

THE DISTRIBUTION AND POLARIZATION OF INCOME IN KOREA, 1965-2005: A HISTORICAL ANALYSIS

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Four measures of inequality in the distribution of income, income sources, consumption, and saving for salary-and-wage-earner households in cities of Korea are reported. Polarization measures are also computed. Income distribution shows improvement during the early part of the 1990s, but modest deterioration during the period 1998-2005. The income inequality variations are found to result mostly from variations in wage inequality. We find that income gaps between the top 10 percent and the bottom 10 percent groups have been widening. Income inequality and polarization did increase in the early 2000s. However, no definitive evidence is found on the presence of a rising trend of polarization. Comparing the Gini and real mean income per household for the United States, Taiwan, and Korea from 1984 to 2003 indicates that Korea's Gini varied relatively favorably.

Keywords: Korea, Distribution of Income, Polarization

JEL classification: D31

1. INTRODUCTION

Korea has been transformed from a closed low-income agricultural economy in the 1960s to an open diversified high-income economy today. Korea's society and economy have become freer and more integrated with the rest of the world.

One of the frequently expressed interests has been equitable distribution of the benefits from Korea's high and rapid rate of economic growth and transformation. Beginning early 2000s, income inequality and polarization has become a serious policy concern and has attracted a lot of attention from policy makers and analysts interested in economic growth,

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equity, and social stability.¹

This paper constructs and focuses on the measurements of inequality in income distribution and polarization in Korea for the period 1965-2005 to shed empirical light on what happened in historical perspective and how Korea compares with other countries. It begins by constructing the data from 1965 to 1979 that are comparable to the data officially published from 1980. Then it focuses on the measurements of inequality in the changes in income distribution and the contribution of alternative income sources to the development of Gini income inequality. It presents Gini coefficients reported in earlier studies. It calculates the polarization indices of income to examine the degree of polarization in Korea. Then, it examines whether there are the trends in income inequality and polarization measures. We compare our Gini measure of income distribution with those of other countries and evaluate the performance of Korea, Taiwan, and the United States with respect to the growth and distribution of income.

This paper is organized as follows: Section 2 presents four measures of income inequality we use and the sources and limitations of the available data. Section 3 discusses our estimates of income inequality. Section 4 decomposes income inequality into the three sources of incomes. Section 5 surveys Gini coefficients reported in Korea in the past. Section 6 compares Gini estimates elsewhere in the world and evaluates the performance of Korea, Taiwan, and the United States. Section 7 discusses the polarization of Korea's distribution of income using the measures of Esteban and Ray (1994) and Wolfson (1994). Section 8 discusses the trends in the Gini and polarization indices in Korea. Section 9 closes this study with a summary and remarks.

2. MEASURING THE DISTRIBUTION OF INCOME

2.1. Measures of Inequality

We use four of the different measures of income inequality: the Gini coefficient denoted by Gini, Theil's entropy measure (Theil), the coefficient of variation (CV), and the decile ratio (the ratio of the income earned by the top 10% to the income earned by the bottom 10% of households, X/I).²

¹ Recently, it has been perceived by the public that the gap between the rich and the poor has widened and income polarization has increased. The governments of Kim Dae Jung and Roh Moon Hyun focused economic policy on income distribution to improve the economic conditions of lower income groups. For a discussion of policy issues, see Kwack (2006).

² See Atkinson (1970), Fields (1983), and Duclos and Araar (2006, chapter 4). The Gini coefficient, G , is defined as $G = (2\mu^2)^{-1} \sum_{i,j} |y_i - y_j|$ where n = the number of sample groups, μ = the total sample mean income, and $y_i = ith$ income. The Theil measure of inequality proposed by Theil (1967), T , is given by

2.2. Data Sources and Description of Data

The statistical data on income distribution in Korea are found in the “Monthly Income and Expenditure per Household by Income Decile of Salary and Wage Earner Households in All Cities” in the Annual Report on the Family Income and Expenditure Survey, produced by the Economic Planning Board (EPB) from 1963-1980, and then in the Annual Report on the Household Income and Expenditure Survey from 1980, produced by the National Statistical Office (NSO).³

From 1979, the Monthly Income and Expenditure per Household has been divided into ten decile groups. Before 1979, it was divided by defined income group. The average number of households in each income group varied. It used more than ten income groups from 1975-1978 and between seven and nine groups from 1970-1974. From 1967-1969, ten income groups were used, whereas eight groups were used for 1965 and 1966.

To make the data comparable, we had to consolidate the figures from 1965 to 1978 by income groups into each income decile. The method used is described in Appendix A. Our consolidated data for the period 1965-2005 are included as Appendix B: Consolidated Data. The data for the period 1982-2005 are included in Appendix B, in spite of the fact that the data from 1982 to 2005 can be obtainable from the Family [Household] Income and Expenditure Survey published by NSO and the website of NSO, www.nso.go.kr. The main reasons to include them in Appendix are twofold: the first reason is that the data sources are not well known and source publications are not readily available to profession, particularly in foreign countries, and the second is that while the data for the period 1982-2005 are currently available from NSO sources, these data may not be available in later years. Hence, the Appendix B can be served as a backup and readily available source of the data.

Several comments are in order on the reliability of the data and its use to represent all households in Korea.⁴ The Family [Household] Income and Expenditure Survey is

$$T = \sum_{j=1}^n s_j [\log(s_j) - \log(1/n)]$$

where s_j is the share of the j th group in total income, and n is the total

number of income groups. A higher value of the index indicates a more equal distribution of income. The coefficient of variation (denoted by CV) is defined by $CV = \sigma / \mu$ where σ is the standard deviation and μ is the mean income. The decile dispersion ratio, X/I, is defined here as the ratio of the average income of the top 10 percent to the average income of the bottom 10 percent.

³ The titles of tables before 1980 differ slightly; “Composition of Income by Income Group,” “Monthly Income and Expenditure of Salary and Wage Earner Households by Income Groups for All Cities,” “Monthly Income and Expenditure per Household by Income Groups of Salary and Wage Earner Households in All Cities”.

⁴ Hyun and Lim (2004) discusses the nature and limitation of available statistical data in empirical measurements of income distribution in Korea. Kang (2000) discusses in details the nature, collection and limitations of household survey data by NSO.

limited to salary-and-wage-earner households in cities. Note that it is a misrepresentation to use the term “All Cities” as the “Monthly Income and Expenditure per Household by Income Decile of Salary and Wage Earner Households in All Cities” does. Among urban households, the Family [Household] Income and Expenditure Survey excludes farm households, fishermen’s households, single person households, households whose income and expenditures are difficult to quantify regularly, and households with two or more business employees. The Family [Household] Income and Expenditure Survey also excludes households in rural areas and households headed by employers, self-employed, and professionals.

3. EMPIRICAL MEASURES OF INEQUALITY

Our measurement concentrates on gross income inequality among salary-and wage-earner households in Korean urban cities. Gross income consists of three income sources, wage earnings, income from assets, and other income, which includes imputed house rents from owner occupied homes, gifts, transfers, and irregular income. In the survey data we used, the sizes and composition of households were similar, so no size adjustment was made.

Using the consolidated data on the calendar year basis, we computed the four measures of inequality in the distribution of gross income and its three components. We reported them in Appendix C. To examine the possible structural breaks in the four measures of inequality for gross income, we employed the method advanced by Bai and Perron (1998). We found four significant structural breaks in the Gini index of gross income during the period: 1970, 1975, 1990, and 1998. (see Figure 1.)

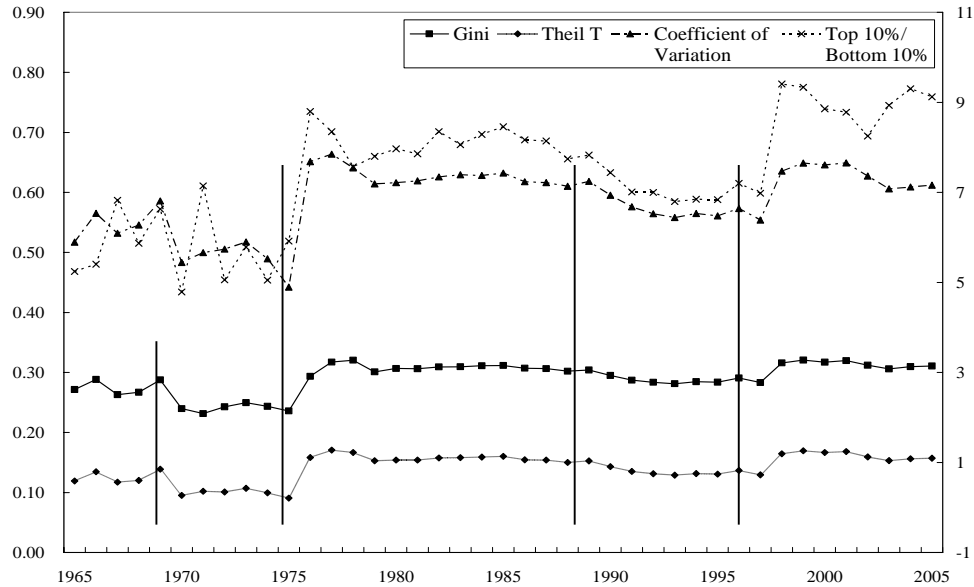


Figure 1. Structure Shift in Income Inequality Measurements

Table 1 summarizes the movement of the four inequality measures during the five sub-periods, grouped according to the analysis of structural breaks. Figure 2 presents Gini coefficients for gross income and for its three sources during the period 1965-2005. As is clear in Table 1 and Figure 2, the Gini, Theil, and CV inequality measures for gross income are lower than for earnings. But, the X/I decile dispersion ratio for gross income is higher than for earnings. It is due to the fact that the X/I decile dispersion ratios for income on assets and other income are much higher than for earnings.

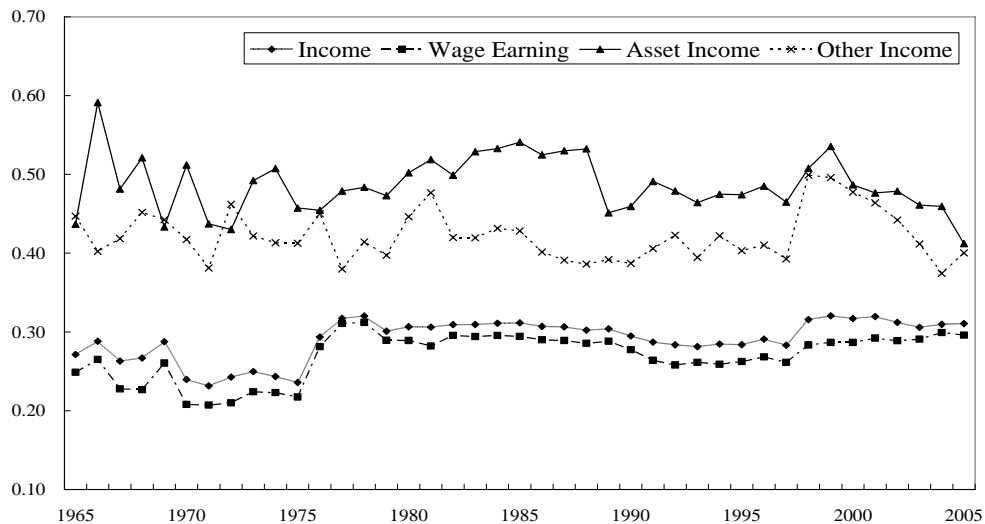
Inequality measures for gross income and earnings follow a similar moderate cycle. Compared to the years 1965-1969, the Gini coefficient of income was low during the period 1970-1975, showing decreasing inequality. For 1976-1989, the Gini coefficient increased by 29 percent, raising inequality. During the period 1990-1997, it declined by 6 percent, and the Gini coefficient of income increased by 7 percent during the period 1998-2005.⁵ The decile ratio rose from 7 in the 1990-1997 period to 9 in the 1998-2005 period, a rise that occurred after the Korean financial crisis.⁶

⁵ Retirement-pay-receipts are included in household income from 2003. Their inclusion raises the income of high income groups relative to that of low income groups. Hence, it worsens the income distribution, raising the Gini coefficient by 0.03 and the decile ratio by 0.2.

