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Globalization and Income Inequality in Korea : An Overview

by Seoghoon Kang

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I. Introduction

The relationship between growth and inequality is still not clearly understood. While some experts argue that, based on the Lewis type or Kuznets's inverse U-shape arguments, an increase in inequality is unavoidable for economic development, others argue that a more equal income distribution may be necessary for sustained economic growth based on the East Asian countries' experiences. Some even argue that economic growth has nothing to do with income inequality based on the initial condition argument.

The relationship between globalization and inequality is even less well understood. Many people tend to think that globalization brings more inequality in developed countries and more equality in developing countries based on the classical Heckscher-Ohlin type of argument. This may not be true because globalization not only affects relative prices and wages (substitution effect) within countries (hence the relative income of individuals), but it can also affect economic growth (income effect). Economic growth promoted by globalization makes us reconsider the classical question: what is the relationship between growth and inequality?

To make a theoretical model of the relationship between globalization, growth and inequality is an extremely difficult task if we take into consideration all the heterogeneity within and between countries. The empirical regression results using cross sectional national data or even longitudinal data seem to be hard to convince the researchers since these results do not fully reflect the aforementioned heterogeneities (as well as the reliability of inequality measures and consistency among different countries' inequality measures). With this in mind, we try to investigate the relationship between growth, globalization and inequality based on Korea's experiences during the last three or four decades.

It is generally accepted that while Korea has experienced rapid economic growth during the past, Korea's income distribution has improved or at least has not been consistently deteriorating up until the early 1990's¹. Korea's experience is somewhat different from most OECD countries, that faced a deteriorating income distribution during the last two decades even though the magnitude of the deterioration was quite diversified²

The next section reviews Korea's rapid economic growth and related government policies and interpret them in terms of globalization. Section III outlines the historical trends in Korea's income distribution. Section IV tries to explain the changes in income distribution in terms of market and in terms of policies. For the market factor, we investigate the relative impact of increased trade and skill-biased technological change on income distribution. For policy factors, we consider the education, labor, tax and welfare policies. The final section draws a conclusion and some policy implications.

¹ A sharp deterioration in Korea's income distribution after the 1997 currency crisis may have a deep implication on the relationship between globalization and income inequality.

² For example see Atkinson(1999).

II. An Overview of Korea's Economic Development in Regards to Globalization

1. Korea's Rapid Economic Growth & Structural Changes

The Korean economy grew rapidly during the last four decades. Between 1953 and 1999, the GDP increased 9,984-fold and per capita GDP 4,253fold in local currency³. During the same time period, the volume of exports increased 4,354-fold (from 33 Million US\$ in 1960 to 143.7 Billion US\$ in 1999).

One of the major areas of change during this period was Korea's industrial structure.(See Table 1). The share of agriculture, forestry and fisheries in GDP has declined from 27.1% in 1970 to 5.0% in 1999. The share of manufacturing increased from 21.2% in 1970 to 31.8% in 1999, and the share of the service industries increased from 50.2% to 62.8% in 1999. Further, the employment structure changed rapidly during this period. The percentage of persons employed in agriculture, forestry and fisheries declined, from 50.4% in 1970 to 11.6% in 1999. While the share of mining and manufacturing in GDP continuously increased during the last four decades, the share of persons employed in these industries fluctuated. It steadily increased until the late 1980's and peaking in 1988 and then declined until the late 1990's, finally recording 19.9% in 1999. The share of persons employed in the service industries over the total number of persons employed almost doubled during this period

The composition of exports has also changed. The share of natural resources, agricultural and fishery products declined, while that of manufacturing increased. Within that, the share of heavy and chemical industries, increased substantially as light exports. The major items of Korea's exports were textiles and apparel, veneer boards and wigs in 1970. In 1999, they are semi-conductors, automobiles and computers. Not only did the components of exports change, but so did the countries Korea was exporting to. In 1980, the share of exports to developed countries was 64.8%, and this ratio remained stable until 1990. From the early 1990's, this share sharply decreased to around 50%, and exports to developing countries increased during this period⁴.

The structure of income distribution also changed a lot during this period. The share of employee's compensation over the GDP increased from 34.1% in 1970 to 43.1% in 1999, while the share of operating surplus decreased from 49.6% in 1970 to 30.3% in 1999⁵.

2. Overview of Industrial and Trade Policies

In 1953, when the Korean War finally ended, Korea was one of the poorest countries in the world following the vast destruction during the War. Even though

³ Between 1960 and 1999, GDP increased 1,990-fold and per capita GDP 1,032-fold.

⁴ The change in trading partners as well as major export items seem to have much implication on Korea's income distribution, which we will address in sections II and III.

⁵ The share of employee's compensation over GDP is still low compared to developed countries such as U.S.A (59.9%, in 1997), Germany (52.7% in 1997), Japan (56.0% in 1997) and U.K. (54.4% in 1997). The share of operating surplus over the GDP in Korea is higher than those of developed countries, for example U.S.A. 22.8%, Germany 23.5%, Japan 20.2%, and U.K. 22.0% in 1997.

Korea's production returned to pre-war level by the end of 1950s, the Korean economy was heavily dependent upon foreign aid and suffered from low domestic savings and limited natural resources.

In 1962, the Korean government established the first of the six consecutive five-year economic development plans. The goals of each of the six economic development plans were to: (1) establish a self-sufficient economy (1962-1966); (2) promote export-oriented development (1967-1971); (3) build up the heavy and chemical industries (1972-1976); (4) further develop the heavy and chemical industries (1977-1981); (5) establish price stability and pursue structural adjustments to the second oil shock (1982-1986); (6) create an advanced economy with social and welfare programs and a balanced economy (1987-1991). Within this series of goals, social and welfare considerations finally came to the forefront during the late 1980's.⁶

The basic philosophy of the Korean government toward economic development was that economic development should be achieved through industrialization, under government control and leadership. The government used direct intervention policies such as price control, direct investment in specific industries such as steel, and financing to promote priority industries. Although the firms should be owned and managed privately, the government could override private investment decisions. Foreign capital should be induced to finance investments. To create employment and repay foreign debts, increasing exports should be a top priority among economic policy measures. Growth should have a higher priority than redressing balances in income distribution and the unevenness of industrial development across regions, because growth is expected to eventually rectify these problems. Applying this philosophy, Korea managed to fulfill all the goals of the six economic development plans. (For the plan of each development plan and their actual outcomes, see Table 2.)

The Korean government used many instruments to protect and sometimes promote some sectors or industries that were thought to be strategically important for the economy, especially trade protection and financial subsidies. There were many items restricted and prohibited for import, tariff rates were not as low as in some other developing countries. Tariff exemptions and tariff drawbacks were used to give exporters access to world material imports at market prices that were crucial for their international competitiveness. This high tariff rate/high exemption scheme was applied differently to many different sectors in the early 1970's: it favored steel, non-ferrous metal, machinery, shipbuilding, electronics and chemicals. One of the most important instruments used to promote these heavy and chemical industries were financial subsidies. The government used the National Investment Funds, composed of contributions from commercial banks and other public funds. Low interest loans from commercial banks were also applied to those industries. Korea's industrial and trade policies in the 1960's and 1970's had been effective in expanding its industrial sector and retaining a high growth rate. In the late 1970's, however, many domestic problems coupled with foreign economic shocks brought into question the industrial and trade policies. As the Korean economy grew and the economic structure changed, it became too complex to be simply directed and guided by the government, and the government's capability to identify the future prospects of the economy became more limited. Moreover, financial subsidies to heavy industries, one of the most important instruments

⁶ For more details, see Cho(1994).

in Korea's industrial policy, resulted in the accumulation of non-performing loans in the banking sector, and the government had to intervene in the restructuring process.

In response to the crisis of the early 1980s, Korea's industrial and trade policies in the 1980's and 1990's differed from those in the previous period. Intervention by the government became more indirect and functional; vertical policies became more horizontal, though direct intervention remained.⁷ In the sense that the industrial policy focuses on more general environments of businesses, for example: investment, R&D and small- and medium-sized enterprises.

The authorities phased out many industry specific policies from the previous period, reduced trade barriers, rationalized and restructured some industries that lost competitiveness, and promoted high technology industry.⁸

3. Measure of Globalization

There seems to be no universally accepted definition and measures of globalization in relevant literature. In a pure economic sense, globalization usually refers to the tendency of integrating the world's markets towards a single market. In a broader sense, however, it includes not only market integration but also an integration of the rules of market systems, physical exchange of human capital, and sharing cultural and social issues. In this paper, we use several indices that, we believe, represent the trend of globalization. These indices are the ratio of sum of export and import amounts to the nominal GDP (EIGDP, hereafter), average tariff rates, rate of import liberalization, and FDI and its ratio over GDP.

EIGDP does not capture the whole idea of globalization, since it depends not only on market openness, but also other factors, such as Korea's and the world's business cycles, and Korea's competitiveness in international markets⁹. Also, trade volumes are

⁷ In the sense that the industrial policy focuses on more general environments of businesses, for example: investment, R&D and small- and medium-sized enterprises.

⁸ The enactment of the Industrial Development Law in 1985 is one symbol of the government's policy changes. Previously, governments established individual industry promotion laws to promote targeted industries, for example: textile, shipbuilding, petrochemical, steel, non-ferrous metal, aviation and electronics. These laws enabled broad intervention by the government, including restriction of entrance and capacity expansion, tax exemption, and setting-up of promotional funds. These individual promotion laws became ineffective after the enactment of the Industrial Development Law. The main contents of this law can be summarized as follows: removal of government regulation and the introduction of fair competition, abolition of specific industry promotion and setting up functional promotions, such as technology development and productivity enhancement, and establishment of the Industrial Development Council, which includes persons from the private sector.

⁹ In fact, Korea's trade volume growth rate seems to be closely correlated with that of the world, as shown in the following table.

	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-1999
Growth rate of world's trade	22.80	18.06	-0.54	12.63	8.13	2.42
Growth rate of Korea's trade	34.08	26.64	9.06	17.03	14.04	0.41

Note : yearly average change, %

basically driven by geographical distance and economic size¹⁰. Despite its limitations as a measure of the degree of globalization, we take its historical trend, not the level itself, to broadly represent Korea's changing degree of globalization.

