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Korean National Income Based on a Chain Index: 1953~2010

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연쇄가중법에 의한 한국의 국민소득: 1953~2010

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ABSTRACT

Korea's national income statistics have been compiled by the Bank of Korea since 1953. However, there is a break in the time series. The current time series (1970 onward) is based on the '1993 SNA (System of National Accounts)' suggested by the UN, and the previous time series (1953~1970) was based on the '1953 SNA'.

The difference between the previous and current time series is 4.8% in 1970 when the two series overlap. The difference is even greater in terms of comparisons across industries. In addition, it has now become even more difficult to connect the current and the previous time series because, in 2009, the Bank of Korea introduced a chain weighted method for calculating the current time series (1970 onward).

Under the chain weighted method, the time series underwent substantial modification; for instance, the economic growth rate during 1970~2005 is 0.9%p higher than the rate under the general method. This paper applies chain weighted values and the '1993 SNA' to the previous time series (1953~1970) by utilizing various national account manuals published by the UN and previous Korean input-output tables in order to calculate a long term time series from 1953 to 2010 based on the same criteria as the current time series (1970 onward).

In the revised time series, it appears that 1953 GDP at current basic prices is 3.5% higher and the growth rate for the period of 1953~1970 is 1.5%p higher each year than under the previous time series. Under the revised time series the size of the Korean economy as of 2010 is 50-fold bigger than that of 1953. In terms of industries, manufacturing and SOC show significant expansion whereas the extent of that of the service industry is relatively small.

우리나라 국민소득 통계는 한국은행에 의해 1953년부터 공식적으로 발표되고 있지만 UN이 제시한 매뉴얼인 「1993 SNA」에 의해 작성된 1970년 이후의 현행 계열과 「1953 SNA」에 의해 작성된 1953~70년의 구계열로 시계열이 단절되어 있다. 더구나 2009년에 한국은행이 1970년 이후 현행 계열에 연쇄가중법을 도입하면서 고정가중법에 의한 기존의 시계열과 더 큰 차이를 보이게 되었다.

본고에서는 UN이 발표한 각종 국민계정 매뉴얼, 우리나라의 과거 산업연관표 등을 활용하여 1953년부터 1970년까지의 구계열에도 포괄범위를 일치시키고 연쇄가중치를 적용하여 1953년부터 2010년까지의 장기 시계열을 일관된 기준으로 구해 보았다.

수정 계열은 구계열에 비해 1953년 경상 기초가격 GDP가 3.5% 높아졌고 성장률은 1953~70년 중 평균 1.5%p 상승한 것으로 나타났다. 한편, 수정 계열을 이용하여 지난 60년간의 우리 경제 변화상을 살펴본 결과 경제규모가 50배 이상 커진 것으로 나타났다. 산업별로는 제조업 및 SOC 산업은 크게 확대된 반면 서비스업은 상대적으로 확대 폭이 작았다.

I. Introduction

The Bank of Korea has announced Korean national income statistics since 1953. However, there is a break in the time series in 1970. Seeking to reduce the differences in classifications and scope by economic activities between the two time series, Nak-Nyeon Kim (2009) applied basic prices as in the current time series to the former time series (1953~1970), the first time such a technique had been employed using Korean data.

However, the criteria of the current and former time series match only partially and no methods of eliminating the time series disarray caused by the chain weighted method are presented because the calculation is based on the data prior to its application.

The break in the Korean national income statistics in 1970 is caused by several revisions in the national income estimation manual having been undertaken since the first release of national income statistics in 1958. The first national income statistics of Korea were based on the '1953 SNA (System of National Accounts)'[1] recommended by the UN. Since then, the manual has been amended a number of times to accord with '1968 SNA', '1993 SNA' and so on, reflecting improvements in statistical methods, the integration of the Korean economy into the global economy and changes in the government's roles.

As the UN manual has changed several times, previous time series should also have been amended based on the latest manual, the '1993 SNA', but revision of the Korean national income statistics has been undertaken only for the period from 1970 onward, thereby giving rise to a break in the current Korean national income statistics, which are divided into the current time series for the period of 1970 onward based on the '1993 SNA' and the previous time series for the period of 1953~1970.

In the case of 1970 when there is overlap between the two series of statistics, the difference between the current and previous time series is 4.8% when comparison is based on total GDP, and the difference is even bigger in regard to comparison between industries in the two time series. In other words, it has been difficult to examine changes in the Korean economy on the basis of a consistent standard. In addition, the introduction of the chain weighted method by the Bank of Korea for the calculation of the current time series in 2009 made the connection between the

1 UN, "A System of National Accounts and Supporting Tables: 1953 SNA," 1953.

current and former time series even more problematic, and caused the statistics to differ from the long-term time series based on the fixed weighted method employed by Kim Nak-Nyeon. The introduction of chain weighted method brought about extensive changes in the time series. For instance, the annual economic growth rate during 1970~2005 is 0.9%p higher on average under the chain weighted method.

This paper sets out to compile a long-term time series for the period of 1953~2010 for the first time. We do so by using coherent criteria and utilizing the UN national account manuals and previous input-output tables of Korea. Efforts are directed particularly toward identifying the characteristics of chain weighted method and suggesting practical methods for its utilization.

This paper is composed as follows. Chapter Ⅱ looks into existing national account data and identifies the characteristic of each component data set. This chapter also tracks data relevant to national income statistics such as the input-output tables, because the value added of the input-output tables is the same as national income statistics. Chapter Ⅲ explores ways to connect the former and current time series, and establishes a time series for the national income statistics for the entire 58-year period since 1953. Chapter Ⅳ reviews the connection of the two time series and undertakes an analysis of the differences between the time series before and after the connection. The chapter also attempts an overview of the changes in the Korean economy over the last 58 years using the connected data. Chapter Ⅴ summarizes the research.

II. National income statistics in Korea

In 1957, the Bank of Korea was designated as the official compilation agency for national income statistics. In 1958, it announced national income statistics for the period of 1953~1957 based on the System of National Accounts and Supporting Tables (hereinafter referred to as '1953 SNA') recommended by the UN. These were the first officially recognized national income statistics of Korea. As shown in <Table 1>, the statistics were compiled with 1955 as the base year, and thereafter the base year was changed every 5 years. The 1953 SNA manual was used for the last time in 1975 to revise the base year for the period of 1953~1977. Statistics were compiled based on the 1968 SNA from the 1980 base year revision and eventually to 1993 SNA from the 2000 base year revision.

Accordingly, the national income statistics from 1970 to the present are based on the '1993 SNA', and the data for 1953~1969 are based only on the '1953 SNA'.

<Table 1> Korean National Income Statistics Base Years

Base year	Year of announcement	Applied period	Applied manual
1955	**1958**	**1953~1957**	**1953 SNA**
1960	1964	1953~1963	"
1965	1967	1953~1966	"
1970	1972	1953~1971	"
1975	**1978**	**1953~1977**	"
1980	**1987**	**1970~1985**	**1968 SNA**
1985	1989	1970~1987	"
1990	1994	1970~1992	"
1995	1999	1970~1997	" (partial introduction of 1993 SNA)
2000	**2004**	**1970~2002**	**1993 SNA**
2005[1)]	2009	1970~2007	"

Note: 1) Since the chain weighted value is applied, 2005 is the reference year.
Source: The Bank of Korea, "Korea's National Accounts System," 2010.

The '1953 SNA' differs from the '1993 SNA' in terms of its basic system, scope and processing method.

Regarding the basic system, the 1953 SNA has individual accounting systems such as those for national income, the input-output table and the money flow table whereas the 1993 SNA consolidates all these accounting systems in order to improve connectivity among statistics. The scope of fixed asset formation is expand to include intangible fixed capital and military supplies transferable to civilian use. And the government's characteristics are changed from being a consumer to being both a consumer and producer. Therefore, the scope of government fixed capital formation, which was limited to government buildings, is expanded to include expenses on machinery and equipment, military supplies transferable to civilian use, and Social Overhead Capital (SOC).

