deepening income concentration since the mid-1990s was accompanied by a sharp rise in the income of the upper income tails in the top percentile.

estimates of top income shares decreases and becomes insignificant. The reason is that there are few who do not file global income tax returns among the upper income earners.

¹¹ Wage income accounts for more than half of total income.

¹² One should note that both estimates of top income shares (series 1 and 3) were not adjusted for the inconsistent coverage of financial income over time. As explained in Appendix A.1, financial income over a certain amount began to be taxed as global income in 1996; however, this practice was suspended for 3 years (1998-2000) after the economic crisis. Therefore, our estimates of top income shares before 1995 and during 1998-2000 could be underestimated because the financial income was not counted during these periods. This factor partly explains the big drop of the top income shares in 1998.

To better understand the mechanism that led to the shift of trend in income concentration in Korea, we compute the top income composition for the selected years of 1933-42 and 2007-2011, which is presented in Figure 2.¹³ Before WWII, three major components of income included business income, wage income and rents, the sum of which accounts for more than 95% of total income during that time. The share of rents declined throughout 1933-1942 while those of other two sources rose. Rents before 1945 mostly consisted of farm rents paid to landlords.¹⁴ Even if we take into consideration that some part of the interest income classified as class II income tax was not counted, the share of financial income was insignificant compared to the three types of income. According to the recent top income composition in 2007-2010, the share of wage income was the largest, although it decreased over time. The share of business income has increased fast instead. Comparing the income compositions of top income groups in 2007-2010 and the pre-WWII period, we find that the share of farm rents which was large in the pre-WWII period became nil in 2010 and those of wage income and financial income went up instead.

< Insert Figure 2 here >

Figure 3 displays the top 1% income share series in Korea and other countries in order to provide a comparative perspective. Korea is not so much different from other countries in the overall pattern of the trend by showing a U-shaped pattern of income concentration. The top 1% income shares in Korea were as high as those in other countries during the pre-WWII period. Notwithstanding the missing years, we may guess that Korea's top income shares fell sharply as those of other countries after

¹³ In pre-WWII period, our data source allows us to compute the income composition of total taxpayers in the tabulation of class III income tax in Table 1. In post-WWII period, the annual report does not allow us to construct the top income composition before 2007.

¹⁴ According to the findings from top income compositions in the U.S. and Japan, financial income, particularly dividends which took a large share of top incomes, fell sharply due to the negative effect of the Great Depression and WWII. It is different from the case of Korea where farm rents accounted for most capital income and dividends were insignificant. It reflects the backwardness of Korea in industrial development compared with other industrialized countries.

WWII and remained low until the mid-1990s.¹⁵ In the mid-1990s when top income shares in Korea began to rise, the level of top income shares in Korea was similar to those in Japan and France and were much lower than the levels of the U.S. and the U.K. However, top income shares in Korea since the mid-1990s has ascended much faster than those in Japan and France. In terms of slope, a rising trend in Korea is similar to those in the U.S and the U.K. As a result, the top income share in Korea in 2010 was located in between those of two country groups which show diverging patterns in income concentration.

< Insert Figure 3 here >

The shares of the top 1% group in wage income were already displayed as series 2 in Figure 1. Unfortunately, the income tax statistics during the pre-WWII period do not provide the tabulation of wage income tax by income brackets and thus we confine our analysis to the period after WWII. Its overall pattern is not so much different from that of top income shares. The top 1% wage income share series remained low until 1997 but demonstrated a rapidly rising trend thereafter. Wage income concentration in Korea has been lower than that of total income throughout the period.¹⁶

Figure 4 presents the top 1% wage income shares series of Korea, Japan and the U.S.¹⁷ The top 1% wage income shares in the U.S. were high in the pre-WWII period, fell sharply during the war, and

¹⁵ Our guess is based on the trend of top wage income shares in Figure 1.

¹⁶ One should note that top wage income shares and top income shares are different in terms of their control total. The former is relative to total employment and the latter is relative to total adult population. Therefore, top wage income shares tend to be lower than top income shares because the latter counts economically inactive population in the denominator. In addition, total income includes capital income which is more unevenly distributed than wage income.

¹⁷ One should note that the top wage shares in Figure 4 are constructed with different definitions of control total for workers across countries. The top wage groups of the U.S. (Piketty and Saez, 2003) are relative to the total number of tax units with positive wages and salaries. The total number of tax units, which exclude female workers with a spouse, is different from the total number of individual workers used for Korea and Japan. However, for Japan (Moriguchi and Saez 2008), only regular workers are counted in the control total, which is different from the other two countries which count both regular and temporary workers. Therefore, to be exact, we cannot directly compare the levels of top wage shares across countries. However, such difference in the definition will not make much difference in the trends we observe in Figure 4.

steadily declined until it began to ascend rapidly in the 1970s. As a result, the top wage share in the U.S ascended to a higher level than that of the pre-WWII period. The high wage income concentration in Japan also declined sharply several years ahead of the U.S. from 1935 to 1944, rose substantially from 1951 to 1961, then again declined gradually, and remained low relatively to that of the U.S.¹⁸ As a result, wage income concentration in the U.S. became much higher than that in Japan in recent years. In terms of top wage income shares, Korea followed Japan with a time lag until the mid-1990s. Although the top wage income shares in the U.S. began to rise in the 1970s, those in Korea and Japan remained low. In terms of the level of wage income concentration, Korea was similar to Japan until the mid-1990s. Although we cannot observe the current trend in Japan in Figure 4, Korea appears to be diverging from Japan in the past 15 years in terms of top wage income shares.

< Insert Figure 4 here >

Figure 5 displays the average wage income (in 2010 constant price) of the top decile and the remaining bottom 90%. The top decile is decomposed into the top 0.1%, the top 0.1-1%, and the top 1-10%. First of all, we find the growth rate of the average wage income subsided after the economic crisis in 1997. However, average wage income series of top income groups do not show a distinguishable stagnation of growth unlike that of the bottom 90%. Until 1985, the average wage incomes of all income groups, including the bottom 90%, increased at similar rates. In contrast, the average wage incomes diverged after 1997 between the top 10% and the bottom 90%. In particular, the growth rate of the average wage income of the top 0.1% is distinguished from those of other income groups.

< Insert Figure 5 here >

¹⁸ Moriguchi and Saez (2008) interpret the rise and fall of the top wage income shares in Japan around the 1960s as the phenomenon caused by the transition of Japan from the a labor-surplus to a labor-shortage economy with rapid industrialization.

IV. Understanding the Evolution of Income Concentration in Korea

We have found that (i) income concentration in Korea was as high as those in other countries in the pre-WWII period during 1933-40, (ii) it fell sharply after WWII and remained low until the mid-1990s, (iii) income concentration has increased in the last 15 years, and (iv) as a result, in terms of top income shares, Korea is now higher than Japan and France although it is lower than the U.K and the U.S. Let us briefly discuss the factors which may have influenced the trends in top income shares in Korea.

First, how can we explain the sharp fall of the top income shares after WWII? High income concentration in the pre-WWII period reflects the characteristics of the Korean economy during the colonial period. The Japanese colonizers in Korea played a dominant role with their comparative advantage in capital and technology. The Japanese in Korea contributed approximately 90% of starting capital to corporations in Korea and thus most executive officers in large corporations were Japanese.¹⁹ The Japanese in Korea who accounted for 2.9% of the population in Korea (in 1940) also owned a sizeable area of land as large as 9.5% of cultivated land in Korea (in 1942).²⁰ It implies that many Japanese landlords in Korea were big landowners. Although we cannot provide statistical evidence from income tax statistics that do not distinguish the ethnicity of taxpayers, there is no doubt that the Japanese accounted for a large share of top income groups at that time.

After liberation, these Japanese colonizers withdrew from Korea and left their assets which were vested in the U.S. army military government in Korea. The military government in 1945-1948 transferred these assets to the Korean government. The Korean government nationalized the big enterprises in key industries such as electricity and distributed other assets to the private sector during the 1950s. Although we don't have evidence on the change in ownership distribution before and after liberation, the ownership distribution does not seem more concentrated after liberation. Regardless of asset concentration, the income earned from these assets decreased much after liberation, which could

¹⁹ According to Joo (1991), the Japanese in Korea contributed 84-88% of starting capital during 1926-39.

²⁰ The data for the population and landownership of Japanese in Korea are obtained from the population census and Huh (2005), respectively.

have affected the income concentration in Korea. The withdrawal of Japanese entrepreneurs as well as the severing of the Korean economy from the Japanese economic bloc made a disruptive impact on the Korean economy. The division of country into two nations and ensuing political chaos engendered economic disorganization in South Korea. In addition, vested properties were not well managed by the officially designated managers until they were transferred to Korean entrepreneurs. Therefore, it is not plausible that those who would replace the Japanese in top income groups after 1945 earned as much as the Japanese.

Income inequality among Koreans at that time may be mostly attributable to inequality in landownership. During the colonial period, landownership was concentrated in the hands of a small number of landlords and thus most farmers were small sharecropping tenants in Korea.²¹ This landownership was de-concentrated by land reform. According to the Land Reform Act in 1949, the holdings of Korean landlords owning more than 3 chongbo (7.5 acres) were not allowed and the excessive holdings were redistributed to the tenants. Although the landlords received securities for the land transfer, the real value of securities sharply dwindled with high inflation. Consequently, the landlords who accounted for a large proportion of the top income group lost their vital source of income after the land reform. De-concentration took place in the late 1940s even before the land reform because landlords expecting the land reform sold their land widely.

Second, why did income concentration stay relatively low throughout 30 years of rapid growth until the mid-1990s? Low income concentration during this period may be due to a rapid decrease of labor surplus in the Korean economy with a drastic expansion of modern industries. During the period of high growth, the non-agricultural sector expanded employment at rates as high as 4-8% per annum as Korea pursued industrialization by promoting labor-intensive export industries. It induced the labor movement from agriculture to other industries such as manufacturing. The decrease of farm household population by 4-5% per annum led to the end of a labor surplus and the ensuing wage increase in the rural areas.

During the initial period of industrialization, the impact of expansion of the non-agricultural sectors

²¹ According to the Statistical Yearbook of the Government of Colonial Korea, land under tenant farming accounted for 57.9% of total cultivated land in 1940 (67.6% in case of paddy field) and tenant farmers accounted for 76.4% of farm households.

is too small to have a considerable effect on farm household income. Therefore, we often observe a polarizing pattern of income growth between the traditional sector and the modern sector during industrialization. Farm household population continued to increase until the mid-1960s after an initial spurt of economic growth because the high population growth overwhelmed the labor drain from the rural areas. Until the mid-1970s, Korea's rural areas were overpopulated with surplus of farmers. The overpopulation in the rural areas continued until high growth began to reduce the rural population. As rapid growth in Korea actively created jobs in non-agricultural sectors and induced the labor movement out of agriculture, the overall earnings of workers increased in all sectors of the economy.²² In this respect, the benefits of economic growth during this period trickled down to the bottom income groups. Thus, Korea could maintain low income concentration even though it experienced a drastic structural change.

Third, why did income concentration rise since the mid-1990s? It may be the result from composite factors including the change in industrial and demographic structures and institutional changes in the tax system and corporate governance. First of all, job creation became stagnant after the mid-1990s, which weakened the trickle-down effect which we observed previously during the period of high growth. The growth rate of non-agricultural employment fell to approximately 2% in the 2000s from 5% in the early 1990s. It corresponds with the subsiding GDP growth rate as Korea enters a mature stage of development. In addition to the stagnant economic growth, the employment inducement effect of economic growth has been weakened since the 1990s as the industrial structure in Korea shifted toward technology-intensive industries from labor-intensive ones. This trend accelerated as Korea deepened its economic relationship with China after establishing diplomatic relations in 1992. In addition, Korean companies relocated their labor-intensive industries and production processes to sites in low-wage countries, which further reduced the demand for unskilled workers in Korea. It resulted in the reduction of manufacturing employment because the job creation in high-technology industries cannot compensate for the job destruction in low-skill labor-intensive industries. Korea's manufacturing sector, which actively absorbed the labor during the period of rapid growth, began to

²² According to Figure 5, the average wage income of all income groups including both the top and the bottom increased at similar rates during the period of high growth in Korea.

release its labor. Thus, polarizing demands for workers with different skill levels placed an end to the trickle-down effect of economic growth which had a favorable effect in income inequality until the mid-1990s.