There has not been a consistent trend towards greater openness in Korea during the last three decades, even though the Korean government primarily employed export-promoting policies during that period. From the 1970's to the early 1980's, Korea was a more open economy, but between 1987 and 1994, we observe a decreasing trend of openness in terms of EIGDP,¹¹ before it increased again, reaching its historical high value in 2000, after Korea's currency crisis.

From the early stage of economic development in the 1960's to the early 1980's, the Korean government employed various domestic market protection policies, such as high tariff rates and import restrictions, and also export-promoting policies such as subsidies and tax exemptions. From the early 1980's, the protective regime used in the past was thought to have reduced the competition in the domestic markets and impede technological upgrading¹². The Korean government has employed. When the tariff reforms were completed in the middle of 190's, the import liberalization ratio reached almost 100% (See Table 4). Hence, in terms of liberalizing international trade, Korea consistently employed gradual globalization policies after the early 1980's.

Another measure of globalization is the amount of foreign direct investment in Korea and its proportion over the GDP. From the Table5 and 6, it can be seen the FDI to Korea was very small compared to other developing countries. Korean government tried to promote the FDI in its process of economic development. Despite some efforts at FDI promotion, in fact the regime-positive list system-is effectively fairly closed. And there were too many government regulations on business activities to induce foreign investment. These restrictive policies were possible, because the domestic investment demand were very high throughout development periods. There were some modest reforms during the 1980's, but this did not really shift until the mid of 1990;s, when the pressure from the OECD countries, and then the IMF following Asian crisis, Korea was urged to create a much more open regime.

III. Historical Trends of Korea's Income Distribution

Korea started its industrialization with a favorable initial condition for income

Source : IMF, *International Financial Statistics Year Book 2000*,

¹⁰ Sohn and Yoon (2001) estimated the distance coefficient in the regression of trade volume on product of GDP, per capital GDP and distance using Korean data as -0.924 , which implies that the gravity model can be also applied to Korea.

¹¹ The decrease in EIGDP in this period can be explained. First, while the growth rate of exports and imports was still high, the growth rate of total fixed capital formation far exceeds that of trade. Second, the import dependent ratio (defined as imported input divided by total input) in the input-output table has been declined in this period. In fact, that ratio was 14.2% in 1980, decreasing to 12.9% in 1985 and 10.8% in 1990. Third, the growth in manufacturing was derived primarily by the non-tradable sectors like gas, water and construction etc.

¹² The liberalization policy in the 1980's was largely driven by government officials in spite of opposition by the large conglomerates (Chaebols) who feared losing the domestic market share from import liberalization (Kim, 1991). Also see Sohn, Yang, and Yim(1998).

distribution. Rodrik(1994) shows that Korea was relatively equal in terms of income and land ownership compared to other developing countries around 1960 when Korea started its own industrialization. The more equitable land ownership was mainly due to the land reform conducted in the late 1940's. Also, the Korean War destroyed and scattered the wealth holdings of the rich (Choo, 1991).

Table 7 shows the historical trends of Korea's income distribution measured by the Gini coefficient. Studies in income distribution should be based on accurate and reliable income and earnings-related micro data. In Korea, though there are some micro income data sets that can be used for the study of household income and employees' earnings inequality, whether they are official or non-official, all of them had some deficiencies to fully reflect the inequality in Korea.¹³

There are different estimates and interpretations about what happened to inequality in Korea, depending on which data sources and estimation methods are used(For more details, see the appendix). From various studies summarized in Table 7, we believe that the inequality continued to decrease until the late 1990's. After the crisis, Korea's inequality was sharply deteriorated. There are some controversies over changes in inequality during the late 1980's. In those periods, there were strong democratic movements both in political and economic senses (especially in labor movement), asset prices bubbles in real estate and stocks, and increased supply of college in effect. It is still remained a puzzle for many researchers, but we believe that the earnings inequality continued to decrease in these periods. (For specific reasons, see appendix)

IV. Determinants of Income Distribution: Market vs. Policy

Among various determinants of income distribution, market forces, government policies and demographical changes seems to be the most important factors¹⁴. In this section, we will show that among the markets factors, a fast economic growth accompanied by a low unemployment rate and an increased supply of highly educated labor (this may be regarded as a policy factor in Korea), tend to improve Korea's income distribution, while technological changes biased toward skilled labor and increased international trade tend to deteriorate the income distribution, although the magnitudes of the impacts are not same.

1. Market Forces and Income Distribution in Korea

(1) Economic Growth, Income Distribution, and Unemployment

Figure 1 shows the trends of Gini coefficients and the (non-agricultural) unemployment rate, and Figure 2 shows those of Gini coefficients and openness measured by the proportion of the sum of exports and imports over the nominal GDP (EIGDP). In Figure 1, it appears that the size of income distribution moves together with that of the unemployment rate. During the last 20 years, the low unemployment rates accompanied by high economic growth rates may explain the relatively low level

¹³ For more details about data problems, see the appendix 2.

¹⁴ We do not explicitly consider the demographical factors in this paper.

of income inequality in Korea compared to those of other countries. The decrease in the unemployment rate itself does not fully explain the decreasing trends of the Gini coefficients. If the unemployment rate of highly educated workers decreased more than that of low educated workers, then income distribution will deteriorate even if the overall unemployment rate decreases. Table 9 shows the historical trend of the unemployment rate by educational attainment. In the Table 9, it is clear that during the last two decades, Korea's overall unemployment rate was very low compared to those of other developing or developed countries. The unemployment rate of the less educated has also been extremely low during this period. From 1980 to 1990, the unemployment rate of high school graduates dropped by 63.4% and recorded 3.4% in 1990, while those with less than high school education dropped by 71.0%, and recorded 1.1%. The unemployment rate of college graduates also dropped during this period, but only by 29.0%, which is far less than those of the less educated. The difference in the change of unemployment rates between the highly and the low educated may explain the improvement in income distribution during this period. But from the early 1990's, the unemployment rate of college graduates dropped more than those of the low educated. Even though this was partly due to the absolutely low unemployment rate of the less educated, it may explain the lack of improvement in income distribution from the early 1990's to the late 1990's.

The next section will try to explain these differences in the trends of unemployment rate by educational attainment. Meanwhile it is worthy to note that the currency crisis in 1997 asymmetrically affected the unemployment rate. The unemployment rate of the low educated increased far more than that of the highly educated, and this may explain the drastic deterioration in income inequality after the crisis.

As seen in Figure 2, the size of income distribution also moves together with that of openness. If Korea specializes in unskilled, labor-intensive industries, then the Hecksher-Ohlin theorem implies that more openness increases the demand for unskilled, labor and tends to improve income distribution. While it may be accepted that Korea has concentrated on unskilled labor-intensive industries, this apparently positive correlation between the Gini coefficient and EIGDP is not consistent with this a priori presumption. There are several possible explanations. First, Korea did not concentrate more on the unskilled, but rather the skilled labor-intensive industries with an increase in openness. One way to investigate Korea's fields of specialization, though it is hard to divide exports into unskilled and skilled labor-intensive goods, is to check the composition of exports and their growth rate. Among exports, the average proportion of machinery and transportation equipment over total exports between 1977 and 2000 was 39.11%. Furthermore, this average proportion increased from 31.17% between 1977 and 1990, to 49.44% between 1991 and 2000 (See Table 10). The growth rate of machinery and transportation equipment was 19.89% between 1977 and 2000, which is far greater than that of total exports, 13.59%. Though the machinery and transportation equipment cannot be simply considered as skilled labor-intensive commodities, it can be argued that Korea has not specialized in unskilled labor-intensive commodities during its process of economic development. Accepting that the Korean economy is becoming more skilled-labor oriented, we may also conjecture that the globalization process tends to deteriorate Korea's income distribution based on the Hecksher-Ohlin theorem. The lack of improvement in income distribution during the mid 1990's may be the result of more specialization on skilled-labor intensive industries.

The second possibility is that while the Hecksher-Ohlin theorem implicitly assumes that exporting and importing products are final goods, such as consumption goods or machinery or capital goods for the production of final goods, it can not be directly applied to Korea's case since the major items of Korea's import is raw materials mainly for exports¹⁵. In other words, the import of capital goods lowers the price of capital, hence increase the demand for high- skilled labor, and the import of raw material reinforces the increase. This point needs further study.

(2). Demand vs. Supply

We now turn to the basic supply and demand analysis. In Table 11, the changes in relative wages between high and low educated labor are divided into those of relative skill supply, demand shifts toward high skilled labor, and the rate of substitution between highly and low educated labor. The relative skill supply is defined as the ratio of the number of college graduates to those of high school graduate equivalent among the population whose ages are over 25 years old. The high school graduate equivalent is defined as the sum of the number of high school graduates and half of the number of those with less than high school education¹⁶.

The relative skill supply in 1975-80 period was just 10.66%, but increased drastically to 25.78% in 1990-95 period. The annual growth rate has accelerated between this period. While the supply of highly educated workers increased during these periods, the relative wages between the highly and low educated consistently decreased. The ratio of wages of college graduates to high school graduates was 2.17 in 1975-80 period, but fell to 1.47 in 1990-95 period. This decreasing ratio would explain the trend of income inequality in this period.

During these periods, the decreasing rate in relative wages was not greater than that of the supply, which in turn implies there has been an increase in the demand for the highly educated. The relation between changes in relative wages and the difference between the growth rates of supply and demand for highly educated labor depend on the inverse of the substitution elasticity between the highly and less educated laborers. This elasticity is usually estimated around 1.5 in the U.S.A. and far higher than 1.5 in Korea estimated by Choi (1997). If we assume that the elasticity is 2.0 in Korea, then we can also observe the positive growth rate in the relative demand for skilled labor, except between 1985-1990. It is interesting to note that the demand for skilled labor decreased between 1985 and 1990 and increased again during 1990 and 1995. This simple supply and demand analysis reveals that the improvement in income distribution during the late

¹⁵ In fact, during last three decades, the share of raw materials over imports was around 50-60%, while that of capital goods was around 20-30%. The share of final goods was less than 10%.

¹⁶ This demand and supply side analysis employed the decomposition method in Johnson (1997). In Johnson, the high school equivalent labor is calculated in several steps. The number of individuals with less than 12 years of schooling is multiplied by the ratio of the average year-round, full time wage of 35- to 44-year old males with less than 12 years of schooling to the wage of that group with exactly 12 years of schooling. To this total, add the number of those with exactly 12 years of schooling. Then, take half of those who have some college background but did not complete the 4-year degree and again, multiply their number by the ratio of the wages of 35- to 44-year old males with some college to that of high school graduates. Due to Korea's lack in data, we simply used the definition in the text.