In addition to the differences in the estimation manual, which is the biggest cause of the discontinuity in the time series, the availability of basic statistics, coming out of new production also contribute to this discontinuity. The followings sections set out the characteristics of the former and current time series, and input-output tables that would help make up for the discontinuity in the time series.

<Table 2> Major Differences between Previous and Current Time Series

	Previous time series (1953~1969 years)	Current time series (1970~2010 years)
Prices	Market prices	Basic prices
Income tax	Included in retail and wholesale	Specified separately from retail and wholesale
Weight values	Fixed weighted value	Chain weighted value
Characteristics	The aggregate of the lower real value matches that of the higher real value	The aggregate of the lower real value does not match that of the higher real value

1. Previous Time Series (Fixed-Base-Year GDP): 1953~1970

The GDP statistics compiled in the previous time series (1953~1970) were revised for the last time with 1975 as the base year, and they comprise the agriculture and fishery, mining, manufacturing and service industries. Among the relevant publications, 'National Income in Korea', issued in 1982, is the final edition.

Major statistics are recorded in the Economic Statistics System (ECOS) of the Bank of Korea. The time series is compiled based on the '1953 SNA', wherein each industry's output is multiplied by the value added ratio, thereby estimating total value added. Constant value added is estimated by either extending the base year value added or converting current value added, rather than employing the currently used double deflation method.[2]

2. Current Time Series (Chain Weighted GDP): 1970~2010

The GDP statistics for 1970 onwards have been announced every five years since 1980, and the final version of the GDP statistics for the current time series (1970~2010) with 2005 as a reference year was compiled in 2009. This time series is calculated, unlike previous statistics, based on the '1993 SNA' by using the chain weighted method. The output amount and the value added of each industry are calculated individually, with value added being broken down into detailed items (compensation of employees, operating surplus, depreciation of fixed capital and net taxes on production). And realization at constant value is by the double

2 Double deflation is a method whereby gross value added is measured at constant prices by subtracting intermediate consumption at constant prices from output at constant prices.

deflation method.

3. Previous Input-output Tables

Input-output tables and national income statistics are inseparably wedded to each other. However, there is a difference between the two. Input-output tables show both intermediate input and value added, whereas national income statistics exclude intermediate input, or the value of inter-industrial transactions. Accordingly, theoretically speaking, the value added or final expenditure amount of the two statistics should be the same.

The first official Korean input-output tables were produced for the year 1960 in 1962. Thereafter, the Bank of Korea itself compiled input-output tables for the benchmark years of 1963, 1966, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005 and update versions. These statistics are available at the Bank of Korea's ECOS and provide useful information with respect to how to deal with value added when comparing and analyzing differences between the current and former time series of the national income statistics.

III. Method of Connecting the Previous and Current Time Series (1953~2010)

Generally, GDP data are revised to include additional value added that has emerged since compilation or following a change in the estimation method or scope of national income.

Regarding the method, there is still controversy over whether to update the data at uniform ratios by going back to the initial period, or to revise gradually without changing the initial data values. For instance, revising the data to the initial period will be difficult as new industries emerge after the compilation process. However, if the method of compiling statistics changes, as it did in the US[3], the initial data values need to be changed too.

3 Eugene P. Seskin, "Improved Estimates of the National Income and Product Accounts for 1959~98 Results of the Comprehensive Revision," *Survey of Current Business*, 1999.

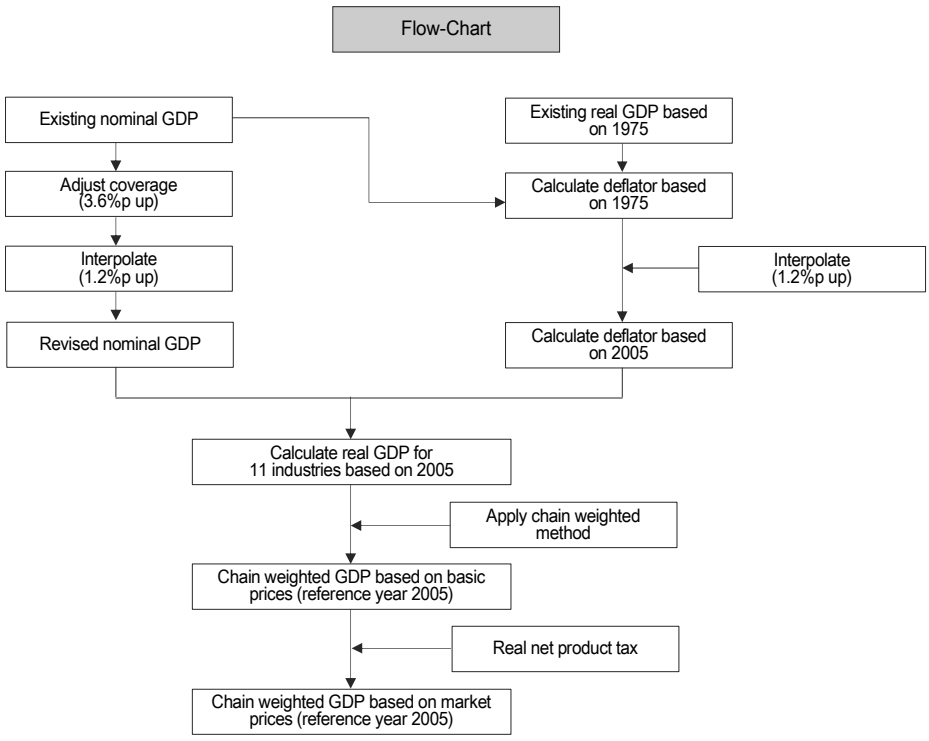
1. Principles of Connection and Classification of Economic Activities

The following principles of connection are established in light of the data availability of the former time series with a 1975 base year, the current time series with a 2005 base year, and the national account manual recommended by international organizations like the UN (1953 and 1993 SNA).

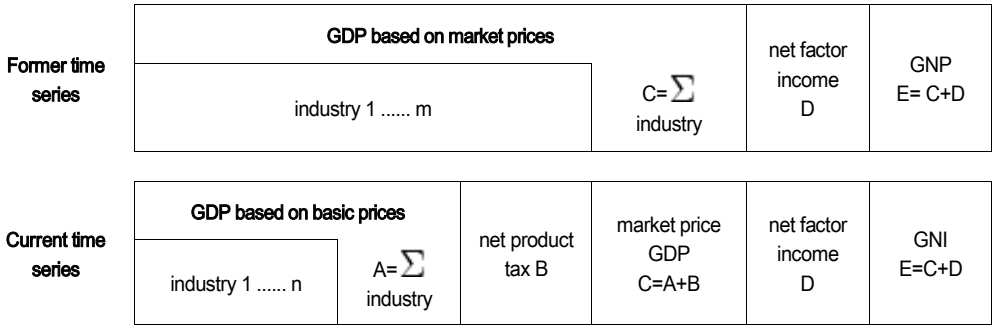
1) Establishing Previous Time Series Based on Basic Prices

The value added of each industry in the previous time series GDP statistics (1953~1970) was calculated based on market prices, whereas the current time series GDP statistics (1970 onward) were established based on basic prices in which net taxes on production (taxes – subsidy) is deducted from the market price. Accordingly, the former time series first needs to be drawn up based on basic prices in order to be connected with current time series. There are two methods of doing

[Figure 1]



[Figure 2]



this. The first is to deduct net taxes on production from the value at market prices. The second is to estimate basic prices by summing up factor cost (compensation of employees + operating surplus + depreciation of fixed capital + net taxes on production).