This explanation which is based on the structural change in Korea may well account for the deterioration of income inequality in Korea, but may not fully explain the increase of top incomes. One of the plausible factors which might have contributed to this rising top incomes is the reduction of marginal tax rates (MTRs). The highest statutory MTR, which was as high as 70% in the 1970s, steadily declined to half of the peak level as presented in Table B5 in Appendix. Korea was no exception to the neoliberalism trend of public policy which many developed countries adopted in the early 1980. We estimate the MTR for the average taxpayer in the top 0.1% wage income group in order to see a true burden of tax for additional income.²³ As we can observe in Figure 6, it is lower than the top MTR because some individuals in the group do not pay tax at the top MTR. It was high in the late 1970s at 54% when the top MTR was 70%. It continued to fall and finally decreased to 35% in recent years.

Piketty, Saez, and Stantcheva (2011) suggested three channels in which the change in MTR could affect the top income shares. First, the tax cut may have a supply-side effect by incentivizing the economic activities of the top income groups. Second, it may reduce tax evasion or increase reported income for tax returns by a pass-through of income from other types of income (for instance, corporate income) to personal income. Third, CEOs may intensify rent-seeking behaviors to influence their pay setting. Piketty, Saez, and Stantcheva (2011) found that the third channel was most important in the U.S.

How could the declining MTRs affect top income shares in Korea? The figure 6 does not show a close long-term relationship between MTRs and top income shares as the case of the U.S. in Saez(2004). However, there is a negative relationship between MTRs and top income shares in Korea after the mid-1990s. In addition, the capital income increased much faster than wage income among

²³ To obtain the MTR of the average taxpayer in the top 0.1% group, we take the weighted average of the average taxpayers of the top 0.01% and the top 0.1-0.01%. See Appendix B4 for the estimation of MTR for the average taxpayer in the top wage income group.

top income earners during the same period.²⁴ It implies that lowered MTRs may increase the saving capacity of top income groups which may help wealth accumulation and thus result in income increase.

< Insert Figure 6 here >

Another factor which contributed to the rising top incomes may be the adoption of Anglo-Saxon corporate governance system in Korea after the 1997 economic crisis. Moriguchi and Saez (2008) point out Japan's highly developed internal labor markets as one of the important factors for the diverging trends between the U.S. and Japan. In Japan, the absence of competitive markets for corporate executives might have prevented the rise of wage inequality. According to Piketty and Saez (2003: Figure 11), the average compensation of the top 100 CEOs on the Forbes list has increased much faster than the average wage since the early 1970s. This contrasting divergence of compensation between top managers and average workers did not happen in Japan whose corporate culture emphasizes firm-specific human capital under the internal promotion system.

Due to the fact that micro-data on top wage groups such as CEO compensation are not available in Korea, we instead investigate the average wage income of the top tails.²⁵ We discovered in Figure 5 that the growth rate of the top 0.1% average wage income was distinguished from those of other income groups. While the top 1% wage income share increased from 4.89% in 1995 to 7.45% in 2010, the top 0.1% wage income share increased faster from 1.27% to 2.16% during the same period.²⁶ It implies that the average wage of the top 0.1% wage earners in 2010 was 21.6 times greater than the average wage of all wage earners whereas it was just 12.7 times greater in 1995. In 1995, the wage level of top 0.1% wage earners relative to the average wage in Korea was similar to that of Japan

²⁴ Although the top 0.1% wage income share rose in Korea, other types of income including capital income increased much faster than wage income for the group. It is shown by widening gap between top income and top wage income shares in Figure 6. Thus, the positive effect of tax cuts on asset accumulation may have been substantial in Korea. It may not be true of the U.S. where wage income drove the rising income concentration.

²⁵ We may obtain information on the compensation of executive officers from the report disclosed by corporations (<http://dart.fss.or.kr>) since 1999. However, the information is not so reliable enough to construct a consistent series of compensation of the top managers.

²⁶ The estimates of top wage income shares are presented in Table B4 in Appendix.

(about 10 times of the average wage). However, it increased to more than 20 times of the average wage, higher than that of Japan, although it was much lower than that of the U.S. (about 40 times in 2010).

Although we cannot specify who belong to the top 0.1%, 16,971 taxpayers in 2010, we speculate that most executive officers of large corporations would belong to this group. After the economic crisis in 1997, many large corporations in Korea reformed their corporate structure and adopted selected elements of the Anglo-Saxon corporate governance system (Chung 2008: 156-189). Compared with the pre-crisis period, equity financing became a major method of raising capital for large corporations. Thus, the voice of shareholders became more influential. Large shareholders asked for further reform in order to align the management to investors' interests. The increasing share of foreign shareholders accelerated the transition toward Anglo-Saxon style shareholder capitalism in Korea. It increased the competitive pressures to the top management in Korea. In addition, large corporations that survived the economic crisis increased their scale and scope in business, which increased the demand for able professional managers. Without mature manager markets in Korea, large corporations, particularly Chaebols having many affiliated companies, activated the internal labor markets for corporate officers, delegated management to professional officers, and controlled them through monitoring and performance-based rewards. Many CEOs in large corporations received exceptional pay-raises along with stock options. That is, Chaebols developed highly competitive internal labor markets for managers of affiliated companies under the umbrella of family owners. In this respect, Korea appears to be located in between the U.S. and Japan in terms of the scope of manager markets and incentive systems. This type of performance-based incentive system for the top management was disseminated to the lower levels of management (Chung 2008: 248-259).

V. Conclusion

In this paper, we constructed the long-term series of top income shares in Korea from 1933 to 2010. From this, we have obtained the following main findings on the evolution of income concentration in Korea.

First, income concentration was very high prior to WWII when Korea was under a colonial rule and dropped drastically after WWII. This pattern is not so much different from what previous studies found for other industrialized countries such as Japan and the U.S. However, the cause for the change could be different. Unlike other countries where the falling capital income of top income groups played an important role, Korea's case is due to the collapse of the colonial system. After liberation, Japanese colonizers who accounted for a large share of the top income groups in Korea withdrew by leaving their businesses in Korea. The land reform after liberation reduced the rental income of the Korean top income groups who earned most of their income from land lease and personal business. Thus, the collapse of the top income share after liberation is attributable to the political chaos from regime change.

Second, top income shares series in Korea remained low throughout the period of rapid industrialization until it began to ascend in the mid-1990s. Income inequality in Korea has deteriorated with the rapidly rising top income shares after the economic crisis. Korea was able to maintain a low level of income concentration during the period of rapid growth because the economic growth accompanied active job creations and the steady increase of wage income. This trickle-down effect was weakened as Korea entered a mature stage of economic development. With globalization and deepening economic relationships with low-wage countries such as China, major companies in Korea accelerated the shift of their major business towards technology-intensive sectors by moving labor-intensive industries and production processes to other countries with abundant labor. This structural change reduced the demand for low-skilled workers while it increased the demand for high-skilled professionals. Consequently, the average wage income of the bottom income groups stayed stagnant in real terms for the last 15 years. Although the diverging demand for different types of workers in the labor market may explain the worsening income distribution in the overall economy, it is not enough to explain why top incomes increased so rapidly last 15 years.

Thus, third, we pay attention to two institutional factors for the rise of top incomes, the marginal tax rate (MTR) and the corporate governance structure. Falling MTRs since the 1980s helped the top income groups to accumulate capital and increase their capital income. Through an international comparison, Korea belongs to the country group with big drop in MTRs and rapid increase in top

income shares since the 1980s. In addition, the changes in the corporate governance structure after the economic crisis contributed to the big pay-raises of the top management in large corporations. After the economic crisis, large corporations in Korea relied on direct capital market instead of indirect finance and adopted some elements of the Anglo-Saxon style corporate system. Without mature outside CEO markets, large corporations, particularly Chaebols with many affiliated companies, activated internal labor markets for corporate officers and intensified competition among the top managers of affiliated companies through performance-based rewards. In this respect, Korea appears to be in between the U.S. and Japan in the scope of the CEO market and incentive system.

In this paper, we have studied the long-run evolution of top income shares in Korea by utilizing the income tax statistics instead of the household survey which suffers from the problem of under-reporting of top incomes. However, top income shares cannot provide detailed information on the situation of the bottom 90 % income groups. Thus, we may need to combine the income tax statistics and the household survey in order to achieve a deeper understanding of income distribution in Korea, which could be our next research topic.

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TABLE 1. Evolution of Income Tax System in Korea, 1933-present

	1933-1953	1954-1975	1976-1995	1996-present
Global income taxation	Class III income tax (1933-1942)		Global income (1976-present)	
Separate income taxation	Class II income tax (interest)	Interest		(Financial income included in global income)
		Dividends		
		Business income and rents		
		Wage income (1957-1974, 1979-1985, 1995-present)		
		Others		
Tax unit	Household	Individual		

Source: Authors' tabulation based on the Income Tax Law of Korea obtained from the website of the Ministry of Government Legislation (Available from URL: <http://www.law.go.kr>).

Notes: 1) Periods specified in the parentheses are those during which the tax statistics are available.

2) Income tax statistics used in this paper are shaded.

TABLE 2. Income Tax Statistics, Control Total, and Pareto Coefficients in 2010

income brackets		taxpayers	reported income	average income	control total for population / income		cumulative rate (%)		Pareto coefficient	
lower limit	upper limit	thou. persons	tril. won	mil. won	thou. persons	tril. won	population	income	b	a
mil. won		A	B	B/A	C	D	$\Sigma A/C$	$\Sigma B/D$		
	21	5,060	56	11			32.28	67.15		
21	33	2,373	61	26			18.95	58.41	2.46	1.68
33	54	2,640	110	42			12.70	48.83	1.99	2.01
54	75	1,222	77	63			5.75	31.66	1.70	2.42
75	96	490	41	84			2.53	19.65	1.74	2.36
96	117	212	22	105			1.24	13.20	1.86	2.16
117	222	195	29	149			0.68	9.72	2.05	1.95
222	325	32	8	263			0.17	5.17	2.36	1.73
325	536	18	7	405			0.08	3.85	2.44	1.69
536		13	17	1,324			0.03	2.72	2.47	1.68
Sum		12,256	429		37,968	639				

Sources: Number of taxpayers and their reported income by income brackets are obtained from the Statistical Yearbook of National Tax in 2010. The control totals for population and income are obtained from population statistics and National Accounts, respectively.

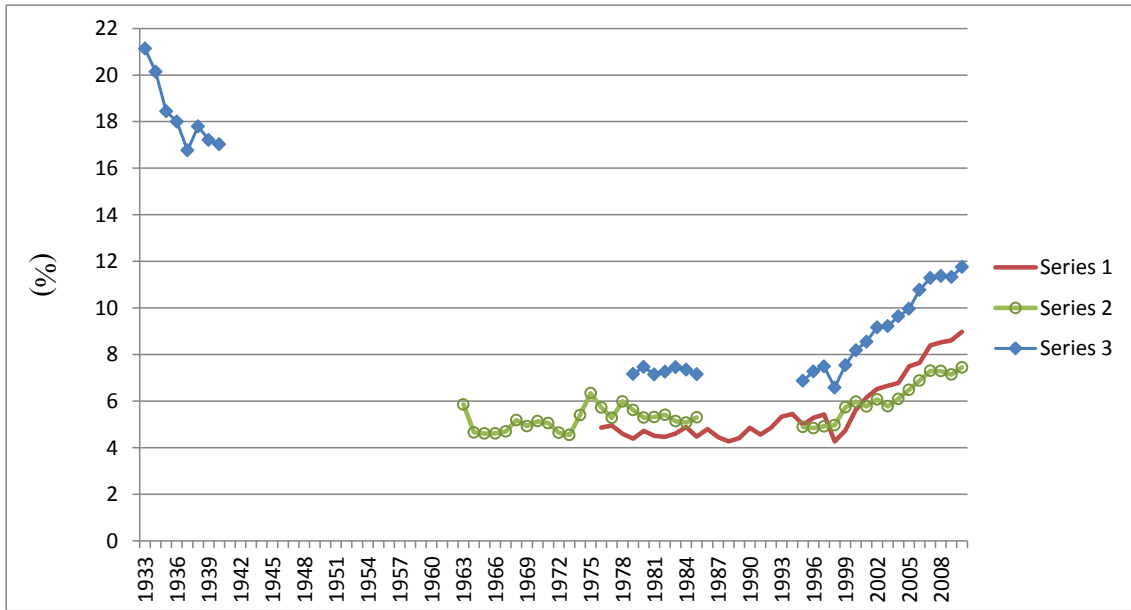
TABLE 3. Threshold and Average Income Levels for Top Income Groups in 2010

Percentile Threshold	Threshold income levels (thou. Won)	Income groups	Number of adults age (person)	Average income levels (thou. won)
		Full Population	37,967,813	16,825
Top 10%	36,662	Top 10-5%	1,898,391	47,528
Top 5%	57,666	Top 5-1%	1,518,713	73,237
Top 1%	106,193	Top 1-0.5%	189,839	114,442
Top 0.5%	137,340	Top 0.5- 0.1%	151,871	175,477
Top 0.1%	288,186	Top 0.1-0.01%	34,171	474,561
Top 0.01%	1,121,247	Top 0.01%	3,797	2,772,543

Sources: Table A2, A3 in Appendix.

