



**Discussion Paper Series**

No.171

**Growth Accounting and Productivity Analysis  
by 33 Industrial Sectors in Korea (1984-2002)**

Hak K. Pyo  
Geun-Hee Rhee  
Bongchan Ha

June 2006

**Hitotsubashi University Research Unit  
for Statistical Analysis in Social Sciences**

**A 21st-Century COE Program**

Institute of Economic Research  
Hitotsubashi University  
Kunitachi, Tokyo, 186-8603 Japan  
<http://hi-stat.ier.hit-u.ac.jp/>

**Growth Accounting and Productivity Analysis by 33 Industrial Sectors  
in Korea (1984-2002)**

June 30, 2006

**Hak K. Pyo, Keun Hee Rhee, and Bongchan Ha\***

\*Professor, Division of Economics, Seoul National University, (E-mail) [pyohk@plaza.snu.ac.kr](mailto:pyohk@plaza.snu.ac.kr) ; Senior Researcher, Korea Productivity Center ; Researcher, Institute of Economic Research, Seoul National University

## 1. Introduction

In recent years, both growth accounting and productivity analysis by sector have attracted renewed attention on a global scale. The decomposition of inputs into capital (K), labor(L), energy(E), and intermediate materials(M) for detailed industry-level analysis of productivity growth was first applied to the post-war US Economy by Jorgenson, Gollop, and Fraumeni (1987). The basic KLEM-methodology has been extended to cover eight European countries by the European KLEM project as explained in Timmer (2000) and Canada-Japan-USA database. In addition, the number of decomposed inputs has increased to include imported goods (I) and services (S) forming the framework of KLEMS methodology as done by Forsgerau and Sorenson (1999).

Earlier studies along the line of the KLEM approach in Korea such as Kwon and Yuhn (1990), of which main interests were limited to estimating elasticity of substitution and productivity growth, using data in manufacturing sector only or value-added accounting. More recent empirical works such as Kim and Hong (1997), Pyo(2001), Timmer and van Ark(2000), and Rhee(2001) have also applied value-added accounting. The earlier exception of applying gross-output accounting was Kim and Park (1985) but it was also limited to manufacturing sector. Therefore, it would be desirable for us to attempt a growth accounting of gross output in a consistent framework of the KLEM approach. In addition to growth accounting, the international comparison of productivity among countries requires a consistent database for purchasing power parity (PPP) at industrial level by each country.

The purpose of this paper is to discuss the application of the KLEM-methodology to the Korean database and present the result of gross output growth accounting and productivity analysis. After a review of availability of data, we have constructed the detailed database of consistent output and inputs data for the Korean economy for the period of 1984-2002. The data in constant prices are available with 1995 as the base year and the decomposition of data is as detailed as specified by the summary of the first ICPA project by Kuroda (2001) and quite comparable to the Japanese database.

The paper is organized as follows. Section 2 examines database on Korea including gross output, four inputs and value-added from national accounts and Input-Output Tables and other sources of data. Section 3 presents the result of growth accounting and productivity analysis. The last section concludes the paper.

## **2. Database for Korea (1984-2002)**

### **2.1 Gross Output Data from National Accounts and Input-Output Table**

National accounts by the Bank of Korea (1999, 2004) reports annual series (1970-2002) of gross output, intermediate consumption, GDP, indirect taxes, consumption of fixed capital, domestic factor income, compensation of employees, and operating surplus of 21 industries including 9 manufacturing industries and 3 sub-sectors of government services in current prices following 1993 UN System of National Accounts.

The Bank of Korea has also published Input-Output Tables since 1960. Its most recent 2000 Input-Output Table is the 19<sup>th</sup> Table. The detailed description of Input-Output Tables during 1970-2000 is summarized in Table 1. The Table for 1995 has 402, 168, 77, and 28 industrial sectors in basic, small, medium, and large classifications, respectively. Therefore, the estimation of time series Input-Output Tables following those methods described in Kuroda (2001) would be required if we have to estimate KLEM model with more than 21 industrial classifications since Input-Output Tables are available only in selected years. We have attached the reclassification of IO tables in Table 2 and 3.

For the present study, we have generated gross output and value-added by 33 industries through RAS method. The generated annual data of both gross output and value-added have been adjusted to match against National Income Accounts which do not contain both indirect tax and subsidy. Since RAS method is sensitive to the benchmark year's value of the I/O coefficients, we have used the I/O Table in the closest year as benchmark value.

We have used V-Table to generate commodity prices by 33 sectors and then used the generated commodity prices to estimate output prices by 33 sectors.

**Table 1. Input-Output Tables in Korea (1970-2000)**

1. Transaction Tables at Producers' Prices (number of sector classification)				
Year	Basic	Small	Medium	Large
1970		153	56	
1973		153	56	
1975	392	164	60	
1978		164	60	
1980	396	162	64	19
1983	396	162	64	19
1985	402	161	65	20
1986		161	65	20
1987		161	65	20
1988		161	65	20
1990	405	163	75	26
1993		163	75	26
1995	402	168	77	28
1998		168	77	28
2000			77	28

\* Extended I-O tables with sector classification of the preceding main I-O tables.

2. Linked Input-Output Tables (number of sector classification)			
Year	small	medium	Large
1975-80-85	161	65	20
1980-85-90	161	75	

### 3. Supporting Tables

(1) Employment Table: 1980 1983 1985 1986 1990\* 1995\* 1998\* 2000\*

(\*including employment matrix)

(2) Fixed Capital Formation Table: 1990 1995 2000

### 4. U-Table and V-Table (21 industries including 9 Manufacturing industries)

Annual U-Table at 1990, 1995, or 2000 constant prices and annual V-Table in both current and constant prices for 1990-2002 are available in 1994, 1999, 2004 National Accounts.

Sources : The Bank of Korea Input-Output Tables(1970-2000) CD-ROM

**Table 2. Reclassification of IO Tables into 33 sectors**

(basic classification)

<b>33 Sectors</b>	<b>Classification in IO Table(1983)</b>	<b>Classification in IO Table(1985)</b>
1. Agriculture	1~38	1~37
2. Coal Mining	39	38~39
3. Metal and Non-metal	40~54, 56~58	40~44, 46~51
4. Oil and Gas	55	45
5. Construction	313~333	324~342
6. Food	59~98	52~91
7. Textile	99~118, 121, 123~125	92~112, 117~122
8. Apparels	119~120, 122, 196	114~116, 123, 197
9. Lumber and Wood	131~133, 135~138	129~131, 133~135
10. Furniture	134, 237, 243	132, 238, 244
11. Paper allied	139~148	136~145
12. Printing, Publishing, allied	149~151	146~148
13. Chemicals	152~172, 174~185	149~183
14. Petroleum products	186~194	186~195
15. Leather	126~130	124~128, 315
16. Stone, Clay, Glass	199~213	200~215
17. Primary metal	214~217, 228~232	216~218, 229~233
18. Fabricated machinery	218~227, 233~236, 238~242, 244~247	219~228, 234~237, 239~243, 245~248
19. Machinery	248~261	249~266
20. Electrical machinery	262~286	267~290
21. Motor	292~295	296~299
22. Transportation equip.	287~291, 296~299	291~295, 300~303
23. Instrument	300~303	304~307
24. Rubber and Misc. Plastic	173, 195, 197~198	184~185, 196, 198~199
25. Misc. manufacturing	304~312	308~314, 315
26. Transportation	344~356	347~360
27. Communication	357~359	361~363
28. Electric utility	334~337	317~320
29. Gas and water utility	338~340	321~323
30. Trade	341~343	343~346
31. Finance	360~366	364~370
32. Other Private service	368~393	371~375, 378~399
33. Public service	367	376~377

<b>33 Sectors</b>	<b>Classification in IO Table(1990)</b>	<b>Classification in IO Table(1995/1998)</b>
<b>1. Agriculture</b>	1~34	1~30
<b>2. Coal Mining</b>	35~36	31~32
<b>3. Metal and Mon-metal</b>	39~50	35~45
<b>4. Oil and Gas</b>	37~38	33~34
<b>5. Construction</b>	325~341	313~329
<b>6. Food</b>	51~93	46~88
<b>7. Textile</b>	94~109, 113~115	89~104, 111~113
<b>8. Apparels</b>	110~112, 116, 122	105~108, 118
<b>9. Lumber and Wood</b>	125~130	120~125
<b>10. Furniture</b>	131, 238, 240	296~298
<b>11. Paper allied</b>	132~142	126~134
<b>12. Printing, Publishing, allied</b>	143~145	135~138
<b>13. Chemicals</b>	146~176	150~173
<b>14. Petroleum products</b>	177~187	139~149
<b>15. Leather</b>	117~121, 123~124	109~110, 114~117, 119
<b>16. Stone, Clay, Glass</b>	194~209	180~195
<b>17. Primary metal</b>	210~212, 223~227	196~198, 209~213
<b>18. Fabricated machinery</b>	213~222, 228~237, 289, 241~245	199~208, 214~227
<b>19. Machinery</b>	246~264	228~246
<b>20. Electrical machinery</b>	265~293	247~275
<b>21. Motor</b>	298~302	282~288
<b>22. Transportation equip.</b>	303~311	289~295
<b>23. Instrument</b>	294~297	276~281
<b>24. Rubber and Misc. Plastic</b>	188~193	174~179
<b>25. Misc. manufacturing</b>	312~317	299~305
<b>26. Transportation</b>	346~358	334~346
<b>27. Communication</b>	359~360	347~349
<b>28. Electric utility</b>	318~321	306~309
<b>29. Gas and water utility</b>	322~324	310~312
<b>30. Trade</b>	342~345	330~333
<b>31. Finance</b>	361~368	352~359
<b>32. Other Private service</b>	369~368, 378~402	350~351, 360~369, 372~399
<b>33. Public service</b>	376~377	370~371