1970's to the early or mid 1990's is a result of the increased supply in skilled labor.

Apparently, the trend in EIGDP is positively correlated with that of the growth rate of the demand for highly educated labor. Between 1980 and 1985, EIGDP increased from 0.64 to 0.66 and the demand for skilled labor also increased by an annual average of 4.09%. Between 1985 and 1990, EIGDP decreased from 0.66 to 0.53 and the demand for skilled labor also decreased by an annual average of 2.19%. Between 1990 and 1995, the relationship does not hold anymore, but the relevant magnitudes are small compared to other periods. If international trade in terms of its ratio over GDP is getting smaller, it tends to decrease the demand for high skilled-labor in developed countries and increase in developing countries. This apparently positive relationship between the changes in EIGDP and demand for skilled labor suggests that the trade structure of the Korean economy is somewhat similar to those of developing countries.

Up until now, we have shown it is possible that greater openness will increase the demand for skilled labor, hence tend to deteriorate the income distribution in Korea. Then the remaining question will be how much of the increase in demand for skilled labor can be attributed to international trade, which we will address in the next section.

(3) Technological Change vs. International Trade

Berman, Bound and Grilliches(1994) decompose the changes in demand for skilled workers into between-industries (interpreted as non-technological change such as international trade or government spending) and within each industries (interpreted as technological changes). Kang and Hong (2000) applies this decomposition method to Korea, and Table 12 reports their decomposition results¹⁷.

The employment share of white-collar workers in manufacturing had been consistently increased throughout the periods, and also the within industries movements were dominant factors for explaining this increase. This means that the increased demand for white-collar workers in manufacturing was mainly due to the skill-biased technological changes within industries rather than international trade. The employment share of white-collar workers in all industries also increased in these periods, but the proportion of within-industries movements showed some fluctuations around 50%. This means that the increase in white-collar workers in all industries is the result of mixture of skill-biased technological change and international trade. Combining these factors, we conclude that the skill-biased technological change and international trade both tends to increase the demand for white-collar workers, but the former was dominant factors in manufacturing industries.

The wage share of white-collar workers, however shows different trends. The increase in wage share was far less than that in employment. From some periods such as

¹⁷ The results between 1976 and 1991 are based on the Korean Standard Industry Classification (KSIC) based on ISIC-1968, which divides the industries into 46 subdivisions, of which 28 are manufacturing industries. They are also based on the Korean Standard Occupation Classification (KSOC), based on ISCO-1968. The results between 1993 and 1997 are based on the KSIC, based on ISIC-1988, which divides the industries into 129 subdivisions, of which 61 are manufacturing industries. They are also based on the KSOC, based on ISCO-1988. The Korea's Industry Classification System underwent a major revision in 1991, and the continuity of industry classification before and after the revision in three digit levels is not assured without extra information. They analyzed each period separately.

between 1986 and 1991, it even decreased in all industries. The relative importance among between and within changes are mixed, while the within factor is relatively important in manufacturing.

From this analysis, we conclude the technological change was more important than international trade in explaining the increase in white-collar workers especially in manufacturing. And this increase was not greater than that in supply as shown in wage share decomposition, possibly resulting in more equality.

2. Government Policies and Their Impact on Income Distribution

The previous section shows that during Korea's economic development, market forces, such as skill biased technological change and increasing international trade concentrating more on skilled labor- intensive industries (or products), tends to deteriorate the income distribution. Another factor that explains the size and tendency of income distribution is government policies, such as education, tax and welfare policies.

(1) Education Policy

The education policy plays a key role in explaining Korea's income inequality. From the early stages of economic development, the Korean government fully recognized the unbalanced resource endowments, i.e. limited natural resources and abundant human resources. With the strong tradition of placing high value on education, primary education was made nearly universal by the early 1960's, now the literacy rate of those over 12 years old is estimated at almost 100 percent, and average year of education is one of highest in the world.

The high education level of Korean people is the result of both education-emphasizing government policy and individual's choice. Government's policies toward education were continuously changing to achieve the goals of economic planning and to meet the changing market demand. In the early stage of economic development, government put more emphases on secondary education to provide workers suitable for mass-production in manufacturing industries. From the early 1980's government started to change its policy emphases on tertiary education(For details, see next section). The government's education policy is reflected on its budget. The share of the education budget over the government budget and also GDP continuously increased during the last four decades (See Table 13). The share of education budget over government budget increased from 16.2% in 1965 to 23.3% in 1998. The share of public expense on education over GDP also increased from 5.2% in 1970 to 5.8% in 2000.

The public expense on college education grew far faster than overall expense. In fact, the ratio of public expense on college education over GDP increased from 1.0% in 1970 to 1.9% in 2000, while that ratio of primary and secondary education decreased from 4.3% in 1970 to 3.9% in 2000. This ratio shows drastic increase in 1980's reflecting the massive expansion in the number of college entrants in 1980's. The average expense per college student reached 8,512 US\$ in 1997, which is more than that of OECD average, 8,252US\$¹⁸.

People also adjust themselves to meet the market demand and utilize the benefits of

¹⁸ Korea's educational expense per student in high school or less is less than that of OECD average (Source, Korea Educational Development Institute, 2000).

policy change. Figure 3 shows the advance rate of graduates to higher school level. It shows that there were huge increase in advance rate from elementary school to middle school and from middle school to high school during 1970's and from high school to college or university during 1980's and 1990's. People also spent more money on education. While the education budget over the total budget increased, the share of the educational expense over household consumption also increased: in fact, it increased more rapidly than that of the share of education over the total budget. For urban households, the share of educational expenses over household consumption was 5.4% in 1965, and 11.2% in 1998. For rural households, this share was 4.5% in 1965 and 10.4% in 1998. These facts imply that public education does not fully meet the demand for education. It also implies that even though the expense of public education over GDP has been between 4.5% and 6.2% during last four decades, which is nearly the average of OECD countries' expense on public education, the Korean people as a whole made more investments on education, far more than those of OECD countries, considering the expenses on private education.

The Effects of College Education Expansion

The government heavily controls the supply of college education even though most colleges in Korea are private^{19, 20}. The government has regulated the number of colleges' entrants and also has had the power of influencing the tuition by allocating government subsidies among colleges. The number of 4-year college entrants was abruptly leveled up by 55% in 1981 and has continuously increased throughout the periods. In 2000, it became almost three times of that in 1980 (See table 14).

Even though the government initiated this sudden increase in the number of college entrants, there are market factors influencing the government's policy; that is, its decision to expand college education was just in response to the increasing market demand of college education. In fact, there were three main factors for the increase in demand of college education.

First, we should consider the baby-boom effect in the education market. The baby-boom generation, born just after the end of the Korean War (1950-1953), started to enter colleges beginning 1974, and the year of 1980 was the mid-point of the baby-boom generation's college entrance, which was highly competitive. The 15-19 aged population in 1975 (born between 1956-1960) showed a drastic increase relative to 1970, which, in turn, led the big jump of the 20-24 aged in 1980 (See table 15).

¹⁹ In Korea, most elementary and middle schools are public, while most college and universities are private. 98.5% out of 5,268 elementary schools and 74.9% out of 2,745 middle schools are public. 52.9% out of 2,023 high schools is public. But, 89.9% out of 159 two-year colleges and 76.5% of 196 universities are private. Government usually controls the tuitions of even private schools and there are not much difference in terms of education expenses between private and public schools except elementary school.

²⁰ It is not clear why the government controlled tightly college education, especially the number of entrants. It might be conjectured that in an early stage of economic development, the government judged that high school graduates were enough to achieve the goals of five-year economic development plans, and the government might have perceptions that it should control the supply of college graduates like any other economic variables or entities.

Second, the economic benefit of a college education, measured by the wage-premium of college graduates in the labor market, had continuously increased by 1980. It resulted from the excess demand (supply shortage) for college-educated labor by the employers, which, in turn, brought an increase in demand for college education in the education market. The average monthly wage of 4-year college graduates was more than twice (228%) that of high-school graduates' wages in 1980. The estimates of the wage-premium of college education using more rigorous statistical specification are summarized in Table 16. It shows that the college wage-premium reached up to more than 70% (72% in 1976, 73% in 1978) before 1980²¹.

Third, the household's budget constraints for the expenditure on college education became less tight, not only because of the income rise from the rapid economic growth in the 1970's, but also because of the price regulation, by the government, over college education. In conclusion, there was a massive increase in the demand for college education, resulting from (i) baby-boom generation's entry into the market and (ii) expected higher (increased) benefit of college education in the labor market, relative to the (decreased) burden of investment. Korea's government has decided to make an outlet for the crowded applicants to colleges and, in turn, to solve the excess demand for the college-educated in the labor market. It also retains price regulation for preventing applicants from being in trouble of capital deficit problem.

The government's policy for the steady and increasing supply of college education since the drastic increase in 1981 has affected the labor market and wage inequality. Since 1981 the college wage premium has been out of the trend of increasing and down to below 70% (See Table 16), meaning that too much demand for college graduates started to be mitigated.

We should note that the turning point, when the wage premium of college education was drastically shrunk, is 1988 (from 0.653 in 1987 to 0.567 in 1988). It was the time when the first male graduates having entered college in 1981 entered the labor market after their mandatory military service²². With the increase in inflow of college graduates, we might think that 1988 is the first year when those who had entered since 1981 fill all graduates of college students.

However, since 1988 the wage premium has showed a constant decrease²³. With the increase in the labor supply of college graduates, the wage premium has constantly decreased. The increasing rate of college graduates' wages is lower than that of high-school graduates' wages. Also, some college-educated labor has bumped into lower-tier jobs.²⁴

Therefore, the over-supply of the college-educated in labor market becomes a new

²¹ In 1980, when we experienced an unexpected negative growth, -2.1%, the college wage premium was slightly decreased to 68%.

²² For most Korean male college students, it takes 7 years to graduate from college, i.e. 4 years of enrollment and 3 years of military service.

²³ Except 1998 and 1999 when we experienced the economic crisis and there was a massive increase in low-skilled unemployment.