Notes: Top 10-5% is the top 10% excluding the top 5%. It is the same for others.

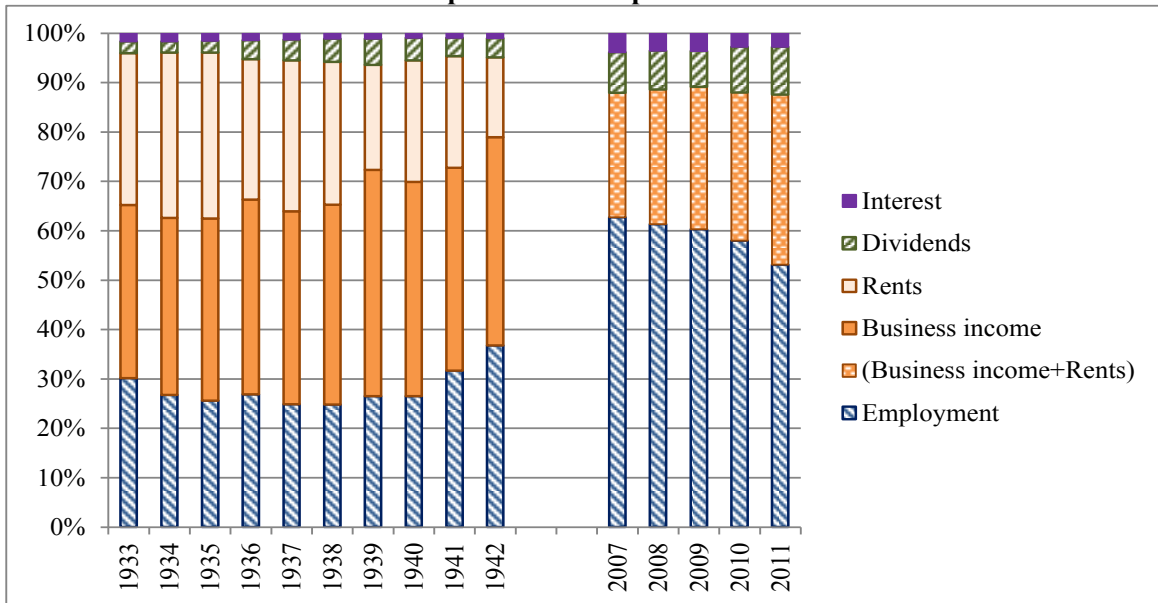
FIG. 1. Top 1% Income Shares in Korea, 1933-2010



Source: Table A4 and B4 in Appendix.

- Note: 1) Top income shares series denoted as series 1 is constructed using global income tax statistics. Series 2 is constructed using the wage income tax statistics. Series 3 is estimated by combining the statistics of global income tax and wage income tax.
- 2) Top income shares are for all Korea(North and South combined) before liberation and for South Korea after liberation.

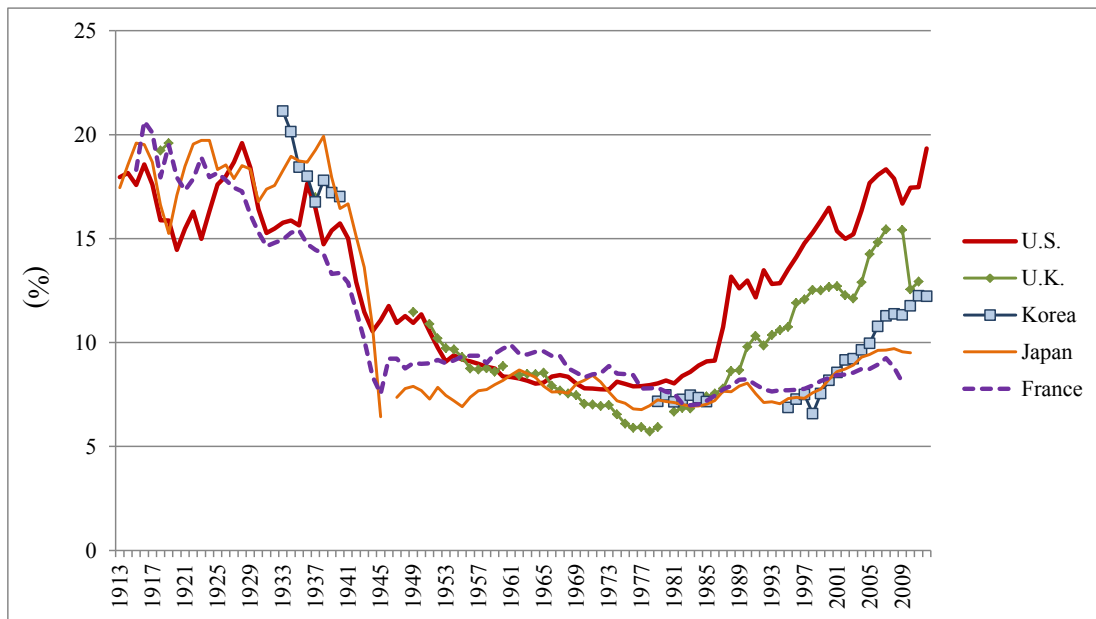
FIG 2. Top Income Composition in Korea



Source: Table A5 in Appendix.

Notes: (1) The income composition for 1933-1942 is computed for total taxpayers in the tabulation of class III income tax statistics, which account for various groups from the top 1.4% in 1933 to the top 4.8% in 1942. For 2007-2010, the top income composition is for the top 1% income earners. (2) For 1933-1942, a portion of interest is excluded. (3) For 2007-2010, taxpayers whose financial income including interest and dividends is less than 40 million won are excluded. (4) Top income compositions are for all Korea(North and South combined) before liberation and for South Korea after liberation.

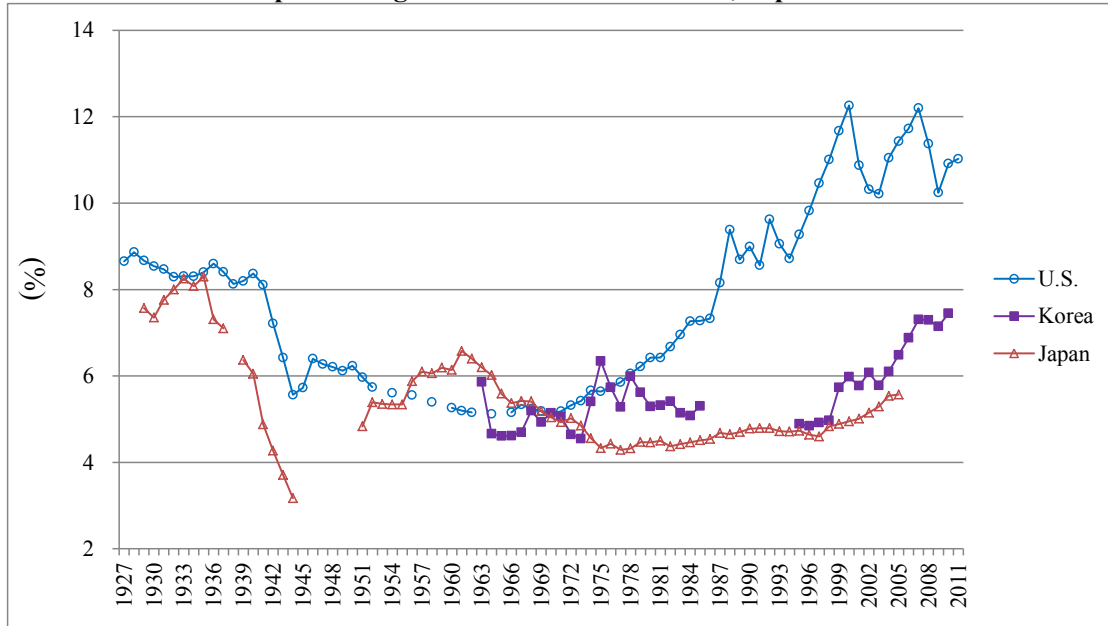
FIG. 3. Top 1% Income Shares in Korea and Selected Countries



Source: Table A4 in Appendix for Korea; Alvaredo, Atkinson, Piketty and Saez, The World Top Income Database (Available from URL: <http://topincomes.g-mond.parisschoolofeconomics.eu>) for other countries

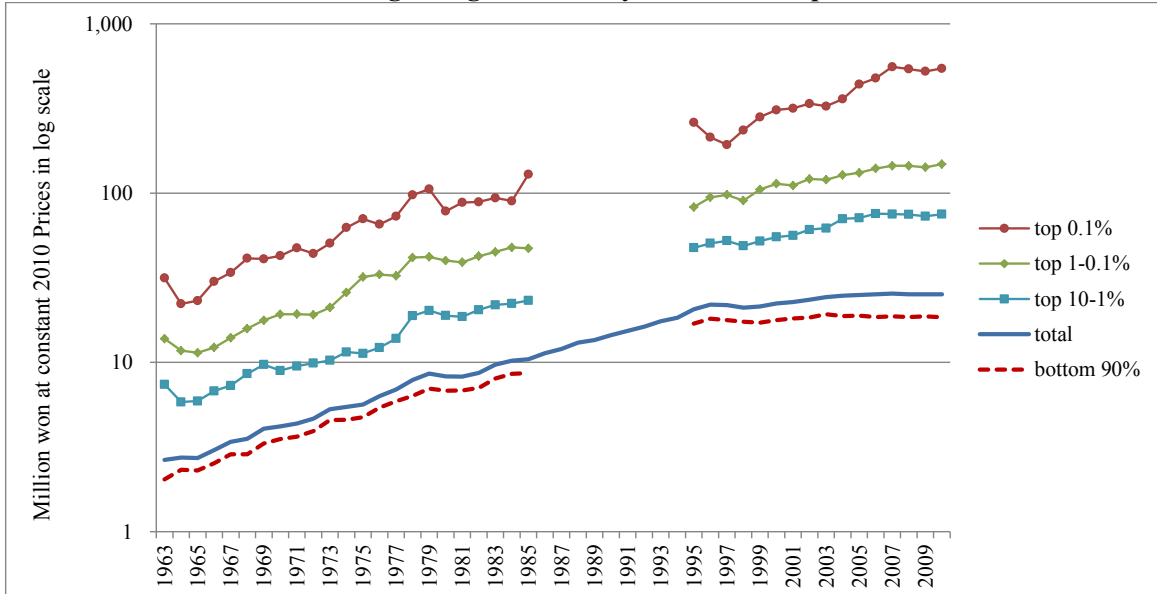
Note: 1) Tax unit for the U.K. is married couples and single adults until 1989 and adults afterwards.
 2) Top income shares are for all Korea(North and South combined) before liberation and for South Korea after liberation.

FIG. 4. Top 1% Wage Income Shares of Korea, Japan and the U.S.