<b>33 Sectors</b>	<b>Classification in IO Table(2000)</b>
<b>1. Agriculture</b>	1~30
<b>2. Coal Mining</b>	31~32
<b>3. Metal and Mon-metal</b>	35~45
<b>4. Oil and Gas</b>	33~34
<b>5. Construction</b>	312~328
<b>6. Food</b>	46~86
<b>7. Textile</b>	87~102, 109~111
<b>8. Apparels</b>	103~106, 116
<b>9. Lumber and Wood</b>	118~123
<b>10. Furniture</b>	295~297
<b>11. Paper allied</b>	124~132
<b>12. Printing, Publishing, allied</b>	133~136
<b>13. Chemicals</b>	148~171
<b>14. Petroleum products</b>	137~147
<b>15. Leather</b>	107~108, 112~115, 117
<b>16. Stone, Clay, Glass</b>	178~193
<b>17. Primary metal</b>	194~196, 207~211
<b>18. Fabricated machinery</b>	197~206, 212~225
<b>19. Machinery</b>	226~245
<b>20. Electrical machinery</b>	246~274
<b>21. Motor</b>	281~287
<b>22. Transportation equip.</b>	288~294
<b>23. Instrument</b>	275~280
<b>24. Rubber and Misc. Plastic</b>	172~177
<b>25. Misc. manufacturing</b>	298~304
<b>26. Transportation</b>	333~345
<b>27. Communication</b>	346~349
<b>28. Electric utility</b>	305~308
<b>29. Gas and water utility</b>	309~311
<b>30. Trade</b>	329~332
<b>31. Finance</b>	352~360
<b>32. Other Private service</b>	350~351, 361~371, 374~401
<b>33. Public service</b>	372~373

**Table 3. Reclassification of National Accounts into 33 Sectors**

National Accounts	33 Sectors
1. Agriculture, Forestry and fishing	1. Agriculture
2. Mining and Quarrying	2. Coal Mining 3. Metal and Non-metal 4. Oil and Gas
3. Food, Beverage and Tobacco	6. Food
4. Textile and Leather	7. Textile 8. Apparels 15. Leather
5. Wood, Paper, Publishing and Printing	9. Lumber and Wood 11. Paper allied 12. Printing, Publishing, allied
6. Petroleum, Coal, and Chemicals	13. Chemicals 14. Petroleum products 24. Rubber and Misc. Plastic
7. Non-Metallic Mineral Products except Petroleum and Coal	16. Stone, Clay, Glass
8. Metal, Fabricated Metal Products	17. Primary metal 18. Fabricated machinery
9. Machinery and Equipment	19. Machinery 20. Electrical machinery 23. Instrument
10. Transport Equipment	21. Motor 22. Transportation equip
11. Furniture and Other Manufacturing Industries	10. Furniture 25. Misc. manufacturing
12. Electricity, Gas and Water	28. Electric utility 29. Gas and water utility
13. Construction	5. Construction
14. Wholesale and Retail Trade, Restaurants and Hotels	30. Trade
15. Transport, Storage and Communication	26. Transportation 27. Communication
16. Finance, Insurance, Real Estate and Business Services	31. Finance
17. Community, Social and Personal Services	32. Other Private service
18. Producers of Government Services	33. Public service

## 2.2 Measurement of Capital Stocks

The success of late industrialization by newly industrializing economies could not have been made possible if both the rapid accumulation of capital and its changing distribution among sectors were not realized in their development process. However, it is difficult to identify these factors empirically because the time series data of capital stocks in fast-developing economies by both types of assets and by industries are not readily available. The lack of investment data for a sufficiently long period of time to apply the perpetual inventory estimation method was the main cause of the problem. However, the National Statistical Office of the Republic of Korea has conducted nation-wide national wealth survey four times since 1968. Korea is one of a few countries which have conducted economy-wide national wealth surveys at a regular interval. Since the first National Wealth Survey (NWS) was conducted in 1968, the subsequent surveys were made in every ten years in 1977, 1987, and 1997, respectively. Since such regular surveys with nation-wide coverage are very rare in both developed and developing countries, an analysis on the dynamic profile of national wealth seems warranted to examine how national wealth in a fast growing economy is accumulated and distributed among different sectors.

The estimation of national wealth by types of assets and by industries was made by Pyo (1998) and updated in Pyo (2003) by modified perpetual inventory method and polynomial benchmark-year estimation method using four benchmark-year estimates. The latter study modifies and extends the earlier one in two respects. First, the result of 1997 NWS has been released in 1999 so that we can make use of additional benchmark-year estimates. Second re-basing the estimates of capital stocks from 1990 prices to 1995 prices seems inevitable because Bank of Korea has re-based their national accounts accordingly.

### 1) National Wealth Survey in Korea

In National Wealth Survey (NWS), the gross capital stock ( $GK$ ) was evaluated by multiplying the purchase price of the fixed tangible asset by the appropriate price index by types of assets which have been compiled and prepared by the Bank of Korea dating back to the year 1910 as follows:

$$GK_i = P_i^t \times PI_i^t$$

where  $GK_i$  is the value of gross capital stock of asset  $i$  evaluated at a certain benchmark year  $m$  ( $m > t$ ),  $P_i^t$  is the purchase price of the asset  $i$  in year  $t$ , and  $PI_i^t$  is the price index to reflect the value of the asset  $i$  in year  $t$ . In other words, the gross capital stock is supposed to reflect the

repurchase value or reacquisition value of the fixed tangible asset.

Second, the net capital stock ( $NK$ ) was deduced by multiplying the gross capital stock by the residual cost ratio as follows:

$$NK_i = GK_i \times (S/P_i^t)^{n/N} = P_i^t \times PI_i^t \times (S/P_i^t)^{n/N}$$

where  $S$  is the value of survived assets,  $N$  is average service life of the asset and  $n$  is the number of years elapsed. In other words, a proportional depreciation method is adopted. The value of survived assets is assumed to be 10 percent of the purchase value when it reaches the assumed average service life and 1 percent of the purchase value when it reaches double the assumed average service life.

Suppose for example, the average service life of a certain asset such as personal computer is 5 years and it was purchased three years ago at the price of 3,000 dollars. In addition, assume that the inflation rate of the computer price since the purchase year is 20 percent. Then the following calculations can be made:

$$GK = 3,000 \times 1.2 = 3,600 \quad (1)$$

$$NK = 3,000 \times 1.2 \times \left(\frac{300}{3,000}\right)^{\frac{3}{5}} \quad (2)$$

Korea's NWS assumes shorter average lives than BEA(1993). For example, BEA's are 32-80 years for residential structure and 31-48 years for nonresidential structure while Korea's NWS assumes average service life of 23-60 years for residential buildings and 8-60 years for nonresidential buildings. For automobiles, Korea's assumed average life (4-5 years) is shorter than BEA's (10 years). The shorter average life and, therefore, higher depreciation rate are typical in the process of late industrialization.

## 2) Estimation of Net and Gross Capital Stock

### (1) Estimating Method for 1968-97

In principle the existence of four benchmark year estimates of gross and net capital stocks makes it possible for us to apply the polynomial benchmark year estimation method. In Pyo's earlier studies (Pyo 1988, 1992, and 1998), he estimated proportional retirement rates and depreciation rates both by types of assets and by industries based on the polynomial equations.

When we applied the polynomial benchmark year equation to estimate the proportional retirement rates for the sub-periods of 1977-87 and 1987-97, most of estimates became negative

including the average economy-wide retirement rates (-3.0% for 1977-87 and -3.1% for 1987-97) except other Construction(0.6%) and Transport Equipment(3.4%) in 1977-87 and Nonresidential Building(0.9%) in 1987-97. Therefore, following Pyo (1998), we have applied the polynomial benchmark year estimation method to estimating depreciation by types of assets only. Thus we have generated net stocks by types of assets first for the period of 1968-97 and then, distributed them over different sectors of industries by using interpolated industrial weights between the respective benchmark years.

We have decided to estimate net capital stock first and then to estimate gross capital stock by using interpolated net-gross conversion ratios for the following two reasons. The basic reason is due to the fact that the margin of prediction error from the polynomial benchmark year equation turns out to be larger with gross capital stock than with net capital stock as had been observed in Pyo (1992).