The inadequacy of basic data for estimating net product tax before 1970 makes the first method unworkable. The second method of estimating basic prices in consideration of factor cost can be adopted if the GDP data for each industry from the 1982 edition of Korean national income are utilized.[4]

Therefore, this paper employs the second method in order to convert the criterion from market prices to basic prices. GDP based on factor cost appears smaller than that based on market prices by an amount equivalent to net indirect tax.[5]

In the 1982 edition of 'Korean National Income', GDP based on factor cost is defined as the sum of compensation of employees, operating surplus and depreciation of fixed capital. To calculate total GDP, the net indirect tax of the former time series is converted to net product tax through partial adjustment, and then the net product tax is added to the GDP figure based on basic prices from the former time series. GNI is derived by adding net factor receipts from abroad to total GDP at market prices.

2) Bringing Concepts and Estimation Methods into Line

First, the method for estimating the government service of the former time series is changed. The former time series recognizes the government as a consumer, and

4 The Korean GDP data for individual industries gives each industry's GDP by factor cost.
5 The Bank of Korea, "Korean National Income," 1982 edition, p.56.

therefore identifies government services as final consumption and considers only factor cost as added value. The current time series recognizes the government as a producer as well as a consumer, and therefore identifies final consumption after estimating the output of government services.[6]

In addition, the scope of fixed capital formation in the government sector is expanded. The former time series considers only fixed capital formation in buildings in its calculation, whereas the current time series considers fixed capital formation in buildings as well as in machinery, equipments, roads and military facilities with non-destructive purposes in its calculation. Accordingly, the scope of fixed capital formation in the former time series is expanded to that of the current time series. As a result, the total sum GDP of the revised time series is higher than that of the former time series in which output and value added are estimated at cost.

Second, taxes on imported goods are separated from the retail and wholesale industries of the former time series and added to net taxes on product. Taxes on imported goods, which are included in retail and wholesale industry in the former time series, are hear stripped out from them.

Third, the classification of the house ownership industry is matched. The previous time series considers house ownership as an independent industry, whereas the current time series includes it in the real estate industry. Hence, the former classification standard criterion is changed to correspond to the criterion of the current time series.

Fourth, the communications industry is separated out. In the previous time series, transport, storage and communication are in the same classification. To match the two time series, communication is therefore separated out and classified with business and personal services.

3) Classification by Economic Activities

Industries are classified into 11 categories in <Table 3>.

6 The Bank of Korea, "1960 Input-Output Table," 1964.

<Table 3> Industrial Classification

Former time series (1953~1969)	Current time series (since 1970)
1. Agriculture and fishery	1. Agriculture and fishery
2. Mining	2. Mining
3. Manufacturing	3. Manufacturing
4. Electricity, gas and water supply	4. Electricity, gas and water supply
5. Construction	5. Construction
6. Retail and wholesale	6. Retail and wholesale
7. Restaurant and accommodation	7. Restaurant and accommodation
8. Transport and storage (communication → social services)	8. Transport and storage
9. Finance, insurance, real estate and business services (house ownership and service industry included)	9. Finance, insurance, real estate and business services
10. Public administration and defense	10. Public administration and defense
11. Social and personal services	11. Social and personal services

2. Method of Connecting Time Series

1) Analysing Differentiating Factors between Former and Current Time Series

This paper looks into factors differentiating the two time series after bringing them into line by converting the market prices of the former time series to base prices of the current time series. The differences mainly comes from ① the expanded scope of fixed capital formation in the manufacturing sector, ② the estimated volume of home ownership, and ③ the inclusion or exclusion of some elements of fixed capital formation in public administration and defense.

The total changed-value of GDP at basic prices amounts to 116.3 billion won in 1970 when the current and previous time series overlap. Out of this, the fixed capital formation in the manufacturing industry is 32.1 billion won, owner-occupied housing in the real estate is 42.9 billion won, the public administration and defense is 34.4 billion won, respectively accounting for 27.6%, 36.9% and 29.6% of the total.

Regarding the construction, its value under the previous time series appears to be about 10 % lower in 1970 than under the current time series, which seems mainly attributable to differences in estimation methods. The Bank of Korea estimated the previous time series by working out construction cost, before

multiplying by the value-added rate.[7] Currently, the Bank of Korea collects data on the construction costs of construction companies, and value-added rate of each construction project is estimated through a more detailed look at the compensation of employees, operating surpluses, the depreciation of fixed capital and so on.

Regarding the public administration and defense sector, the depreciation of fixed capital accounts for 2.3% in the value added of the 1960 Input-Output table and 3.4% in the value added of the 1966 Input-Output Table. In 2008, the ratio rose to 30.6% as the scope of the depreciation of fixed capital had widened; hence we raised the base value of the previous time series by 25.6%, which represented the size of the gap between the two time series.

2) Methods of Connecting Time Series

a. Production (at current prices)

There are two types of method for connecting up the previous time series, which is based on different criteria, like Korean national income: either fixing or changing the initial values. The former was extended by interpolation without changing 1953 initial value. Kim (2009), who conducted a research study on methods of connecting the time series of Korean national statistics, adopted the method of fixing initial values. The focus of his research was placed on bringing the scope of the statistics into line rather than on matching the existing time series. The problem, however, was that the difference in the pre- and post- 1970 values widened considerably.

Meantime, the Bureau of Economic Analysis of the US Department of Commerce changes initial values when the cause of difference lies in definitions or in changes of classification and statistical methods.[8] This paper adopts the method of changing the initial values if the cause of the difference lies in definitions or in changes of classifications and statistical methods, and it uses the method of fixing initial values and extending by interpolation in other cases. Detailed revisions on individual industries are made in light of methods of compiling national income statistics in the past, and SNA of the United Nations.

The method of connecting the current and former time series on the basis of

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7 The value-added ratio is based on the survey data in the 1960 Input-Output Tables. And it is noted that a value-added ratio based on an independently conducted investment survey is used in both 1966 and 1970. The Bank of Korea (1982), *op. cit*., p.100.

8 Eugene P. Seskin and Shelly Smith, "Improved Estimates of the National Income and Product Accounts, Results of the 2009 Comprehensive Revision," *Survey of Current Business*, 2009.

current prices involves four main steps. First, the methods of processing or changing scope of the two time series should be matched in order to connect the current and former time series. The differences between value added at market prices and value added based on factor cost are used in order to separate out taxes on imported goods from the retail and wholesale industries.

Second, interpolation is employed to deal with the still remaining difference after the processing methods of the two time series are brought into line. However, increase or decrease in inventories, net factor income, and statistical discrepancy are the same as those in the previous time series. Third, the total sum of value added based on basic prices was made by the sum of industry's GDP, which was the revised time series for individual industries.

Fourth, the conversion of GDP at basic prices to GDP at market prices requires net product taxes. However, in 1970, when the net indirect taxes of the former time series and the net product taxes of current time series overlap, net indirect taxies are 5.2% larger than net product taxes. The reason for this seems to be that indirect taxes include more taxes than product taxes. Accordingly, the former time series is matched with the current time series through the reduction of an amount equivalent to the excluded amount from the former time series.

GNI is calculated by adding net factor income from abroad to newly calculated GDP based on market prices; and the result only relates to current prices.

b. Production (at constant prices)

The chain weighted method should be applied to the current GDP statistics time series of production[9] in order to obtain a new economic growth rate using the revised national income statistics. In order to get the real GDP of the current time series, the previous time series should be recompiled based on 2005 prices because the reference year of current GDP is the year of 2005. This process requires a deflator (current value added/constant value added based on 2005 data). Theoretically, the deflator with the 2005 reference year can be obtained by using

9 The US and Japan estimate and announce their economic growth rates based on expenditure data. However, Korea has done so based on production activity data since the 1950s. Nathan Associates, Inc., who came to Korea after the Korean War to consult on reconstruction and development, publishing a report titled "An Economic Program for Korean Reconstruction, 1954", noted that "Korean GDP, as a tool to draw up economic development plans, was estimated focusing on production activity data. Since fundamental statistics were almost non-existent in Korea, easily accessible estimation and data processing methods were adopted in consideration of production activity data." The Bank of Korea (2009c), p.44.

the deflators in the current and former time series.