⁶This view was presented in Chung (2001).

Table 1. Estimated Measures of Inequality

	1965-1969	1970-1975	1976-1989	1990-1997	1998-2005
<u>Income</u>					
Gini	0.28	0.24	0.31	0.29	0.31
Theil	0.13	0.10	0.16	0.13	0.16
CV	0.55	0.49	0.63	0.57	0.63
X/I	5.99	5.62	8.09	7.01	9.00
<u>Earnings</u>					
Gini	0.25	0.21	0.29	0.26	0.29
Theil	0.10	0.08	0.14	0.11	0.14
CV	0.48	0.44	0.59	0.51	0.56
X/I	5.00	4.86	7.57	6.22	8.05
<u>Income on assets</u>					
Gini	0.49	0.47	0.50	0.47	0.48
Theil	0.44	0.40	0.44	0.40	0.41
CV	1.10	1.06	1.11	1.10	1.10
X/I	46.78	25.62	23.86	16.42	21.03
<u>Other income</u>					
Gini	0.43	0.42	0.42	0.40	0.45
Theil	0.32	0.30	0.31	0.30	0.40
CV	0.89	0.87	0.95	0.94	1.14
X/I	26.67	22.13	11.50	11.96	14.30

**Figure 2.** Gini Measurements for Different Sources of Income per Household of Salary and Wage Earners by Income Decile

Overall, the cycles in the movement of the Theil and CV inequality measures are similar to the cycles in the movements of the Gini coefficient. The decile ratios for income on assets and other income move differently. The ratios for income on assets decreased by 7 percent and other income by 48 percent during the period 1976-1989. The decile ratio for other income increased by a further 4 percent during the period 1990-1997.

4. THE CONTRIBUTION OF SOURCE INCOMES TO INEQUALITY

The inequality measure for gross income reflects the overall degree of inequality. Gross income consists of three different components of income in this paper; that is, earnings, income from assets, and other income. We examine the contribution of each source of income to the change in inequality of gross income in Korea between 1965 and 2005. The Gini coefficient for total income can be written as the weighted average of the Gini coefficients of each income source. In our case, the Gini coefficient for the entire sample can be exactly decomposed into three components:⁷

$$G = \sum_{j=1}^3 s_j G_j + \sum_{i>j} \phi_i \phi_j (D_{ij}/Y), \quad (1)$$

where G =Gini coefficient for gross income, $G_j = jth$ source income, $j = 1$ (earnings), 2 (income on assets) and 3 (other income), s_j = the share of jth source income in total income, ϕ_j = number of households in group j as a proportion of the total number of households, D_{ij} = Gini difference, and Y = mean income.

We defined s_j as 0.5 times the sum of shares in current and preceding years, and we computed the inter-groups term, $\sum_{i>j} \phi_i \phi_j (D_{ij}/Y)$, which is found to be close to zero.

Hence, the Gini coefficient of gross income is a weighted average of the Gini coefficients of income sources. We computed the ratio, $s_j G_j / G$, for each of the three income inequality measures. The ratio is the contribution of jth income source to the variations in the Gini coefficient of total income. It shows the extent to which the Gini coefficient of gross income is affected by the individual income sources.

⁷See Rao (1969), Pyatt (1976), Fields (1983, p.98-124), and Jenkins (1995). Theil (1979, 1989) also presents the decomposition method in the case of Theil inequality measure.

Table 2. Contributions of Income Sources to Inequality of Income

	(Contribution (%) by)			
	<u>Gini</u>	Earnings	Income on Assets	Other Income
1965-1969	0.28	76.9	6.2	16.5
1970-1975	0.24	78.6	5.9	15.9
1976-1989	0.31	85.8	4.7	9.4
1990-1997	0.29	78.9	4.1	17.0
1998-2005	0.31	79.2	2.7	18.1
	<u>Theil</u>	Earnings	Income on Assets	Other Income
1965-1969	0.13	86.2	15.7	34.3
1970-1975	0.10	87.9	15.1	34.5
1976-1989	0.16	90.2	9.0	15.3
1990-1997	0.13	85.6	8.8	32.1
1998-2005	0.16	85.5	5.6	37.9
	<u>CV</u>	Earnings	Income on Assets	Other Income
1965-1969	0.55	76.0	6.9	17.0
1970-1975	0.49	78.2	6.5	16.2
1976-1989	0.63	84.6	5.1	10.5
1990-1997	0.57	76.6	4.7	19.8
1998-2005	0.63	76.0	3.2	23.0
	<u>X/I</u>	Earnings	Income on Assets	Other Income
1965-1969	5.99	72.3	6.9	17.0
1970-1975	5.62	75.9	6.5	16.2
1976-1989	8.09	84.4	5.1	10.5
1990-1997	7.01	75.9	4.7	19.8
1998-2005	9.00	76.5	3.2	23.0

The results of the computation are presented in Table 2. The table shows that the distribution of earnings explains about 80 percent of the distribution of gross income; the distribution of other income explains about 15 percent; and the distribution of income on assets explains about 5 percent. About 5 percent contribution by income on assets is a consequence of the low share of income on assets that exists in the Survey data. The contributions by the income sources imply that a change in the distribution of income for salary-and-wage-earner households in urban cities is determined to a great extent by changes in the distribution of earnings.

5. SURVEY OF PREVIOUS GINI COEFFICIENT ESTIMATES IN KOREA

Table 3 presents the Gini coefficients reported in the 1960s. These earlier studies showed that the lowest Gini coefficient of income distribution for the period 1965 to 1970 was 0.27 in 1966 and the highest was 0.43 in 1968.⁸

Table 3. Gini Coefficient of Income Distribution in 1960s

	1965	1966	1967	1968	1969	1970
Institute of Social Sciences (1966)		0.34				
Oshima (1970)		0.27				
Chae (1972)						0.38
Mizoguch <i>et al.</i> (1976)	0.34		0.40	0.43	0.42	0.36

Note: Oshima (1970), Chae (1972) and Mizoguch *et al.* (1976) are also cited by Choo (1982), Appendix 2, Table 2-4, p. 403, and Choo (1979b), p. 24.

Studies of Korea's income distribution since 1970 can be divided into two groups.

The first group estimated the Gini coefficients for the distribution of income for all households in Korea.⁹ These include the estimates by the Economic Planning Board from 1980, the National Statistical Office from 2003, the associates of Choo and by the associates of Ahn.¹⁰ The Gini coefficients by both Choo and Ahn associates are summarized in Table 4. Kwon (1993) estimated that the Gini coefficient of income distribution for all households 0.4.¹¹ Note that the Gini coefficients for all households estimated by both Choo associates, Ahn associates and Kwon (1993) are higher than estimated that the Gini coefficients for salary-and-wage-earner households in urban cities as discussed below.

⁸For discussions on the method and data base in earlier studies, see Choo (1977, 1979b).

⁹The first group supplemented data for farm and fishery households, single-person households, households with mingled business and household incomes, and households with high incomes. See Leipziger *et al.* (1992), p. 10-32.

¹⁰The studies by the associates of Choo are Choo (1978, 1993), Choo and Kim (1978), Choo and Yoon (1984). The studies by the associates of Ahn are Ahn (1992, 1995, 1997), and Kim and Ahn (1987).

¹¹We should acknowledge that there are the studies, which are difficult to belong to the two groups. The studies are Kwon (1993), Lee and Whang (1998), Park and Kim (1998), and Kim and Kamiya (2005).

Table 4. Gini Estimates of Korea by Choo and Ahn Associates

Year	Choo Associates			Ahn Associates		
	Whole	Farm	Non-Farm	Whole	Farm	Non-Farm
1965	0.344	0.225	0.417			
1970	0.332	0.295	0.346	0.365	0.194	0.395
1976	0.391	0.327	0.412	0.368	0.215	0.434
1980	0.389	0.356	0.405	0.378	0.208	0.444
1982	0.357	0.306	0.371	0.377	0.154	0.432
1985	0.345	0.297	0.369	0.380	0.123	0.431
1986	0.337	0.297	0.342	0.377	0.118	0.424
1988	0.336	0.290	0.350	0.384	0.115	0.425
1990	0.323	0.299	0.324	0.402	0.105	0.441
1993	0.310	0.310	0.306	0.380	0.093	0.409
1994				0.385	0.087	0.414
2003	0.341					
2004	0.344					
2005	0.348					

Notes: Figures of Choo Associates for 1965, 1970, 1976, 1982, 1986, and 1990 are from Choo (1993), and figures for 1980, 1985, 1988, 1993 and 2003-2005 are from NSO website and *Social Indicators in Korea*. Figures of Ahn Associate for 1968-1981 are from Ahn (1992) and those for 1982-1994 are from Ahn (1995).

The second group estimated the Gini coefficients for the distribution of income in salary-and wage-earner urban households. The estimates of Gini coefficients are those by Yoon (1997), *Social Indicators in Korea* by the National Statistical Office from 1981, Jung and Choi (2001), Choi (2003), Ryu (2001), Min (2006) and those reported in this paper. They are given in Table 5. As shown in Figure 3, the Gini estimates in these studies for the period 1982-2005 are virtually identical, although the estimates of Yoon (1997) and Ryu (2001) slightly differ. This outcome results from the fact that they used averaged monthly data or sample data from the same sources. The Gini estimates by Yoon (1997) and in this study are similar from 1965 to 1988. The Gini coefficients are declined from 0.27 in the middle of the 1960s to 0.24 in 1975 and remain around 0.3 until the end of 1980s. After falling to 0.28 in the mid-1990s, the Gini coefficient rose to 0.321 in 1999 and gradually declined to 0.311 in 2005.