## (2) Estimating Method for 1953-1967

Since we have decided to use estimates of 1968 NWS as the first benchmark year estimates, we have to estimate capital stocks for the period of 1953-67 using the perpetual inventory equation backward. We first deflated the net stock data of 1968 NWS in current prices into those in 1995 prices using implicit GDP deflator of capital formation. Then, we have estimated capital-output coefficients by industries by regressing net capital stock in 1995 constant prices on real GDP by industries and a linear time trend variable during the period of 1968-87 in order to generate estimate of net stocks by industries during 1953-67 in 1995 prices. We have also used the 1968 NWS weights of different types of assets for the period of 1953-1967.

In order to estimate net stocks by industries for the period of 1968-76, we have used both 1968 NWS and 1977 NWS to estimate interpolated industrial weights by each type of assets. Then, for the period of 1953-67, we have used both cumulated weights of capital formation by industries from old National Accounts by the Bank of Korea (1984) and industrial weights of 1968 NWS.

## (3) Estimating Method after 1997

National Statistical Office of Korea has decided to terminate National Wealth Survey by 1997 and to switch from direct estimation to indirect estimation of national wealth following the method of BEA and OECD. The cost of such direct national wealth survey has increased significantly as the size of national economy has expanded considerably. In addition, some of the participating institutions such as Kookmin Bank for unincorporated business enterprises have been privatized so that National Statistical Office alone can no longer afford national

wealth survey. Japan had terminated its National Wealth Census in 1970 for almost the same reasons.

Therefore, for the period after 1997 which is the last national wealth survey, we have to estimate capital stocks by a modified perpetual inventory method using 1997 NWS as benchmark estimates. First, we estimate net stocks by type of assets in constant prices by using the depreciation rates estimated from the period of 1987-1977 and distribute them across industries using both industrial weights in 1997 NWS and those in subsequent Mining & Manufacturing Census and Surveys and Wholesale and Retail Surveys. In the long run, the estimated depreciation rates by type of assets may need to be updated and revised by the micro data-based studies. Second the generated net stocks by type of assets and by industries have to be converted into gross stock by using the net-gross conversion ratio of 1997 NWS for the time being. But ultimately we may need further studies on the trend of net-gross conversion ratio by type of assets and by industries and the average asset life.

### 3) Reconciliation with Database of Pyo (2003)

Since the database of Pyo (2003) covers 10 broad categories of industrial sector together with 28 sub-sectors of Manufacturing, it can be reclassified and reconciled with 33-sector classification for the ICPA project. Assuming that the flow of capital service is proportional to capital stock, we used the average capital stock of two years as the capital service<sup>1</sup>.

In order to make quality adjustments to the capital input data, we have taken the following steps:

- (1) Following Kuroda(2001), we define the capital service of asset  $i$  in industry  $j$  as

$$\begin{aligned} K^{ij}(t) &= b^{ij}(t) \bar{A}^j(t) & i = 1, \dots, n; j = 1, \dots, m \\ &= b^{ij}(t) \cdot \frac{1}{2} [A^j(t) + A^j(t-1)] \end{aligned} \quad (3)$$

where  $b^{ij}(t)$  denote the proportion of the  $i$ -th asset type on the  $j$ -th sector's total capital service input  $\bar{A}^j(t)$  which is the average of unweighted sum over all assets during the  $t$ -th and  $(t-1)$ th period.

---

<sup>1</sup> We could not use the formula of Kuroda and Nomura (1999) because investment data in National Income Accounts are classified either by asset type or by industry but not by both.

(2) The growth rate of capital service input is defined as

$$\ln K^j(t) - \ln K^j(t-1) = \left[ \ln \bar{A}^j(t) - \ln \bar{A}^j(t-1) \right] + \sum_i \bar{v}_i^j \left[ \ln b^{ij}(t) - \ln b^{ij}(t-1) \right]$$

$$j = 1, 2, \dots, J \quad (4)$$

where  $\bar{v}_i^j$  is the average share of an individual component in the value of property compensation. The first term on the right side is the change of the quantity of capital service and the second term is the change of the quality of the capital service.

The growth rate of the quality of capital was very small in comparison to the growth rate of the quantity of capital. There was no substantial change in the structure of capital in Korea during 1984-2002.

#### 4) Measurement of Capital Input Price

Following Jorgenson, et.al (1987) and Timmer (2000), the aggregate index of capital services over the different types of assets in  $j$ -sector ( $K_i(t)$ ) can be assumed as a translog function of the services of individual assets ( $\bar{A}_i^j(t)$ ) as follows:

$$\ln K^j(t) - \ln K^j(t-1) = \sum_i \bar{v}_i^j \left[ \ln \bar{A}_i^j(t) - \ln \bar{A}_i^j(t-1) \right]$$

where weights are given by the average shares of each type of capital in the value of property

compensation,  $\bar{v}_i^j = \frac{1}{2} \left[ v_i^j(t) + v_i^j(t-1) \right]$  and  $v_i^j(t) = \frac{p_i^j(t) K_i^j(t)}{\sum_i p_i^j(t) K_i^j(t)}$  with  $P_i(t)$  the rental

price of capital services from asset type  $i$ .

In order to apply the above aggregation formula, it is necessary to impute the rental prices of capital services. In the absence of taxation, Hall and Jorgenson (1967), Jorgenson, Gollop and Fraumeni (1987) and Jorgenson and Yun (1991) have derived the following formula for imputing the rental price of capital services from asset type  $i$ :

$$P_i(t) = \{r(t) + \delta_i - \Pi_i(t)\} q_i(t-1) \quad (5)$$

where  $r(t)$  is the rate of return,  $q_i(t)$  is the acquisition price of investment good  $i$  with  $\Pi_i(t) = \frac{[q_i(t) - q_i(t-1)]}{q_i(t-1)}$  which is the rate of inflation in the price of investment good  $i$ . The

nominal rate of return after tax is usually assumed to be the same for all assets in an industry so that  $r(t)$  does not have subscript  $i$ .

The acquisition prices of each asset in different industries are not usually available and, therefore, investment deflators are frequently used as substitutes for the acquisition prices. But investment deflators in National Accounts are available either by types of assets or by industries not by both. Estimates of depreciation rates in Pyo(2003) are also available either by types of assets or by industries not by both.

In case of Korea, there have been studies by Yun and Kim (1997) and Won and Hyun(2000) on the estimation of effective marginal tax rates following methods developed by King and Fullerton (1984) and Jorgenson and Landau (1993). Since they have used the above formula for cost of capital, they must have generated the imputed cost of capital. But their estimates are based on whole industries not for each industry and even those estimates are not available. Faced with lack of data and consistent estimates for the variables to impute rental price of capital in each industry, we have adopted the following approach.

In order to get capital input prices different for both each asset  $i$  and each industry  $j$ , we have slightly changed Eq (5) to Eq (5)', which is the formula of the capital input price for both each asset  $i$  and each industry  $j$ :

$$P_j^i(t) = \{r_j(t) + \delta_i - \Pi_i(t)\}q_i(t-1) \quad (5)'$$

In Eq (5)' we have assumed that the price of investment asset  $i(q_i)$ , the rate of depreciation of asset  $i(\delta_i)$ , and the inflation rate of investment asset  $i(\Pi_i)$  are identical across all industries. But we have assumed that the rate of return can be different in each industry.

The application of the Eq. (5)' requires data on the rate of return by industry  $j(r_j)$ , the acquisition price of investment asset  $i(q_i)$ , and the rate of depreciation of asset  $i(\delta_i)$ . Because we do not have data for the nominal rate of return for each industry but for the nominal value of capital services summed over all types of assets in  $j$ th industry, we estimated the rate of return for each industry,  $r_j(t)$ , by using the equality between the nominal capital income in  $j$ th industry ( $CI_j$ ) and nominal value of capital services summed over all types of assets in  $j$ th industry ( $\sum_i P_i^j(t) \cdot K_i^j(t)$ ). From this equality we estimated the rate of return for each industry,

$r_j(t)$  as follows:

$$\begin{aligned}
CI_j(t) &= \sum_i P_i^j(t) \cdot K_i^j(t) \\
&= \sum_i \{r_j(t) + \delta_i - \Pi_i(t)\} q_i(t-1) K_i^j(t) \\
r_j(t) &= \frac{CI_j(t) - \sum_i \{\delta_i - \Pi_i(t)\} q_i(t-1) K_i^j(t)}{\sum_i q_i(t-1) K_i^j(t)} \quad (6)
\end{aligned}$$

Using these nominal rates of return of each industry( $r_j(t)$ ), we were able to calculate the rental price of capital services of each asset and industry by adding the depreciation rate and subtracting the inflation rate of capital, and multiplying the result to the price of capital.

### 2. 3 Measurement of Labor Input

In order to measure labor input for KLEM model, we have to obtain both quantity data of labor input such as employment by industries and hours worked and quality factors such as sex, education and age. Both availability and reliability of labor statistics in Korea have improved since 1980. But the measurement of labor input by industries cannot be readily made because the statistics of employment by industries are not detailed enough to cover 33 sectors.