However, this method is valid only when the current value of the corresponding year in the current time series, whose reference year is 2005, matches the current value of the corresponding year in the previous time series, whose base year is 1975. When current value changes due to variation in scope, as in this paper, the deflator referenced on 2005 can be projected backward until 1953 by reflecting the rate of increase of the deflator based on 1975.

Real value added by individual industries can be obtained through deflators calculated by this method. And gross value added, obtained by summating all the real value added by industries, is a constant value resulting from the previously adopted fixed weighted method. However, the national income statistics were compiled based on the chain weighted method in 2009 by the Bank of Korea, and therefore, gross value added should be reevaluated based on the chain index.

One can turn constant GDP at basic price estimated by this process into constant GDP at market price by adding constant net product tax to constant GDP at basic prices. The constant prices of product tax or product subsidy are calculated by multiplying the real output of the year under comparison by the tax rate or subsidy rate of the reference year. Since output amount data before 1970 are lacking, the adjusted data were estimated by utilizing the rate of increase in each industry's value added, real net product taxes, current product taxes and product subsidies in 1970.

c. Expenditure

Expenditure is estimated from the viewpoint of consumers, not producers. Hence, expenditure is based on market prices including net product taxes. However, matrix data with a product amounts and product taxes are not available. Hence, this paper includes in expenditure the changed amount of value added at basic prices, which is estimated from production activities, without consideration of product taxes. As a result, finance, insurance, real estate and business services show a relative large expansion, whereas construction, accommodation and food services all shrink.

These differences between the previous and the current time series in production activity are allocated to expenditure as below. First, housing related services, accommodation and food service are categorized simply as private consumption; public administration and defense as government consumption; and construction as fixed capital formation. Transport and storage services and others are allocated in <Table 4> in proportion to final demand by industry using the domestic transaction table of the 1960 input-output tables.

<Table 4> Changes in Production Activity Reflected in Expenditure

(Unit: %)

	Private expenditure	Government expenditure	Fixed capital formation
Agriculture, forestry and fishery	100.0		
Mining	100.0		
Manufacturing	94.7		5.3
Electricity, gas and water supply	86.0	14.0	
Construction			100.0
Retail and wholesale	95.7	2.0	2.1
Food and accommodation	100.0		
Transport and storage	89.9	9.1	1.0
Finance, insurance and real estate	75.7	24.3	
Public administration and defense		100.0	
Social and personal services	70.7	29.3	

IV. Result of Time Series Connection

1. Comparison between Time Series Before and After the Revision

<Table 5> compares the current value added time series before and after the revision. Annual figures show that the total GDP of revised time series rose by 3.5% in 1953, by 2.7% in 1956, and by as much as 4.8% in 1970. This reflects the fact that the rate of increase in each industry varies from year to year.

<Table 6> shows figures for revised real GDP. Real GDP (at basic prices) in 1953 with reference year 2005 prices is 17 trillion KRW, and increases by an annual average of 7.6% during 1953~1970 to amount to 58.9 trillion KRW in 1970. Shown by industry, the real GDP of the agriculture, forestry and fishery industry was 6.8 trillion KRW in 1953 and it less than doubled to 12.5 trillion KRW in 1970, whereas the real GDP of the manufacturing industry increased by more than 10 times from 0.4 trillion KRW in 1953 to 5.1 trillion KRW in 1970.

The economic growth rate changes in line with the revision of real GDP. <Table 7> shows the difference in growth rates between the current and former time series. In 1954, the GDP growth rate of the revised time series is 1.2%p higher than that of the former time series. It is 3.0%p higher than the former time series in 1968, and

<Table 5> Comparison between Time Series Before and After the Revision (at basic prices)

(Unit: billion KRW, %)

	Before revision (A)	After revision (B)	(B/A), %
1953	45.7	47.3	3.5
1954	62.4	64.9	3.9
1955	108.7	111.9	2.9
1956	144.7	148.6	2.7
1957	186.7	192.4	3.1
1958	190.9	197.9	3.7
1959	199.9	208.2	4.2
1960	224.7	234.4	4.3
1961	273.2	284.8	4.2
1962	325.6	340.3	4.5
1963	469.4	488.4	4.0
1964	678.1	704.3	3.9
1965	750.8	781.8	4.1
1966	951.4	992.3	4.3
1967	1,159	1,212.6	4.6
1968	1,478.3	1,547.1	4.7
1969	1,928.6	2,016.7	4.6
1970	2,413.7	2,530.0	4.8
Average	644.0	672.4	4.0

increases by an average of 1.5%p during 1954~1970 which is mainly attributable to the revision of current GDP, and to the change of the previously-used fixed weighted index to a chain weighted index.

According to index theory, substitution bias[10] arising from the fixed weight method is greatly reduced when the chain weighted method is applied, in which process, in general, the growth rate before the reference year is revised upward whereas that after the reference year is revised downward. With the introduction of the chain weighted method, the annual economic growth rate in Korea during 1971~2005 is seen to increase by an average of 0.9%p.

The growth rate of the former time series increases after the revision because the real volume growth rate is over-estimated in the fixed weighted method in which

10 Refers to a phenomenon in which a gap appears between real index and fixed weighted index which uses a fixed commodity basket or weighted value because the fixed weighted index fails to reflect changes in relative prices and quantity system that appears as time goes by. The Bank of Korea, "Understanding Chain Weighted Measures of Economic Growth," 2009, p.27.

<Table 6> Real Value Added by Industry

(Unit: trillion KRW)

	Agriculture, forestry, fishery	Manufacturing	Construction	Retail, wholesale	Food, accommodation	Transport, storage	Finance, insurance and real estate[1)]	Public administration and defense	Basic price GDP
1953	6.8	0.4	0.6	1.4	0.6	0.2	2.6	13.8	17.0
1954	7.3	0.5	0.8	1.4	0.7	0.2	2.6	12.8	18.0
1955	7.5	0.6	0.8	1.6	0.7	0.3	2.8	12.7	19.2
1956	7.0	0.7	0.7	1.6	0.8	0.3	2.9	12.3	19.2
1957	7.6	0.8	0.9	1.9	0.9	0.3	3.0	11.7	20.9
1958	8.2	0.9	0.9	1.9	1.0	0.4	3.2	10.9	22.2
1959	8.2	0.9	1.1	2.2	1.2	0.4	3.3	10.7	23.3
1960	8.0	1.0	1.1	2.3	1.1	0.5	3.4	10.6	23.8
1961	9.0	1.1	1.2	2.3	0.9	0.5	3.5	10.5	25.2
1962	8.5	1.2	1.4	2.6	0.9	0.5	3.7	10.8	26.1
1963	9.3	1.4	1.7	2.8	1.0	0.6	3.8	11.2	28.7
1964	10.8	1.5	1.8	2.8	1.0	0.7	4.1	11.5	31.7
1965	10.7	1.9	2.2	3.0	1.2	0.9	4.4	11.8	33.8
1966	11.9	2.2	2.7	3.5	1.3	1.1	4.6	12.6	38.2
1967	11.3	2.7	3.2	4.1	1.6	1.4	5.0	13.3	41.3
1968	11.4	3.4	4.5	4.8	1.8	1.8	5.5	14.0	46.8
1969	12.6	4.2	6.2	5.5	2.0	2.3	6.0	14.6	53.7
1970	12.5	5.1	6.5	6.4	2.4	2.8	6.7	15.4	58.9

Note: 1) Finance, insurance, real estate and business services.

the high weighted value of the reference year and the high volume growth rate of the comparison year are applied. For instance, the share of manufacturing products in industry was very small in the 1950s, but since then it has increased significantly, whereas that of agriculture, fishery and forestry products has moved along a path in quite the opposite direction.