²⁴ Uh (1995) showed that the ratio of those who having lower-tier jobs among the college graduates in 1995.

dilemma in Korea. Table 15 shows that the 15-24 aged populations began to decrease in 1995, but Table 14 shows that the number of college entrants are still increasing. The advancement ratio from high school to college rises to more than 80% (1980: 39.2%, 1985: 53.8%, 1990: 47.2%, 1997: 81.4%, 1999: 84.5%). Table 5 also shows that among those who entered colleges in 1981 and after (25-34 aged in 1996), the ratio of the college-educated population in Korea is the highest among OECD countries.

(2)Labor Policy

Korean government had strongly protected the employee's job by not allowing the lay-offs and putting severe restrictions on firing workers, but with no minimum wage act and lots of restrictions on the process of labor union's strike. It is not clear whether these policies help to reduce or worsen the inequality.

Lay-offs became an employer's legal right in 1998, just after the Korean currency crisis. Before 1998, the workers' employments were strongly protected by law. This protection resulted in almost lifetime employment (minimal job mobility) of employees, and wage structure based on tenures and ages, not on individuals' work performances at least until the late 1980's. Almost lifetime employment and non-performance based wage system helped to reduce the overall wage inequality. After the Korean crisis, or even before the crisis, this structure has been changed to more flexible employment and performance based wage system. These changes were Korean firms' and workers' responses to increased competition both in domestic and international market brought up by globalization. Keum and Cho (2001) showed that the job retention rate of Korea worker between 1995 and 1999 was even less than minimum level of job retention rate of U.S. during 1980's. This seems to be the part of explanation of increasing, or at least not improving inequality in late 1990's.

There was no Minimum Wage Act until 1987 on the ground that minimum wage could raise the firms' production costs. Even when it became effective in 1988, the ratio of minimum wage over average wage was relatively low, and the ratio of workers who are affected by this law had never exceeded 10% (it was just 1.0% between Sep. 1999 and Aug. 2000). Hence, the Minimum Wage Act does not have much impact on the wage inequality. The introduction of Minimum Wage Act seems to be the result of democratic movements in that period, not a government's response to the globalization. From the beginning of economic development, the labor laws for organizing labor unions and for the right of collective bargaining were enacted and labor unions were actually organized. Collective bargaining, however has not had a role as a device of wage determination before 1987 when there was massive democratic movement. This was because the government and also employers did not want this process was used to accelerate the wage increase. A union's right to strike was fully guaranteed in 1987, and collective bargaining outcomes began to influence wage inequality. However, it is not certain that unions have had positive effects on improving wage inequality. Even though unions made the wage distribution less dispersed within a workplace, it tends to make the wage gap widen among establishments. Lee(1999) showed that the firm's capability to pay more premium is more important than the union's bargaining power in the process of wage premium determination in Korea.

(3)Tax Policy

Tax policy was not widely used to loosen the income inequality. Even though the Gini coefficient of after-tax income are somewhat smaller than those of pre-tax income as shown in Table 17, its absolute differences are not that big. We assert that the tax policy was not primarily used to loosen inequality based on the following arguments: As shown in Table 18, the tax revenue as a percent of GDP of Korea had been far less than those of other developed countries whether the Social Security Tax is included or not. The effective income tax rate of richest 10% wage and salary workers was just 7.74% in 1970 and 5.20% in 1980²⁵. This rate increased to 12.98% in 1994, but still far less than those in other developing countries. Furthermore, the income tax rate for the self-employed remained quite low, 3.14% in 1994.

The proportion of direct tax over total tax increased from 38.5% in 1970 to 46.8% in 1995. This might help loosening inequality. Hyun and Nah(1994) showed that the income tax tends to loosen the inequality, but the value added tax to deteriorate the inequality :The income tax decreased the Gini coefficient by 1.13%, but value added tax increased the Gini by 1.70% in 1987. Even though the proportion of direct tax showed increasing trend, its absolute level is far less than that of U.S. (90.5% in 1993) and Japan (69.4% in 1993)²⁶.

From these arguments, we believe that the tax policy was not widely used to reduce inequality and also was not quite effective to do so. It is not clear why the Korean government did not actively use the tax policy as a tool for loosening inequality. It may be the reflection of government philosophy on the economic development, that is-economic growth is more important than economic equality, and growth will eventually mitigate inequality.

(4)Welfare Policy

Welfare policy was not widely used to loosen the inequality, either. Individual welfare was mainly based on private transfers, not by public assistances. Compared to the welfare budgets of the OECD countries, that of Korea has been continuously low (see Table 19).²⁷ In particular, public assistance and public health appear to be the lowest among the welfare areas. Hyun and Lim (2000) showed that welfare policy was even less important than tax policy whose role was also minimal. For example,

²⁵ See Hahn(1982) and Hyun and Nah(1993)

²⁶ But this level is similar to that of Germany (47.6%, in 1993) and bigger than that of France(40.2%, in 1993).

²⁷ However, such a comparison should be cautiously used for determining the extent to which the welfare budget increases. When we compare welfare expenditure internationally, we need to consider the tax burden rate together with the rate of welfare budget to GDP. Most countries with high welfare budget share to GDP show a high rate of tax burden, implying that citizens' willingness to pay higher taxes is required for higher share of welfare budget to GDP. The lower share of welfare budget along with lower tax burden rate in Korea indicates that people agreed to pay lower taxes and to receive small welfare benefits relatively compared to the developed countries. Considering the low tax burden rate of 20.7%, we can observe a smaller gap between the share of welfare budget in Korea and those of other countries.

the proportion of public transfer in total income amount is only 0.60% in 1991, and 0.92% in 1996. The national pension system finally began in 1988, but pension benefits will be paid for normal retirees from 2008. This means the pension system does not help to reduce inequality during the past three decades.

Such a low welfare budget attributes to the growth-oriented policy, which has been pursued since the 1960's. The continuous decline in poverty ratio brought by fast economic growth with very low unemployment also helps the government not to widely use the welfare policy to reduce inequality (for poverty ratio, see Table 20). The strong tradition of putting extremely high values on family is another factor not to implement public assistance program.

V. Conclusion and Policy Implications

The Korean economy during the last three or four decades can be characterized by rapid economic growth and improvement in income distribution (except after the 1997 currency crisis). This experience is different from most other developed or developing countries. In this paper, we try to review Korea's fast economic growth with emphasis on globalization and also historical trends of Korea's income distribution. We also analyze the two key determinants of income distribution: market forces and government policy.

It is argued that among the market forces, high economic growth accompanied by very low unemployment rates especially among low educated labor tends to improve the income distribution, while the skill biased technological change and international trade, especially exports concentrating more on skilled labor-intensive products tends to deteriorate the income distribution. It is also argued that Korea's educational policy, with the Korean tradition that places higher value on education, was a major policy tool to improve the income distribution, even though the primary goals of the educational policy was not to reduce income inequality. The other policies such as labor, tax and welfare policies were not that effective.

Based on Korean experiences, we draw some policy implications for other countries. We emphasize that the rapid economic growth was the driving force for low unemployment, which in turn reduce poverty ratio and inequality. Lowering the unemployment rate should be on the top priority.

Based on Korean experiences especially after the Korean economic crisis, globalization tends to deteriorate the inequality and reversing the trend turns out to be a not easy task. Countries with the similar stage of economic development and industrial structure to Korea should implement policies to mitigate the worsening equality before the globalization fully affects the inequality.

If economic forces along with globalization tend to deteriorate inequality, we recommend governments to implement market-friendly indirect policy such as educational policy to mitigate the inequality. Education policies that make people invest more on education by providing more easily accessible, timely designed education system is strongly recommended.

Finally, we recommend putting more efforts to the measurement of inequality. Without accurate and reliable measurement, the effects of globalization and also the impact of government policies are hard to measure. We need further studies in order to understand the relationship between globalization and inequality. Among the subjects, the causality between income inequality and economic performance, the relation between foreign direct investment and income distribution, and the precise channel through which globalization affects income distribution seem to be of primary interests.

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Table 1. Korea's Economic Growth and Structural Changes.**(1) Changes in Composition of Output and Employment**

Year	Per Capita Gross National Income		Share of Production over GDP (%)				
	In 10 thousand KRW	In US\$	Agriculture, Fishery and Forestry	Mining	Manufacturing	Construction, Electricity, Water and Gas	Other Services
1970	9	249	27.1	1.5	21.2	6.7	43.5
1975	29	592	25.0	1.6	25.9	6.0	41.5
1980	97	1,598	14.8	1.5	28.2	10.1	45.4
1985	194	2,229	12.6	1.3	29.2	10.5	46.4
1990	417	5,886	8.5	0.8	28.8	13.5	48.4
1995	835	10,823	6.2	0.4	29.4	13.4	50.6
1999	1,017	8,551	5.0	0.4	31.8	11.4	51.4

Year	Participation Rate(%)	Unemployment Rate(%)	Employment Share (%)			Income Share (%)			
			AFF	MM	Services	EC	OS	CFC	ITS
1970	57.6	4.4	50.4	14.3	35.3	34.1	49.6	6.9	9.5
1975	58.3	4.1	45.7	19.1	35.2	32.4	50.4	7.4	9.8
1980	59.0	5.2	34.0	22.5	43.5	39.7	40.1	8.0	12.2
1985	56.6	4.0	24.9	24.4	50.6	40.6	38.0	9.8	11.6
1990	60.0	2.4	17.9	27.6	54.5	45.9	32.2	10.6	11.4
1995	61.9	2.0	12.4	23.6	64.0	47.7	30.2	10.8	11.4
1999	60.5	6.3	11.6	19.9	68.5	43.1	30.3	13.6	13.0

Note: AFF denotes Agriculture, Fishery and Forestry, MM Mining and Manufacturing, EC Employee's Compensation, OS Operating Surplus, CFC Consumption of Fixed Capital, and ITS Indirect Taxes and Subsidy.

Sources: The Bank of Korea, *National Accounts*, Various Issues. National Statistical Office, *Economically Active Population Survey*, Various Issues.