Following the characteristics of labor input described in Kuroda (2001), the sources of labor statistics are presented in Table 4. Economically Active Population Yearbook by National Statistical Office reports the number of employment, unemployment, not-economically-active population and economically active population by 10 categories of age group (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60 over). Employment by industries is available in 9 broad categories of industries:(1) Agriculture, Forestry and Fishing (2) Mining (3) Manufacturing (4) Construction (5) Wholesale, Retail, Restaurants and Hotel (6) Electricity and Gas, and (7) Transportation, Storage and Communication and (8)Finance, Insurance, Real Estate, and Business Service (9)Other Services. More detailed classifications of employment will have to rely on Employment Table, which is published as a supporting table to Input-Output Table. But it is available only every five year when main Input-Output Tables are

published. Mining and Manufacturing Census (Survey) by National Statistical Office also report employment statistics but it is limited to mining and manufacturing only. Unemployed persons by gender and educational attainment are also available from the same source.

Report on Monthly Labor Survey by Ministry of Labor publishes monthly earnings and working days of regular employees by 12 broad categories of industries. Survey Report on Wage Structure by the same ministry reports wages by 6 categories of occupational classification in old series (1980-1992) and now reports 9 new categories in new series (1993-1999): (1) Senior Officials and Managers (2) Professionals (3) Technicians (4) Clerks (5) Service and Sales Workers (6) Skilled Agriculture and Fishery Workers (7) Craftsmen and Assembler (8) Plant and Machine Operator and (9) Other Laborer. Nominal and real wage index are also available from Report on Monthly Labor Survey by Ministry of Labor.

**Table 4. Characteristics of Korean Database for KLEM Model**

<p><b>(1)Gross output</b></p> <ul style="list-style-type: none"> <li>-National Accounts</li> <li>-Input-Output Table (1980,1985,1990,1995,2000)</li> <li>-U-Table and V-Table Annual tables (1985-2002)</li> </ul>	<p>Number of Sectors</p> <p>21</p> <p>392-402</p> <p>22</p>
<p><b>(2)Capital stock (capital services)</b></p> <ul style="list-style-type: none"> <li>-Gross and Net Stock data: National Wealth Survey (1987)(1997)</li> <li>-Capital Formation data: National Accounts(1999, 2004)</li> <li>-Annual Gross and Net Stock by Industries and by Types of Assets and Estimated Depreciation Rates are available in Pyo (2001)</li> <li>-Net stock and Investment data: Mining and Manufacturing Census Mining and Manufacturing Survey</li> <li>- Types of assets: residential building, nonresidential building, other construction, transport equipment, machinery equipment</li> </ul>	<p>5 types of assets and 10 large industries with 28 sub-manufacturing industries</p>
<p><b>(3)Labor input (hours worked)</b></p> <ul style="list-style-type: none"> <li>-Survey Report on Wage Structure (Ministry of Labor)</li> <li>-Economically Active Population Survey (NSO)</li>   <li>-sex (male/female)</li> <li>-educational attainment (middle school and under, high school, and college and/or above)</li> <li>-age classes</li> </ul>	<p>18 types</p> <p>2 types</p> <p>3 types</p> <p>3 types</p>

(16~34, 35~54, and 55 above)	
<b>(4)Intermediate inputs</b> -National Accounts -Input-Output Table(1980, 1985, 1990, 1995, 2000) -U-Table and V-Table Annual Tables(1985-2002) -Energy Input; sectors 2, 4, 14, 28, and 29	

For the present study, we have obtained the raw data file of Survey Report on Wage Structure from the Ministry of Labor and Economically Active Population Survey from National Statistical Office for the period of 1984-2002. The data are classified by two types of gender (Male and Female), three types of age (16-34, 35-54, and 55 above), and three types of education (middle school and under, high school, and college and/or above) and, therefore, there is a total of 18 categories of labor.

Since the raw-data file of the Survey Report on Wage Structure contains more detailed industrial classification than that of the Economically Active Population Survey, we calculated the quantity of labor from the Economically Active Population Survey and the quality of labor from the Survey Report on Wage Structure. This enables us to include self-employed labor as well as to use more detailed data. However, since the Survey Report on Wage Structure does not include the Agriculture and Government sectors, we had to use the average value of the entire economy for the quality measure of these two sectors.

In order to make quality adjustments to the employment data, we have taken the follow steps:

1) Defining  $P_{Li}^j$  as wage rate for  $j$ -sector and  $l$ -type category of labor, the share of labor income by  $l$ -type category of labor in  $j$ -sector can be expressed as;

$$v_{Li}^j = \frac{p_{Li}^j L_i^j}{\sum p_{Li}^j L_i^j} \quad (7)$$

The average weight of  $j$ -sector and  $l$ -type labor income during the period of  $(t-1)$  and  $t$  can be generated as;

$$\bar{v}_{Li}^j = \frac{1}{2} [v_{Li}^j(t) + v_{Li}^j(t-1)] \quad (8)$$

2) In order to make a quality adjustment to labor input data, we have further decomposed labor

input of  $j$ -sector and  $l$ -type as follows:

$$L_l^j(t) = d_l^j(t)M^j(t)H^j(t) \quad (9)$$

where  $d_l^j$  denotes relative weight of working hours of  $l$ -type in  $j$ -sector. In other words,  $L_l^j(t)$  measures labor input of  $l$ -type labor in  $j$ -sector.  $M^j$  and  $H^j$  denote the employment and average working hours of  $j$ -sector respectively.

3) Finally, the growth rate of  $j$ -sector labor input has been computed as follows:

$$\begin{aligned} \ln L^j(t) - \ln L^j(t-1) = & \left[ \ln M^j(t) - \ln M^j(t-1) \right] + \left[ \ln H^j(t) - \ln H^j(t-1) \right] \\ & + \sum_l \bar{v}_{Ll}^j \left[ \ln d_l^j(t) - \ln d_l^j(t-1) \right] \quad j = 1, 2, \dots, 33 \end{aligned} \quad (10)$$

where the first bracket on the right hand side measures change in employment, the second bracket measures change in average working hours, and the third bracket measures the change in quality of labor through change in weighted working hours.

The average growth rate of the quality of labor is 1.33% and it explains about 42% of the growth rate of labor. It is a relatively high proportion in comparison to the proportion of the quality of capital.

## 2.4 Measurement of Energy Input and Material Input

In order to separate energy input from intermediate input, we have decomposed intermediate inputs into two input categories following ICPA criterion. For this purpose, we have used IO Tables and identified 5 sectors (sector 2, 4, 14, 28 and 29) as energy input sector and the remaining 28 sectors as material input sector.

## 2.5 Deflators for Gross Output and Inputs

The 21-sector gross output data by Bank of Korea's national accounts are available only in current prices. For the period after 1985, we have used V Table in both constant and current prices to generate implicit gross output deflators by sector. For the period before 1985, we have used Linked IO Table in constant prices to generate implicit gross output deflators by sector for 1985 and interpolated the data for 1984. For the deflators of energy input and material input, we

have used the same sources of data; V Table for the period after 1985 and Linked IO Table before 1985. The basic characteristics of KLEM database in Korea (1984-2002) in 1995 prices is presented in Table 5. During the period of 1984-2002, Korea's gross output has grown at the average annual rate of 7.95 percent. Four inputs have grown at the rate of 9.36 % (K), 3.15 % (L), 5.28 % (E), and 8.47 % (M) respectively.

## 2.6 Input Shares

Regarding shares of inputs, we have used Compensation of Employees in Gross Domestic Product and Factor Income by Kind of Economic Activity in national accounts and Operating Surplus to generate relative share of labor input and capital input respectively in total value-added and then adjusted them into shares in total gross output. We have divided the amount of energy input and material input by gross output to generate shares of energy input and material input respectively.

## 3. Growth Accounting and Productivity Analysis

We have conducted a growth accounting and a productivity analysis for Korea (1984-2002). We have quality-adjusted the input data. In other words we have used education, sex and age for labor input and individual assets data for capital input to consider the changes of the input shares.

**Table 5. KLEM data in Korea (1984-2002)**

Year	(1995 prices)				
	Gross output (bill. won)	K (bill. won)	L (100,000hour)	E (bill. won)	M (bill. won)
1984	320640	273246	41711	28576	145281
1985	339199	301366	43116	24885	158202
1986	384485	331320	43556	29246	179567
1987	439153	366098	47350	34362	207712
1988	486723	408891	48921	38819	230433
1989	514333	460284	49911	42292	244819
1990	569375	523683	50585	27729	296468
1991	622993	599730	51736	31184	324144
1992	657020	677878	52080	33933	343405

1993	696338	755237	52971	37269	362548
1994	754081	838348	54336	41352	392516
1995	829403	930893	56097	48772	430735
1996	905645	1031360	57127	54132	474389
1997	978101	1130389	57246	57184	514881
1998	918702	1208037	52486	70490	457315
1999	1034499	1270100	53264	77940	525203
2000	1162277	1339583	55659	86816	600586
2001	1241612	1427315	56627	90451	628288
2002	1363415	1530471	58221	95153	689711
growth(%)	8.04	9.36	3.15	6.68	8.65

1) Capital(K) and labor(L) are the values without quality.

2) The growth rates are the average growth rates.

3) The growth rates of capital and labor include both growth rates of quantity and quality.