2. Characteristics of the Korean Economy Seen from the Perspective of the Long Term Time Series

[Figure 3] shows economic growth trends during the 58 years after the Korean war until 2010 using the revised time series. The growth rate was low right after the

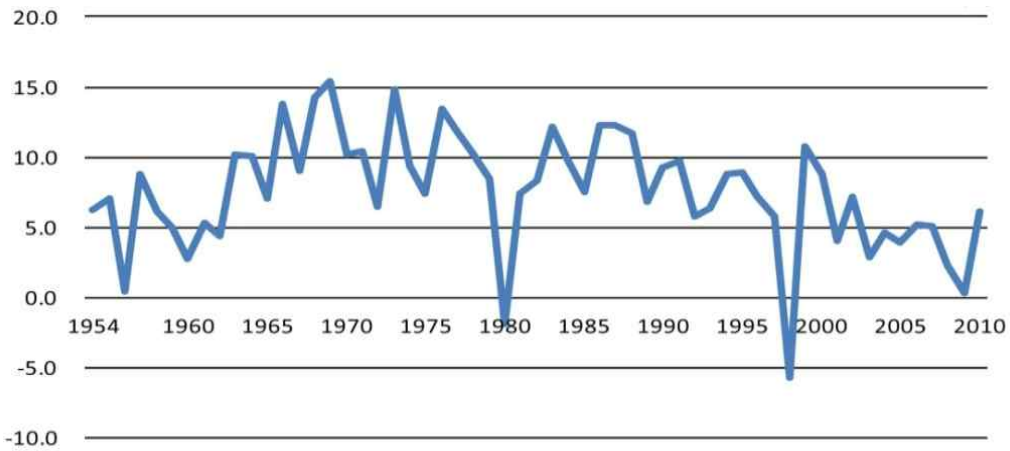
<Table 7> Differences in Economic Growth Rates between the Current and Former Time Series

(Unit: %)

	Before revision(A)	After revision(B)	A-B, %p
1954	6.3	5.1	1.2
1955	7.2	4.5	2.5
1956	0.5	-1.4	1.8
1957	8.8	7.6	1.2
1958	6.1	5.5	0.7
1959	4.9	3.8	1.2
1960	2.9	1.1	1.7
1961	5.3	5.6	-0.3
1962	4.5	2.2	2.2
1963	10.3	9.1	1.1
1964	10.1	9.6	0.5
1965	7.0	5.8	1.2
1966	13.9	12.7	1.1
1967	9.1	6.6	2.5
1968	14.3	11.3	3.0
1969	15.4	13.8	1.6
1970	10.2	7.6	2.6
Average	8.0	6.5	1.5

[Figure 3] Economic Growth Rate

(Unit: %)



<Table 8> Average Annual Economic Growth Rate in Each Decade

(Unit: %)

1950s	1960s	1970s	1980s	1990s	2000s	Total average
5.6	9.2	10.3	8.6	6.7	4.6	7.6

<Table 9> Growth Ratios by Industry (2010/1953)

(Unit: times)

Agriculture, forestry and fishery	Manufacturing	Electricity, gas and water supply	Construction	Retail and wholesale	Transport and storage	Finance, insurance and real estate	Public administration and defense	Basic GDP
4.2	664.3	1349.4	98.6	55.8	245.5	69.2	4.1	55.5

Note: Based on constant value added.

war, but was very high in the 1960s backed by the active economic development policy of the government utilizing foreign loans. In the early 1980s, the growth rate turned negative due to the second oil shock that erupted in the late 1970s, political instability and so on. However, the rate turned positive in the mid-1980s thanks to the three lows — low interest rates, low exchange rates and low oil prices.

In the 1990s, the growth rate gradually declined, and in 1998, it shifted back into negative territory due to the Asian financial crisis. Although the rate rebounded somewhat thereafter, the overall growth rate has remained around 4~5%.

A similar trend appears in <Table 8>, which shows the economic growth rate of Korea for each period. In the 1950s, in the aftermath of the Korean War, the growth rate stayed at 5.6%; however, it increased continuously to 9.2% in the 1960s, and to 10.3% in the 1970s. And then, the rate gradually fell back to 8.6% in the 1980s, to 6.7% in the 1990s, and to 4.6% in the 2000s, which means that the economy is on the path to maturity.

Changes in the Korean industrial structure estimated based on the long term time series show that the most static industries among Korean industries over the last half a century have been public administration/defense and agriculture/forestry/fishery. The agriculture/forestry/fishery and public administration/defense industries increased merely 4.2 times and by 4.1 times from 1953 to 2010, respectively; while the manufacturing sector increased by 664.3 times over the same period. In particular, social overhead capital (SOC) in forms such as electricity, gas and water supply increased by a massive 1,349.4 times, thereby satisfying demand from industry as well as the private sector and making a

<Table 10> Individual Industry Weights in All-industry (at current value)

(Unit: %)

	1953	1960	1970	1980	1990	2000	2009
Agriculture, forestry and fishery	46.9	38.3	29.1	16.0	8.7	4.6	2.6
Mining	1.1	2.3	1.6	1.4	0.8	0.3	0.2
Manufacturing	7.4	12.0	18.5	24.6	26.6	28.3	27.7
Electricity, gas and water supply	0.4	0.6	1.3	2.1	2.1	2.5	1.8
Construction	1.9	3.1	5.1	7.9	10.4	6.9	6.9
Retail and wholesale	11.6	9.3	14.2	13.2	11.8	9.6	8.6
Accommodation and food service	2.0	2.1	2.2	1.6	2.4	2.8	2.4
Transport and storage	1.5	3.8	5.7	6.5	4.7	4.5	4.4
Finance, insurance and real estate	16.0	10.5	7.0	11.2	14.7	19.3	19.9
Public administration and defense	7.4	9.2	6.7	6.2	5.3	5.7	6.7
Social and personal services	3.8	8.9	8.4	9.4	12.6	15.4	18.7
GDP (at basic prices)	100.0	100.0	100.0	100.0	100.0	100.0	100.0

significant contribution to enhancing the quality of life.

At the same time, the speed of growth over the past six decades differs from industry to industry, which has given rise to significant changes in the industrial structure of the Korean economy. In 1953, for instance, agriculture/forestry/fishery accounted for 46.9% of all-industry production when based on current value while the manufacturing sector made up just 7.4%.

However, the ratio of the manufacturing sector went up to 18.5% in 1970, and this growth momentum continued with the ratio rising to 24.6% in 1980, 26.6% in 1990 and 28.3% in 2000. Nonetheless, it lost dynamism thereafter, retreating to 27.7% in 2009. In the case of social and personal services, the sector grew from 3.8% in 1953 to 8.4% in 1970, to 12.6% in 1990 and to 18.9% in 2009, indicating the constantly expanding ratio of the service industry as it relates to the quality of life.

In contrast, public administration and defense stood at 7.4% in 1953, and at 9.2% of all-industry in 1960, but it has been more or less constant at around 5~6% since 1960. The mining sector declined continuously from 1.1% in 1953 to 0.2% in 2009.

All these movements mean that the economic structure of Korea has significantly changed over the last half-century.

V. Conclusions

There is a break between the current and former time series in 1970. This paper set out to make the connection between the current and former time series on the basis of the 1993 SNA and by utilizing past national income data, input-output tables and so on. This enabled us to look into the long-term economic trends since the Korean War with a more coherent set of criteria. The characteristics of the connected time series are as follows.

First, the time entire series has uniform compilation and industrial classification criteria for the entire 58 years. When the criteria of current time series are applied to the former time series, current GDP at basic prices increases by 3.5% in 1953.

Second, the chain weighted method, which was introduced by the Bank of Korea in 2009, is applied to obtain the real GDP for years before 1970. The subsequent re-estimation of the growth rate gives an average annual growth rate 1.5%p annually higher during the years from 1954~1969.