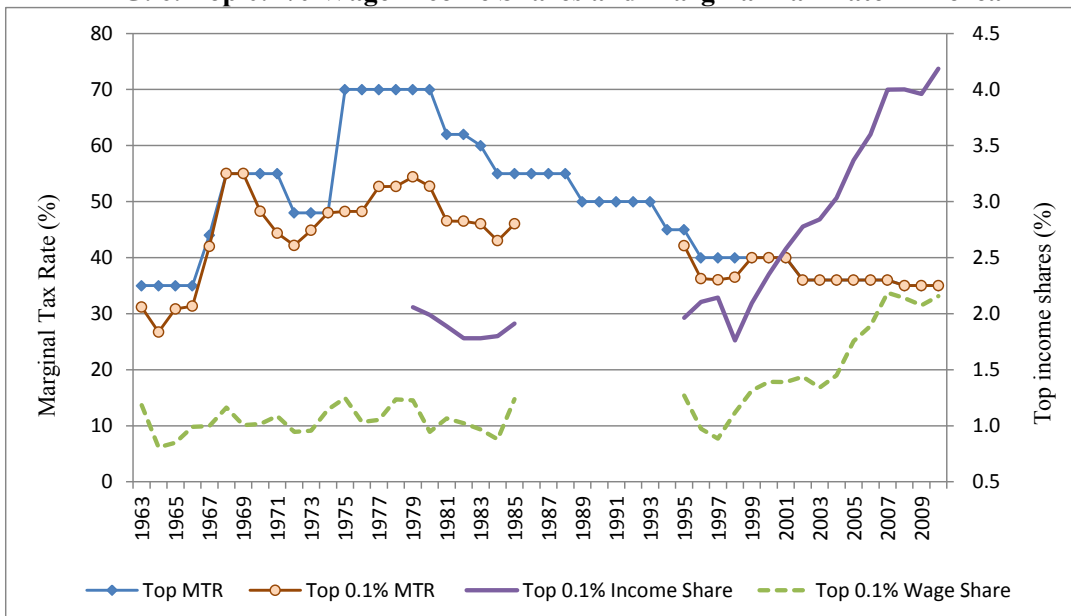
Sources: Table B4 in Appendix for Korea; Moriguchi and Saez (2008) for Japan; Piketty and Saez (2003) and updated estimates (Available from URL: : <http://elsa.berkeley.edu/~saez>) for the U.S.

FIG. 5. Average Wage Income By Income Groups in Korea



Source: Authors' calculation from Tables B1 and B4 in Appendix.

FIG. 6. Top 0.1% Wage Income Shares and Marginal Tax Rate in Korea



Source: Table B5 in Appendix for Top MTR; the MTRs for average Top 0.1% (Top 0.1% MTR) based on the authors' calculation.

<Appendix>

A. Top Income Shares

A.1. Income Taxation Data

The global income tax system was first introduced in 1934 by the colonial government. The Income Tax Law classified the sources of income into three classes: corporate income (Class I income), interest from corporate bonds and bank deposits (Class II income) and earned income from other sources (Class III income). Class III income consisted of salaries, wages, bonuses, farm income (classified further into income of farm owners and tenants), business income, rental income from real estate, dividends, interest from financial assets other than those classified as the Class II income. Capital gains were not taxed. Class III income was taxed for the households earning annually more than 800 won. The data on the number of taxpayers, the amount of income, tax paid, and tax rate by income brackets can be obtained from *Chōsen Zeimu Tōkeisho* [Statistical Tables of Public Revenue of Colonial Korea] and *Chōsen Sōtokufu Tōkei Nenpō* [Statistical Yearbook of the Government of Colonial Korea].

After liberation, the global income tax system was abolished. Instead, taxes were withheld at source separately on labor income, business income, rental income from real estate, interest and dividends. Thus, the data on total income earned by taxpayers are not available for this period of the separate tax system although statistics on the amount of tax paid for each source of income are reported in *Kuksae Tonggae Yeonbo* [Statistical Yearbook of National Tax] published by National Tax Service of Korea.

The global income tax system was reintroduced in 1975. Since then, the global income which includes interest, dividend, rents, wages, salaries, bonuses, and pension, excluding capital gains, was taxed. It should be noted that all taxpayers are not required to file global income tax returns. Taxpayers with wage income which includes wages, salaries and bonuses do not have to file global income tax returns if the amount of income from sources other than wage income does not exceed a certain level. For this type of taxpayers, the wage income tax is withheld at source. Those whose financial income (interest and dividends) exceeds 40 million won should file global income tax returns.²⁷ Taxes on financial income less than 40 million won are withheld at source. Therefore, the statistics on global income tax do not cover all the top income earners because wage income tax is withheld at source. Therefore, we have to combine statistics of global income tax and those of wage income tax in order to account for all top income earners.

Global income tax statistics can be obtained from *Kuksae Tonggae Yeonbo* [Statistical Yearbook of National Tax] since 1976. Unfortunately, it does not provide separate statistics on tax withheld at

²⁷ It was legislated as the financial global income tax in 1996. However, the enforcement was suspended during the period of 1998-2000 due to the economic crisis. Prior to 2003, the financial global income tax was levied if the total financial income of a couple exceeds 40 million won. Since 2003, the number of individuals who are required to pay the financial global income tax decreased since the criterion changed to include the total financial income of an individual rather than that of a couple. We cannot make adjustments for the inconsistency of coverage due to data limitations.

source such as wage income for the period of 1976-1994. The data on wage income tax for 1979-85 can be obtained from the internal source of National Tax Service. The available information on income tax has become rich in recent years, but was poor in the earlier years.

Adjustments are needed to ensure the consistency of long-term series in Korea which experienced the different regimes before and after liberation. However, some adjustments could not be made due to data limitations. First, due to the fact that Korea was divided after liberation, the pre-liberation data include both South and North Korea; however, those after liberation cover only South Korea. Second, before liberation, the current year's tax was levied on the income earned in the previous year. The system changed after the liberation so that it was levied on the income earned in the corresponding year. Thus, we shift the pre-liberation data forward by one year so that data for the period of 1934-43 correspond to those for 1933-42. Third, during the colonial period, the total household income was taxed and the amount of tax was allocated to individual household members in proportion to each member's income. It was different from the system after liberation in which taxes were levied against individuals rather than households. We adjust the income tax statistics during the colonial period so that they may correspond to the individual-based income tax statistics. Fourth, as aforementioned, global income tax statistics exclude the financial income of those who are not required to file global tax returns. The criterion for the filing requirement changed over time. We cannot make adjustment for this due to data limitations.

A.2. Control Totals for Population and Income

To compute the top income shares, we need to define the denominators (or control totals) for population and income. It is desirable to define the population denominator as the total number of income earners; yet, it is not possible to compute it due to data limitations. Thus, we define the population denominator as the total number of adults, defined as 20 years old and above. Because studies on other countries adopt the same definition, it is good for an international comparison. We obtain the total number of adults from the population statistics published by the Korea Statistical Office. For the period before liberation, we interpolate the data by using the rate of change between the population census in 1930, 1935, 1940 and 1944. The number of adults is presented in Table A.1.

The control total for income is obtained from National Accounts. The table of income account by institutional sectors in National Accounts provides the data on the amount of income accruing to households and nonprofit institutions serving households by source, such as compensation of employees, operating surplus, and property income. From this, we need to subtract the items which do not belong to the earnings of individual households usually defined as earned cash income. They are employer's social contribution in compensation of employees, imputed rents to owner-occupier in operating surplus, and financial intermediation services indirectly measured (FISIM) in the financial income. We compute the control total for income by subtracting these items from the household

income in National Accounts.²⁸

For the colonial period, we use the National Accounts constructed by Kim et al. (2012). Because the income account by institutional sectors was not constructed in this study, we compute the household income by subtracting the imputed rents from the sum of compensation of employees and operating surplus. Although we have to exclude the retained corporate income from the operating surplus, we cannot make adjustment for this because we do not have the relevant information. However, it will not make much difference for our estimation of the income denominator during this period because the retained corporate income would be a relatively small amount. The data on the income denominator is presented in Table A.1.²⁹ The ratio of global income taxpayers to the total adult population increased over time but remained low. It was less than 5% before liberation and less than 10% after liberation. It implies that a large proportion of taxpayers only paid the wage income tax which was withheld at source. Table A.1 also presents the total income and average income per adult at constant 2010 prices along with consumer price index to be used for the conversion. The data on consumer price index since 1965 are taken from the web-based database (KOSIS) of the Korea Statistical Office. Those before 1940 are obtained from the deflator for private consumption estimated by Kim et al. (2012: 507). We interpolate the data for the period between 1940 and 1965 by using the index for the Seoul area estimated by Park and Kim (2011).

A.3. Computing Top Income Shares

A.3.1. Pareto interpolation

We estimate the top income shares by using the number of taxpayers and the amount of income by income brackets obtained from the income tax statistics. To estimate the income shares of the top fractiles such as the top 10%, 1%, 0.1%, and 0.01%, we use the same Pareto interpolation method as Piketty and Saez (2001: 39). Pareto distribution has a cumulative distribution function specified as $F(y)=1-(k/y)^a$, where k and a are constants and a is called a Pareto coefficient. The distribution has a property such that the average income of taxpayers with an income level above a threshold income, y , is proportional to y by factor of b and $b=a/(a-1)$.

By using this property, we can estimate the top income shares as follows. First, we compute the cumulative proportion of taxpayers and income by dividing the number of cumulative taxpayers and the amount of cumulative income in each income bracket in the income tax statistics by the control

²⁸ The household income in National Accounts also includes the income of nonprofit institutions serving households which should be excluded for our purpose. However, due to the limitations of data, we cannot make adjustment for this. However, the amount is relatively too small to make much difference.

²⁹ The income denominator cannot be computed for the period of 1943-74. The income denominator for the period of 1941-42 cannot be computed since Kim et al.'s (2012) study ends in 1940, although the income tax statistics are available until 1942. The national accounts in Korea provide the income by institutional sectors after 1975.

total of population and income defined in A.1, respectively. Second, we select the income bracket which has the cumulative proportion of taxpayers, p , closest to the top fractiles such as the top 1%. If the lower income threshold for this bracket is s , using the above property of the Pareto distribution, we can estimate the Pareto coefficient $a(= b/(b-1))$ and $k(=s \cdot p^{1/a})$. Once we estimate a and k , we can compute the income share of the corresponding income group based on the relationship that $1-F(y)=(k/y)^a$. For example, if we compute the top 1% income shares, we place $1-F(y)$ equal to 0.01 and solve the equation in order to get the threshold income, y . Then, the average income of the top percentile is the product of y and b . The income share of intermediate fractiles such as the top 1-0.1% can be computed by the difference between income shares of the top 1% and the top 0.1%.

A.3.2. Adjustment of Income Tax Statistics for the Colonial Period

Income tax to be paid during the colonial period was counted by applying a corresponding tax rate to the household's net taxable income which equals the sum of income earned by all household members net of deductions. Then, the amount of tax to be paid by the household was allotted to each household member by the share of each member in the total household income. Due to this feature of the tax system at that time, the income tax statistics of this period provide two kinds of tabulations. One tabulation (Case A data) provides the number of taxpayers defined as household and the amount of net taxable income by brackets of the net taxable income. The other tabulation (Case B data) provides the number of taxpayers defined as individual by tax-paid brackets without any information on income.

To adjust the data for our purpose, first, we compute the amount of income by adding deductions to the net taxable income. The deductions during this period consisted of deductions for wage income, dependent family, and insurance; the deduction rate was scheduled to rise with an income decrease. We also make adjustment for the deduction for dividends, the tax on which was levied after deducting 40% of dividends. The deduction rate of dividends is thought to increase as the amount of dividends increases unlike the deduction for wage income. Because the data do not provide the deductions by income brackets, we apply the ratio of total deductions to the total net taxable income in order to obtain the total income regardless of income bracket.³⁰

Second, we should make an adjustment so that the tabulation in terms of household unit may be converted to the one in terms of an individual unit. Moriguchi and Saez (2008) made an adjustment in the Case A data for the pre-war period of Japan by substituting household income for household head's income. They considered that this adjustment does not make much difference because the income of household heads accounts for more than 95% of the household income. However, it may lead to an upward or downward bias in the estimation depending on the income groups. Therefore, we compare the estimates from Case A data and Case B data. By using Case B data with tax-paid

³⁰ The ratios for wage income and deductions are 6.9-9.9% and 0.9-2.2%, respectively.

brackets, we can compute the net taxable income corresponding to tax-paid in Case B data because we have the corresponding tax rates for all the brackets of the net taxable income. It allows us to compute the number of taxpayers by brackets of net taxable income in terms of individual household members from Case B data. However, the Case B data do not provide the amount of net taxable income by brackets. Therefore, we assume that the average net taxable income for each bracket equals $L+(H-L)*d$, where L and H are the lower and upper thresholds of the bracket.³¹ Although d may be different among brackets, it is assumed that d is constant in order to compute d based on the total amount of net taxable income from Case A data.³² Once we compute d , we obtain the amount of income by income brackets.