In Table 5, we present average growth rates of gross output and four inputs in 1995 constant prices. The gross output of whole industries has grown at an average annual rate of 8.04 percent while capital(K), labor(L), energy(E), and material input(M) have grown at the rate of 9.36 percent, 3.15 percent, 6.68 percent, and 8.65 percent respectively during the period. The average estimated shares of four inputs were 0.20 ( $v_K$ ), 0.20 ( $v_L$ ), 0.08 ( $v_E$ ) and 0.52 ( $v_M$ ) respectively. We have estimated total factor productivity based on both gross output growth accounting and value added growth accounting.

### 3.1 Gross Output Growth Accounting

The economy-wide growth rate of TFP during the pre-crisis period (1984-1997) has been estimated as 0.20 percent as shown in Table 6. And the growth rate, during the post-crisis period (1998-2002), has been estimated as in 1.48 percent. After the economic crisis in 1997, the growth rate of gross output has been declined, and the growth rates of input factors like as capital, labor, energy and material have also reduced from those before the crisis. Accordingly, the growth rate of TFP during the post-crisis period has been relatively higher than that of the pre-crisis period.

The relative contribution of TFP to gross output growth (22.29%) increase in the post-crisis period seems to reflect structural adjustments made after the financial crisis of 1997-1998. Idle capacities were cut-off and the level of employment was also drastically reduced.

**Table 6. Gross Output Growth Accounting of TFP in Whole Industry in Korean Economy**  
<average growth rate(%)>

	gross output	Capital input			Labor input			energy	material	TFP
		total capital	quality of capital	quantity of capital	total labor	quality of labor	quantity of labor			
84-'97	8.58	2.20	0.00	2.20	0.81	0.33	0.48	0.36	5.00	0.20
98-'02	6.64	1.21	0.00	1.22	0.17	0.12	0.04	0.77	3.02	1.48
84-'02	8.04	1.93	0.00	1.93	0.63	0.27	0.36	0.48	4.45	0.55
contribution ratio to output growth(%)										
84-'97	100.00	25.64	0.00	25.64	9.44	3.85	5.59	4.20	58.28	2.33
98-'02	100.00	18.22	0.00	18.37	2.56	1.81	0.60	11.60	45.48	22.29
84-'02	100.00	24.00	0.00	24.00	7.84	3.36	4.48	5.97	55.35	6.84

\* The growth rates of inputs are weighted by each share of income.

We can examine the relative contribution ratio of the input factors to the output growth. The contribution ratio to output growth during the post-crisis period has been reduced from the pre-crisis period; capital (18.22%), labor(2.56%), and material(45.48%), with the exception of energy(11.60%). Hence, the contribution ratio of TFP to output growth was increased up to 22.29 percent during the post-crisis period.

The economy-wide growth rate of TFP has been estimated as 0.55 percent during the entire period of our analysis, 1984-2002, and the contribution ratio of TFP to output growth is 6.84 percent, which is of rather insignificant magnitude. The relative magnitude of contribution to output growth is in the order of material, capital, labor, TFP and energy. The quality of capital has not affected the growth of output at all, but the quality of labor has affected the growth of output about 3.36 percent.

The total factor productivity growth in gross output growth accounting is lower than that without quality adjustment in input data. We are reconfirming both Krugman's(1994) proposition and empirical findings by Young(1994) and Lau and Kim(1994).

Secondly, the growth rate of TFP in manufacturing's gross output during the pre-crisis period (1984-1997) has been estimated as 1.21 percent as shown in Table 7. And the growth rate of TFP during the post-crisis period (1998-2002) has been estimated in 1.73 percent. The pattern

of the growth rates of TFP is similar to the entire economy. But quantity of labor input in manufacturing has been reduced during the post-crisis period. It reflects a drastic structural adjustment in Korea's labor market after the financial crisis of 1997-1998. As a consequence, the contribution rate of labor to output growth has become negative.

In manufacturing, the growth rate of TFP has been estimated as 1.36 percent during the entire period of 1984-2002. The contribution ratio of TFP to output growth is estimated as 15.16 percent.

**Table 7. Gross Output Growth Accounting of TFP in Manufacturing**

< average growth rate(%)>

	gross output	Capital input			Labor input			energy	material	TFP
		total capital	quality of capital	quantity of capital	total labor	quality of labor	quantity of labor			
84-'97	9.28	1.17	0.07	1.10	0.21	0.19	0.02	0.33	6.36	1.21
98-'02	8.15	0.86	0.11	0.75	-0.04	0.07	-0.11	0.98	4.62	1.73
84-'02	8.97	1.08	0.08	1.00	0.14	0.16	-0.01	0.51	5.87	1.36
Contribution ratio to output growth(%)										
84-'97	100.00	12.61	0.75	11.85	2.26	2.05	0.22	3.56	68.53	13.04
98-'02	100.00	10.55	1.35	9.20	-0.49	0.86	-1.35	12.02	56.69	21.23
84-'02	100.00	12.04	0.89	11.15	1.56	1.78	-0.11	5.69	65.44	15.16

\* The growth rates of inputs are weighted by each shares of income.

**Table 8 Gross Output Growth Accounting of TFP in Services**

<average growth rate(%)>

	gross output	Capital input			Labor input			energy	material	TFP
		total capital	quality of capital	quantity of capital	total labor	quality of labor	quantity of labor			
84-'97	8.82	3.08	0.04	3.03	1.66	0.24	1.42	0.45	3.89	-0.26
98-'02	5.50	1.61	0.01	1.60	0.64	0.36	0.28	0.60	1.61	1.04
84-'02	7.90	2.67	0.04	2.63	1.38	0.27	1.10	0.49	3.26	0.10

Contribution ratio to output growth(%)										
84-'97	100.00	34.92	0.45	34.35	18.82	2.72	16.10	5.10	44.10	-2.95
98-'02	100.00	29.27	0.18	29.09	11.64	6.55	5.09	10.91	29.27	18.91
84-'02	100.00	33.80	0.51	33.29	17.47	3.42	13.92	6.20	41.27	1.27

\* The growth rates of inputs are weighted by each shares of income.

Thirdly, the growth rate of TFP in service sectors during the pre-crisis period (1984-1997) has been estimated as -0.26 percent as shown in Table 8. During the pre-crisis period the growth rate of capital in service sector (3.08%) has been much higher than that in manufacturing (1.17%), so its growth might have affected adversely on the overall efficiency in service sector.

But the growth rate of TFP during the post-crisis period (1998-2002) has changed to 1.04 percent. The growth rates of both input factors and gross output have slowed down during the post-crisis period.

As a result the growth rate of TFP has been estimated as 0.10 percent in service during the entire period. The relative contribution of TFP on output growth in service has become lower than manufacturing. And the relative magnitude of the contribution to output growth is in the order of material, capital, labor, energy and TFP.

### 3.2 Value Added Growth Accounting

Next, we have analyzed the growth of TFP by a value-added growth accounting. In Table 9 the economy-wide growth rate of TFP during the pre-crisis period (1984-1997) has been estimated as 0.37 percent. And the rate during the post-crisis period (1998-2002) has been estimated as 0.71 percent. As a whole the growth rate of TFP is estimated to be 0.46 percent. So the pattern of TFP growth from value-added accounting is similar to that from gross output growth accounting. But the absolute levels of TFP growth rates are lower in value-added growth accounting than those in gross output growth accounting.

Again, the effect of quality change in capital input was almost negligible. But the growth and contribution ratio of labor quality to value-added are considerable. The contribution ratio of labor quality to the growth of value added is about 10 percent as a whole. The contribution of total labor to the growth of value added is composed of two factors, labor quality (9.88%) and labor quantity (13.13%).

The economy-wide contribution ratio of capital to growth of value added is 70 percent, that of labor is 23 percent, and that of TFP is 7 percent. In value added context the role of capital in production is therefore greater than labor as shown in Table 9.

**Table 9 Value Added Growth Accounting of TFP in Whole Industry**

&lt;average of log growth rate(%)&gt;

	Value Added	Capital Input			Labor input			TFP
		total capital	quality of capital	quantity of capital	total labor	quality of labor	quantity of labor	
84-'97	7.81	5.44	-0.01	5.45	2.00	0.82	1.19	0.37
98-'02	4.12	2.99	-0.01	3.00	0.42	0.30	0.12	0.71
84-'02	6.78	4.76	-0.01	4.77	1.56	0.67	0.89	0.46
Contribution ratio to output growth(%)								
84-'97	100.00	69.65	-0.13	69.78	25.61	10.50	15.24	4.74
98-'02	100.00	72.57	-0.24	72.82	10.19	7.28	2.91	17.23
84-'02	100.00	70.21	-0.15	70.35	23.01	9.88	13.13	6.78

1) The growth rates of each input are weighted by its share of income.