Table 5. Gini Estimates for Salary and Wage Earner Households in Urban Cities

Year	This Study	Yoon	Jung & Choi	Choi	Ryu	Min <i>et al.</i>
		(1997)	NSO (2001)	(2003)	(2001)	(2006)
1965	0.271	0.289				
1966	0.288	0.289				
1967	0.263	0.315				

Year	This Study	Yoon (1997)	NSO	Jung & Choi (2001)	Choi (2003)	Ryu (2001)	Min <i>et al.</i> (2006)
1968	0.267	0.297					
1969	0.288	0.288					
1970	0.240	0.266					
1971	0.231	0.261					
1972	0.243	0.261					
1973	0.250	0.276					
1974	0.243	0.263					
1975	0.236	0.312					
1976	0.293	0.326					
1977	0.316	0.341					
1978	0.320	0.325					
1979	0.301	0.311				0.310	
1980	0.307	0.312				0.312	
1981	0.306	0.312				0.311	
1982	0.309	0.316	0.309		0.309	0.314	0.309
1983	0.310	0.317	0.309		0.309	0.315	0.309
1984	0.311	0.318	0.311		0.311	0.316	0.311
1985	0.312	0.318	0.312		0.311	0.316	0.311
1986	0.307	0.313	0.307		0.307	0.312	0.306
1987	0.307	0.309	0.307		0.307	0.311	0.306
1988	0.302	0.300	0.301		0.302	0.307	0.302
1989	0.304	0.309	0.304		0.304	0.309	0.303
1990	0.295	0.302	0.295	0.297	0.295	0.300	0.294
1991	0.287	0.294	0.287	0.290	0.287	0.293	0.287
1992	0.284	0.290	0.284	0.285	0.284	0.288	0.283
1993	0.281	0.287	0.282	0.282	0.281	0.285	0.281
1994	0.285	0.289	0.285	0.286	0.285	0.289	0.284
1995	0.284	0.282	0.284	0.285	0.284	0.289	0.283
1996	0.291		0.291	0.291	0.291	0.295	0.290
1997	0.283		0.283	0.283	0.283	0.287	0.282
1998	0.316		0.316	0.316	0.316	0.321	0.315
1999	0.321		0.320	0.321	0.320	0.327	0.320
2000	0.317		0.317	0.321	0.317	0.323	0.316
2001	0.320		0.319		0.320		0.319
2002	0.312		0.312		0.312		0.311
2003	0.306		0.306				0.305
2004	0.310		0.310				0.309
2005	0.311		0.310				0.310

Note: NSO refers to *Social Indicators in Korea* published by NSO.

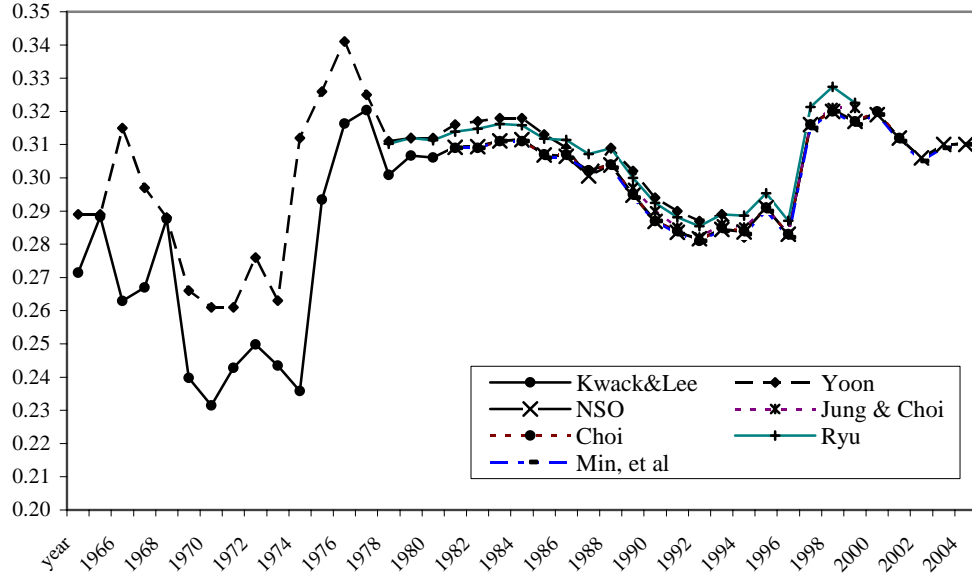


Figure 3. Gini Estimates for Salary and Earner Households in Urban Cities

6. INTERNATIONAL PROSPECTS

It is almost impossible to collect Gini coefficients that are strictly comparable internationally. Problems arise in data quality, measurement errors, and in definitions of income, sampling methods, and so forth.¹² The income inequality measures in this paper are based on the survey of salary-and wage-earner households in urban cities. Some other countries may be those based on nationwide households, for example Taiwan and the United States. To figure out the sampling-bias of the survey of salary-and wage-earner households in urban cities from the survey of all (nationwide) households by the NSO, we present Table 6. The Gini figures for urban wage earner households are about 90 percent smaller than those for all households. However, the ratios of each of X/I and Gini/sample mean income for both households are virtually constant over the period of the three years. Hence, the income inequality measures based on the survey of salary-and-wage-earner households in urban cities can be used for an international comparison.

¹²The Gini coefficients for some OECD countries are based on individual incomes. Household surveys based on expenditure data are generally considered as more accurate than income data.

Table 6. Inequality Measures for Salary-and-Wage-Earner Households in Urban Cities and for All (nationwide) Households

	2003	2004	2005
Urban Cities (A)			
Gini	0.306	0.310	0.311
X/I	8.932	9.303	9.122
Gini/Mean Income	0.010	0.010	0.010
All(B)			
Gini	0.341	0.344	0.348
X/I	7.230	7.350	7.560
Gini/Mean Income	0.013	0.012	0.012
Urban relative to All Households (A)/(B)			
Gini	0.897	0.900	0.892
X/I	1.235	1.266	1.207
Gini/Mean Income	0.807	0.811	0.802

For a rough international comparison, Gini coefficients are presented in Table 7 for selected countries, reported by the World Bank (2006). Gini coefficients are higher than 0.4 for developing countries in Asia and Latin America, and lower for the OECD member countries with the exception of the United States whose Gini coefficient, 0.4, which is the highest among the OECD countries. The table shows that Korea's Gini is mid-sized.¹³

Table 7. Income Gini Coefficients for Major Countries in the World

	Year of Survey	Gini Coefficients		Year of Survey	Gini Coefficients
USA	2000	0.408	Australia	1994	0.352
Canada	2000	0.326	New Zealand	1997	0.362
Austria	2000	0.291	Japan	1993	0.249
Belgium	2000	0.33	Hong Kong	1996	0.434
Denmark	1997	0.247	China	2001	0.447
Finland	2000	0.269	Korea	1998	0.316
France	1995	0.327	Malaysia	1997	0.492
Germany	2000	0.283	Philippines	2000	0.461
Greece	2000	0.343	Singapore	1998	0.425
Ireland	2000	0.343	Thailand	2002	0.42

¹³ Foster and Pearson (2002, Annex p.38) shows that the Anglo-Saxon OECD countries excluding Canada have Gini coefficients higher than 0.3, while Canada and the other OECD countries have less than 0.3 Gini coefficients.

Italy	2000	0.35	Taiwan	2003	0.343
Netherlands	1999	0.309	Argentina	2003	0.528
Norway	2000	0.258	Brazil	2003	0.58
Portugal	1997	0.385	Chile	2000	0.571
Spain	2000	0.347	Columbia	2003	0.586
Sweden	2000	0.25	Mexico	2002	0.495
Switzerland	2000	0.337			
UK	1999	0.36			

Note: World Bank (2006), Table 2.8, p. 76-78. For Taiwan, ROC, Taiwan, Directorate General of Budget, Accounting and Statistics, ROC, *Social Indicators of the Republic of China 2004*, Table 12.

Cornia, Addison, and Kiiski (2004, table 2.1) give their estimate of the ratio of the income shares of the top and bottom deciles: 11.8 for the United Kingdom around 1970, 23.4 for the United States, 11.7 for Germany, and 6.6 for Japan around 1970. Korea's decile ratio of 5.6 in 1970-1975 and in the range of 7 to 9 for the period 1990-2005 is relatively lower.

Table 8 provides the Gini coefficients of the income distribution and real mean incomes from 1984 to 2003 for three countries, the United States, Taiwan, and Korea. In Figure 4, we show mean income on the horizontal axis and the Gini coefficient compatible with a given level of mean income on the vertical axis. The schedule is called the "Gini-Income locus". The Gini-Income locus for the United States and Taiwan is positive. But the Gini-Income locus for Korea does not show a positive trend and varies around the Gini value of 0.3. For the United States the Gini coefficient rose by 11 percent and the real mean income per household by 24 percent from 1984 to 2003; for Taiwan, by 17 and 75 percent; and for Korea, by -1 and 112 percent, respectively. When we look at the distribution of income divided by the mean value of real income without considering other factors, we can conclude that Korea's distribution of income per its sample mean value of household real income varied over time more favorably than the other two countries.¹⁴

¹⁴ Leipziger *et al.* (1992) claims that Korea attained economic development with a lower degree of income inequality, as compared with other developing countries in the world.

Table 8. Gini and Real Income per Household-United States, Taiwan, and Korea

	United States		Taiwan		Korea	
	Gini Coefficient	Mean Income (2004 \$)	Gini Coefficient	Mean Income (2000 NT\$)	Gini Coefficient	Mean Income (2000 won)
1984	0.415	47518	0.287	428154	0.311	866
1985	0.419	48667	0.29	434081	0.312	906
1986	0.425	50579	0.296	447679	0.307	985
1987	0.426	51538	0.299	477447	0.307	1116
1988	0.427	52192	0.303	529855	0.302	1218
1989	0.431	53725	0.303	581080	0.304	1434
1990	0.428	52418	0.312	626502	0.295	1548
1991	0.428	51290	0.308	681099	0.287	1739
1992	0.434	51246	0.312	718584	0.284	1917
1993	0.454	53331	0.316	789326	0.281	1993
1994	0.456	54381	0.318	818653	0.285	2159
1995	0.45	55313	0.317	845773	0.284	2321
1996	0.455	56486	0.317	835429	0.291	2492
1997	0.459	58320	0.32	858421	0.283	2535
1998	0.456	60014	0.324	845822	0.316	2199
1999	0.457	62044	0.325	873614	0.321	2275
2000	0.462	62671	0.326	891445	0.317	2387
2001	0.466	62114	0.35	863690	0.320	2522
2002	0.462	60768	0.345	879766	0.312	2612
2003	0.464	60654	0.343	905097	0.306	2656
% change from 1984-2003	11.16	24.41	17.82	74.86	-1.71	112.10

Note: For Taiwan, Taiwan Directorate General of Budget, Accounting and Statistics, ROC, *Social Indicators of the Republic of China 2004*, Table 12. For the United States, Strawser (2006), p. 53.