(2) Changes in Exports & Imports by Economic Group (Unit: US\$ Mil, %)

		1980	1985	1990	1995	1999
Export	Developed Countries	11,335 (64.8)	21,162 (69.9)	45,331 (69.7)	62,425 (49.9)	72,792 (50.7)
	Developing Countries	6,169 (35.2)	9,121 (30.1)	19,685 (30.3)	62,633 (50.1)	70,894 (49.3)
	Total	17,505	30,283	65,016	125,058	143,685
Import	Developed Countries	13,864 (62.2)	20,127 (64.6)	49,771 (71.3)	91,492 (67.7)	71,022 (59.3)
	Developing Countries	8,430 (37.8)	11,008 (35.4)	20,073 (28.7)	43,627 (32.3)	48,731 (40.7)
	Total	22,292	31,136	69,844	135,119	119,752
Balance	Developed Countries	-2,528	1,035	-4,439	-29,067	1,770
	Developing Countries	-2,260	-1,888	-389	19,006	22,163
	Total	-4,787	-853	-4,828	-10,061	23,933

Note: 1) Figures in parentheses are the component ratio.

Source: The Korea International Trade Association, *The Main Trade Indicators 2000*

Table 2: Plan and Outcomes of the Six Economic Development Programs(in %, Mil. US\$)

	1st		2nd		3 rd	
	Plan	Actual	Plan	Actual	Plan	Actual
Growth Rate	7.1	7.8	7.0	9.5	8.6	9.1
Exports	137.5	250.4	550.0	1132.3	3510.0	7814.6

	4th		5th		6 th	
	Plan	Actual	Plan	Actual	Plan	Actual
Growth Rate	9.2	5.7	7.6	9.8	7.2	10.0
Exports	20242.0	20607.8	5300.0	3390.0	5440	6960.0

Source: The Bank of Korea, *National Accounts*, Various Issues.

Table 3. Summary of Exports and Imports (Unit: One Million U.S. dollars)

Year	Total(A)	Exports(B)	Imports(C)	Nominal GDP(D)	(A)/(D)	(B)/(D)	(C)/(D)
1970	2819	835	1984	8000	0.352	0.104	0.248
1971	3462	1068	2394	9400	0.368	0.114	0.255
1972	4146	1624	2522	10600	0.391	0.153	0.238
1973	7465	3225	4240	13500	0.553	0.239	0.314
1974	11312	4460	6852	18800	0.602	0.237	0.364
1975	12356	5081	7274	21100	0.586	0.241	0.345
1976	16489	7715	8774	28900	0.571	0.267	0.304
1977	20857	10047	10811	37100	0.562	0.271	0.291
1978	27683	12711	14972	52000	0.532	0.244	0.288
1979	35394	15056	20339	61900	0.572	0.243	0.329
1980	39797	17505	22292	62200	0.640	0.281	0.358
1981	47385	21254	26131	69600	0.681	0.305	0.375
1982	46104	21853	24251	74400	0.620	0.294	0.326
1983	50637	24445	26192	82300	0.615	0.297	0.318
1984	59876	29245	30631	90600	0.661	0.323	0.338
1985	61419	30283	31136	93400	0.658	0.324	0.333
1986	66298	34715	31584	107600	0.616	0.323	0.294
1987	88301	47281	41020	135200	0.653	0.350	0.303
1988	112507	60696	51811	180800	0.622	0.336	0.287
1989	123842	62377	61465	220700	0.561	0.283	0.278
1990	134859	65016	69844	252500	0.534	0.257	0.277
1991	153395	71870	81525	295100	0.520	0.244	0.276
1992	158407	76632	81775	314700	0.503	0.244	0.260
1993	166036	82236	83800	345700	0.480	0.238	0.242
1994	198361	96013	102348	402400	0.493	0.239	0.254
1995	260177	125058	135119	489400	0.532	0.256	0.276
1996	280054	129715	150339	520000	0.539	0.249	0.289
1997	280781	136164	144616	476600	0.589	0.286	0.303
1998	225595	132313	93282	317700	0.710	0.416	0.294
1999	263438	143686	119752	405800	0.649	0.354	0.295
2000	332749	172268	160481	457400	0.727	0.377	0.351

Note: Repaired vessels are excluded from 1986. Reference dates are based on the date of customs clearance. Exports are valued at F.O.B. and imports at C.I.F. Both exports and imports include trade without drafts and exclude smuggling trade, issued bank notes, negotiable bonds, shares, and similar securities.

Source: The Korea International Trade Association

Table 4. Tariff and Non-tariff Import Restrictions in Korea, 1977-96

Year	Simple Average Tariff Rates (%)	Number of Prohibited or Restricted Items	Number of Automatic Approval Items (A)	Total Number of Import Items (B)	Rate of Import Liberalization (A/B) (%)
1977	29.7	621	664	1,312	52.7
1979	24.8	928	682	1,010	67.5
1981	24.9	1,911	5,649	7,560	74.7
1983	23.7	1,482	6,078	7,560	80.4
1985	21.3	970	6,945	7,915	87.7
1987	19.3	499	7,408	7,911	93.6
1989	12.7	465	9,776	10,241	95.5
1991	11.4	283	9,991	10,274	97.2
1992	10.1	240	10,034	10,274	97.7
1993	8.9	199	10,220	10,417	98.1
1994	7.9	150	10,352	10,502	98.6
1995	7.9	101	10,401	10,502	99.0
1996	7.9	76	10,783	10,859	99.3

Note: The classification of import items was based on the SITC basic codes in 1997, four-digit CCCN codes for 1979, eight-digit CCCN codes during 1981-87, and 10-digit HS codes after 1989.

Source: The Korea International Trade Association, *The Main Trade Indicators*; Nam (1995); Park (1997)

Table 5. FDI Trends in Korea (Unit: 100 Mil. US\$, %)

	1980~85 ¹⁾	86~89 ¹⁾	90~95 ¹⁾	96	97	98	99
Amount	1.0	8.0	9.8	23.3	28.4	54.2	88.0
(FDI/ GDP)	(0.1)	(0.5)	(0.3)	(0.4)	(0.6)	(1.6)	(2.2)

Note: 1) Average.

Source: The Bank of Korea.

Table 6. FDI in Selected Countries (Unit: 100 Mil. US\$, %)

	1993	1994	1995	1996	1997	1998	1993~1998
Korea	5.9 (0.2)	8.1 (0.2)	17.8 (0.4)	23.3 (0.5)	28.4 (0.6)	54.2 (1.6)	23.0 (0.6)
Singapore	46.9 (8.1)	85.5 (12.2)	72.1 (8.6)	78.8 (8.6)	97.1 (10.1)	72.2 (8.6)	75.4 (9.4)
Malaysia	50.1 (7.8)	43.4 (6.0)	41.8 (4.8)	50.8 (5.0)	51.1 (5.1)	37.3 (5.1)	45.7 (5.6)
China	275.2 (4.6)	337.9 (6.2)	358.5 (5.1)	401.8 (4.9)	442.4 (4.9)	454.6 (4.7)	378.4 (5.1)
Mexico	67.2 (1.7)	123.6 (2.9)	95.3 (3.3)	91.9 (2.8)	128.3 (3.2)	102.4 (2.5)	101.4 (2.7)
US	435.3 (0.7)	451.0 (0.6)	587.7 (0.8)	764.5 (1.0)	1,092.6 (1.3)	1,933.8 (2.2)	877.5 (1.1)
UK	154.8 (1.6)	93.5 (0.9)	204.0 (1.8)	258.3 (2.2)	369.9 (2.8)	631.2 (4.5)	285.3 (2.3)

Note: 1) The numbers in parentheses are the ratio of FDI to GDP.

2) Average.

Source: UN, World Investment Report; IMF, International Financial Statistics

Table 7. Historical Trends of Korea's Income Distribution

Year	Choo (1992)	Ahn (1992,1995)	Whang & Lee (1996)	FIES (NSO)	Yoo (1998)
1965	0.3439	0.3365			
1966		0.3287			
1967		0.3647			
1968		0.3458			
1969		0.3464			
1970	0.3322	0.3125			
1971		0.3074			
1972		0.3121			
1973		0.3676			
1974		0.3823			
1975		0.3769			
1976	0.3908	0.3899			
1977		0.3780			
1978		0.3699			
1979		0.3752			
1980	0.3891	0.3567		0.3065	0.366
1981		0.3572		0.3059	
1982	0.3574	0.3766	0.393	0.3092	
1983		0.3736		0.3094	
1984		0.3804		0.3111	0.351
1985	0.3449	0.3803	0.384	0.3115	
1986	0.3368	0.3771		0.3069	0.340
1987		0.3777		0.3065	
1988	0.3355	0.384	0.365	0.3006	0.327
1989		0.4127		0.3039	
1990	0.3226	0.4017		0.2948	0.300
1991		0.4013	0.365	0.2869	0.302
1992		0.3883		0.2836	0.287
1993	0.3097	0.3797		0.2817	0.289
1994		0.3845	0.363	0.2845	
1995				0.2837	
1996				0.2907	0.288
1997				0.2830	0.282
1998				0.3163	
1999				0.3210	
2000				0.3207	

Note:

- 1) The figures of the years 1965, 1970, 1976, 1982, 1986, and 1990 are from Choo et al (1992), and those of the years 1980, 1985, 1988 and 1993 are from the Social Statistical Survey of the National Statistical Office.
- 2) Ahn's estimates are based on Ahn (1992) until 1981 and Ahn (1995) since 1982.
- 3) Whang and Lee (1996) covers only urban households.
- 4) Yoo (1998)'s estimates are based on the Basic Survey of Wage Structure of the Department of Labor, which covers establishments that hires more than 10 regular employees.

Table 8. Income Structure of Workers' Household in Urban Areas in 1999

	Average	1st class	2nd	3rd	4th	5th
Income (thousand wons)	2,224.7	815.6	1,404.1	1,885.1	2,542.0	4,475.0
Change(in YOY,%)	4.3	4.0	2.6	3.2	4.2	5.4
Ration to the 1st income class	2.73	1.00	1.72	2.31	3.12	5.49

Source: National Statistical Office, *Family Income and Expenditure survey*, March 2000.