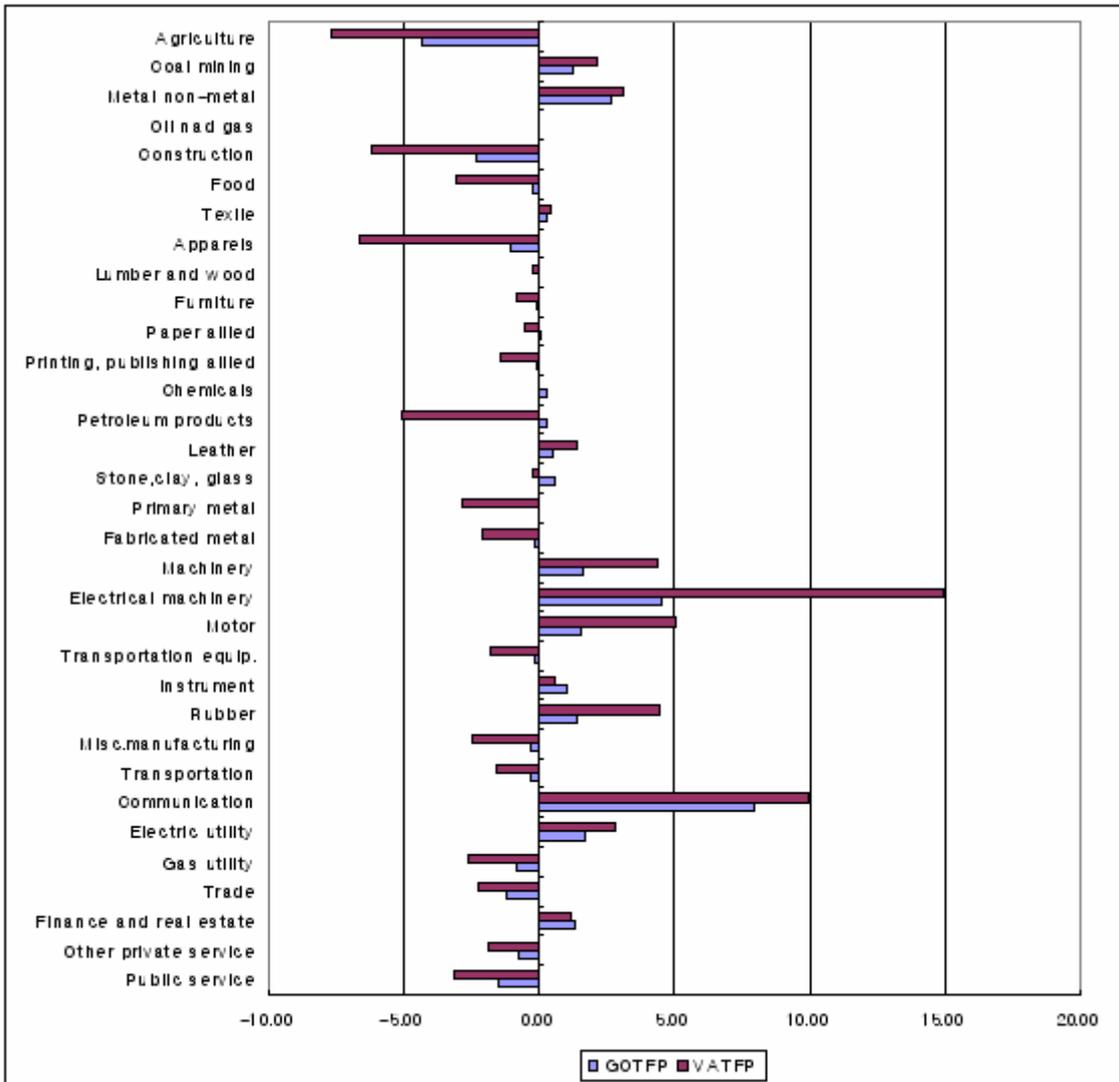
2) Value added is deflated by 1995 price.

### 3.3 Sectoral Growth of TFP

In manufacturing, the sectors such as electrical machinery, machinery, motor, rubber, and instrument have showed relatively higher growth rates of TFP during the entire period of 1984-2002 as shown in Figure 1 and Table 10. Among them the electrical machinery sector which was based on IT technology has shown higher growth of productivity. But the labor intensive sectors such as Apparels, Misc Manufacturing, Food, and Fabricated metal have shown lower growth rates of total factor productivity.

**Figure 1 Sectoral Growth of Total Factor Productivity**

<average growth rate(%)>



1) GOTFP : TFP by gross output growth accounting

2) VATFP : TFP by value added growth accounting

**Table 10 Sectoral Growth of TFP (Gross Output Growth Accounting: 1984-2002)**

&lt;average of log growth rate(%)&gt;

Code	Industry	Gross output	capital input	labor input	energy	material	TFP
1	Agriculture	0.90	4.40	-0.07	0.14	0.74	-4.32
2	Coal mining	-7.28	-0.09	-5.66	-0.57	-2.17	1.21
3	Metal non-metal	2.18	-0.95	-0.90	0.61	0.77	2.65
4	Oil and gas	0.00	0.00	0.00	0.00	0.00	0.00
5	Construction	4.63	2.00	1.12	0.15	3.69	-2.33
6	Food	2.42	0.48	0.11	0.04	2.06	-0.26
7	Textile	2.69	0.46	-0.15	0.06	2.02	0.29
8	Apparels	-1.60	0.24	-0.26	0.01	-0.51	-1.08
9	Lumber and wood	1.22	0.51	-0.45	0.10	1.06	0.01
10	Furniture	8.09	1.45	0.56	0.24	5.97	-0.12
11	Paper allied	6.03	1.48	-0.08	0.42	4.12	0.08
12	Printing, publishing allied	6.87	1.00	0.75	0.09	5.14	-0.10
13	Chemicals	8.34	1.54	-0.06	1.34	5.25	0.27
14	Petroleum products	5.87	0.91	-0.10	3.89	0.89	0.28
15	Leather	1.46	0.08	-0.38	0.05	1.26	0.45
16	Stone, clay, glass	5.53	1.21	0.14	0.80	2.83	0.56
17	Primary metal	4.68	0.62	-0.04	0.88	3.30	-0.07
18	Fabricated metal	7.19	1.41	0.30	0.21	5.45	-0.19
19	Machinery	12.38	1.17	0.78	0.25	8.56	1.61
20	Electrical machinery	17.63	1.34	0.47	0.17	11.11	4.54
21	Motor	17.14	1.09	1.16	0.28	13.05	1.55
22	Transportation equip.	6.93	1.36	0.30	-0.06	5.48	-0.15
23	Instrument	11.80	1.13	0.74	0.20	8.71	1.02
24	Rubber	10.71	1.49	-0.31	0.38	7.79	1.36
25	Misc. manufacturing	1.65	0.77	-0.26	0.05	1.42	-0.33
26	Transportation	4.91	0.94	0.82	0.95	2.57	-0.37
27	Communication	19.43	5.31	2.09	0.25	3.83	7.96
28	Electric utility	7.53	3.20	0.09	1.18	1.36	1.69
29	Gas utility	15.66	3.38	1.06	10.40	1.66	-0.85
30	Trade	9.19	5.43	0.78	0.44	3.77	-1.23
31	Finance and real estate	9.97	3.80	1.51	0.38	3.00	1.30
32	Other private service	8.39	2.28	2.94	0.38	3.54	-0.75
33	Public service	3.14	0.39	2.46	0.18	1.61	-1.50
	Total	8.04	1.93	0.63	0.48	4.45	0.55

1) Capital and labor are adjusted with quality, and weighted by each share of income

On the other hand, the sector of Communication which has been strongly related with IT technology has recorded the highest growth rate (7.96%) of TFP among service. But the sectors such as Construction, Public Service, Trade, Gas utility, Other Private Service, Transportation and etc. have produced negative growth rates of TFP.

Therefore, we can see that the main sectors for productivity growth have been the IT-related sectors. Korean economy has heavily invested in IT sectors on a full scale since 1995 (Table 11) as analyzed in Ha and Pyo (2004).

**Table 11 The investment in IT sector**

Year	IT Investment (billion won)	Growth(%)
1995	15,125.7	-
1996	17,916.0	16.9
1997	19,122.0	6.5
1998	17,099.2	-11.2
1999	23,716.0	32.7
2000	32,190.9	30.6
2001	31,502.0	-2.2
2002	33,143.8	5.1
2003	31,551.8	-4.9
2004	31,391.9	-0.5

\*Investment is real value in 2000 prices

\*Source: Bank of Korea (<http://ecos.bok.or.kr>)

### 3.4 Productivity Trend and Capital-Output Coefficient

We have generated a series of labor productivity; gross output per men-hour (GO/L). During the entire period of 1984-2002, the growth rate of economy-wide labor productivity is estimated as 6.19 percent, 8.71 percent in manufacturing and 4.37 percent in service (Table 12). As expected, the growth of labor productivity in manufacturing has been greater than that of service sector. It may reflect product and process innovation in manufacturing. During the period of 1988-2002 the decline of labor input has affected the growth of labor productivity in manufacturing. The trends in labor productivity are shown in Figure 2.