Comparing the estimates of top income shares based on the two methods mentioned above, we find that the estimate of the top 0.01% income shares based on Case A data is slightly greater than that based on the Case B data, whereas it is the other way round for top 1% income shares. However, there is not much difference between the top 0.1% and 0.5% income shares. It is due to two biasing factors which work in opposite direction when we estimate the top income shares based on Case A data, by substituting household income for household head's income. The first factor causes an upward bias since we overestimate household head income by including the incomes of other household members in household head income. The second factor gives rise to a downward bias as we enlarge the top income group to lower income levels due to the omission of high-income members other than household heads in Case B data. In the estimation of the top 0.01% income shares, the first factor dominates the second factor and vice versa in the estimation of the top 1% income shares.³³

In this paper, we use Case B data based on the individual unit in order to make the top income shares series in the colonial period consistent with those after liberation.

A.3.3. Combining Global Income Tax Statistics and Wage Income Tax Statistics

Due to the extensive withholding system, a small portion of taxpayers are required to file the global income tax returns as Table A.1 shows. In particular, taxpayers with wage income do not have to file

³¹ The coefficient d locates the average in between L and H . For instance, if d equals 0.4, the average is greater than L by 40% of difference between H and L . For the brackets of top incomes, the number of taxpayers tends to fall as the income increases. Thus, the average income of the bracket will be less than the midpoint, which implies that d is between 0 and 0.5.

³² When there is only one taxpayer in a bracket, usually observed in the highest income bracket, we can use the amount of income directly from Case A data. Although the assumption of constant d is restrictive, it will not make a significant error because the total amount of net taxable income is obtained from actual data.

³³ Moriguchi and Saez (2008) used the data similar to Case A data when they estimated the top income shares in Japan for the pre-war period. In this case, the estimate of the top 1% income shares using the data based on the household unit has a significant downward bias compared with the estimate based on an individual unit. The bias becomes larger in the estimation of the top 5% income shares.

global income tax returns if the amount of income from other sources does not exceed a certain level and the wage income tax is withheld at source in this case. Therefore, we complement global income tax statistics with wage income tax statistics in order to make up for a large number of wage income earners missing in the global income tax statistics. Because many taxpayers who file global income tax returns are also counted in wage income tax statistics, we have to remove those overlapping taxpayers when we combine the two income tax statistics.

Global income tax statistics provide the tabulation of number of taxpayers and the amount of income by income sources and by brackets of total income. The wage income in this tabulation is the double-counted amount of income when we combine the statistics. To subtract this part of the income, we have to make the income brackets of the two income tax statistics correspond each other. Faced with a similar problem, Moriguchi and Saez (2008: Appendix A.3.1) introduced an assumption that those with higher total income tend to have higher wage income. That is, they assumed that the ratios of wage income to total income are constant for each bracket.³⁴ Then, they computed the ratios by brackets of total income and converted the brackets of total income to those of wage income by multiplying the thresholds of total income by the ratios. This method just shifts the thresholds with the number of taxpayers and the amount of income unchanged.

Then, we remove the double-counted part by subtracting the number of taxpayers and the amount of wage income from the global income tax. We add up the global income tax statistics and the wage income tax statistics net of the double-counted part. To remove the overlapping part and to add up the two income statistics, we also have to make different income brackets of the two statistics correspond to each other. For this, we have to split the brackets of one tax statistics further with new thresholds set by using the other tax statistics. For this, we use the Pareto interpolation method.³⁵

³⁴ This assumption of Moriguchi and Saez (2008) may not reflect reality if the distribution of income by sources varies much among individual taxpayers. Thus, we try to estimate the top income shares by making different assumptions on the distribution. However, the estimates are not so much different from 11.9%, the estimate based on the method of Saez and Moriguchi (2008). Thus, we adopt the method of Saez and Moriguchi (2008), which allows us to compare our estimate of top income shares in Korea with that in Japan.

³⁵ This method is different from the Pareto interpolation explained in A.3.1 which does not use the data on the upper thresholds. The Pareto interpolation in A.3.1 uses only the lower thresholds and the number of taxpayers and their income above the lower thresholds. This method which considers the income bracket as an open upper interval is suitable when we estimate the top fractiles income shares; however, it is not proper when we create additional brackets within an income bracket by a new threshold. Therefore, we use an interpolation method which uses both the upper and lower thresholds of an income bracket. First, to interpolate the number of taxpayers, we use the equation $H(y_{i+1})/H(y_i) = (y_i/y_{i+1})^\alpha$ induced from the Pareto cumulative distribution function where y_i and y_{i+1} are the lower and upper thresholds of the corresponding income bracket, respectively, and H is the share of taxpayers with income higher than the threshold income, y . From the equation, we can obtain α , the Pareto coefficient of the income bracket which is different from a in the equation of A.3.1. If we substitute y_c , a new threshold income, for y_i in the above equation, we obtain the number of taxpayer in a corresponding new income bracket. Similarly, we can interpolate the amount of income by using the equation $G(y_{i+1})/G(y_i) = (y_i/y_{i+1})^{\alpha-1}$ where G is the share of income

A.3.4. Additional Adjustments Made by Periods

To overcome the limitations of data, we made additional assumptions if allowed. The data for the period of 2005-2010 are sufficient enough to estimate the top income shares without any adjustment.

However, the data for 1995-2004 are not complete as those for 2005-2010. The tabulations of global income tax for 1995-2004 provide the amount of income by brackets of net taxable income rather than total income. They should be converted into the amount of total income by income brackets. We compute the amount of deductions and exemptions (the difference between income and net taxable income) by using the data on the tax rate and the tax paid by brackets of net taxable income in income tax statistics and obtain the data by income brackets. The tabulations of wage income tax also provide the amount of net taxable income by brackets. We also need to convert the net taxable income into total income by adding exemptions and deductions to the net taxable income. However, the data source just provides the total amount of wage income without income brackets. Thus, we compute the ratios of wage income to net taxable wage income by income brackets from the data of year 2005 and apply the ratios to other years in order to convert the net taxable income into total wage income. Information needed to compute the double-counted amount of income when we combine the global income tax and wage income tax in A.3.3 is not available before 2005. Thus, from the data for the year 2006, we compute the ratios of the double-counted taxpayers to total taxpayers and their wage income to total wage income, respectively. We use the ratios for the period of 1995-2005 in order to remove the double-counted parts by income brackets.

The data for 1979-85 are similar to those for 1995-2004, as mentioned above. We do not have to make adjustments for wage income since we can obtain the amount of wage income by income brackets for this period. However, we do not make an adjustment for the overlapping parts for this period when we combine the global income statistics and wage income statistics. First of all, the relevant information is not available for this period. Second, this period is far too old to use the ratios computed from the data of year 2006. Third, during this period, only 3% of taxpayers filed global income tax returns. Thus, there were less overlapping taxpayers during this period compared with the more recent years. During this period, those who earned a large amount of financial income were exempt from filing global income tax returns as long as the financial income was their only income source. Overlapping taxpayers not adjusted in this period tend to yield an upward bias in estimating the top income shares, whereas the absence of financial global income tax leads to a downward bias.

No additional adjustment is needed for the period of 1933-40, except for the adjustments made in A.3.2. We also estimate the top income shares based only on the global income tax statistics, which are available since 1976. Although the top income shares estimated this way has a shortcoming for its narrow coverage of taxpayers compared with those estimated after combining two kinds of income tax

above the threshold income, y .

statistics, they allow us to estimate the continuous series in the top income shares over 1976-2010 without missing periods.

The estimates of the threshold income and the average income for the top percentiles are presented in Tables A2 and A3. They are converted into real terms at constant 2010 prices by using consumer price index. The estimates of top income shares are presented in Table A4.

A4. Top Income Composition

The income tax statistics before liberation provide the amount of income by sources without dividing the taxpayers into separate income brackets. Therefore, the reported figures under the title of the top 1% income composition in Table A5 for 1933-42 are not exactly those for top 1%. The size of top income groups varies from the top 1.4% in 1933 to the top 4.8% in 1942. We cannot compute the top income composition between 1942 and 2006 since the income tax statistics do not provide relevant information for computing the top income composition. We obtain income composition for the top 10%, 1%, 0.1%, and 0.05% for the period of 2007-10 by combining the statistics of global income tax and wage income tax.

The top income composition is presented in Table A5 by income sources such as wage income(wages, salaries, bonuses, and pension), business income(unincorporated business profits, farm income, and self-employment income), rents (rents from farmland and real estate), interest and dividends. After liberation, rents from farmland disappeared due to the land reform; the rents from real estate were then included as business income.

B. Top Wage Income Shares

B.1. Wage Income Taxation Data

We cannot estimate the top wage income shares before liberation because the income tax statistics during this period do not provide data by sources of income. After liberation, income taxes were separately withheld at source. The *Kuksae Tonggae Yonbo* [Statistical Yearbook of National Tax] (*Semu Tonggae Yonbo* [Statistical Yearbook of Tax Affairs] before 1965) provides the data on the number of taxpayers, the amount of income, tax paid, and tax rates by income brackets back to the year 1957. As aforementioned, the data source does not provide statistics on separate tax withheld at source, such as wage income tax for the years 1976-1994. Although the data on wage income tax for 1973-85 can be obtained from an internal source, they are missing for the years 1986-94.

B.2. Total Wage Denominator

We need to define control totals for total wage earners and total wage income in order to estimate the top wage income shares. The number of total wage earners changes depending on the sources of data due to the different coverage of workers. The total number of employment in the *Kyungje Hwaldong Ingu Yonbo* [Annual Survey on Economically Active Population(ASEAP)], published by Korea Statistical Office is found to be considerably lower than the number of employment from income tax statistics in recent years which provide the comprehensive information on wage income earners including taxpayers, workers with wage level below the exemption point, and daily workers. The reason is that among the workers counted in income tax statistics, there are some who are not classified as employed in the ASEAP. It is due to the difference in detecting the status of employment between the two data sources.³⁶ Here, we define the control total for wage income earners as the total number of employment in the ASEAP which includes regular, temporary and daily workers. The ASEAP provides data with consistent coverage back to the year 1963. Unfortunately, the income tax statistics does not report information on daily workers before 2008.

The total amount of wage income cannot be obtained from income tax statistics and thus computed from National Accounts. Wages and salaries in the table of income account by institutional sectors of National Accounts, net of employer's social contribution, are the most comprehensive; however, they include earnings of workers who are not classified as employed in the ASEAP. The wage income of this group is estimated to account for 6.7% of wage and salaries in National Accounts in 2009.³⁷ Because we do not have relevant data to compute the figure for other years, we deflate the wage and salaries of National accounts for other years by the same rate of 6.7%.

The amount of wage and salaries is available in National Accounts since 1975. For earlier years, we extrapolated our estimate in 1975 by using the growth rate of the compensation of employees presented in the table of distribution of national income in National Accounts published by the Bank of Korea (1982). The amounts of total and average wage income are converted into those at constant 2010 prices by using the consumer price index. The data are presented in Table B1.

B.3. Top Wage Numerator

The data on the top wage income are obtained by using the number of taxpayers and the amount of

³⁶ The ASEAP defines a worker as employed if he or she works more than one hour for pay during a surveyed week which is much shorter than the time span for income tax statistics which detect the employment based on the record of pay during a year.

³⁷ The income tax statistics in 2009 allows us to estimate the proportion of income earned by daily workers who are not classified as employed in the ASEAP. The income level of this group of workers is very low. By assuming that workers with a lower level of wage income in the income tax statistics tend to be classified as unemployed, we compute the amount of wage income accruing to the workers who should not be classified as employed, so that the number of employment in the income tax statistics may equal the total employment in the ASEAP. This is estimated to be 6.7% of wage and salaries in National Accounts in 2009.

income by income brackets provided by income tax statistics. To estimate the income shares of top percentiles, we utilize the same method of Pareto interpolation as presented in A.3.1. Due to the fact that the information provided by the income tax statistics varies over years, we made assumptions to compute the top wage income. Because we already explained the data on wage income for the periods of 1995-2010 and 1979-1985 in A.3.4, we focus on the data of the earlier period here.