Table 9. Unemployment Rate by Educational Attainment (in thousand person, %)

Year	Total	Less than high school	High school graduates	College graduates & over
1980	748(3.1)	382(3.8)	307(9.3)	60(6.2)
1985	622(4.0)	222(2.5)	291(5.9)	109(6.6)
1986	611(3.8)	201(2.2)	286(5.4)	124(6.9)
1987	51993.1)	157(1.7)	251(4.3)	111(5.7)
1988	435(2.5)	114(1.3)	220(3.6)	101(4.7)
1989	463(2.6)	115(1.3)	231(3.5)	116(4.8)
1990	454(2.4)	100(1.1)	240(3.4)	114(4.4)
1991	436(2.3)	95(1.1)	241(3.2)	101(3.6)
1992	465(2.4)	96(1.1)	261(3.3)	108(3.4)
1993	550(2.8)	109(1.4)	302(3.6)	140(4.0)
1994	489(2.4)	100(1.3)	259(3.0)	130(3.6)
1995	419(2.0)	86(1.1)	226(2.5)	108(2.7)
1996	425(2.0)	83(1.1)	232(2.5)	110(2.6)
1997	556(2.6)	119(1.5)	308(3.3)	130(3.0)
1998	1461(6.8)	410(5.8)	766(8.2)	285(5.7)
1999	1353(6.3)	369(5.2)	713(7.6)	271(5.3)
2000	889(4.1)	232(3.3)	453(4.7)	204(3.9)

Source: Ministry of Labor

Table 10. Composition and Growth Rate of Exports

Commodities	Composition			Growth Rate(%)		
	77-00	77-90	91-00	77-00	77-90	91-00
Total	100.0	100.0	100.0	13.59	15.90	10.58
Foods and live animals	3.73	4.92	2.19	4.89	7.16	1.95
Beverage and tobacco	0.31	0.45	0.12	4.76	1.991	8.47
Crude materials, inedible except fuels	1.38	1.44	1.30	9.37	11.16	7.04
Mineral fuels, lubricants and related materials	2.10	1.38	3.03	34.51	34.71	34.25
Animal and vegetable oils, fats and waxes	0.03	0.04	0.01	26.37	4.17	55.24
Chemicals and related products, n.e.c.	4.75	3.17	6.81	21.06	22.26	19.51
Manufactured goods classified chiefly by material	24.68	26.86	21.84	11.04	13.35	8.04
Machinery and transport equipment	39.11	31.17	49.44	19.89	23.34	15.40
Miscellaneous manufactured articles	22.88	30.34	13.19	6.66	14.63	-3.70
Etc	1.03	0.23	2.07	39.30	29.50	52.03

Source: The Korea Trade Association

Table 11. Demand and Supply Analysis

Periods	1975-1980	1980-1985	1985-1990	1990-1995
Relative skill supply	10.66	13.32	17.75	25.78
Changes in relative skill supply %	1.91	4.57	5.90	7.75
Relative wage	2.17	2.15	1.75	1.47
Changes in relative wage %	0.27	-0.24	-4.05	-3.41
Demand shift %				
Elasticity of substitution=1.5	2.31	4.21	-0.17	2.63
Elasticity of substitution =2.0	2.45	4.09	-2.19	0.92
EIGDP	0.64	0.66	0.53	0.53
Changes in EIGDP %	1.79	0.55	-4.07	-0.09

Table 12. Decomposition of the Share of White Collar Workers

			1976-1981	1981-1991	1986-1991	1993-1997
Employment	All Industries	Between	4.457	2.262	3.869	3.270
		Within	1.484	2.832	3.888	2.406
		Total	6.242	5.094	7.758	5.576
	Manufacturing	Between	0.758	0.152	1.353	0.396
		Within	2.047	4.333	8.346	4.509
		Total	2.805	4.486	9.699	4.905
Wage	All Industries	Between	3.768	1.805	0.377	-
		Within	-1.179	3.351	-1.171	-
		Total	2.590	5.156	-0.794	-
	Manufacturing	Between	0.717	-0.456	0.691	-
		Within	-1.717	4.927	1.594	-
		Total	-0.460	4.471	2.285	-

Source: Kang and Hong (2000).

Table 13. Education Budget and Its Share

(1) Share of education expense

year	Proportion of educational budget over GDP	Share of education budget in government budget	Share of education in total consumption (urban households)	Share of education expense in total consumption (farm household)
1965	-	16.2	5.4	4.5
1970	5.2	17.6	7.6	6.8
1975	4.3	14.4	7.3	6.6
1980	6.0	18.9	6.2	9.9
1985	5.7	20.3	7.8	12.1
1990	4.7	21.1	8.4	10.7
1995	5.5	22.8	9.8	10.5
1998	6.2	23.3	11.2	10.4

Source : NSO, Social Indicators in Korea, various issues

(2) Public Expenditure on Education over GDP

Table 14. Number of College Entrants.

Year	2-year college	(Increase Rate, %)	4-year college	(Increase Rate, %)	Total
1980	80,620		115,755		196,375
1981	106,316	55.44	179,935	31.87	286,251
1982	98,740	6.37	191,399	-7.13	290,139
1983	100,770	4.83	200,640	2.06	301,410
1984	104,185	1.96	204,570	3.39	308,755
1985	108,483	-1.29	201,934	4.13	310,417
1986	109,695	-1.83	198,235	1.12	307,930
1987	110,234	-1.80	194,657	0.49	304,891
1988	107,778	-3.67	187,521	-2.23	295,299
1989	114,615	2.29	191,817	6.34	306,432
1990	130,670	2.39	196,397	14.01	327,067
1991	141,115	2.40	201,107	7.99	342,222
1992	159,432	5.36	211,884	12.98	371,316
1993	174,964	4.20	220,774	9.74	395,738
1994	197,143	4.91	231,617	12.68	428,760
1995	223,689	9.49	253,605	13.47	477,294
1996	252,868	6.94	271,208	13.04	524,076
1997	276,231	9.05	295,739	9.24	571,970
1998	304,637	5.60	312,293	10.28	616,930
1999	306,802	2.24	319,278	0.71	626,080
2000	318,135	0.66	321,399	3.69	639,534
2000/1980	3.95		2.78		3.26

Source: Ministry of Education

Table 15. Youth Population

Year	1960	1966	1970	1975	1980	1985	1990	1995
15 – 19 yrs. Old	2,383,154	2,708,146	3,088,134	4,146,912	4,239,729	4,316,264	4,448,996	3,863,491
20 – 24 yrs. Old	2,279,449	2,298,683	2,523,170	3,123,126	4,053,638	4,245,090	4,396,309	4,304,378

Source: National Statistical Office.

Table 16. College Wage Premium to High School

Year	College wage Premium to High School
1976	0.721
1978	0.731
1980	0.679
1981	0.682
1982	0.660
1983	0.674
1984	0.677
1985	0.681
1986	0.660
1987	0.653
1988	0.567
1989	0.528
1990	0.519
1991	0.483
1992	0.412
1993	0.390
1994	0.385
1995	0.389
1996	0.401
1997	0.410
1998	0.419
1999	0.412

Note ; 1) The regression equation is,

$\ln(\text{monthly wage}) = \text{sex, education dummies (based on high-school), age, age squared, tenure, tenure squared}$

2) Data is from the Basic Survey of Wage Structure of Ministry of Labor

Table 17. Pre-tax and Post-tax Gini Coefficients

year	Pre-tax Gini	Post-tax Gini	PO Index	RS Index
1982	0.3244	0.3134	-0.0339	-0.0110
1983	0.3214	0.3053	-0.0501	-0.0161
1984	0.3127	0.2985	-0.0454	-0.0142
1985	0.3154	0.3007	-0.0466	-0.0147
1986	0.3115	0.2967	-0.0475	-0.0148
1987	0.3062	0.2893	-0.0552	-0.0169
1988	0.2965	0.2785	-0.0607	-0.0180
1989	0.3143	0.2939	-0.0649	-0.0204
1990	0.2924	0.2737	-0.0640	-0.0187
1991	0.2899	0.2728	-0.0590	-0.0171
1992	0.2850	0.2694	-0.0547	-0.0156
1993	0.2874	0.2727	-0.0511	-0.0147
1994	0.2942	0.2791	-0.0513	-0.0151
1995	0.2986	0.2822	-0.0549	-0.0164
1996	0.3016	0.2837	-0.0594	-0.0179
1997	0.2928	0.2766	-0.0553	-0.0162
1998	0.3293	0.3118	-0.0531	-0.0175
1999	0.3240	0.3045	-0.0602	-0.0195

Source : Kim, Lim and An(2001)

Table 18. Total Tax Revenue as a percent of GDP

	Korea	Japan	U.S.	France	Sweden	U.K.	Australia
Excluding Social Security Contribution							
1980	17.3	18.0	21.0	23.9	34.8	29.3	28.4
1996	21.1	18.1	21.5	26.0	36.5	29.8	31.1
Including Social Security Contribution							
1980	17.5	25.4	26.9	41.7	48.8	35.1	28.4
1996	23.2	28.4	28.5	45.7	52.0	36.0	31.1

Source : OECD, revenue Statistics of OECD Member Countries, 1965-1997

Table 19. Social Welfare Budget and Tax burden Rate in OECD Countries (in % of GDP)

	Korea	Japan	U.S.A.	U.K.	Germany	Sweden	France
Social Welfare Expenditure(A)	4.42	12.44	15.64	22.84	28.27	38.03	28.73
Old aged, Disabled, Survivors(B)	1.24	6.00	7.07	9.03	13.01	12.87	12.66
A-B=C	3.18	6.44	8.57	13.81	15.26	25.16	16.07
Tax burden rate(D)*	20.7	29.1	27.0	33.5	39.2	50.1	43.9
A/D	21.4	42.7	57.9	68.2	72.1	75.9	65.4
C/D	15.4	22.1	31.7	41.2	38.9	50.2	36.6

Note: * Social Security Tax included

Source: OECD, *Social Expenditure Statistics of OECD Members Countries*, 1996.