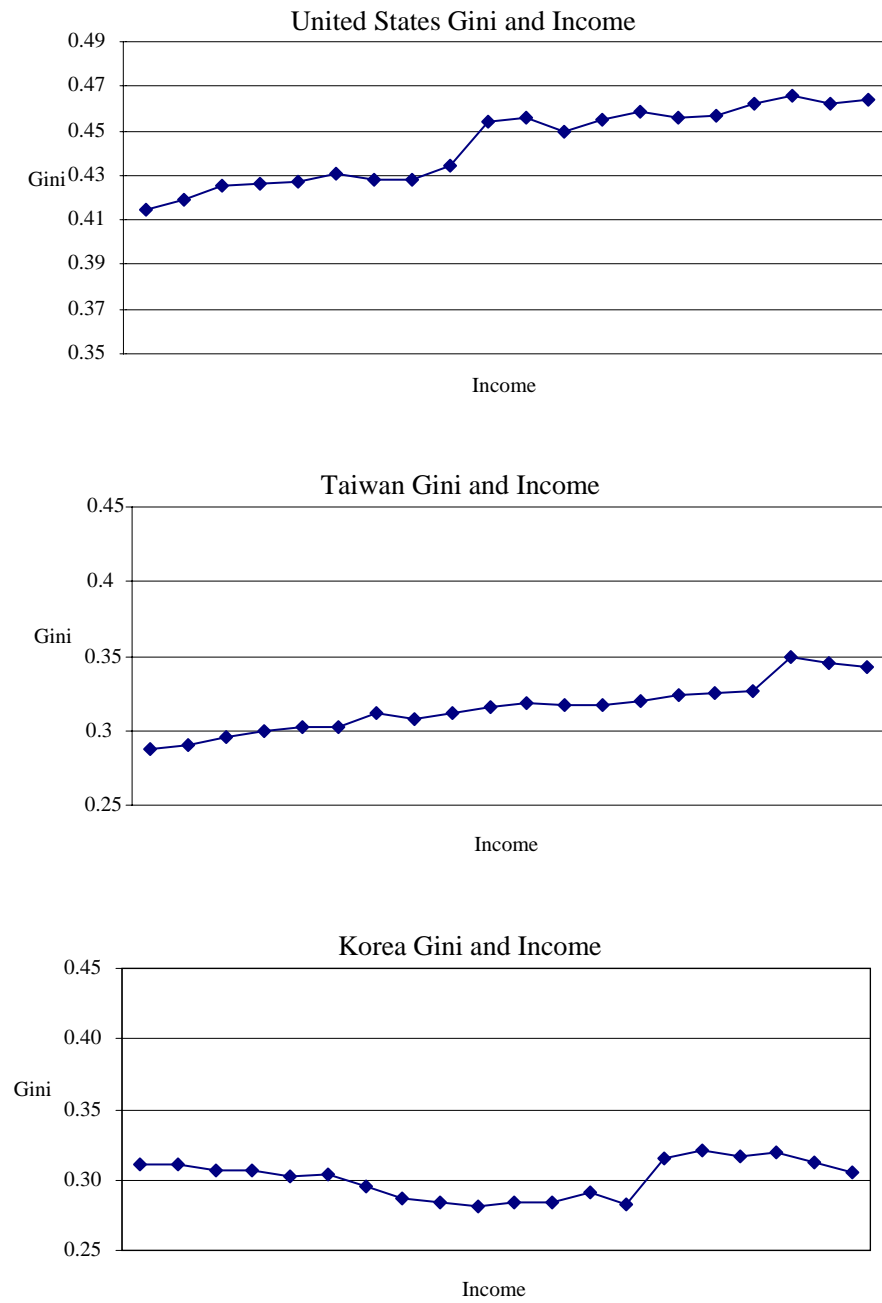


Figure 4. Gini and Income: the United States, Taiwan, and Korea

7. INCOME POLARIZATION

The four inequality measures we utilized are the numerical representation of the spread of an income distribution and emphasize the deviation from the mean income within a population, ignoring clustering around local means. Though related to inequality, polarization is a particular type of change in the income distribution: a movement of the observations from the middle of the distribution towards the two tails. Esteban and Ray (1994, 1999), and Wolfson (1994, 1997) try to capture ‘clustering’ along the income dimension.

The Esteban-Ray index (hereafter denoted by ER) can be expressed as:

$$ER = A \sum_{i=1}^K \sum_{j=1}^K \pi_i \pi_j \pi_i^\alpha |y_i - y_j|, \quad (2)$$

where y_i is the average income in the i th group normalized by the mean income in a population, π_i is the ratio of the population in the i th group to the total population, and A is a normalization scalar. The degree of polarization sensitivity parameter α must lie between 0 and 1.6. The ER is equal to the Gini coefficient if α is set to 0.

The index of Wolfson (1994) (hereafter denoted by W) is derived from the Lorenz curve. It is twice the area between the Lorenz curve and the tangent line at the median point. The Wolfson index lies between 0 and 1. It can be expressed as follows:

$$W = 2(2T - G)/(m/\mu), \quad (3)$$

where $T = 0.5 - L(0.5)$ and $L(0.5)$ denotes the income share of the bottom half of the population. G is the Gini index, m is the median income, and μ is the mean income. In our computation, the median income, m , is regarded as the half of the sum of V and VI income group’s income.

We calculated the two polarization indices, ER and W , for each year over the period 1965-2005. In our calculation of the ER index, we use $\alpha = 1.5$ to give a large weight to ‘polarization’ and use $A = 10$ to make the magnitude of ER comparable to the Gini. Table 9 contains Gini coefficients and the two polarization measures, ER and W in addition to the ratio of top 10 group to bottom 10 group, X/I .¹⁵ Figure 5 presents the movements in the measures of Gini, ER , and W . The Gini, ER , and W measures do provide different patterns and trends in Korea before 1978, but the three measures are not distinctly different thereafter and move in the same direction.¹⁶ From 1990 until

¹⁵ Min *et al.* (2006, p. 95) provides the figures of ER and W from 1982 to 2005. The trends of the figures are similar to the trends of our figures.

¹⁶ Ravallion and Chen (1997) reported that the the Gini index and and W index moved in the same direction in their worldwide cross country sample.

1997, they tend to stay at the level in 1990 or slightly lower level. The three measures shift up in 1998 and 1999 and then shift down in 2001 at slightly lower levels. From 2002 the measures move downward mildly in the same direction.

Table 9. Income Inequality and Polarization, 1965-2005

Year	Gini	ER	W	X/I
1965	0.271	0.173	0.286	5.244
1966	0.288	0.183	0.319	5.405
1967	0.263	0.171	0.206	6.825
1968	0.267	0.173	0.216	5.871
1969	0.288	0.184	0.243	6.630
1970	0.240	0.159	0.234	4.787
1971	0.231	0.155	0.161	7.145
1972	0.243	0.160	0.220	5.056
1973	0.250	0.167	0.217	5.785
1974	0.243	0.162	0.233	5.052
1975	0.236	0.165	0.193	5.917
1976	0.293	0.198	0.201	8.799
1977	0.316	0.168	0.169	8.183
1978	0.320	0.195	0.210	7.568
1979	0.301	0.194	0.279	7.800
1980	0.307	0.194	0.274	7.968
1981	0.306	0.193	0.272	7.856
1982	0.309	0.196	0.275	8.352
1983	0.310	0.196	0.278	8.061
1984	0.311	0.197	0.283	8.288
1985	0.312	0.197	0.281	8.458
1986	0.307	0.194	0.277	8.167
1987	0.307	0.194	0.277	8.142
1988	0.302	0.191	0.271	7.745
1989	0.304	0.192	0.270	7.828
1990	0.295	0.186	0.262	7.441
1991	0.287	0.182	0.255	7.009
1992	0.284	0.179	0.253	6.999
1993	0.281	0.178	0.251	6.796
1994	0.285	0.180	0.257	6.849
1995	0.284	0.179	0.257	6.840
1996	0.291	0.184	0.266	7.203
1997	0.283	0.179	0.257	6.980
1998	0.316	0.200	0.282	9.410
1999	0.321	0.203	0.291	9.337
2000	0.317	0.200	0.284	8.856

2001	0.320	0.202	0.291	8.781
2002	0.312	0.197	0.285	8.253
2003	0.306	0.193	0.274	8.932
2004	0.310	0.196	0.280	9.303
2005	0.311	0.196	0.280	9.122

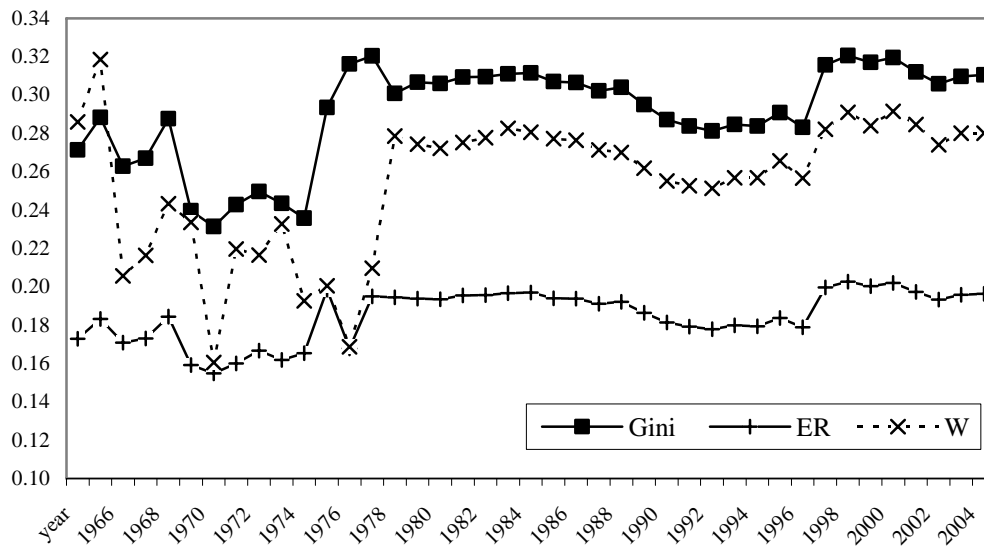


Figure 5. Income Inequality and Polarization

The financial crisis in Korea during 1997-1998 represent unprecedented severe economic, social, and political shocks. The Korean economy and financial markets experienced overshooting phenomena.¹⁷ The Gini, *ER*, and *W* estimates shift up in 1998 by 11.7 percent, 11.7 percent, and 9.7 percent, respectively. The high upward shifts are clearly represented by the overshooting in the *X/I* in 1998 by 34 percent. The higher income group experienced larger receipts of interest on financial assets and deposits because of higher interest rates. The overshooting phenomenon continued until 2001, and started to move downward from 2002 to 2005. Consequently, the Gini, *ER*, *W*, and *X/I* in 2005 are higher than their 1996-1997 levels, but lower than their 1998-1999 levels. The household survey data start to include retirement-receipts from 2003. This technical

¹⁷For what actually happened and how reacted in Korea, see an excellent book, *Korean Crisis- Unraveling of the Miracle in the IMF Era* by Donald Kirk (1999) who served as correspondent in Asia and claimed the book as describing ‘the great dramas of modern Asian history’. In addition, see Coe and Kim (2002), Kwack (2001), and Moon, Lee, and Yoo (1999).

change in the statistical data leads the inequality measurements and the income of high income groups to be higher than would be otherwise. If the retirement-receipts are excluded, the Gini, *ER*, *W*, and *X/I* in 2005 are 0.307, 0.194, and 0.278, and 9.12, respectively, a decrease by 1.3 percent, 1.1 percent, 1 percent, and 2.2 percent.