The data on income tax for the period of 1973-78 are taken from *Juyo Saemu Tonggae*[Statistics on Major Tax Affairs], an unpublished internal document reported in 1981. This source provides the number of taxpayers and the amount of tax paid by income brackets without specifying the amount of wage income. It is similar to the situation of Case B data in A.3.2. In A.3.2, we estimate the average income of an income bracket by estimating d when the average income is specified as $L+(H-L)*d$, where L and H are the upper and lower thresholds, respectively. Because we know the total income, we assume that d is constant in all the income brackets and thus, we can estimate d . However, we do not have information on total wage income here. Thus, we assume that the average wage income is $1.5*L$ for the highest income bracket and therefore, compute the average wage income for other income brackets by fixing d equal to 0.4, which is based on the estimate from the adjacent year when the data are available to estimate d . Finally, we compute the total wage income by income brackets by multiplying the number of taxpayers and the average wage income.

The data for 1968-72 are taken from *Kuksae Tonggae Yeonbo* [Statistical Yearbook of National Tax] which provides the tax rate, the number of taxpayers, the amount of income, and tax paid by income brackets. The amount of income in 1970-72 can be used directly because it equals the total wage income to workers. However, in 1969-68, we have data on the amount of net taxable income which needs to be converted to the amount of wage income taxpayers earned. Since the conversion rate cannot be estimated based on the data for this period, we use the conversion rate by income brackets for 1970 instead. The conversion rate in 1970 is the ratio of total wage income to net taxable income which is estimated by using the tax rate and the amount of tax paid by income brackets.

The Statistical Yearbook of National Tax in 1957-67 provides two kinds of tables on income tax statistics. One is the table which provides the tax rate, the number of taxpayers and the amount of income by income brackets. The information from this table is adequate for our purpose; yet, income bracket is too coarse to be used with a small number of brackets. The other table divides income groups into finer brackets but provides only the number of taxpayers. It is similar to Case B data in A.3.2. Thus, we apply the same method as used for Case B data to the latter table and estimate the amount of income by income brackets. We also use the conversion rate for 1970 to convert the amount of net taxable income into total wage income for this period because the table provides the amount of net taxable income only.

The threshold income and the average income for top income groups are presented in Tables B2 and B3. They are also converted to constant 2010 prices by using the consumer price index. Top income shares are presented in Table B4. Although wage income tax statistics go back to the year

1957, we can estimate the top income shares since 1963 because the ASEAP is available since 1963.

B.4. Marginal Tax Rates for Top Wage Income Earners

The marginal tax rates(MTRs) at the wage income threshold for the top wage income groups such as the top 10%, 1%, 0.1%, and 0.01% are estimated by using the method of Moriguchi and Saez (2008: Appendix C.3). We assume that a taxpayer at each threshold income has only wage income and forms a household with a non-working spouse and two dependent children. We compute the net taxable income by subtracting exemptions and deductions based on the income tax law in the corresponding years from the threshold income and use the tax schedule to obtain the MTRs. The estimates of MTRs are presented in Table B5.

By using the MTR at each threshold income, we can obtain the MTR for the average taxpayer of each top income group. To obtain the MTR of the average taxpayer in the top 0.1% group, we take the weighted average of the average taxpayers of the top 0.01% and the top 0.1-0.01%.

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Table A1. Adult Population, Number of Taxpayers, Income, and CPI

	Total adult population(age 20 and over)	Number of taxpayers (thousands)		Taxpayer/adult population (%)		Total income (billion won)	Average income	CPI (2010=100)
	(thousands)	Global income tax	Wage income tax	Global income tax	Wage income tax		(thousand won)	
	A	B	C	B/A	C/A	D	D/A	E
1933	11,094	154		1.4		14,107	1,272	0.0000103
1934	11,262	173		1.5		14,280	1,268	0.0000114
1935	11,432	193		1.7		16,170	1,414	0.0000122
1936	11,520	198		1.7		16,051	1,393	0.0000129
1937	11,609	237		2.0		19,104	1,646	0.0000140
1938	11,699	269		2.3		18,743	1,602	0.0000153
1939	11,789	276		2.3		16,491	1,399	0.0000196
1940	11,880	362		3.1		19,782	1,665	0.0000205
1941	11,992	534		4.5				0.0000213
1942	12,105	576		4.8				0.0000232
1976	17,959	402		2.2		83,236	4,635	12.65
1977	18,592	443		2.4		94,564	5,086	13.92
1978	19,249	475		2.5		111,224	5,778	15.94
1979	19,941	551	4,889	2.8	24.5	119,086	5,972	18.86
1980	20,653	589	5,005	2.9	24.2	107,503	5,205	24.27
1981	21,386	612	5,888	2.9	27.5	111,687	5,222	29.45
1982	22,109	714	6,041	3.2	27.3	120,347	5,443	31.57
1983	22,805	682	6,595	3.0	28.9	131,324	5,759	32.65
1984	23,475	748	7,071	3.2	30.1	148,740	6,336	33.39
1985	24,093	762	7,124	3.2	29.6	161,995	6,724	34.21
1986	24,702	855		3.5		185,049	7,491	35.15
1987	25,325	662		2.6		209,937	8,290	36.23
1988	25,962	704		2.7		233,492	8,993	38.81
1989	26,637	637		2.4		256,211	9,618	41.03
1990	27,454	740		2.7		283,125	10,313	44.54
1991	28,140	828		2.9		318,729	11,327	48.70
1992	28,818	934		3.2		344,085	11,940	51.73
1993	29,464	1,129		3.8		368,007	12,490	54.21
1994	30,078	1,256		4.2		404,667	13,454	57.61
1995	30,659	1,338	7,198	4.4	23.5	447,923	14,610	60.19
1996	31,168	1,216	6,958	3.9	22.3	486,670	15,614	63.15
1997	31,689	1,254	6,944	4.0	21.9	498,359	15,727	65.96
1998	32,134	1,166	6,269	3.6	19.5	477,469	14,859	70.91
1999	32,645	1,267	5,520	3.9	16.9	487,741	14,941	71.49
2000	33,254	1,529	5,934	4.6	17.8	512,345	15,407	73.10
2001	33,888	1,669	6,447	4.9	19.0	519,834	15,340	76.08
2002	34,472	1,842	6,188	5.3	17.9	534,899	15,517	78.18
2003	35,007	1,905	6,258	5.4	17.9	543,903	15,537	80.92
2004	35,436	1,943	6,268	5.5	17.7	559,652	15,793	83.83
2005	35,760	2,279	6,107	6.4	17.1	579,632	16,209	86.14
2006	36,226	2,736	6,621	7.6	18.3	601,400	16,601	88.07
2007	36,641	3,074	7,749	8.4	21.1	619,847	16,917	90.30
2008	37,133	3,584	7,981	9.7	21.5	616,895	16,613	94.52
2009	37,536	3,571	8,541	9.5	22.8	617,346	16,447	97.13
2010	37,968	3,785	9,244	10.0	24.3	638,798	16,825	100.00

Note: 1) Statistics are for all Korea(North and South combined) before liberation and for South Korea after liberation.

2) Total income and average income are at constant 2010 prices.

Table A2. Threshold Income of Top Income Groups

	P99.99	P99.95	P99.9	P99.5	P99	P95	P90
1933	185,136	74,267	46,849	16,099	10,574		
1934	204,486	74,608	47,750	15,359	9,576		
1935	203,989	75,431	48,587	15,589	9,686		
1936	186,339	71,454	45,799	14,952	9,290		
1937	230,471	89,483	54,298	16,233	10,076		
1938	223,658	84,185	52,474	16,527	10,425		
1939	204,640	71,145	46,085	13,768	8,762	2,902	
1940	244,524	83,155	54,223	16,849	10,231	3,383	
1979	134,528	76,165	59,973	32,722	25,451	12,746	8,620
1980	131,681	71,280	49,722	30,250	23,515	12,118	7,681
1981	129,168	69,434	53,369	28,930	22,590	11,868	8,458
1982	135,663	70,123	54,625	31,498	24,662	13,301	8,728
1983	148,668	80,784	62,378	34,124	26,454	14,289	9,013
1984	164,008	83,902	65,254	35,865	28,537	14,661	9,276
1985	176,154	83,921	64,847	36,524	28,729	15,995	10,274
1995	491,648	203,713	145,270	78,818	59,355	37,894	27,176
1996	537,942	235,608	167,108	87,999	65,729	45,555	38,402
1997	565,959	246,090	176,106	92,871	70,157	46,914	39,543
1998	448,465	192,108	138,262	78,374	59,922	42,164	35,935
1999	486,342	224,510	163,549	89,336	67,751	44,563	37,462
2000	572,142	230,732	180,846	100,672	76,737	48,202	40,149
2001	643,994	257,243	191,493	103,962	78,826	48,487	39,829
2002	696,920	277,351	209,788	97,466	87,251	50,418	40,654
2003	722,777	284,802	213,303	98,665	88,808	51,149	41,061
2004	806,511	310,419	225,376	115,051	93,771	53,973	37,936
2005	865,770	325,577	218,593	111,832	89,597	49,962	34,286
2006	959,947	366,053	249,599	125,117	100,483	62,827	42,321
2007	1,083,951	403,846	271,725	126,665	97,468	58,654	39,139
2008	1,065,100	404,935	274,469	126,696	98,568	58,207	38,024
2009	1,037,115	402,641	274,394	125,905	97,364	56,961	36,467
2010	1,121,247	429,935	288,186	137,340	106,193	57,666	36,662

Note: 1) Statistics are for all Korea(North and South combined) before liberation and for South Korea after liberation.

2) P99.99 denotes the threshold income of the top 0.01% income group.

Unit: Thousand won at constant 2010 prices

Table A3. Average Income of Top Income Groups

	top 0.01%	top 0.05%	top 0.1%	top 0.5%	top 1%	top 5%	top 10%
1933	359,055	156,610	106,495	40,912	26,871		
1934	355,881	156,563	105,868	39,632	25,540		
1935	359,875	158,179	107,221	40,527	26,083		
1936	345,633	151,223	102,622	38,906	25,080		
1937	385,462	174,275	116,965	43,171	27,589		
1938	480,069	189,942	124,160	44,661	28,512		
1939	405,180	159,368	105,667	37,695	24,080	8,387	
1940	473,861	187,105	123,566	44,549	28,346	9,841	
1979	512,514	185,821	122,936	57,197	42,802	22,290	16,142
1980	372,248	148,377	103,502	51,511	38,885	20,587	14,990
1981	311,005	135,555	98,583	49,158	37,303	20,148	14,952
1982	290,985	130,921	96,980	51,531	39,553	21,825	16,143
1983	268,720	134,996	102,570	55,748	42,952	23,594	17,382
1984	349,532	156,217	114,080	60,333	46,560	25,081	18,494
1985	428,742	179,165	128,467	63,844	48,125	26,082	19,393
1995	972,494	408,145	286,940	133,403	100,460	56,029	42,656
1996	1,125,617	468,747	328,597	151,973	113,513	60,450	50,959
1997	1,147,621	478,519	337,094	155,989	117,839	62,271	52,487
1998	834,256	365,999	261,673	127,911	97,797	54,803	46,707
1999	1,076,139	444,339	313,043	148,645	112,730	59,450	49,977
2000	1,299,678	521,668	362,397	165,489	126,143	65,468	54,530
2001	1,461,176	583,285	395,385	173,074	131,227	67,697	55,609
2002	1,643,735	645,496	430,878	191,399	142,185	73,126	58,965
2003	1,706,857	667,576	441,596	194,848	143,277	74,882	60,113
2004	1,929,356	732,958	478,835	208,657	152,226	82,413	62,424
2005	2,193,549	827,865	546,320	224,453	161,493	83,047	61,236
2006	2,350,134	901,954	597,657	247,515	178,895	93,586	69,576
2007	2,724,409	1,030,650	676,493	270,385	190,875	96,384	71,713
2008	2,621,057	1,005,841	664,608	267,317	188,931	95,597	71,207
2009	2,552,755	981,317	651,362	264,069	186,387	93,967	70,064
2010	2,772,543	1,063,113	704,359	281,254	197,848	98,159	72,844

Note: Statistics are for all Korea(North and South combined) before liberation and for South Korea after liberation.