Table 20. Poverty ratio(%)

Year	Poverty Ratio 1	Poverty Ratio 2
1975	20.04	21.52
1976	20.39	19.62
1977	19.59	19.54
1978	17.91	17.49
1979	15.15	16.00
1980	14.45	15.25
1981	12.70	13.37
1982	14.80	20.42
1983	14.21	18.96
1984	14.26	18.88
1985	12.22	18.50
1986	11.82	16.51
1987	9.57	14.30
1988	10.47	15.46
1989	11.88	16.88
1990	10.48	15.74
1991	9.75	14.94
1992	9.36	8.81
1993	7.96	8.61
1994	6.90	8.15
1995	7.36	8.47

Footnotes: Poverty ratio 1 is calculated on the basis of urban household expenditures and poverty ratio 2 is inferred on the basis of urban household income

Source: Park and Kim (1998)

Figure 1. The Gini Coefficient and Unemployment Rate

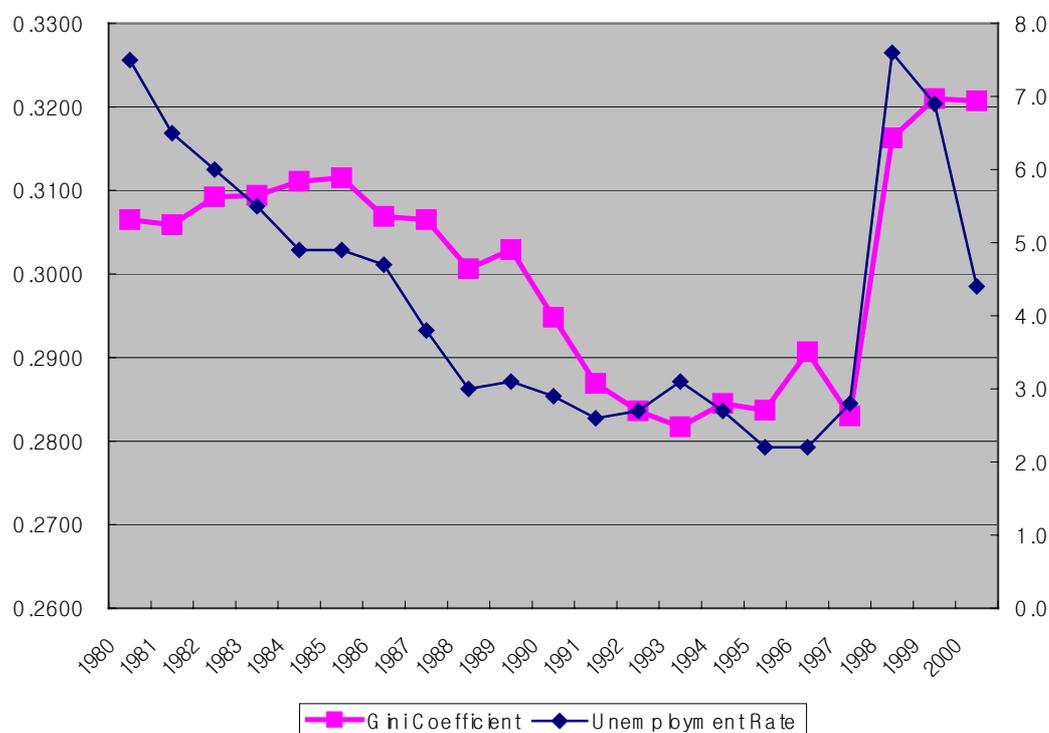


Figure 2. The Gini Coefficient and EIGDP

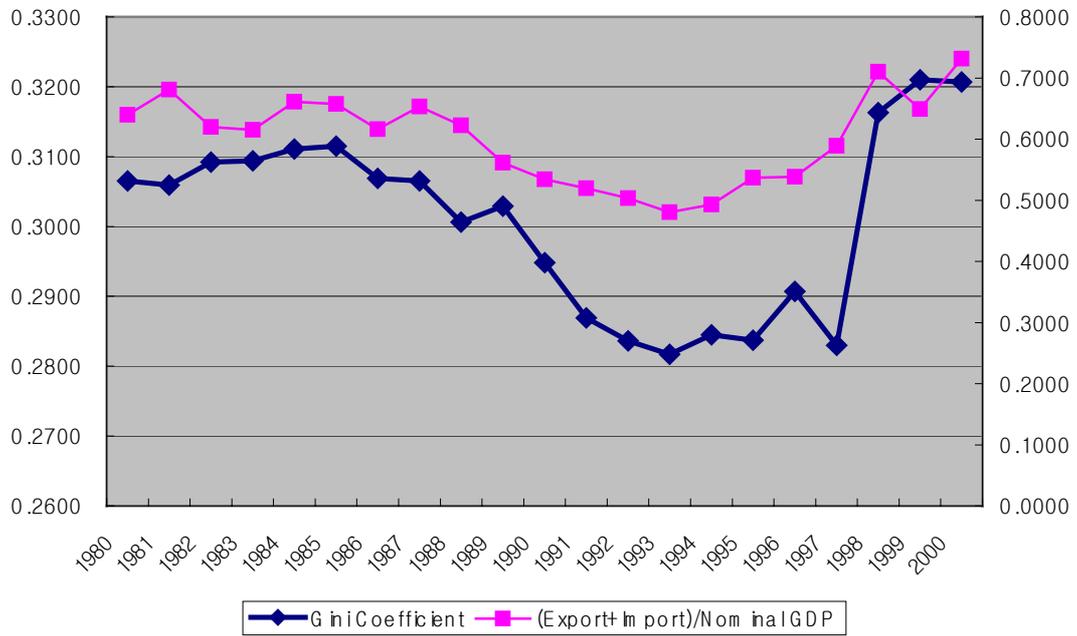
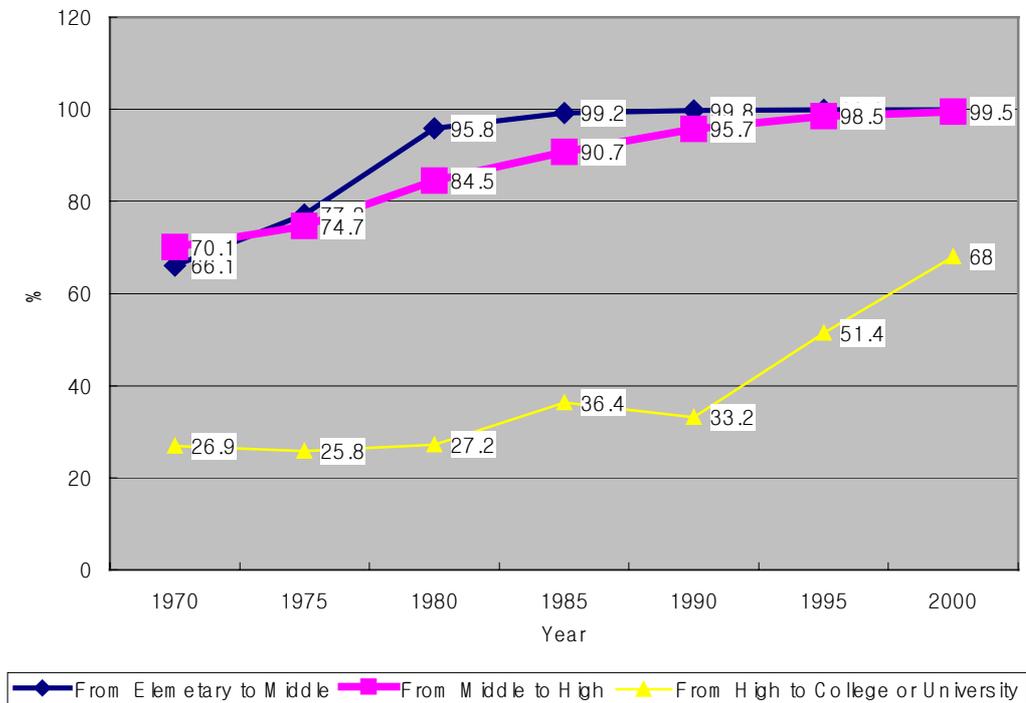


Figure 3. Advance Rate of Graduates to Higher School Level



Appendix . Issues in the Measurement of Korea's Income Distribution

Data

An accurate measurement of income distribution crucially depends on reliable income related data and its accessibility. One way to measure income inequality is to use administrative data, such as the tax records of the National Tax Office, which are neither open to researchers, nor reliable due to the practice of usual underreporting. The National Statistical Office (NSO, hereafter) has carried out several income-related surveys. Also, the Ministry of Labor has done a few earnings-related surveys.

Among them, the Family Income and Expenditure Survey (FIES, hereafter) and National Survey of Family Income and Expenditure (NSFIE, hereafter) are widely used in the study of household income distribution. Both surveys are conducted by the NSO. The FIES began in 1951 and is most widely used for its long data series. It is a cross-sectional monthly household survey, whose sample number was around 5,246 in 1999. The FIES, however, has serious shortcomings for the study of income inequality due to its limited sample coverage. The sample in the FIES only includes urban households with two or more household members and those whose household heads are employed. Hence, it excludes one-person household, households in rural areas and those whose heads are self-employed. In 1999, it was estimated that the FIES covered only 38.3% of all households. On the other hand, the NSFIE, which began in 1991, covers all kinds of households, except agricultural and fishery households. Its sample number is around 24,000. Unlike the FIES, the NSFIE does not suffer from the severe sample under-coverage problem, but this survey is done only every five years, i.e. 1991 and 1996 (and in 2001, expected).

As for earnings, the Basic Survey of Wage Structure conducted by the Ministry of Labor is widely used. This is an annual establishment-employee-survey for the earnings of the employees and characteristics of the establishments. The samples were around 3,900 establishments with ten or more regular employees until 1998, and expanded to 5,600 establishments with five or more regular employees from 1999. This survey, however, covers establishments with more than five regular employees only, hence excluding the smaller establishments with less than five employees. This survey also covers regular employees only within the establishment, excluding all non-regular employees. It is estimated that over fifty percent of all employees were non-regular employees in 1999.

To overcome these data problems, several private, semi-private, and public research institutes have conducted income and/or earnings related surveys in recent years. These surveys include the Korean Household Panel Study conducted by the Daewoo Economic Research Institute and the Korea Labor and Income Panel Study conducted by the Korea Labor Institute. It appears that these non-government oriented data can be used to supplement the official data, but not to replace them.

In short, we do not have comprehensive, consistent and reliable data for the income or earnings. With these limitations in minds, we will present and interpret the historical trends of Korea's income distribution.

Definition of Income

We turn now to the concepts and definitions of income. Table A1 summarizes the concept and definition of income according to United Nation's guidelines, in Atkinson et al (1995) and in FIES. The FIES divides the household income into wages and salary, self-employment income, property income and transfer income.