The economic analysis in relation to the financial crisis is performed as a dual process: one time shift responses to the shock and adjustments to economic conditions during the period of post-shock. The Korean financial crisis substantially has affected the major institutional changes in the operations and behaviors of government, firms, households and foreign organizations in Korea. The changes and evolution in institutions led the economy to run in a more market friendly manner.

The global and internal economic conditions have called for significant adjustments in production toward more skill-intensive goods and services. The share of the manufacturing industry in the output has been declining, while the shares in the service sectors, particularly financial services, have been rising.¹⁸ Even in the manufacturing industry, skill-intensive sectors such as IT have been rapidly growing and have greatly contributed to the growth in productivity and exports.¹⁹ Furthermore, the strengthening of a capital-skill complementary relationship is found in the production.²⁰ Rising skill intensity of the Korean economy increases the demand for skilled workers and raises premium for skills. It further has led to a larger income gap or disparity between skilled and unskilled labor.²¹ Hence, a deterioration and polarization in the distribution of income can be predicted to occur further, all other things being equal. How much the deterioration would be and how speedily it would increase in the near future? It is difficult to provide an answer quantitatively to this question because the available information is insufficient and the years of experience is too short.

Many analysts in Korea have sought to answer to that question. Choi (2002) computed the *ER* and *W* measures during the period 1982-2001, using information of the sample of 5200 households in urban cities.²² The computed two measures (as given in his Table 2), are virtually identical to the estimates reported in this paper, because the data base is the same as the data used in this study. He stated that his statistics confirmed the view that the polarization phenomenon started from 1994 and 1995.

¹⁸ See Oh (2001) for the discussions on the process of de-industrialization. Kim (2007) states that the share of the service sector in Korea's total value added and employment is 56% and 65% in 2005, respectively. The share of the manufacturing sector in Korea's total value added is 28.4% in 2005.

¹⁹ See Kwack (2007).

²⁰ See Kwack and Lee (2005).

²¹ This point is described in details by Park (2000). Much of the studies have been undertaken on the relationship between skill-intensive technical changes and earning inequality because of the high rise in U.S. wage and income inequality from early 1970s. See Acemoglu (2002) for an excellent survey and discussions on the subject.

²² The sample is from NSO's *Family [Household] Income and Expenditure Survey* Household Survey.

Shin and Cheon (2005) computed Gini and *ER* index using KLIPS database of Korea Labor Institute. Gross income of household consists of wage earning, income from financial assets, social insurance, and transfers. The Gini index gradually rose from 0.405 in 1997 to 0.435 in 2003, about 7.4 percent and the *ER* index rose from 0.169 in 1977 to 0.207 in 2003, about 22.4 percent. The levels at the initial year are higher than our estimates in 1997, 0.283 for Gini and 0.179 for *ER*. Higher levels of the two measures obtained by Shin and Cheon (2005) reflected that the non-wage income levels [and share] reported in KLIPS are higher than those reported in the NSO's Family [Household] Income and Expenditure Survey.²³ The Gini estimate of the wage income in 1997 is reported to be 0.343. In order to make the Gini estimate for total income 0.405 in 1997, the Gini index for the non-wage is needed to be higher than 0.405. For instance, if we assume that the weight for the wage income is 0.7 and the weight for the non-wage income is 0.3, the Gini coefficient for the non-wage income is approximately close to 0.55. The rate of increase in the Gini, 7.4 percent, is close to the estimate in this paper for the rate of increase of the Gini index, 8.1 percent. However, the rate of increase in the *ER*, 22.4 percent, is much higher than our estimate of 7.8 percent.

Shin and Shin (2007) restated the findings of Shin and Cheon (2005) and then examined the trends of the Gini and *ER* index computed using NSO's Survey Report on Wage Structure in the same period as Shin and Cheon (2005) used. They found that the Gini and *ER* index move closely with each other. This finding is the same as what we found. Using KLIPS data, Shin (2007) extended his sample period 1997-2003 to 1997-2004. The rate of increase in the Gini is about 5.8 percent, since the Gini level in 2004 is lower than in the preceding year. His measure of the extended *ER* index rises from 0.0505 in 1997 to 0.1199 in 2004, about 137 percent rise, indicating a rising rate of polarization as shown in Shin and Cheon (2005).²⁴

8. TIME TREND

Though income inequality rose or fell temporarily for both periods, both the poor and the rich did well on the average over the period we are concerned. The available Gini coefficient estimates for salary-and-wage-earner households show no strong rising trends in Korea. After 2000 it seems apparent that the decile ratio rose gradually, indicating widening gaps in income between the top 10 percentile and the bottom 10 percentile groups. Also, no rising trends appears in income polarization from 2002.

To statistically examine the presence of trend in Gini inequality and *ER* and *W* polarization measures, we introduce a hypothesis on the determination of income

²³ Shin and Cheon (2005, p. 92) states this point.

²⁴ This statistical results differs from the results given in this paper and, hence, a through comparative study need to be done on KLIPS and NSO's data to clarify out the differences.

inequality.²⁵ Blinder and Esaki (1978) proposed that unemployment rate and inflation are major determinants of income inequality. Aghion and Williamson (1998) and Wood (1995) studied how globalization affects wage inequality. It has been further advanced that skill-biased technical progress raises income for skilled workers and hurts unskilled workers. This implies that human capital is a major determinant of income distribution. Globalization is represented in this paper by the openness in trade and human capital is by the efforts to educate. The hypothesis we want to test is written as

$$\log(\text{inequality}) = \alpha + \beta_0 T + \beta_1 \log(\text{GDP} / \text{POP}) + \beta_2 \log(\text{OP}) + \beta_3 \log(\text{EDH}), \quad (4)$$

where T is a year time trend, GDP and POP are real GDP and population, OP is the ratio of the sum of exports and imports to GDP, and EDH is the ratio of educational expenditures to total consumption expenditures of urban households.

Table 10. Regressions of log (Gini, ER, and W)

	log (Gini)		log (ER)		log (W)	
	1970-2005	1979-2005	1970-2005	1979-2005	1970-2005	1979-2005
constant	-38.1 (2.25)	-131.8 (2.31)	-30.4 (1.78)	-132.2 (2.33)	-116.8 (2.83)	-151.9 (2.67)
T	0.019 (2.23)	0.069 (2.26)	0.015 (1.74)	0.069 (2.27)	0.059 (2.82)	0.081 (2.63)
log (GDP/POP)	-0.32 (2.77)	-1.28 (2.42)	-0.28 (2.47)	-1.28 (2.43)	-0.59 (2.09)	-1.34 (2.53)
log (OP)	0.16 (2.38)	0.21 (0.61)	0.21 (2.94)	0.22 (0.61)	-0.18 (1.08)	0.24 (0.67)
log (EDH)	-0.24 (4.86)	-1.81 (1.17)	-0.23 (4.68)	-1.82 (1.18)	-0.46 (3.86)	-2.54 (1.64)
\bar{R}^2	0.74	0.34	0.74	0.34	0.59	0.35
SEE	0.039	0.031	0.039	0.031	0.095	0.031
DW	2.12	0.87	2.12	0.87	1.69	0.91

Notes: ¹ Figures in parentheses are t-statistic. ² T=year trend variable; GDP=real GDP; POP=population; OP=the ratio of real exports and imports to real GDP; EDH=percentage of educational expenditures in total consumption expenditures of urban households.

²⁵ Ahn (1997, p. 45-49) sets up an hypothesis that Gini coefficient depends on the real growth rate of the manufacturing industry, the non-farm household unemployment rate, inflation, inflation in land price, time trend, and squared time trend. The regressions from 1965-1994 show that the unemployment rate and land price inflation are statistically significant.

The regressions are run for the period 1970-2005 and the results are presented in Table 10.²⁶ All the coefficient estimates, exclusive of the coefficient for the openness variable, *OP*, in the equation for polarization index *W*, are statistically significant at the 10 percent level of significance. The coefficient estimate of the openness variable is statistically insignificant for polarization index *W*. A rise in per capita GDP and the education efforts of urban households reduces income inequality and polarization. During the period 1970-2005, the coefficient for a time trend is positive for the Gini index (1.9 percent per year), *ER* polarization index (1.5 percent) and *W* polarization index (5.9 percent).

Since most of the empirical studies on polarization in Korea, notably by Shin and Cheon (2005), cover the period from 1997 to 2005, a regression was run for the same period even though the small sample size of 9 may not yield statistically meaningful results. However, statistically significant time trend rates of 7 to 8 percent per year is found in the Gini income inequality and two polarization measures. Because of fitting the equations starting the data from 1997 just before the financial crisis, the high estimates would contain the effects of missing variables in the regressions such as the occurrence of the financial crisis and thereafter on-going changes in social values, economy operating systems, and political power structure. The missing variables likely lead the variables of the openness and the education efforts to be statistically insignificant.

9. SUMMARY AND REMARKS

The Korean economic growth in the past three decades was spectacular. Incomes at all levels are rising, while incomes at the upper end seem to be rising faster. The Gini coefficient of gross income declined between the 1950s and 1970s and then the trend reversal took place in 1997. It does not increase at a high rate for the entire sample period. This seems to suggest that inequality trends in the Korea's distribution of income are not worried much. However, the decile ratio is higher and rising, indicating that Korea needs to worry about widening income gaps between high income groups and low income groups. The polarization indices, *ER*, and *W*, do not show a clear upward trend, although income inequality and polarization did increase in the early 2000s after the financial crisis. Whether Korea will face a rising trend of income gaps between high and low income groups and rising polarization or not remains to be seen.

The variations in gross income inequality are found to be closely associated with the variations in wage inequality. Even though the inequality in the distribution of income on assets is relatively large and fluctuates over a wide range, its contribution to the variations in inequality in gross income distribution is small.

²⁶The data sources are the Bank of Korea, National Statistical Office, and International Monetary Fund.

The Gini coefficients and real income statistics in Korea, Taiwan, and the United States suggest that variations in Korea's income distribution relative to income growth over time were more favorable than in the other two countries.

Our approach to estimating inequality and polarization relies on easily obtainable data. The data does not adequately include statistics on the self-employed or rural households. Income distribution and polarization are determined through extremely complex processes in a society which are greatly affected by demographic and social changes.²⁷ Analysis and policy suggestions regarding income distribution should be based on reliable comprehensive statistical information including socio-economic data such as the distribution of population by age, education, and asset holding, and the distribution of wealth. The lack of complete information in Korea needs to be remedied.

Appendix A. Approximation Method

The method we utilized for the computation is a linear approximation to transform old series of distribution of income into new series based on ten income groups. Let us assume that old distribution is divided by i groups, $i < 10$, and for sake of illustration, $i = 1, \dots, 8$. x_i and y_i are the per household income level of i th group in the old and new distribution series, respectively. The approximation must satisfy $\sum_{i=1}^8 n_i x_i = \sum_{k=1}^{10} m_k y_k$, where n_i and m_i are the numbers of household in i th group in the old and new distribution series, respectively. Note that m_k is the same for all k .