We have also generated a series of capital-output coefficients; capital-gross output

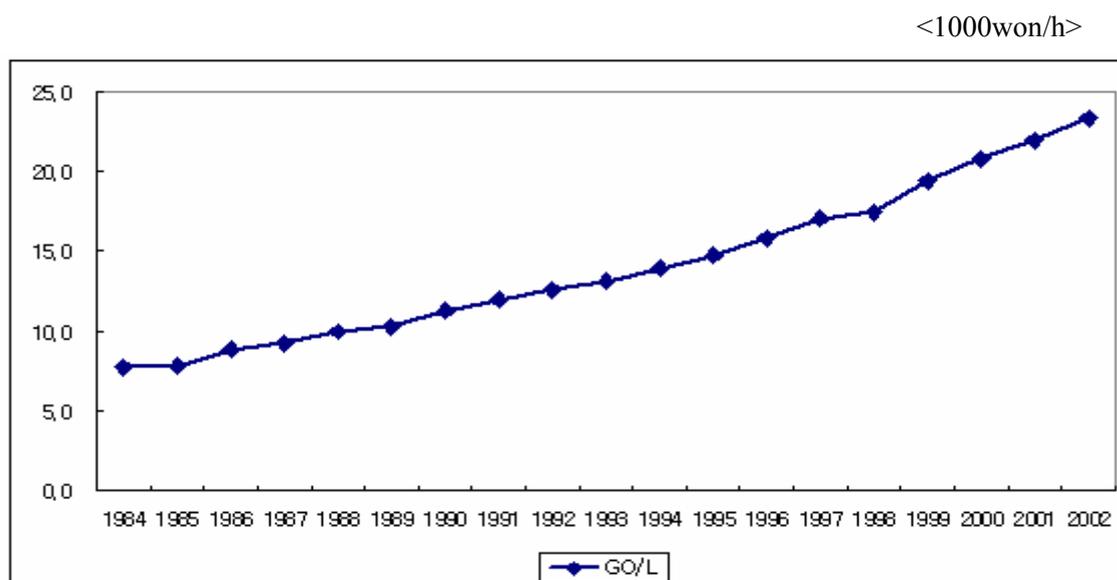
coefficients(K/GO) as shown in (Table 13). The economy-wide capital-output coefficient has grown at average rate of 1.53 percent. The economy-wide capital-labor ratio has grown at 7.72 percent.

**Table 12. The Growth of Labor Productivity**

		<average growth rate(%)>		
	period	gross output	labor input	labor productivity
whole industry	84-'97	8.58	2.44	6.14
	98-'02	6.64	0.34	6.31
	84-'02	8.04	1.85	6.19
manufacturing	84-'97	9.28	0.64	8.64
	98-'02	8.15	-0.74	8.90
	84-'02	8.97	0.26	8.71
service	84-'97	8.82	4.48	4.33
	98-'02	5.50	1.02	4.48
	84-'02	7.90	3.52	4.37

\* Labor input is total working hours

**Figure 2 Labor Productivity(GO/L)**



\*GO=gross output, L=total working hours

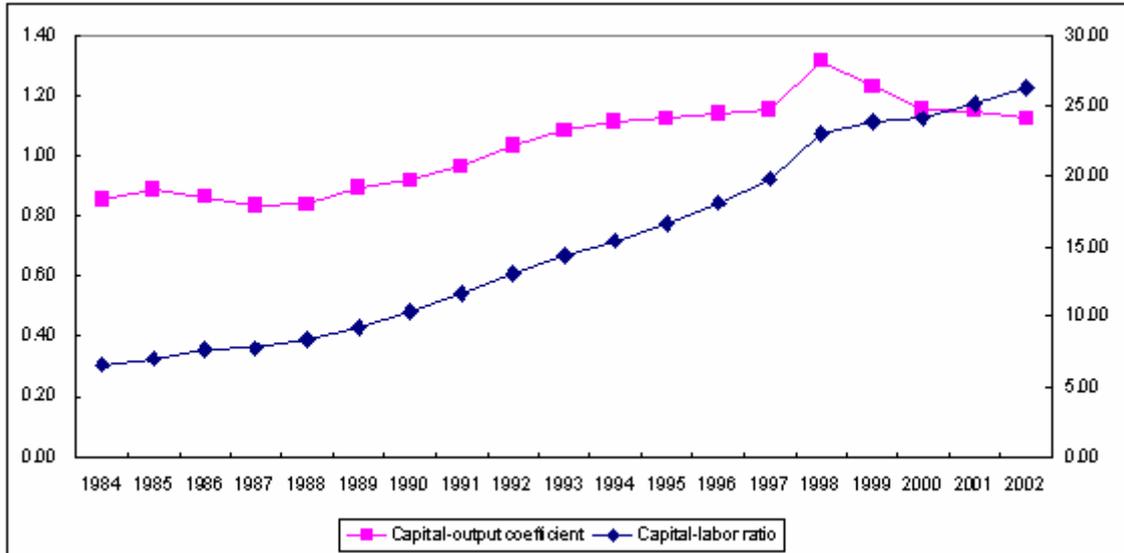
**Table 13 Trends in Productivity and Capital-Output Coefficients in Korea(1984-2002)**

Year	Labor productivity	Capital-output coefficient	Capital-labor ratio
	GO/L	K/GO	K/L
	(1000 Won/h)		(1000 Won/h)
1984	7.69	0.85	6.55
1985	7.87	0.89	6.99
1986	8.83	0.86	7.61
1987	9.27	0.83	7.73
1988	9.95	0.84	8.36
1989	10.30	0.89	9.22
1990	11.26	0.92	10.35
1991	12.04	0.96	11.59
1992	12.62	1.03	13.02
1993	13.15	1.08	14.26
1994	13.88	1.11	15.43
1995	14.79	1.12	16.59
1996	15.85	1.14	18.05
1997	17.09	1.16	19.75
1998	17.50	1.31	23.02
1999	19.42	1.23	23.85
2000	20.88	1.15	24.07
2001	21.93	1.15	25.21
2002	23.42	1.12	26.29
Average			
growth rate(%)	6.19	1.53	7.72

Note: 1) Labor(L) is measured in terms of total working hours.

2) The growth rates are the average of logarithm growth rates.

**Figure 3. Capital-Output Coefficient/Capital-Labor Ratio**



#### 4. Conclusion

In the present paper, we have constructed a Korean database of gross output, GDP, and four input series during the period of 1984-2002 in the framework of KLEM Model. According to a gross-output growth accounting, the Korean economy has recorded a significant growth of gross output at the average rate of 8.04 percent during the period of 1984-2002. On the other hand, capital(K), labor(L), energy(E), and material input(M) have grown at the rate of 9.57 percent, 1.85 percent, 6.68 percent, and 8.65 percent respectively during the period. The average estimated shares of four inputs were 0.20 ( $v_K$ ), 0.20 ( $v_L$ ), 0.08 ( $v_E$ ) and 0.52 ( $v_M$ ) respectively. As a consequence, the total factor input and total factor productivity has increased at the average annual rate of 7.49 percent and 0.55 percent respectively. Therefore, the relative contribution of total factor productivity to gross output growth is estimated to be only 6.84 percent which is of rather insignificant magnitude. We think that the quality adjustment in labor input has played a role in estimating lower growth rate of total factor productivity. We are reconfirming both Krugman's(1994) proposition and empirical findings by Young(1994) and Lau and Kim(1994). We also have noted that there was a discernable structural turning point after the 1997 economic crisis in Korea: both capital-gross output coefficient and capital-value-added coefficient has started to fall after 1998.

## References

- Bank of Korea, National Accounts, (1984, 1994, 1999, 2004)
- Bank of Korea, Input-Output Tables (1970-2000) CD-ROM
- Bureau of Economic Analysis, Fixed Reproducible Tangible Wealth in the United States, 1925-85, Washington, D.C.:U.S. Government Printing Office, 1993
- Hall and Jorgenson, Tax Policy and Investment Behavior, *American Economic Review*, 57:3, June, pp391-414, 1967
- Jorgenson, D.W., F. M. Gollop and B.M.Fraumeni, *Productivity and US Economic Growth*, Cambridge MA: Harvard University Press, 1987
- Jorgenson, D.W. and Landau, Ralph, *Tax reform and the Cost of Capital*, The Brookings Institution, Washington, D.C., 1993
- Jorgenson, D.W. and Yun K.Y., *Tax Reform and the Cost of Capital*, Oxford, Oxford University Press, 1991
- King, Mervyn and Don Fullerton, *The Taxation of Income from Capital*, University of Chicago Press, 1984
- Kim, Kwang Suk and Sung Duk Hong, *Accounting for Rapid Economic Growth in Korea, 1963-1995*, Korea Development Institute, KDI Press, Seoul, 1997.
- Kim and Park, *Sources of Economic Growth in Korea, 1963-1982*, Seoul: KDI Press, 1985
- Krugman, Paul, "The Myth of Asia's Miracle". *Foreign affairs*, November/December 1994
- Kuroda, M., *The International Comparison of the Productivity among Pan-pacific Countries*, mimeo, 2001
- Kuroda, M., and K. Nomura, "Productivity Comparison and International Competitiveness", *Journal of Applied Input-Output Analysis*, Vol. 5, 1999
- Kwon, J.K, and Kyhyang Yuhn, *Analysis of Factor Substitution and Productivity Growth in Korean Manufacturing 1961-1981*, Korean Economic Development, Greenwood Press, Westport, CT, pp. 145-166, 1990.
- Lau, Lawrence J. and Jong-Il Kim, "The Sources of Growth of East Asian Newly Industrialized