Unit: Thousand won at constant 2010 prices

Table A4. Top Income Shares in Korea

	top 0.01%	top 0.05%	top 0.1%	top 0.5%	top 1%	top 5%	top 10%
1933	2.82	6.16	8.37	16.09	21.13		
1934	2.81	6.17	8.35	15.63	20.14		
1935	2.54	5.59	7.58	14.33	18.44		
1936	2.48	5.43	7.37	13.96	18.00		
1937	2.34	5.30	7.11	13.12	16.77		
1938	3.00	5.93	7.75	13.94	17.80		
1939	2.90	5.70	7.55	13.47	17.21	29.98	
1940	2.85	5.62	7.42	13.38	17.02	29.55	
1979	0.86	1.56	2.06	4.79	7.17	18.66	27.03
1980	0.72	1.43	1.99	4.95	7.47	19.78	28.80
1981	0.60	1.30	1.89	4.71	7.14	19.29	28.63
1982	0.53	1.20	1.78	4.73	7.27	20.05	29.66
1983	0.47	1.17	1.78	4.84	7.46	20.49	30.18
1984	0.55	1.23	1.80	4.76	7.35	19.79	29.19
1985	0.64	1.33	1.91	4.75	7.16	19.40	28.84
1995	0.67	1.40	1.96	4.57	6.88	19.18	29.20
1996	0.72	1.50	2.10	4.87	7.27	19.36	32.64
1997	0.73	1.52	2.14	4.96	7.49	19.80	33.37
1998	0.56	1.23	1.76	4.30	6.58	18.44	31.43
1999	0.72	1.49	2.10	4.97	7.55	19.90	33.45
2000	0.84	1.69	2.35	5.37	8.19	21.25	35.39
2001	0.95	1.90	2.58	5.64	8.55	22.07	36.25
2002	1.06	2.08	2.78	6.17	9.16	23.56	38.00
2003	1.10	2.15	2.84	6.27	9.22	24.10	38.69
2004	1.22	2.32	3.03	6.61	9.64	26.09	39.53
2005	1.35	2.55	3.37	6.92	9.96	25.62	37.78
2006	1.42	2.72	3.60	7.45	10.78	28.19	41.91
2007	1.61	3.05	4.00	7.99	11.28	28.49	42.39
2008	1.58	3.03	4.00	8.05	11.37	28.77	42.86
2009	1.55	2.98	3.96	8.03	11.33	28.57	42.60
2010	1.65	3.16	4.19	8.36	11.76	29.17	43.30

Note: 1) Statistics are for all Korea(North and South combined) before liberation and for South Korea after liberation.

2) The income shares of the top 0.5-0.1% are the difference between the top 0.5% and 0.1% income shares.

Unit: %

Table A5. Top Income Composition

	top 1%							top 0.05%			
	Employment	Business	Rents	Interest	Dividends	Employment		Business+Rents	Interest	Dividends	
1933	30.1	35.1	30.7	1.7	2.4	2007	39.5	28.4	7.6	24.5	
1934	26.8	35.8	33.5	1.7	2.3	2008	40.1	29.3	7.2	23.4	
1935	25.6	36.9	33.6	1.6	2.4	2009	39.5	32.0	7.2	21.3	
1936	26.9	39.4	28.5	1.4	3.8	2010	38.7	31.2	5.1	25.0	
1937	24.9	39.1	30.5	1.3	4.2						
1938	24.8	40.4	28.9	1.2	4.7						
1939	26.5	45.8	21.3	1.1	5.3	2007	42.5	30.6	6.9	19.9	
1940	26.5	43.4	24.6	1.0	4.6	2008	41.7	32.2	6.6	19.5	
1941	31.6	41.1	22.6	1.0	3.7	2009	41.1	34.4	6.7	17.8	
1942	36.8	42.1	16.2	1.0	3.9	2010	40.9	33.5	4.7	20.9	
		Business+Rents									
2007	62.7	25.2		3.9	8.2	2007	83.1	12.8	1.5	2.7	
2008	61.3	27.3		3.6	7.8	2008	83.5	13.0	1.2	2.3	
2009	60.3	28.9		3.7	7.2	2009	82.9	13.7	1.3	2.1	
2010	58.0	30.0		2.8	9.3	2010	82.6	14.0	0.9	2.5	

Note: 1) The figures before liberation are not exactly the income shares of the top 1%. They are income shares of different top income groups from the top 1.4% in 1933 to the top 4.8% in 1942.

2) A portion of interest is excluded in the estimation before liberation and taxpayers with financial income below 40 million won are excluded after liberation.

3) The top income composition for 1943-2006 cannot be estimated due to data limitations.

4) Statistics are for all Korea(North and South combined) before liberation and for South Korea after liberation.

Unit: %

Table B1. Number of Employment and Wage Income

	Number of Employment	Eamers of Wage Income(thousands)			Ratio(%)	Wage Income	Average Wage Income	CPI
	(thousands)	Taxpayer	Workers Below Exemption Point	Daily workers		(billion won)	(thousand won)	(2010=100)
	A	B			B/A	C	C/A	D
1963	2,383	653				6,335	2,659	2.1
1964	2,363	797				6,485	2,744	2.7
1965	2,609	965				7,122	2,730	3.0
1966	2,780	1,142				8,452	3,040	3.4
1967	3,040	1,517				10,329	3,398	3.7
1968	3,400	1,735				12,038	3,541	4.1
1969	3,547	2,650				14,406	4,061	4.6
1970	3,746	2,868				15,725	4,198	5.4
1971	3,923	4,026				17,111	4,362	6.1
1972	4,005	3,573				18,626	4,651	6.8
1973	4,153	2,616				21,947	5,285	7.0
1974	4,444	2,778				24,281	5,464	8.8
1975	4,751	1,226			25.8	26,805	5,642	11.0
1976	5,140	1,693			32.9	32,556	6,334	12.6
1977	5,714	1,732			30.3	39,537	6,919	13.9
1978	6,242	1,880			30.1	49,210	7,884	15.9
1979	6,479	2,435			37.6	55,738	8,603	18.9
1980	6,464	2,332			36.1	53,500	8,277	24.3
1981	6,605	3,086			46.7	54,499	8,251	29.5
1982	6,839	2,888			42.2	59,379	8,682	31.6
1983	7,170	3,239			45.2	69,530	9,697	32.6
1984	7,631	3,665			48.0	78,057	10,229	33.4
1985	8,104	4,042			49.9	84,551	10,433	34.2
1986	8,433					95,534	11,329	35.2
1987	9,191					110,444	12,016	36.2
1988	9,610					125,770	13,087	38.8
1989	10,390					141,075	13,578	41.0
1990	10,950					158,832	14,505	44.5
1991	11,699					179,787	15,368	48.7
1992	11,910					193,816	16,273	51.7
1993	11,944					209,359	17,528	54.2
1994	12,479					229,358	18,379	57.6
1995	12,899	7,198			55.8	265,286	20,566	60.2
1996	13,200	6,958			52.7	289,645	21,943	63.2
1997	13,404	6,944			51.8	292,255	21,804	66.0
1998	12,296	6,269			51.0	259,316	21,089	70.9
1999	12,663	5,520			43.6	270,860	21,390	71.5
2000	13,360	5,934			44.4	297,557	22,272	73.1
2001	13,659	6,447			47.2	310,938	22,764	76.1
2002	14,181	6,188			43.6	333,200	23,496	78.2
2003	14,402	6,258			43.4	350,132	24,311	80.9
2004	14,894	6,268			42.1	368,642	24,751	83.8
2005	15,185	6,107	5,796		40.2	380,356	25,048	86.1
2006	15,551	6,621	5,974		42.6	392,243	25,223	88.1
2007	15,970	7,749	5,628		48.5	406,945	25,482	90.3
2008	16,206	7,981	6,065	7,381	49.2	409,760	25,284	94.5
2009	16,454	8,541	5,754	7,559	51.9	415,049	25,225	97.1
2010	16,971	9,244	5,932	7,825	54.5	428,282	25,236	100.0

Note: 1) The number of taxpayers before 1972 is computed by dividing the sum of monthly tax units withheld at source by 12.

2) The number of taxpayers before 1974 includes those with wage income below the exemption point.

Table B2. Threshold Wage Income of Top Income Groups

	P99.99	P99.95	P99.9	P99.5	P99	P95	P90
1963	37,721	27,339	26,643	13,072	10,365	7,530	5,638
1964	29,202	21,589	16,522	11,820	9,981	5,741	4,743
1965	30,524	21,262	16,905	11,069	9,671	5,633	4,708
1966	31,984	21,169	19,308	11,171	9,618	6,649	5,187
1967	42,673	26,582	21,873	11,475	8,564	7,172	6,119
1968	54,303	23,602	23,543	15,416	12,610	8,230	7,324
1969	53,520	30,953	22,783	16,667	14,346	9,380	8,214
1970	55,936	35,415	27,849	19,191	15,795	9,115	6,952
1971	42,934	30,725	31,128	19,044	15,479	9,417	7,195
1972	46,307	28,582	28,884	18,022	14,552	9,523	7,726
1973	72,502	42,400	33,653	19,840	16,715	9,954	7,895
1974	89,806	52,519	41,684	21,728	18,002	11,439	8,536
1975	101,130	59,141	46,941	27,414	20,317	10,722	8,390
1976	94,015	54,980	43,638	25,520	20,957	11,916	8,999
1977	103,857	61,311	48,734	31,489	25,967	13,153	9,643
1978	139,858	81,789	64,916	40,130	31,578	18,950	13,741
1979	140,040	51,358	70,444	42,750	33,566	19,507	14,077
1980	112,666	65,453	51,802	37,722	30,617	18,569	14,209
1981	103,481	72,027	55,962	36,213	29,887	17,966	13,587
1982	107,680	77,305	63,450	39,927	32,000	19,890	15,314
1983	128,567	83,466	70,094	42,750	34,569	20,866	16,704
1984	129,055	81,958	70,719	43,923	35,058	21,840	17,066
1985	156,401	96,965	70,974	46,333	36,662	22,996	17,549
1995	423,720	170,410	117,344	83,877	66,166	47,014	39,418
1996	316,124	169,153	128,275	93,517	77,552	50,213	47,372
1997	270,530	164,916	132,888	97,226	83,288	58,150	48,986
1998	357,529	171,846	125,984	90,446	73,569	45,543	45,948
1999	420,592	223,576	172,356	104,507	83,972	50,526	49,823
2000	466,582	244,968	185,445	100,075	92,747	56,898	52,456
2001	484,007	230,437	178,611	91,342	92,907	57,965	52,440
2002	517,274	251,961	198,779	106,372	101,703	64,007	56,227
2003	496,453	249,161	197,987	108,873	102,701	66,590	56,732
2004	576,654	275,907	209,691	126,018	99,478	69,401	57,780
2005	696,220	306,165	214,859	121,463	103,150	68,380	57,542
2006	773,525	339,656	242,554	145,150	121,575	79,157	64,459
2007	899,780	359,269	252,737	141,794	116,432	71,570	59,710
2008	869,648	370,122	264,132	115,942	115,522	71,319	58,833
2009	806,972	361,377	252,355	115,935	112,152	69,605	57,515
2010	869,824	384,761	271,865	128,797	120,464	73,118	57,606

Note: P99.99 denotes the threshold income of the top 0.01% income group.