We define the mean value of per household income and the mean number of households in the old distribution series as:

$$x = \sum_{i=1}^8 x_i / 8, \quad n = \sum_{i=1}^8 n_i / 8.$$

And, the mean number of households in the new distribution series is:

$$m = \sum_{k=1}^{10} m_k / 10 = \sum_{k=1}^8 n_k / 10.$$

²⁷ We have no clearly established unified theory for size distribution of income, see Chenery, Hollis B. *et al.* (1974), p. 43. We have the functional theory of income distribution. The marginal productivity theory and human capital theory of a Mincer type explain the determination of wage rates and is not directly connected to the theory of size distribution. Income includes yields on assets. Hence, we need a theory of the distribution of asset ownership in order to explain income distribution.

The share in the cumulative household numbers and in the cumulative per household income level of household in the old distribution from $i=1$ to j and the share in the cumulative household numbers in the new distribution from $k=1$ to 10 are

$$CS_{nj} = \sum_{i=1}^j n_i / n, \quad CS_{xj} = \sum_{i=1}^j x_i / x, \quad \text{and} \quad CS_{mj} = \sum_{k=1}^j m_k / m = j/10.$$

CS_{nj} and CS_{xj} are the share of the cumulative numbers of household and the share of the cumulative per household income level in i th group in the old distribution series from group 1 to j , respectively. Similarly, CS_{mj} is the share of the cumulative numbers of household in the new distribution series from group 1 to j , respectively.

An approximation of a rise in the share of the cumulative income level of j th group for the new distribution is assumed to be: for $j=1$,

$$z_1 = CS_{n1} + (CS_{m1} - CS_{n1}) \cdot [(CS_{x1} - CS_{n1}) / (CS_{n2} - CS_{n1})].$$

For $j \geq 2$,

$$\begin{aligned} z_j &= (CS_{mj} - CS_{mj-1}) \cdot [(CS_{x\lambda(j)} - CS_{y_{j-1}}) / (CS_{n\lambda(j)} - CS_{mj-1})] \\ &= (0.1) [(CS_{x\lambda(j)} - CS_{y_{j-1}}) / (CS_{n\lambda(j)} - CS_{mj-1})]. \end{aligned}$$

$\lambda(j)$ is defined by

$$\lambda(j) = \min\{\lambda \mid CS_{x(\lambda-1)} < j/10 \leq CS_{x\lambda}\} \quad (j = 2, 3, \dots, 10, \lambda = 1, 2, \dots, 8).$$

The actual value used for the computation, w_j , is the approximated value, z_j , plus an adjustment factor. It is written

$$w_j = z_j + \sigma_j.$$

σ_j is an adjustment figure to make smooth in the distribution and it is subjectively determined.

1, 2, 3,.. in the x-axis of Figure represent income groups in the old distribution, and I, II, III,.. represent income groups in the new distribution. w_j is represented by the distance between point e and d and is computed by the length between point d and e times the ratio of the distance between c and b to the distance between a and b . The ratio of the distance between c and b to the distance between a and b measures the increase in

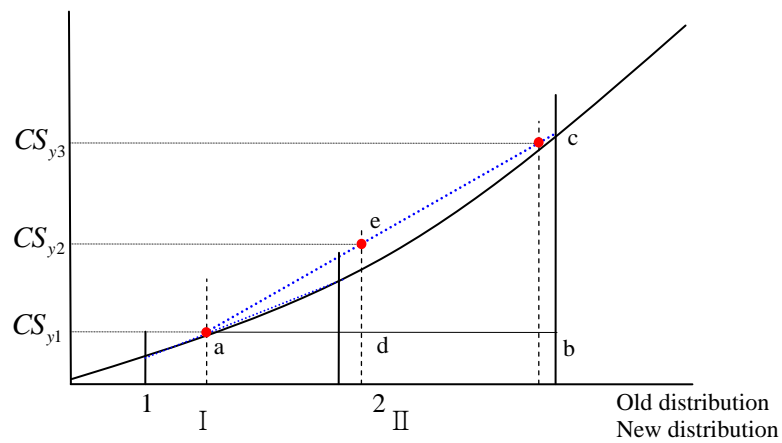
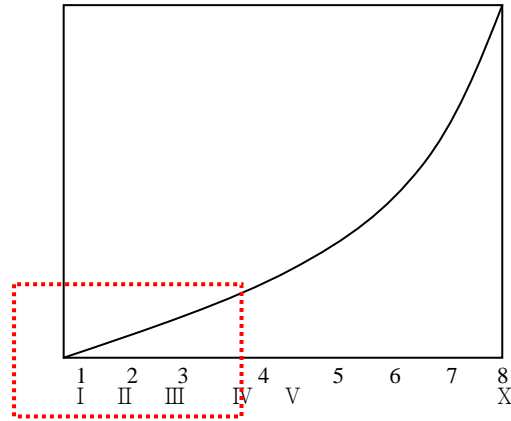
share per unit increase in the household number.

The share of the cumulative per household income level of j th group for the new distribution series is given by

$$CS_{yj} = CS_{y(j-1)} + w_j \cdot$$

The income level of j th group is a change in the share of the cumulative per household income times the mean value of the per household income in the new distribution, that is

$$(CS_{yj} - CS_{y(j-1)})y = w_j y \cdot$$



Appendix B. Consolidated Data, 1965-2005Data: Monthly Income per Household of Salary and Wage Earners by Income Decile
(thousand won)

Year	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
1965	8.5	3.1	3.2	5.9	6.6	7.5	7.7	9.2	10.5	14.7	16.3
1966	11.8	4.5	5.0	7.6	8.5	9.7	10.5	11.6	14.1	21.9	24.3
1967	18.2	6.0	9.6	12.2	14.1	16.2	18.0	19.6	21.8	23.5	41.0
1968	21.3	8.4	10.2	13.9	16.1	18.7	20.8	22.7	25.4	27.5	49.1
1969	24.7	8.9	10.1	16.9	18.2	20.7	23.2	25.3	30.5	33.9	59.0
1970	28.2	12.6	16.2	19.1	21.8	24.6	27.2	30.0	31.6	38.9	60.1
1971	33.3	10.3	23.5	26.8	27.6	29.3	30.2	32.0	35.3	43.8	73.9
1972	38.1	16.7	23.2	27.0	29.0	32.8	34.4	38.2	41.3	53.6	84.5
1973	40.4	15.7	23.8	27.8	33.1	35.3	36.2	39.9	46.2	55.2	90.7
1974	47.8	20.3	23.7	33.5	37.9	42.7	48.3	51.0	56.8	61.2	102.5
1975	65.6	20.3	39.4	46.0	50.6	59.8	67.1	76.2	81.9	94.1	120.3
1976	88.2	26.9	48.6	57.4	61.0	74.6	84.0	89.2	97.1	106.9	236.7
1977	106.0	32.6	54.6	65.2	68.7	83.6	90.8	99.0	116.9	176.1	272.2
1978	144.4	46.6	59.4	87.5	99.2	106.4	126.1	150.9	177.6	237.3	352.8
1979	194.7	60.9	94.4	115.6	136.3	156.4	179.4	204.8	240.3	295.6	475.0
1980	234.1	71.4	111.5	139.6	163.9	187.7	213.0	244.6	285.8	354.1	568.9
1981	281.0	87.6	136.7	168.4	195.9	223.8	253.8	289.3	340.6	425.2	688.2
1982	313.6	92.6	152.3	188.1	217.9	249.1	282.7	324.5	381.8	473.1	773.4
1983	359.0	110.6	175.6	213.0	249.5	281.8	319.8	369.5	435.8	542.4	891.6
1984	395.6	117.8	190.7	233.4	273.8	311.0	357.1	410.7	486.0	599.0	976.3
1985	423.8	124.5	206.5	254.7	293.4	330.8	378.9	436.3	516.0	643.4	1053.0
1986	473.6	141.1	231.7	286.6	329.9	374.3	425.8	491.7	581.3	720.4	1152.3
1987	553.1	164.9	272.3	332.3	385.3	438.8	499.4	574.5	677.6	842.9	1342.6
1988	646.7	202.3	323.9	392.2	451.3	514.0	584.1	670.2	785.2	976.3	1566.8
1989	804.9	252.8	403.3	485.9	561.2	638.1	723.1	828.9	970.7	1204.9	1979.0
1990	943.3	303.0	485.5	580.7	667.8	758.6	859.6	981.2	1140.3	1400.5	2254.6
1991	1158.6	385.9	601.9	724.6	831.8	943.8	1067.4	1216.2	1407.5	1700.6	2704.9
1992	1356.1	443.7	710.3	855.5	984.0	1113.7	1258.8	1434.7	1658.5	1994.5	3105.5
1993	1477.8	493.3	776.9	934.1	1075.2	1217.0	1373.3	1562.3	1813.7	2178.5	3352.5
1994	1701.3	567.7	882.5	1060.8	1227.3	1393.2	1578.3	1805.4	2091.5	2516.0	3888.3
1995	1911.1	632.5	991.7	1192.6	1378.7	1571.2	1781.9	2029.3	2357.0	2847.3	4326.1
1996	2152.7	683.0	1079.0	1319.9	1535.1	1763.4	2009.1	2297.7	2676.7	3241.5	4919.4
1997	2287.3	729.2	1165.0	1435.4	1667.6	1900.2	2156.0	2460.4	2847.1	3419.8	5089.8
1998	2133.1	562.7	1005.4	1255.2	1481.5	1703.4	1951.0	2252.1	2628.3	3193.0	5294.9
1999	2224.7	602.2	1028.9	1293.4	1514.8	1747.5	2022.7	2341.7	2742.3	3327.6	5622.5
2000	2386.9	683.5	1114.9	1389.6	1636.0	1886.1	2172.3	2502.6	2907.3	3519.5	6053.1
2001	2625.1	757.8	1215.3	1508.1	1774.3	2057.2	2383.4	2753.3	3216.1	3925.8	6654.4
2002	2792.4	832.2	1305.5	1630.4	1919.3	2218.1	2555.9	2934.6	3449.4	4206.4	6868.1
2003	2940.0	782.1	1404.4	1785.5	2092.7	2387.5	2725.3	3137.5	3673.8	4420.6	6985.8
2004	3113.4	790.9	1445.2	1857.7	2197.4	2544.0	2914.0	3358.8	3914.9	4750.2	7357.8
2005	3250.8	848.0	1481.9	1914.6	2288.2	2666.4	3065.4	3513.7	4065.6	4924.6	7735.6

Data: Monthly Earnings per Household of Salary and Wage Earners by Income Decile
(thousand won)