Third, the economic growth rate trend estimated based on the revised time series for the last 58 years shows that the Korean economy was accelerating until the 1970s and since then its pace has decelerated somewhat.

Fourth, the size of the Korean economy increased more than 50-fold from 1953 to 2010. However, the growth rate by sector shows that the manufacturing and SOC sectors increased greatly while the service sector expanded on a relatively small scale.

References

Kim, Nak Nyeon, "National Accounts of Korea, 1911~2007: A Long Term Series of Principal Indicators," *Economic Analysis* 15(2), The Bank of Korea, Economic Institute, 2009, pp.55~95.

Seskin, Eugene P., "Improved Estimates of the National Income and Product Accounts for 1959~98, Results of the Comprehensive Revision," *Survey of Current Business*, 1999.

Seskin, Eugene P. and Shelly Smith, "Improved Estimates of the National Income and Product Accounts, Results of the 2009 Comprehensive Revision," *Survey of Current Business*, 2009.

The Bank of Korea, "Rebasing of the Korean National Income Statistics to Reference Year 2005," 2009a.

_____, "Quarterly National Accounts," No. 4, 2009b, pp.95~157.

_____, "Understanding of Chain Weighted GDP," 2009c.

_____, "A System of National Accounts in Korea," 2010.

_____, "Input-Output Tables in Korea," 1960, 1963, 1966, 1968, 1970.

_____, "National Income in Korea," 1965, 1975, 1978, 1982.

UN, "A System of National Accounts and Supporting Tables: 1953 SNA," 1953.

_____, "A System of National Accounts and Supporting Tables: 1953 SNA (revised version)," 1960.

_____, "A System of National Accounts," 1969.

_____, "A System of National Accounts," 1993.

<Appendix Table 1> GDP in Korea by Kind of Economic Activity (at current prices)

(Unit: billion KRW)

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP	Net factor income[5]	GNI
1953	22.2	0.5	3.5	0.2	0.9	5.5	1.0	0.7	7.6	3.5	1.8	47.3	1.6	48.9	0.6	49.5
1954	25.9	0.6	6.4	0.3	1.5	7.5	1.5	1.3	9.6	6.0	4.1	64.9	3.1	67.9	0.6	68.5
1955	50.2	1.2	11.1	0.5	3.1	13.1	2.3	2.6	11.7	7.9	8.3	111.9	4.2	116.1	1.4	117.5
1956	70.5	1.7	14.9	0.3	3.9	16.9	3.4	3.6	13.7	9.3	10.4	148.6	5.1	153.7	1.4	155.1
1957	88.0	2.9	18.1	1.0	6.2	18.9	4.7	6.0	17.3	14.8	14.4	192.4	8.5	200.9	1.4	202.3
1958	82.7	3.4	21.2	1.6	5.9	19.0	4.9	6.8	20.4	17.0	15.1	197.9	11.7	209.6	1.4	211.0
1959	73.0	4.0	24.6	1.3	6.7	22.8	5.8	8.1	22.2	20.5	19.3	208.2	15.3	223.5	1.5	225.0
1960	89.9	5.3	28.1	1.5	7.2	21.8	4.9	8.9	24.6	21.5	20.9	234.4	17.5	251.9	1.8	253.7
1961	114.6	5.7	35.5	2.7	8.5	26.8	5.0	11.3	25.9	25.2	23.6	284.8	17.2	302.0	2.8	304.8
1962	131.4	7.4	41.9	3.7	10.3	36.0	5.5	13.7	29.4	32.8	28.2	340.3	25.3	365.6	3.2	368.8
1963	219.3	8.6	65.3	3.8	13.0	51.6	6.9	15.8	35.5	34.5	34.0	488.4	28.6	517.0	3.3	520.3
1964	337.5	12.9	104.4	5.2	17.9	73.4	10.1	18.6	43.6	41.4	39.5	704.3	31.3	735.6	5.3	740.9
1965	307.5	16.9	136.7	7.9	24.4	100.2	13.7	25.3	50.5	49.2	49.4	781.8	44.8	826.6	7.7	834.3
1966	362.3	20.0	170.9	11.2	33.5	138.3	17.6	40.3	62.9	66.2	69.0	992.3	68.5	1060.8	13.4	1,074.2
1967	393.0	24.9	212.8	13.5	43.3	179.9	24.5	59.9	86.9	82.3	91.6	1,212.6	95.1	1307.7	22	1,329.7
1968	476.9	26.1	282.8	17.0	69.5	213.4	33.2	86.0	112.3	104.6	125.3	1,547.1	143.6	1690.7	23.2	1,713.9
1969	607.6	30.9	367.5	24.1	106.6	291.4	43.8	114.3	138.3	131.6	160.6	2,016.7	191.1	2207.8	25	2,232.8
1970	736.7	41.3	468.7	34.0	128.7	358.4	56.9	145.0	178.2	168.7	213.5	2,530.0	245.1	2,775.1	37.0	2,812.1
1971	927.1	46.6	576.6	41.0	137.0	463.8	74.1	176.5	226.7	201.7	274.9	3,146.1	288.4	3,434.5	15.8	3,450.3
1972	1,123.2	46.4	784.2	55.0	155.9	607.7	94.4	218.6	269.5	244.3	331.6	3,930.8	310.3	4,241.1	1.7	4,242.8
1973	1,349.8	56.8	1,171.6	62.2	214.7	843.6	118.0	295.7	324.7	268.5	387.0	5,092.5	406.5	5,499.0	-9.7	5,489.3
1974	1,895.3	90.5	1,609.0	51.7	307.0	1,330.8	157.9	382.0	471.0	365.5	524.3	7,184.8	660.6	7,845.4	-4.3	7,841.1