Wages and salary includes cash and non-cash benefits received from employers and excludes employer's contribution to social security. Income from self-employment represents the revenues from self-employment that is transferred to household economic activities. Property income only includes actual, realized, and regular returns on wealth. This includes interests, dividends, and rents from real estate, along with the income from patents, copyrights, and rents from other property. It excludes the imputed rents of the owner-occupied housing, gains or losses from buying or selling assets such as houses, stocks, and bonds. Transfer income includes both public transfer income, such as pension and social security benefits, and regular private transfers from other household or private institutions. The sum of these four categories of income is called current income. Non-current income includes assistance or contributions from other households for special family events, such as weddings or funerals, and sales

from used materials and other sources. Household income is defined as the sum of current and non-current income.

The NSO calculates disposable income by subtracting non-consumption expenditures from the household income. Non-consumption expenditures include taxes, such as national income tax, property taxes for housing and auto owners, contributions to social security and social insurance, paid interest, contributions to charities, and private transfers to other households. This definition of disposable income needs to be adjusted: disposable income should be calculated by subtracting direct taxes and social security contributions from the household income. The direct taxes includes only national income taxes and payroll taxes paid by the employees and self employed and omits indirect taxes such as value added taxes and property taxes.

Reliability

It is quite normal to under-report the income in household income-related surveys. We can check the reliability of the survey data by comparing the estimated figures from the income survey with those of national accounts. National accounts in themselves are also estimates from various sources, and they should not be always treated as “true values”. We can interpret the comparison results between survey and aggregated data as indicators of consistency between them. Table A2 reports the ratio of survey estimates to adjusted national accounts estimates. The survey estimates in Table 6 are based on the 1996 NSFIE. The national accounts are compiled by the Bank of Korea.

The ratio of 96FIES estimates of total household income to that of national accounts is 0.893. This ratio shows that the FIES can be regarded as “good” in terms of Atkinson et al (1995)’s categorization. The ratio of wages and salary in 96FIES to compensation of employees in national accounts is 0.879. The ratio of income from business and subsidiary work in 96FIES to operating surplus (including quasi-corporate revenue) in national accounts is 1.120. These ratios show that it is reasonable to assume there exists consistency between micro-survey income data and aggregated national account data. The property income in 96FIES, however, seems to be under-estimated. The ratio of property income in 96FIES to that of national accounts is 0.339. The interest in 96FIES is just 15.6% of that in national accounts. This under-estimated tendency in property income can be found in many surveys of other countries, for example see Atkinson et al (1996). However, the degree of under-estimation seems to be very severe. The transfer income is also under-estimated in 96FIES. The ratio of transfer income in 96FIES to current transfers in national accounts is just 0.204.

In short, the survey estimates are fairly consistent with those in the national accounts in the sense that the overall ratio of estimated total household income from 96FIES to that of national accounts is 0.893. The wages and salary seems to be fairly consistent between the two estimates, and the property and transfer income in 96FIES seems to be severely underestimated.

Table A1. Definition of Income

Headings	UN guidelines	Atkinson et al.	FIES
1. Wage and salary income (before deduction of direct taxes or employee social security contributions)	Compensation of employees (includes employer's contributions to social security and similar schemes)	Compensation of employees (excludes employer's contributions to social security and similar schemes, includes sick pay paid by the government)	Earnings (= Compensation of employees, excludes employer's contributions to social security and similar schemes, and income from co-operatives)
2. Primary income (excluding property income, before deduction of direct taxes or employee social security contributions)	1+gross entrepreneurial income + income from producers' co-operatives = Primary income	1+gross self-employment income	1+self employment income transferred to household
3. Primary income (including property income, before deduction of direct taxes or employee social security contributions)	2+property income (includes rent, dividends, interest and imputed rents of owner occupied housing)	2+realized property income (excludes imputed rents of owner occupied housing)	2+ realized property income (excludes imputed rents of owner occupied housing)
4. Market income		3+occupational pensions + other cash income	
5. Gross income (before deduction of direct taxes or employee social security contributions)	3+social security benefits +pensions/annuities + other current transfers (alimony and child support) = Total household income	4+social insurance cash transfers +universal cash transfers + social assistance	3+social security benefits + social insurance cash transfer + (regular) private transfer = Current income
6. Disposable income	5-direct taxes-social security contributions-pension fund contribution = Total available household income	5-direct taxes-social security contributions	5-direct taxes-social security contributions – social insurance contributions (medical insurance, unemployment insurance)

Table A2. The Ratio of Survey Estimates to Adjusted National Accounts Estimates**(Unit: Billion Won)**

96National Accounts		96FIES		96 N.A. Estimates (A)	96 FIES Estimates (B)	100*B/ A
Compensation of employees		Wages and salary		184,141.1	161768.3	87.9
Operating surplus		Income from business and subsidiary work		68,400.4	81805.5	120.0
Property income	Subtotal	Property income	Subtotal	40498.3	13716.0	33.9
	Interest		Interest	37665.9	5817.9	15.6
	Dividend		Dividend	1587.8	476.5	30.0
	Rent		Rent	1244.6	7368.6	592.0
Current transfer	Subtotal	Transfer income	Subtotal	10333.8	13495.3	20.4
	Social security benefits		Social Security benefit	7854.5	1699.5	21.6
	Social transfer		Pension	2479.3	409.2	16.5
Receipts		Income		303,373.9	270783.9	89.3

Source: Kang (2000)

Due to data limitations, it is hard to find consistent time series estimates of income distribution that covers all the different kinds of households or individuals in Korea. For households where the heads of the families are employees, the Gini coefficient can be directly estimated from the National Statistical Office(NSO)'s Family Income and Expenditure Survey (FIES). The Gini coefficient for all households, including self-employed or employer, can be estimated in two ways. One way is to directly use the NSO's Social Statistical Survey or the National Survey of Family Income and Expenditure Survey (NSFIE) whose sample includes all the different kinds of households. Another way is to separately estimate the Gini coefficient of the employee and the self-employed households and combine them. The Gini coefficients of the self-employed are usually estimated from the employee's income data via the consumption function. NSO's figures in Table 7 follow the first line of approach, while Choo(1992), Ahn (1992, 1995) and Whang & Lee (1996) follow the second.

According to Choo's estimates (1992), Korea's income distribution has improved since the mid 1970's. The Gini coefficient, which was 0.3908 in 1976, steadily decreased to 0.3097 in 1993. According to Ahn's estimates (1992, 1995), however, Korea's income distribution has improved from the mid 1970's to mid 1980's, but it worsened in the late 1980's. The Gini coefficient peaked in 1989, and improved until the mid 1990's. Ahn (1992, 1995) finds that the deterioration in income distribution in the late 1980's was because of the inflated land prices during that period. Since both Choo and Ahn used similar data and methodologies in their estimation of the Gini coefficients, this contradictory conclusion might be regarded as a "puzzle" (Lee and Whang, 1998). While the causes of this difference need further study, we will accept the proposition that Korea's income inequality has improved during the 1980's for the following reasons. First, we will place more weight on Lee and Whang(1998)'s result, since this seems to be the first empirical study that used the FIES raw data explicitly and the methodologies to estimate the Gini coefficient is crystal-clear to the readers. Lee and Whang (1998)'s study shows that income distribution has improved during the 1980's. Second, the NSO's estimates of the Gini coefficients, that include only urban households whose heads of the families are employees, show a moderate improvement in income distribution during the mid 1980's to the early 1990's. Since these estimates directly use the FIES data and do not employ any artificial assumptions (like similarity in marginal propensity to consumption between employees and the self-employed), we should regard the NSO's estimates as being reliable ones for the Gini coefficients for urban households whose heads of the families are employees (except non-sampling errors such as underreporting and non-responses). Accepting Lee and Whang (1998) and the NSO's estimates, we cannot find strong enough evidence of a deteriorating income distribution, especially for the self-employed, during this period. Third, Yoo(1998)'s estimate also shows that the earnings inequality also improved during the 1980's. Even though the

“puzzle” might still be regarded as a puzzle, we accept the proposition that the income distribution in the 1980’s improved for the above-mentioned reasons.

From the early 1990’s to the period before the 1997 currency crisis, income distribution did not improve at the same rate as those of previous periods and, in some years, it even deteriorated, although the absolute magnitude of deterioration does not seem to be significant. The NSO’s estimates of the Gini coefficients based on the FIES, again whose sample includes urban households whose heads of the families are employees, show that income distribution had improved in the early 1990’s and stabilized somewhat until the 1997 currency crisis, after which it deteriorated sharply.

The Gini coefficient, including all the various kinds of households during the 1990’s, has not been estimated yet. The Gini coefficients based on 1991 National Survey of Family Income and Expenditure (NSFIE) and 1996 NSFIE - recall that NSFIE does not suffer from the sample under-coverage problem, was 0.3274 and 0.3088 respectively (Hyun and Im 2001), implying that the income distribution of all households improved during the first half of the 1990’s.

Table 7 also shows the trends in earnings inequality from the late 1970’s. According to Yoo (1998)’s estimates, the earnings inequality also improved from 1979 to the mid 1990’s. The Gini coefficient of earnings in 1979 was 0.366, decreasing to 0.282 in 1997. The similarity in the trends of inequality between household income and individual earnings is expected since the major portion of household incomes are salaries and wages.

The dramatic change in income inequality after the 1997 Korean currency crisis is worth mentioning. Korea’s income distribution has worsened significantly after the 1997 currency crisis. The Gini coefficient (in the sample of urban households whose heads of families are employees) sharply increased from 0.284 in 1997 to 0.316 in 1998. This change in distribution is mainly due to a sharp decrease in the wage rate and an increase in unemployment rates induced by a rapid economic contraction, and the restructuring of firms and financial institutions. Income distribution generally interacts with unemployment and poverty. Such an interaction appeared more strongly during the economic crisis. The economic restructuring during this period caused high unemployment and poverty rates, which eventually resulted in a more unequal distribution of income. Although we observed a rapid recovery in macroeconomic indices, such as wage rates and the unemployment rate in 1999, income distribution did not recover to the pre-crisis level. The Gini coefficients kept increasing even after the economic recovery in 1999, although the unemployment rate and poverty rate showed a downturn since 1999. As shown in Table 8, the income of the poorest 20% of households in urban areas increased only by 4% in 1999, while the share of the richest 20% of households increased by 5.4%. This amplified the gaps between income groups. We briefly conclude, despite the data limitations, that the income distribution in Korea has been improving until the end of the 1980’s or early 1990’s when it partially stabilized or showed a slight deterioration. After the currency crisis, it deteriorated sharply.²⁸