Year	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
1965	7.6	3.0	3.1	5.6	6.2	6.9	7.3	8.0	9.1	12.5	14.0
1966	10.4	4.2	4.8	7.1	7.8	8.9	9.5	10.2	12.7	18.2	20.3
1967	15.1	5.9	8.9	11.0	12.2	13.8	15.3	16.4	17.7	18.7	31.2
1968	17.7	7.9	9.5	12.7	14.2	16.3	18.0	19.3	20.7	22.1	36.3
1969	21.0	8.3	9.4	15.4	16.0	18.2	20.3	21.9	26.1	28.2	46.4
1970	24.3	11.9	15.3	17.7	19.7	22.1	23.7	26.1	26.8	32.8	47.2
1971	28.9	9.9	21.6	24.5	24.7	26.2	26.9	27.6	30.5	36.8	60.2
1972	33.0	16.1	21.8	25.1	26.4	29.7	30.3	33.6	35.4	44.5	67.2
1973	35.6	15.1	22.5	26.0	30.4	31.9	32.7	35.4	40.2	46.9	75.1
1974	43.4	19.4	22.8	32.1	35.6	39.9	45.1	45.9	50.8	54.7	87.8
1975	60.0	19.2	37.8	43.8	47.9	56.2	62.4	71.4	75.6	80.6	104.6
1976	82.0	25.1	46.6	54.8	58.3	70.6	79.4	84.1	91.5	99.0	210.7
1977	99.1	30.7	51.9	61.8	65.5	78.8	85.4	93.5	108.9	167.0	247.0
1978	134.2	44.0	56.6	83.4	94.6	101.3	117.9	141.6	163.4	216.1	323.5
1979	177.6	55.9	88.4	108.3	127.0	146.5	165.8	191.2	221.7	268.6	413.5
1980	211.0	66.0	104.6	131.4	153.3	174.7	197.9	224.4	258.3	315.1	487.2
1981	248.9	80.5	127.8	156.9	183.2	208.2	233.4	263.1	304.4	372.0	559.6
1982	284.3	84.4	143.1	177.7	204.2	232.6	260.9	299.1	344.0	425.0	671.3
1983	323.9	103.1	164.3	199.2	234.6	263.1	294.3	334.6	391.3	488.5	765.9
1984	357.6	108.7	179.5	217.6	259.2	291.8	328.9	374.4	440.7	535.5	839.4
1985	378.8	114.0	192.5	239.6	274.5	305.8	346.7	394.9	459.8	561.8	897.7
1986	419.0	125.6	212.5	267.1	304.3	344.0	385.5	445.2	513.7	625.1	966.8
1987	482.7	145.7	247.2	303.6	349.7	395.5	448.8	513.4	597.2	725.1	1100.2
1988	566.8	179.6	297.4	361.0	411.9	462.9	524.2	597.5	687.4	841.9	1304.3
1989	694.6	221.3	366.8	437.5	497.8	564.2	636.5	721.7	849.6	1043.7	1605.6
1990	809.3	264.7	440.8	518.5	590.3	670.4	750.3	855.3	993.0	1211.9	1797.3
1991	986.2	337.9	544.3	651.4	745.4	827.3	929.1	1057.2	1222.1	1465.3	2080.6
1992	1156.6	388.0	644.3	771.3	886.0	992.8	1107.7	1256.0	1447.5	1707.9	2363.2
1993	1275.7	434.7	707.9	846.4	962.6	1082.3	1215.5	1382.7	1570.6	1888.3	2665.0
1994	1449.0	499.7	796.7	953.6	1095.2	1239.7	1399.0	1584.3	1809.9	2149.4	2961.3
1995	1642.5	553.4	892.2	1065.9	1240.2	1411.1	1577.2	1803.7	2065.2	2434.0	3380.7
1996	1837.7	596.3	971.0	1182.0	1382.8	1565.9	1769.2	2001.5	2325.6	2783.9	3797.3
1997	1938.8	626.7	1036.6	1284.0	1476.2	1672.6	1876.9	2131.4	2464.6	2936.4	3880.8
1998	1815.5	485.8	905.0	1145.0	1355.3	1540.9	1757.5	2022.8	2319.7	2759.6	3861.2
1999	1873.3	518.9	906.0	1161.8	1383.1	1577.6	1817.5	2093.1	2390.1	2883.4	3999.4
2000	2008.5	572.3	979.8	1234.6	1481.6	1706.6	1933.1	2220.6	2559.9	3024.8	4368.0
2001	2210.5	652.0	1070.9	1347.4	1580.4	1824.2	2100.7	2440.5	2798.8	3380.8	4905.8
2002	2379.8	723.9	1159.3	1453.2	1720.1	1984.9	2274.4	2581.7	3013.6	3660.5	5223.5
2003	2593.3	666.7	1245.8	1626.6	1921.3	2206.4	2486.1	2863.2	3311.6	3916.6	5685.1
2004	2728.1	662.0	1262.7	1664.9	1981.8	2297.4	2639.2	3037.1	3500.5	4187.3	6045.8
2005	2801.9	700.1	1292.3	1687.3	2045.0	2390.9	2729.4	3170.5	3603.4	4305.2	6090.9

Data: Monthly Income on Assets per Household of Salary and Wage Earners by Income Decile
(thousand won)

Year	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
1965	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6
1966	0.4	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	1.5	1.6
1967	0.8	0.0	0.2	0.3	0.5	0.6	0.7	0.8	1.0	1.2	3.2
1968	0.8	0.1	0.1	0.2	0.4	0.5	0.5	0.7	1.1	1.3	3.0
1969	0.7	0.1	0.1	0.4	0.4	0.5	0.5	0.6	0.7	1.0	2.5
1970	0.9	0.1	0.2	0.3	0.3	0.4	0.7	0.8	1.1	1.3	3.8
1971	0.8	0.1	0.4	0.4	0.5	0.5	0.5	0.7	0.8	1.3	3.0
1972	1.1	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.5	2.2	3.3
1973	1.3	0.2	0.4	0.5	0.6	0.8	0.8	1.1	1.4	2.4	5.3
1974	1.4	0.3	0.2	0.3	0.6	0.7	0.9	1.7	1.8	2.0	5.5
1975	2.4	0.5	0.7	0.9	1.0	1.4	1.8	1.9	2.5	6.3	7.2
1976	2.3	0.6	0.7	1.0	1.0	1.6	1.7	2.0	2.2	2.7	9.6
1977	2.1	0.3	0.6	0.8	0.8	1.4	1.5	1.6	2.6	2.9	8.2
1978	3.2	0.5	0.5	0.9	1.4	1.5	3.0	3.1	3.7	7.4	9.9
1979	5.7	1.0	1.4	1.9	2.8	3.0	4.4	5.3	6.5	10.1	20.4
1980	7.8	1.1	1.6	2.1	2.9	4.3	5.2	7.6	10.4	15.1	27.1
1981	10.4	1.2	1.9	3.2	3.2	5.2	6.8	9.9	13.0	21.6	38.1
1982	8.4	1.4	1.5	2.3	3.6	4.1	6.7	7.4	11.1	13.9	32.5
1983	10.2	1.1	2.2	2.4	2.7	3.6	6.7	12.3	14.0	19.1	37.9
1984	10.4	1.8	2.0	3.4	3.0	3.8	8.1	8.6	11.6	16.8	44.6
1985	11.1	1.9	2.7	3.0	3.3	4.8	6.6	8.4	11.6	21.0	47.7
1986	15.0	2.5	3.4	3.3	5.7	6.9	9.5	11.5	19.0	29.4	58.7
1987	17.6	2.7	3.2	4.4	5.6	8.9	11.4	15.2	21.1	33.7	69.6
1988	18.3	3.1	2.9	3.5	4.8	9.2	12.0	18.3	23.4	35.9	70.2
1989	22.5	5.6	5.8	6.9	10.4	12.5	17.3	22.2	29.0	40.9	74.5
1990	25.7	7.0	7.0	9.5	10.8	12.7	19.2	22.9	31.3	44.4	92.2
1991	27.8	5.7	5.9	8.1	10.2	14.9	21.9	27.1	32.3	43.9	108.0
1992	34.7	8.2	7.2	11.4	13.9	17.9	28.0	33.1	37.5	60.2	129.6
1993	33.8	8.8	9.3	12.9	15.6	17.7	22.8	29.8	39.8	50.3	131.1
1994	41.9	10.3	11.6	15.3	21.1	24.1	24.9	34.0	41.5	66.4	169.9
1995	42.8	8.8	15.5	17.4	19.0	20.9	32.9	27.7	42.6	68.3	174.5
1996	51.6	11.8	12.4	18.3	20.6	26.5	41.3	41.6	53.4	84.0	206.1
1997	53.6	13.2	15.9	18.8	21.8	32.3	32.5	48.4	62.7	96.0	194.2
1998	43.3	7.7	12.3	9.5	17.4	17.6	31.6	39.4	50.9	76.5	169.8
1999	46.0	6.3	16.1	14.3	13.7	18.6	22.2	34.9	55.5	73.8	203.9
2000	45.1	10.9	15.7	16.0	13.7	24.1	29.6	40.4	42.3	69.8	188.0
2001	50.3	13.8	13.5	14.7	24.3	20.6	28.1	38.4	81.4	90.9	177.3
2002	52.2	10.8	14.5	19.3	18.2	22.9	31.7	54.4	71.7	94.1	184.2
2003	41.3	7.0	19.4	18.6	15.9	19.5	23.2	31.6	54.4	68.3	155.5
2004	41.4	5.3	16.7	16.8	18.2	24.7	26.8	40.8	46.2	58.7	159.7
2005	43.5	10.6	16.4	21.0	21.3	32.2	30.5	34.9	55.3	61.3	151.6

Data: Monthly Other Income-Subsidiary Earnings, Transfers, and Irregular Income-per Household of Salary and Wage Earners by Income Decile (thousand won)