<Appendix Table 1> Continued

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP	Net factor income[5]	GNI
1975	2,559.5	142.6	2,116.3	107.0	432.8	1,586.3	214.7	480.0	598.4	516.0	771.2	9,524.9	952.9	10,477.8	-104.6	10,373.2
1976	3,304.8	156.2	3,117.6	160.8	567.4	1,995.4	274.1	642.5	867.0	746.0	1,113.3	12,945.1	1,465.7	14,410.8	-97.5	14,313.2
1977	4,012.2	242.1	3,969.0	238.0	881.1	2,410.2	307.4	917.9	1,219.3	978.9	1,420.3	16,596.6	1,905.4	18,502.0	-119.2	18,382.8
1978	4,956.5	309.0	5,376.2	308.0	1,653.2	3,179.8	381.0	1,275.2	1,784.9	1,248.8	1,851.1	22,323.7	2,621.1	24,944.7	-67.0	24,877.7
1979	5,942.2	340.4	7,011.8	511.9	2,342.3	3,919.0	460.3	1,774.0	2,436.1	1,622.9	2,342.1	28,703.0	3,346.4	32,049.4	-210.6	31,838.8
1980	5,576.0	484.3	8,557.4	739.0	2,749.6	4,582.1	552.4	2,262.7	3,885.6	2,165.1	3,270.2	34,824.3	4,285.3	39,109.6	-630.4	38,479.2
1981	7,339.4	657.8	10,961.0	1,010.8	2,972.8	5,840.2	699.1	3,003.2	4,414.8	2,681.9	4,278.6	43,859.6	5,446.1	49,305.7	-1,143.3	48,162.4
1982	7,873.5	703.7	12,506.4	1,203.6	3,691.3	6,656.0	870.9	3,375.9	4,694.2	3,151.6	5,598.1	50,325.3	6,351.5	56,676.8	-1,251.1	55,425.7
1983	8,427.0	767.1	15,236.4	1,567.0	4,430.7	7,614.9	1,049.8	3,617.9	5,926.0	3,470.0	6,794.2	58,901.1	7,784.0	66,685.1	-1,235.8	65,449.3
1984	9,143.2	831.8	18,564.8	1,988.7	4,923.2	9,014.6	1,191.0	3,933.1	6,937.8	3,745.9	7,938.2	68,212.2	8,311.3	76,523.5	-1,619.3	74,904.2
1985	10,173.6	949.9	20,522.8	2,248.9	5,292.1	10,037.7	1,378.8	4,020.1	8,635.9	4,148.3	9,362.3	76,770.4	8,928.8	85,699.1	-2,032.5	83,666.6
1986	10,534.7	1,124.6	25,502.2	2,896.2	5,570.5	12,019.2	1,861.3	4,715.2	10,441.7	4,557.2	10,759.4	89,982.1	10,272.0	100,254.1	-2,105.5	98,148.7
1987	11,120.5	1,163.4	31,322.5	3,163.7	6,788.0	14,672.9	2,160.8	5,266.5	12,757.5	5,180.0	12,516.7	106,112.6	11,825.6	117,938.2	-1,470.9	116,467.2
1988	13,220.8	1,173.1	38,101.7	3,352.0	8,521.5	16,652.5	2,632.4	5,968.1	16,389.7	6,040.5	14,688.5	126,741.0	13,783.8	140,524.8	-881.2	139,643.6
1989	13,894.3	1,141.6	40,874.7	3,464.7	11,222.9	17,691.4	3,329.8	7,067.0	19,984.1	7,325.3	17,743.2	143,739.1	14,881.0	158,620.1	-285.2	158,334.8
1990	14,998.3	1,308.2	45,919.9	3,576.3	17,942.8	20,284.8	4,186.6	8,170.7	25,372.3	9,089.2	21,652.8	172,502.0	18,880.8	191,382.8	-98.5	191,284.3
1991	16,240.3	1,469.6	56,139.6	4,124.3	23,587.5	23,169.8	5,525.7	9,836.9	32,526.6	11,208.9	26,220.6	210,049.7	21,378.5	231,428.2	-331.1	231,097.1
1992	17,995.6	1,328.5	61,931.0	4,895.9	25,587.3	25,460.6	6,489.3	11,332.8	40,044.4	13,381.3	30,973.1	239,419.7	24,573.5	263,993.2	-492.1	263,501.1
1993	18,240.7	1,358.7	70,628.6	5,714.7	29,343.9	28,014.6	7,208.3	12,854.8	47,358.0	15,145.8	35,733.3	271,601.4	27,160.2	298,761.6	-704.5	298,057.1
1994	20,652.0	1,715.7	83,187.2	6,619.8	32,322.5	31,658.2	8,452.0	14,765.8	57,434.0	17,263.1	42,606.2	316,676.4	33,296.2	349,972.6	-1,016.9	348,955.6
1995	22,828.8	1,778.8	98,816.2	7,387.6	37,450.4	36,225.3	9,829.4	16,939.4	68,470.0	20,024.9	50,636.3	370,387.1	39,266.5	409,653.6	-1,640.0	408,013.6

<Appendix Table 1> Continued

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP	Net factor income[5]	GNI
1996	23,961.1	1,787.8	106,902.8	8,196.2	42,601.6	37,913.6	11,228.5	18,478.2	81,153.8	22,879.2	59,488.9	414,591.8	46,360.8	460,952.6	-2,316.3	458,636.3
1997	23,895.6	1,868.5	115,374.5	9,114.3	46,969.6	38,481.6	12,038.0	20,026.2	93,731.1	25,573.2	66,704.1	453,776.7	52,536.9	506,313.6	-3,448.2	502,865.4
1998	22,354.7	1,651.1	120,255.6	10,336.3	40,146.4	36,470.6	10,864.1	21,139.6	96,830.9	27,092.2	68,419.7	455,561.1	45,466.1	501,027.2	-8,452.8	492,574.3
1999	24,799.2	1,636.0	133,657.0	12,287.0	38,019.6	43,642.0	13,431.3	22,510.0	98,160.3	28,550.8	75,529.4	492,222.8	56,782.2	549,005.0	-6,827.6	542,177.5
2000	24,939.1	1,675.4	152,176.8	13,705.5	37,413.8	51,912.4	14,869.4	24,275.6	103,984.0	30,494.0	83,101.7	538,547.6	64,688.4	603,236.0	-3,077.2	600,158.8
2001	25,272.5	1,634.4	153,952.2	15,257.7	41,375.9	54,452.0	16,062.8	25,805.6	113,764.9	33,367.9	98,357.2	579,303.1	72,112.2	651,415.3	-1,516.3	649,898.9
2002	25,407.7	1,721.5	167,192.2	16,646.7	45,771.6	57,172.6	17,772.2	28,262.3	131,707.7	37,133.4	109,580.3	638,368.2	82,170.8	720,539.0	457.3	720,996.3
2003	25,306.6	1,693.6	175,923.5	17,656.1	54,817.8	58,246.9	17,941.2	30,782.9	140,399.4	40,827.1	118,607.4	682,202.7	84,911.0	767,113.7	657.7	767,771.4
2004	27,681.0	1,759.2	205,825.9	17,497.3	57,833.2	61,425.6	17,925.3	34,632.4	145,959.1	44,435.4	126,857.6	741,832.1	85,060.7	826,892.7	2,434.0	829,326.7
2005	25,853.0	1,992.9	213,646.2	17,611.5	59,284.5	64,193.9	18,275.8	35,292.2	154,502.7	48,200.9	137,036.1	775,889.6	89,351.3	865,240.9	-813.7	864,427.3
2006	25,751.2	1,925.8	220,940.1	18,546.9	61,359.3	67,855.9	19,464.8	36,424.2	162,061.7	52,262.6	148,093.6	814,686.1	94,057.8	908,743.8	1,390.3	910,134.2
2007	25,208.8	2,001.2	238,610.9	19,155.3	64,979.0	72,543.7	20,861.8	40,070.5	175,605.6	55,515.9	160,229.3	874,782.0	100,231.0	975,013.0	1,800.9	976,813.9
2008	24,686.0	2,336.0	256,209.4	12,298.6	64,612.2	77,912.2	22,507.0	41,613.1	186,924.1	59,396.8	171,192.6	919,688.0	106,763.8	1,026,451.8	7,663.6	1034,115.4
2009	26,615.0	2,220.5	266,578.2	17,258.2	66,576.6	80,757.0	23,237.8	40,162.5	190,398.5	63,706.6	181,325.1	958,836.0	106,200.8	106,5036.8	4,746.2	1,069,783.1
2010	27,018.7	2,237.3	323,049.9	21,044.6	68,800.8	90,115.0	24,130.3	42,909.6	201,206.4	66,031.0	190,468.0	105,7011.8	115,791.6	117,2803.4	320.0	1,173,123.4

Note: 1) Electricity, gas and water supply. 2) Restaurant, accommodation. 3) Finance, insurance, real estate and business services. 4) Public administration and defense. 5) Net factor income from the rest of the world.