Unit: Thousand won at constant 2010 prices

Table B.3. Average Wage Income of Top Income Groups

	top 0.01%	top 0.05%	top 0.1%	top 0.5%	top 1%	top 5%	top 10%
1963	73,115	38,665	31,496	19,651	15,581	10,173	8,236
1964	38,095	26,826	22,196	14,992	12,788	7,950	6,531
1965	39,306	27,023	23,146	14,842	12,587	8,038	6,576
1966	80,445	38,569	30,083	17,560	14,031	9,253	7,505
1967	90,282	43,635	33,894	19,861	14,822	8,627	7,685
1968	115,965	53,359	41,186	22,757	18,381	11,291	9,557
1969	119,931	55,484	40,839	24,716	20,034	12,740	10,747
1970	99,151	54,210	42,629	26,079	21,583	13,486	10,213
1971	138,629	60,980	47,425	27,169	22,083	13,540	10,773
1972	119,650	55,049	43,952	26,496	21,605	13,637	11,064
1973	108,754	63,600	50,479	29,987	24,027	14,605	11,655
1974	134,709	78,778	62,526	38,359	29,537	16,731	13,326
1975	151,696	88,712	70,411	48,283	35,784	18,127	13,753
1976	141,022	82,470	65,457	38,279	36,303	19,117	14,642
1977	155,786	91,675	72,870	44,609	36,532	21,206	16,106
1978	209,787	122,684	97,374	59,393	47,236	27,967	21,677
1979	371,725	136,325	105,503	61,726	48,325	29,076	23,059
1980	170,049	98,789	78,186	53,970	43,805	26,832	21,404
1981	203,417	113,269	88,005	55,525	43,901	26,487	21,131
1982	200,786	108,110	88,734	58,658	47,011	28,721	23,097
1983	171,859	111,572	93,696	61,640	49,844	30,420	24,675
1984	182,155	104,112	89,835	65,095	51,956	31,474	25,213
1985	390,953	176,360	129,086	69,963	55,360	33,214	26,445
1995	949,131	383,894	261,307	127,511	100,586	63,040	52,855
1996	535,486	281,496	213,469	128,118	106,245	68,792	56,087
1997	400,762	239,535	193,016	125,168	107,224	74,862	57,834
1998	700,867	325,720	235,516	128,835	104,794	64,873	54,386
1999	728,820	371,305	281,394	152,706	122,699	73,829	59,112
2000	813,099	409,373	309,902	164,382	133,179	81,702	62,889
2001	898,146	427,611	316,524	158,959	131,432	82,001	63,758
2002	935,270	455,564	337,449	176,505	142,785	89,862	69,053
2003	868,443	435,856	325,778	175,332	140,533	91,120	69,939
2004	1,019,289	506,795	358,958	191,278	150,994	94,346	78,547
2005	1,416,708	626,003	439,313	209,618	162,488	97,910	80,360
2006	1,531,785	680,066	476,942	226,153	173,557	106,892	85,462
2007	2,010,649	820,551	557,274	247,962	186,166	106,615	86,275
2008	1,789,626	778,509	540,790	237,382	184,466	106,068	85,786
2009	1,731,113	749,829	523,615	232,904	180,176	103,418	83,713
2010	1,723,153	771,841	544,354	249,109	187,951	108,342	86,264

Unit: Thousand won at constant 2010 prices

Table B4. Top Wage Income Shares in Korea

	top 0.01%	top 0.05%	top 0.1%	top 0.5%	top 1%	top 5%	top 10%
1963	0.28	0.73	1.18	3.70	5.86	19.13	30.98
1964	0.14	0.49	0.81	2.73	4.66	14.48	23.80
1965	0.14	0.49	0.85	2.72	4.61	14.72	24.09
1966	0.26	0.63	0.99	2.89	4.62	15.22	24.69
1967	0.27	0.64	1.00	2.92	4.36	12.70	22.62
1968	0.33	0.75	1.16	3.21	5.19	15.94	26.99
1969	0.30	0.68	1.01	3.04	4.93	15.68	26.46
1970	0.24	0.65	1.02	3.11	5.14	16.06	24.33
1971	0.32	0.70	1.09	3.11	5.06	15.52	24.70
1972	0.26	0.59	0.95	2.85	4.65	14.66	23.79
1973	0.21	0.60	0.96	2.84	4.55	13.82	22.05
1974	0.25	0.72	1.14	3.51	5.41	15.31	24.39
1975	0.27	0.79	1.25	4.28	6.34	16.06	24.38
1976	0.22	0.65	1.03	3.02	5.73	15.09	23.12
1977	0.23	0.66	1.05	3.22	5.28	15.32	23.28
1978	0.27	0.78	1.24	3.77	5.99	17.74	27.50
1979	0.43	0.79	1.23	3.59	5.62	16.90	26.80
1980	0.21	0.60	0.94	3.26	5.29	16.21	25.86
1981	0.25	0.69	1.07	3.36	5.32	16.05	25.61
1982	0.23	0.62	1.02	3.38	5.41	16.54	26.60
1983	0.18	0.58	0.97	3.18	5.14	15.68	25.45
1984	0.18	0.51	0.88	3.18	5.08	15.38	24.65
1985	0.37	0.85	1.24	3.35	5.31	15.92	25.35
1995	0.46	0.93	1.27	3.10	4.89	15.33	25.70
1996	0.24	0.64	0.97	2.92	4.84	15.68	25.56
1997	0.18	0.55	0.89	2.87	4.92	17.17	26.52
1998	0.33	0.77	1.12	3.05	4.97	15.38	25.79
1999	0.34	0.87	1.32	3.57	5.74	17.26	27.64
2000	0.37	0.92	1.39	3.69	5.98	18.34	28.24
2001	0.39	0.94	1.39	3.49	5.77	18.01	28.01
2002	0.40	0.97	1.44	3.76	6.08	19.12	29.39
2003	0.36	0.90	1.34	3.61	5.78	18.74	28.77
2004	0.41	1.02	1.45	3.86	6.10	19.06	31.73
2005	0.57	1.25	1.75	4.18	6.49	19.54	32.08
2006	0.61	1.35	1.89	4.48	6.88	21.19	33.88
2007	0.79	1.61	2.19	4.87	7.31	20.92	33.86
2008	0.71	1.54	2.14	4.69	7.30	20.97	33.93
2009	0.69	1.49	2.08	4.62	7.14	20.50	33.19
2010	0.68	1.53	2.16	4.94	7.45	21.47	34.18

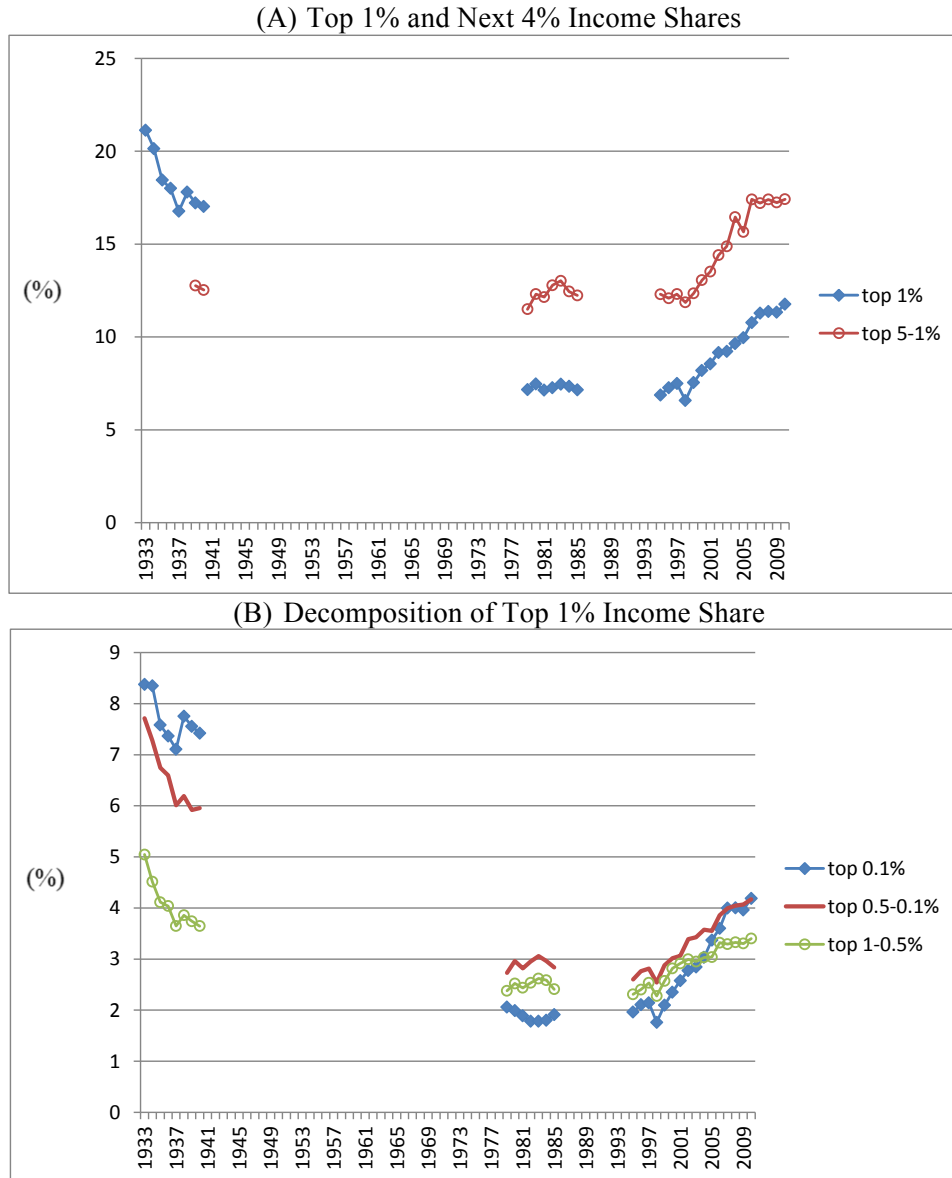
Note: The income shares of the top 0.5-0.1% are the difference between the top 0.5% and 0.1% income shares.
Unit: %

Table B5. Marginal Tax Rates of Top Wage Income in Korea

	Top MTR	0.01%	0.1%	1%	5%	10%
1933	13.5	3.3	1.3	0.2		
1934	27.0	8.0	2.5	0.4		
1935	27.0	8.0	3.5	0.6		
1936	27.0	8.0	3.5	0.6		
1937	34.0	10.0	4.0	1.3		
1938	34.0	12.0	5.5	1.3		
1939	57.0	16.0	8.0	2.0	0.3	
1940	57.0	16.0	10.0	2.0	0.3	
1963	35.0	35.0	25.0	7.0	7.0	7.0
1964	35.0	35.0	15.0	15.0	7.0	7.0
1965	35.0	35.0	25.0	15.0	7.0	7.0
1966	35.0	35.0	25.0	15.0	7.0	7.0
1967	44.0	44.0	38.5	16.5	16.5	7.7
1968	55.0	55.0	55.0	22.0	13.2	13.2
1969	55.0	55.0	55.0	29.7	16.5	16.5
1970	55.0	55.0	37.4	15.4	12.1	9.9
1971	55.0	46.2	37.4	15.4	12.1	9.9
1972	48.0	48.0	32.0	15.0	12.0	9.0
1973	48.0	48.0	40.0	19.0	12.0	9.0
1974	48.0	48.0	48.0	32.0	19.0	15.0
1975	70.0	50.0	40.0	25.0	12.0	10.0
1976	70.0	50.0	40.0	30.0	15.0	10.0
1977	70.0	55.0	45.0	35.0	15.0	10.0
1978	70.0	55.0	45.0	35.0	18.0	12.0
1979	70.0	55.0	45.0	30.0	15.0	12.0
1980	70.0	55.0	45.0	30.0	18.0	15.0
1981	62.0	48.0	40.0	28.0	18.0	10.0
1982	62.0	48.0	40.0	28.0	15.0	10.0
1983	60.0	50.0	38.0	22.0	15.0	10.0
1984	55.0	47.0	35.0	21.0	12.0	10.0
1985	55.0	51.0	35.0	21.0	15.0	10.0
1995	45.0	45.0	36.0	27.0	27.0	18.0
1996	40.0	40.0	30.0	20.0	20.0	20.0
1997	40.0	40.0	30.0	30.0	20.0	20.0
1998	40.0	40.0	30.0	30.0	20.0	20.0
1999	40.0	40.0	40.0	30.0	20.0	20.0
2000	40.0	40.0	40.0	30.0	20.0	20.0
2001	40.0	40.0	40.0	30.0	20.0	20.0
2002	36.0	36.0	36.0	27.0	18.0	18.0
2003	36.0	36.0	36.0	27.0	18.0	18.0
2004	36.0	36.0	36.0	27.0	27.0	18.0
2005	36.0	36.0	36.0	27.0	27.0	18.0
2006	36.0	36.0	36.0	36.0	27.0	18.0
2007	36.0	36.0	36.0	36.0	27.0	18.0
2008	35.0	35.0	35.0	35.0	26.0	17.0
2009	35.0	35.0	35.0	35.0	24.0	15.0
2010	35.0	35.0	35.0	35.0	24.0	15.0

Unit: %

FIG. A1. Income Shares of Top Fractiles in Korea, 1933-2010



Source: Table A4 in Appendix.

Note: 1) Top income shares are for all Korea(North and South combined) before liberation and for South Korea after liberation.

2) The top 5-1% denotes the income share of the top 5% excluding the top 1%. The top 0.5-0.1% denotes the income share of the top 0.5% excluding the top 0.1%. The top 1-0.5% denotes the income share of the top 1% excluding the top 0.5%.