Year	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
1965	0.7	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.0	1.6	1.8
1966	0.9	0.2	0.2	0.4	0.5	0.6	0.8	1.1	1.1	2.2	2.4
1967	2.2	0.1	0.6	0.9	1.4	1.8	2.0	2.5	3.1	3.6	6.6
1968	2.8	0.4	0.6	1.0	1.5	1.9	2.2	2.8	3.6	4.1	9.7
1969	3.0	0.5	0.6	1.1	1.8	2.1	2.4	2.9	3.5	4.7	10.1
1970	3.0	0.5	0.7	1.0	1.8	2.1	2.8	3.1	3.7	4.8	9.1
1971	3.6	0.4	1.6	1.9	2.4	2.6	2.7	3.6	4.0	5.7	10.7
1972	4.0	0.5	1.0	1.4	2.1	2.5	3.3	3.7	4.4	6.9	14.0
1973	3.4	0.4	0.9	1.3	2.1	2.6	2.7	3.5	4.7	5.9	10.3
1974	3.0	0.6	0.7	1.1	1.8	2.1	2.6	3.2	4.1	4.8	8.9
1975	3.2	0.6	0.9	1.2	1.6	2.2	2.8	2.9	3.6	7.1	8.4
1976	3.9	1.2	1.3	1.7	1.7	2.4	2.9	3.2	3.8	4.2	16.7
1977	4.8	1.6	2.1	2.6	2.4	3.4	3.8	4.0	5.3	7.0	16.2
1978	7.0	2.2	2.3	3.2	3.3	3.6	5.2	6.8	7.1	15.1	20.7
1979	11.4	4.0	4.6	5.4	6.4	6.9	9.2	8.2	12.1	16.7	41.2
1980	15.2	4.3	5.2	6.1	7.6	8.6	10.0	12.5	17.0	23.9	54.6
1981	21.7	6.0	7.0	8.3	9.6	10.5	13.7	16.3	23.1	31.7	90.4
1982	21.0	6.8	7.7	8.2	10.1	12.4	15.1	18.1	26.7	34.2	69.6
1983	24.9	6.4	9.1	11.5	12.1	15.1	18.8	22.6	30.6	34.9	87.9
1984	27.7	7.2	9.2	12.4	11.6	15.4	20.1	27.8	33.6	46.7	92.4
1985	33.9	8.6	11.3	12.1	15.7	20.3	25.6	33.0	44.6	60.5	107.6
1986	39.5	13.0	15.8	16.1	19.9	23.4	30.9	35.0	48.6	65.9	126.8
1987	52.8	16.6	21.8	24.3	30.0	34.3	39.2	45.9	59.4	84.2	172.8
1988	61.5	19.6	23.7	27.7	34.7	42.0	47.8	54.5	74.4	98.5	192.3
1989	87.8	25.9	30.7	41.5	52.9	61.4	69.3	85.0	92.1	120.4	298.9
1990	108.2	31.2	37.8	52.6	66.7	75.4	90.1	103.0	116.1	144.2	365.1
1991	144.7	42.4	51.7	65.1	76.2	101.7	116.4	131.9	153.2	191.4	516.4
1992	164.7	47.4	58.8	72.9	84.2	103.0	123.1	145.6	173.5	226.4	612.6
1993	168.3	49.8	59.7	74.7	97.1	117.0	134.9	149.9	203.3	239.9	556.4
1994	210.4	57.7	74.2	91.8	110.9	129.4	154.4	187.1	240.2	300.0	756.9
1995	225.8	70.4	84.1	109.3	119.5	139.3	171.8	197.8	249.2	345.1	770.8
1996	263.4	74.8	95.7	119.7	131.7	171.0	198.6	254.7	297.7	373.7	916.1
1997	294.9	89.3	112.4	132.7	169.7	195.3	246.6	280.8	319.9	387.4	1014.8
1998	274.4	69.3	88.1	100.7	108.8	145.0	162.0	189.9	257.7	356.9	1263.9
1999	305.5	77.0	106.9	117.3	118.0	151.4	183.0	213.8	296.7	370.3	1419.1
2000	333.5	100.3	119.4	139.0	140.7	155.4	209.6	241.6	305.0	424.8	1497.0
2001	364.3	92.0	130.8	146.0	169.5	212.4	254.6	274.5	335.9	454.1	1571.3
2002	360.3	97.4	131.7	158.0	180.9	210.3	249.8	298.4	364.1	451.8	1460.5
2003	305.4	108.4	139.3	140.4	155.4	161.7	216.1	242.7	307.7	435.8	1145.1
2004	343.9	123.6	165.7	176.1	197.5	221.8	248.0	280.9	368.2	504.3	1152.3
2005	405.4	137.2	173.2	206.2	221.8	243.3	305.4	308.3	406.9	558.0	1493.0

Sources: National Statistical Office, Annual Report on the Household Income and Expenditure Survey. Economic Planning Board, Annual Report on the Family Income and Expenditure Survey.

APPENDIX C. Inequality Measures, 1965-2005

Inequality Measurements: Income				
Year	Gini	Theil T	Coefficient of Variation	X/I
1965	0.271	0.119	0.517	5.244
1966	0.288	0.134	0.565	5.405
1967	0.263	0.117	0.532	6.825
1968	0.267	0.120	0.546	5.871
1969	0.288	0.139	0.586	6.630
1970	0.240	0.095	0.483	4.787
1971	0.231	0.102	0.500	7.145
1972	0.243	0.101	0.505	5.056
1973	0.250	0.107	0.517	5.785
1974	0.243	0.099	0.490	5.052
1975	0.236	0.091	0.442	5.917
1976	0.293	0.158	0.651	8.799
1977	0.317	0.171	0.664	8.348
1978	0.320	0.167	0.641	7.568
1979	0.301	0.153	0.614	7.800
1980	0.307	0.154	0.616	7.968
1981	0.306	0.154	0.619	7.856
1982	0.309	0.158	0.626	8.352
1983	0.310	0.158	0.629	8.061
1984	0.311	0.159	0.628	8.288
1985	0.312	0.160	0.632	8.458
1986	0.307	0.155	0.618	8.167
1987	0.307	0.154	0.616	8.142
1988	0.302	0.150	0.610	7.745
1989	0.304	0.153	0.618	7.828
1990	0.295	0.143	0.595	7.441
1991	0.287	0.135	0.576	7.009
1992	0.284	0.131	0.564	6.999
1993	0.281	0.129	0.558	6.796
1994	0.285	0.132	0.565	6.849
1995	0.284	0.130	0.561	6.840
1996	0.291	0.137	0.573	7.203
1997	0.283	0.129	0.554	6.980
1998	0.316	0.164	0.635	9.410
1999	0.321	0.170	0.649	9.337
2000	0.317	0.167	0.646	8.856
2001	0.320	0.168	0.649	8.781
2002	0.312	0.159	0.627	8.253
2003	0.306	0.153	0.606	8.932
2004	0.310	0.156	0.609	9.303
2005	0.311	0.157	0.612	9.122

Inequality Measurements: Earnings

Year	Gini	Theil T	Coefficient of Variation	X/I
1965	0.249	0.101	0.473	4.695
1966	0.265	0.113	0.514	4.819
1967	0.228	0.088	0.458	5.312
1968	0.227	0.086	0.454	4.593
1969	0.261	0.113	0.522	5.583
1970	0.208	0.071	0.413	3.962
1971	0.207	0.084	0.448	6.068
1972	0.210	0.076	0.434	4.181
1973	0.224	0.087	0.463	4.986
1974	0.223	0.084	0.445	4.517
1975	0.217	0.079	0.407	5.450
1976	0.281	0.144	0.615	8.381
1977	0.309	0.160	0.633	7.768
1978	0.311	0.157	0.621	7.325
1979	0.289	0.140	0.582	7.397
1980	0.289	0.137	0.575	7.382
1981	0.282	0.129	0.556	6.952
1982	0.296	0.144	0.591	7.954
1983	0.294	0.142	0.591	7.429
1984	0.296	0.143	0.589	7.722
1985	0.294	0.143	0.591	7.875
1986	0.290	0.138	0.576	7.697
1987	0.289	0.136	0.570	7.551
1988	0.286	0.134	0.569	7.262
1989	0.288	0.136	0.575	7.255
1990	0.277	0.125	0.547	6.790
1991	0.264	0.112	0.513	6.157
1992	0.258	0.107	0.496	6.091
1993	0.262	0.110	0.506	6.131
1994	0.259	0.107	0.497	5.926
1995	0.262	0.110	0.503	6.109
1996	0.268	0.115	0.513	6.368
1997	0.261	0.109	0.496	6.192
1998	0.284	0.130	0.542	7.948
1999	0.287	0.132	0.547	7.707
2000	0.287	0.132	0.552	7.632
2001	0.292	0.137	0.566	7.524
2002	0.289	0.133	0.558	7.216
2003	0.291	0.137	0.560	8.527
2004	0.299	0.145	0.575	9.133
2005	0.296	0.141	0.565	8.700

Inequality Measurements: Income on Assets

Year	Gini	Theil T	Coefficient of Variation	X/I
1965	0.437	0.320	0.897	10.828
1966	0.591	0.653	1.347	34.083
1967	0.481	0.424	1.094	114.878
1968	0.521	0.475	1.143	53.062
1969	0.433	0.347	1.004	21.029
1970	0.512	0.472	1.192	28.452
1971	0.437	0.355	1.008	45.580
1972	0.430	0.308	0.887	18.316
1973	0.492	0.433	1.137	26.523
1974	0.507	0.458	1.140	20.577
1975	0.457	0.362	0.979	14.268
1976	0.454	0.408	1.157	17.115
1977	0.470	0.380	1.017	28.402
1978	0.468	0.363	0.918	18.939
1979	0.473	0.380	1.031	20.400
1980	0.502	0.415	1.047	24.636
1981	0.519	0.458	1.109	31.750
1982	0.499	0.438	1.114	23.214
1983	0.529	0.481	1.125	34.455
1984	0.533	0.512	1.250	24.778
1985	0.541	0.527	1.269	25.105
1986	0.525	0.478	1.167	23.480
1987	0.530	0.485	1.175	25.778
1988	0.532	0.489	1.153	22.645
1989	0.451	0.342	0.956	13.304
1990	0.459	0.366	1.022	13.171
1991	0.491	0.424	1.111	18.947
1992	0.479	0.400	1.071	15.805
1993	0.464	0.389	1.087	14.898
1994	0.475	0.418	1.145	16.495
1995	0.474	0.423	1.154	19.830
1996	0.485	0.425	1.136	17.466
1997	0.465	0.376	1.038	14.712
1998	0.508	0.452	1.143	22.052
1999	0.535	0.532	1.293	32.365
2000	0.487	0.443	1.184	17.248
2001	0.476	0.397	1.046	12.848
2002	0.479	0.391	1.034	17.056
2003	0.461	0.391	1.071	22.214
2004	0.459	0.387	1.076	30.132
2005	0.412	0.308	0.948	14.302

Inequality Measurements: Other Income-Subsidiary Earnings, Transfers, Other and Irregular Income

Year	Gini	Theil T	Coefficient of Variation	X/I
1965	0.447	0.332	0.864	19.468
1966	0.402	0.267	0.802	10.369
1967	0.419	0.300	0.838	57.308
1968	0.452	0.353	0.979	24.537
1969	0.442	0.339	0.954	21.644
1970	0.417	0.293	0.861	18.240
1971	0.381	0.258	0.814	30.448
1972	0.462	0.368	1.003	30.472
1973	0.422	0.297	0.856	24.943
1974	0.413	0.283	0.840	15.381
1975	0.412	0.282	0.832	13.323
1976	0.450	0.412	1.180	13.904
1977	0.377	0.255	0.858	9.456
1978	0.401	0.264	0.815	8.777
1979	0.397	0.306	0.970	10.300
1980	0.446	0.343	1.012	12.698
1981	0.477	0.429	1.175	15.067
1982	0.420	0.301	0.923	10.235
1983	0.420	0.315	0.963	13.734
1984	0.431	0.317	0.938	12.833
1985	0.428	0.307	0.904	12.512
1986	0.401	0.279	0.882	9.754
1987	0.391	0.271	0.883	10.410
1988	0.386	0.257	0.845	9.811
1989	0.392	0.280	0.907	11.541
1990	0.387	0.273	0.895	11.702
1991	0.406	0.304	0.960	12.179
1992	0.423	0.332	1.012	12.924
1993	0.395	0.275	0.888	11.173
1994	0.422	0.322	0.982	13.118
1995	0.403	0.291	0.925	10.949
1996	0.410	0.302	0.942	12.247
1997	0.393	0.282	0.917	11.364
1998	0.499	0.498	1.308	18.238
1999	0.496	0.499	1.316	18.430
2000	0.477	0.464	1.263	14.925
2001	0.464	0.430	1.202	17.079
2002	0.442	0.381	1.115	14.995
2003	0.412	0.329	1.019	10.564
2004	0.374	0.262	0.887	9.323
2005	0.400	0.312	0.991	10.882

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