<Appendix Table 2> GDP in korea by kind of Economic Activity (at 2005 constant prices)

(Unit: billion KRW)

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP
1953	6,786	320	433	16	625	1,377	643	173	2,580	13,757	2,171	16,953	469	16,889
1954	7,340	271	513	20	768	1,418	725	212	2,553	12,844	2,451	18,025	489	17,946
1955	7,461	305	625	20	770	1,611	670	258	2,803	12,709	2,597	19,203	571	19,201
1956	6,958	315	723	23	718	1,623	774	330	2,866	12,274	2,770	19,199	640	19,282
1957	7,623	410	778	26	896	1,851	913	338	2,981	11,652	2,891	20,879	706	20,980
1958	8,192	423	861	31	923	1,930	1037	377	3,166	10,909	3,033	22,176	740	22,271
1959	8,180	489	945	37	1,129	2,196	1179	435	3,266	10,727	3,237	23,270	782	23,379
1960	8,020	626	1,026	38	1,124	2,335	1088	480	3,427	10,579	3,353	23,844	837	24,028
1961	9,013	668	1,071	39	1,228	2,317	911	477	3,479	10,452	3,472	25,199	840	25,303
1962	8,485	817	1,202	48	1,417	2,601	943	528	3,679	10,832	3,851	26,120	977	26,412
1963	9,306	864	1,401	53	1,676	2,832	952	619	3,783	11,242	4,286	28,670	1,134	29,106
1964	10,774	983	1,546	63	1,803	2,760	991	724	4,082	11,466	4,558	31,696	1,158	32,042
1965	10,682	1,064	1,871	76	2,247	3,043	1,200	863	4,357	11,804	4,903	33,766	1,362	34,286
1966	11,940	1,118	2,204	90	2,717	3,548	1,295	1,118	4,644	12,578	5,263	38,227	1,689	39,016
1967	11,252	1,251	2,691	115	3,240	4,129	1,559	1,373	5,032	13,343	5,813	41,339	2,066	42,549
1968	11,416	1,237	3,438	142	4,487	4,810	1,819	1,804	5,534	13,998	6,442	46,779	2,658	48,628
1969	12,634	1,225	4,198	184	6,175	5,475	2,047	2,326	6,015	14,640	7,020	53,690	3,249	56,122
1970	12,476	1,434	5,054	219	6,484	6,355	2,395	2,790	6,692	15,380	7,632	58,903	3,753	61,851
1971	13,112	1,459	5,855	269	6,362	7,387	2,771	3,095	7,575	16,190	8,669	65,012	4,172	68,309
1972	13,454	1,515	6,626	302	6,253	8,156	2,973	3,341	8,172	16,244	9,299	69,368	4,357	72,757
1973	14,289	1,733	8,763	358	7,723	9,093	3,381	3,967	9,186	16,635	10,034	79,346	5,224	83,516

<Appendix Table 2> Continued

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP
1974	15,133	1,812	10,330	409	8,615	10,020	3,431	4,176	9,501	17,160	10,641	86,696	5,792	91,351
1975	15,883	2,010	11,719	465	9,142	10,653	3,536	4,573	10,678	17,700	11,461	93,712	5,741	98,054
1976	17,238	2,038	14,390	571	10,027	11,554	3,754	5,081	12,432	18,261	12,437	105,029	7,305	111,247
1977	17,691	2,333	16,662	616	12,899	12,405	3,832	5,948	14,838	19,092	13,440	115,827	9,160	124,394
1978	15,868	2,455	20,521	827	16,560	13,633	3,764	6,784	16,919	19,916	14,733	126,728	10,810	137,204
1979	17,643	2,356	22,445	886	17,351	14,398	3,876	7,525	18,336	20,919	16,132	137,311	11,753	148,715
1980	14,650	2,270	21,962	948	16,901	14,234	3,758	7,620	21,083	21,925	17,767	134,669	11,564	145,903
1981	16,895	2,266	24,208	1,095	15,749	15,588	3,810	7,927	21,307	22,607	19,216	144,591	12,454	156,706
1982	18,156	2,014	25,696	1,163	18,335	16,937	4,242	8,716	23,523	23,436	21,064	156,302	13,679	169,699
1983	19,649	2,160	29,788	1,518	22,182	18,491	4,764	9,232	26,241	24,219	23,737	175,267	15,398	190,372
1984	19,041	2,263	35,238	1,926	23,456	19,849	5,010	9,984	28,844	24,331	26,873	192,077	17,228	209,141
1985	20,147	2,400	37,520	2,310	24,825	20,954	5,393	10,353	32,925	24,808	29,752	206,469	18,485	224,765
1986	21,168	2,536	45,401	2,928	25,733	23,791	5,850	10,973	36,793	25,501	32,324	231,568	20,880	252,276
1987	20,162	2,537	54,226	3,296	28,363	26,882	6,349	12,100	43,231	26,263	35,369	258,773	24,388	283,220
1988	22,017	2,533	61,138	3,648	30,750	29,976	6,991	13,333	51,318	27,468	38,823	288,560	27,559	316,245
1989	21,910	2,431	63,334	4,069	34,590	31,846	7,985	14,155	57,476	28,805	42,968	307,496	29,901	337,598
1990	20,613	2,229	69,375	4,802	42,797	34,622	8,571	15,436	63,450	30,315	47,311	335,197	33,515	368,986
1991	21,201	2,271	76,280	5,336	47,857	37,414	9,496	16,597	71,761	31,925	52,191	366,840	37,606	404,825
1992	23,033	2,017	80,111	5,898	47,246	39,030	10,283	17,647	79,123	33,692	56,508	388,495	39,264	428,164
1993	21,987	2,006	84,144	6,675	51,548	41,571	10,851	18,086	87,933	35,265	60,890	412,917	41,914	455,264
1994	21,941	2,209	92,721	7,629	54,059	44,595	11,914	19,452	96,390	36,410	67,533	446,678	48,088	495,199

<Appendix Table 2> Continued

Year	Agriculture and fishery	Mining	Manu-facturing	E,G,W[1]	Con-struction	Retail, wholesale	R, A[2]	Transport, storage	F,R,B[3] services	Public admin-istration[4]	Social, personal services	Basic price GDP	Net product taxes	Market price GDP
1995	23,406	2,184	102,787	8,290	57,005	47,330	13,103	21,121	106,438	37,600	73,685	485,055	53,933	539,424
1996	24,342	2,186	109,995	9,239	60,887	50,273	14,032	22,677	114,123	39,667	79,846	518,732	59,044	578,186
1997	25,364	2,169	116,406	10,235	61,695	52,018	14,424	24,625	121,982	41,359	86,111	547,661	63,451	611,529
1998	23,411	1,795	107,926	10,276	54,855	47,849	12,811	22,918	119,892	41,761	84,906	518,879	57,313	576,587
1999	24,610	1,926	132,756	11,296	51,343	55,002	15,541	25,935	120,244	43,620	93,463	571,642	66,690	638,458
2000	24,883	1,953	155,888	12,772	49,074	59,768	16,393	29,472	125,290	43,281	102,731	620,985	73,518	694,628
2001	25,276	1,938	159,650	13,694	51,730	61,576	17,659	30,979	129,707	43,823	110,645	645,752	76,348	722,229
2002	24,715	1,941	173,607	14,761	53,526	64,800	18,649	32,018	143,459	44,787	120,559	692,289	81,459	773,868
2003	23,387	2,009	182,940	15,342	58,245	62,444	18,381	32,329	146,998	45,823	125,640	712,939	82,602	795,558
2004	25,512	2,002	201,171	16,393	59,438	62,344	18,411	34,379	148,778	46,897	131,011	746,145	86,162	832,305
2005	25,853	1,993	213,646	17,612	59,284	64,194	18,276	35,292	154,503	48,201	137,036	775,890	89,351	865,241
2006	26,240	1,992	230,893	18,333	60,564	67,053	18,740	37,083	159,936	50,521	144,326	815,680	94,369	910,049
2007	27,294	1,910	247,408	19,026	62,135	70,657	19,637	39,137	168,875	52,184	151,497	859,518	96,992	956,515
2008	28,827	1,922	254,467	20,199	60,611	71,452	20,057	41,033	173,954	52,903	156,445	881,437	97,090	978,499
2009	29,759	1,906	250,568	21,024	61,716	70,861	19,862	38,666	176,185	54,888	161,122	886,241	95,514	981,625
2010	28,475	1,758	287,600	22,020	61,682	76,909	19,999	42,367	178,407	55,821	166,316	940,853	101,396	1,042,111

Note: 1) Electricity, gas and water supply. 2) Restaurant, accommodation. 3) Finance, insurance, real estate and business services. 4) Public administration and defense.