- Countries”, *Journal of Japanese and International Economies*, 1994.
- Pyo, Hak K., Estimates of Capital Stock and Capital/Output Coefficients by Industries: Korea, 1953-1986, *International Economic Journal*, summer 1988
- Pyo, Hak K., A Synthetic Estimate of National Wealth of Korea, 1953-1990, KDI Working Paper No.9212, Korea Development Institute, Seoul, 1992
- Pyo, Hak K., “Estimates of Fixed Reproducible Tangible Assets in the Republic of Korea, 1953-1996, KDI Working Paper No.9810, Korea Development Institute, Seoul, 1998
- Pyo, Hak K., “Economic Growth in Korea (1911-1999): Along-term trend and Perspective”, in *Seoul Journal of Economics*, Vol.14 No. 1, Seoul, spring 2001
- Pyo, Hak K., Estimates of Capital Stocks by Industries and Types of Assets in Korea (1953-2000), *Journal of Korean Economic Analysis*, Panel for Korean Economic Analysis and Korea Institute of Finance, Seoul 2003
- Rhee, Keun-Hee, Total Factor Productivity Analysis in Korean Manufacturing, Korea Productivity Center, 2001(In Korean)
- Timmer, M.P Towards European Productivity Comparisons using the KLEMS Approach- An Overview of Sources and Methods, , Groningen Growth and Development Centre and The Conference Board, 2000
- Timmer, M.P and van Ark, Capital Formation and Productivity Growth in South Korea and Taiwan: Realising the Catch-up Potential in a World of Diminishing Returns, Groningen Growth and Development Centre University of Groningen, 2000
- Won Yunhi and Jin Kwon Hyun, “Marginal Effective Tax Rates in Korea: 1960-1998”, Working Paper 00-02, Korea Institute of Public Finance,2000
- Young, Alwyn, “Lessons from the East Asian NICs : A Contrarian View”, *European Economic Review*, papers and proceedings, 1994
- Yun and Kim, Marginal Effective Tax Rate of Corporate Investment in Korea, *Public Economics*, 1997 (in Korean)



## Appendix

Table A-1. Gross Output in 33 Sectors

Table A-2. GDP in 33 Sectors

Table A-3. Capital Stocks in 33 Sectors

Table A-4. Labor Input in 33 Sectors

Table A-5. Energy Input in 33 Sectors

Table A-6. Material Input in 33 Sectors

Table A-7. Average Shares of Capital Inputs

Table A-8. Average Shares of Labor Inputs

Table A-9. Average Shares of Energy Inputs

Table A-10. Average Shares of Material Inputs

Table A-11. Capital Price Index

Table A-12. Capital Input Price

Table A-13. Energy Price Index

Table A-14. Material Price Index

Table A-15. Price Index of Commodities from V-Table

Table A-16. Price Index of Gross Output Deflators by 33 Industries

Table A-17. Growth rate of the quality of capital input

Table A-18. Growth rate of the quality of labor input

**Table A-1. Gross Output in 33 Sectors (Unit : million won)**

**(1995 constant price)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	29215739	28502027	31150991	31565628	31495661	30387648	29336447	31339901	32711157	32444247	31778092	33405706	34569982	36339822	33543806	32863543	35003608	35121304	34361770
2	1093990	1068954	1046165	1063149	1053500	1030347	913519	838731	795618	662133	469102	287859	363719	428578	432729	428387	397819	343386	295258
3	977380	1126842	1213396	1379992	1559871	1779359	1880712	2044912	2398257	2624322	2696950	3051162	2944605	2567001	1907245	1937967	1815587	1613141	1447923
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	29330494	30747798	37046061	44380974	50757668	54847114	59739987	63023459	65557717	69864784	76804773	83740788	89160180	93641131	89185668	87902538	86139694	76227811	67519952
6	27369509	27996602	30716571	32699588	33821405	33718000	34750169	36785379	37821085	37615716	37505577	39188876	42201627	45951186	43267076	43466039	44836850	43373002	42337471
7	13354964	12030750	13191425	14315010	16158690	17167644	19430579	19678332	19164782	18610133	18597538	18657346	21442117	23949712	22810837	24235125	24097562	21765806	21663999
8	9508608	12174188	13055963	14439482	15069582	15346036	16747076	16212917	15089346	13874900	12890184	11842091	12497322	13601604	12135735	12164003	11325569	8603417	7129887
9	2205512	1856840	2081842	2248441	2410828	2537176	2862615	3132701	3282346	3171775	3325507	3591983	3488953	3272990	2544411	2562912	2624991	2645484	2749602
10	1221163	1370688	1684403	2073015	2395117	2765617	3399446	3565969	3574890	3516586	3705609	3835717	3632915	3432089	2727658	3483766	4367371	4476787	5241196
11	3565720	3641438	4180186	4915255	5538102	6013221	6970278	7620871	8121512	8751954	9407227	10033174	10549028	11256926	9560117	10319087	10576833	10590075	10559709
12	2339141	2411093	2706393	3303882	3879603	4354304	4929420	5480809	5862578	6158644	6413045	7709764	7668296	7582200	6848945	6735027	7316311	7694570	8058784
13	12442335	12916872	15085809	17523312	20297080	22107078	25856188	29441458	32282653	35215868	38611653	41130944	48112086	52671958	48441534	53934657	54223455	53539904	55818802
14	14423175	12329700	11972427	12051590	11727580	10624352	11242537	11047957	12144442	13274824	14223272	15937258	20021333	23417015	25131451	29201002	35061008	38759082	41505414
15	2843470	2860369	3564085	4424857	5340406	6116511	7689028	7523355	6862037	6269290	5664622	5140872	4881413	4640932	3493238	3707974	3978031	3636183	3697316
16	4712678	5027358	5818208	6830498	7697490	8341920	9324230	10481325	11716304	13128817	15718104	18673581	19076504	19033988	16013752	16016817	15853600	14261778	12750417
17	5313551	5551993	6304787	7173416	8019903	8877756	10483875	11584327	12390606	13158035	14402605	15559388	18411119	20678927	19752044	19084666	17784748	15312002	12343401
18	14868286	16292004	18793938	22600039	25966933	29648142	34567943	37917123	39253179	41082915	44068628	46994631	50479719	54147224	46119998	51127224	53265033	52583013	54228429
19	5814417	6905962	8518540	11020747	13097361	14449595	17473033	19915655	21424396	23074120	25910405	29859093	30503961	31028908	24586475	32770496	38748945	44397946	53965824
20	11835432	13219797	17069800	22584307	27445468	31816365	39243357	45573427	49587230	54019672	60258817	68219453	82026478	99330821	95532593	129895260	169796950	225189240	282847340
21	3337701	4336397	6659525	9789296	13264185	16653853	19579893	22858738	25507597	28309373	32976401	38268745	38218650	36931605	28880008	40070596	52552933	59110805	72975900
22	3959746	4974420	5455516	5914656	5763080	5389493	5124813	5676267	6332110	6864369	7857632	9372522	11030086	12747171	11041860	12465498	13978337	13871920	13789684
23	845010	1131108	1277457	1572096	1818272	1973213	2312312	2701252	2980366	3308850	3730371	4371865	4549922	4672749	3885335	4820934	6014077	6063582	7065633
24	3098243	4088472	5181969	6005617	7212695	8018388	9317978	10507269	11308285	12303980	13632577	14799968	15401991	16015839	14013547	16433395	18075326	18627843	21300506
25	3162523	2888590	3269659	3755858	4158337	4346160	4939441	4862272	4589990	4364356	4282105	4141903	4209834	4046162	3284910	3668587	3978446	4011498	4252685
26	17336118	16559683	17590522	19459797	21156662	21076144	22677011	25026376	26657655	27972932	30753540	34258637	38965043	43152705	40025693	42564032	43609789	42369083	41934094
27	1584081	1772116	2076267	2403034	2796939	3313468	3936676	4770380	5574774	6509304	7864386	9527932	12333894	16684260	19770771	25991329	34610025	42616764	52364234
28	4849914	4719915	5156446	5725233	6313921	6558274	7380594	8348003	8721562	9545699	10646347	11993315	13947265	15381595	14864708	15424740	16878454	17469653	18799646
29	611774	693970	821820	1007049	1193968	1481599	1906052	2241118	2532991	2798513	3277413	3818575	5015192	6416731	6560411	7400009	8774393	9406138	10247839
30	24036076	25184096	28198068	32030312	35891317	38408200	42677924	46385714	48280575	50761784	54544239	59569997	62466868	63857116	59375594	73020793	89825123	104696500	125688430
31	19508995	24712101	28458289	33757361	37153217	39380214	42912874	47687080	49811343	54335847	58639938	66132820	73618285	80574106	84289251	90842812	106069600	112393500	117465590
32	28294107	33887229	37241329	41557847	45087934	45729601	47916775	56039341	61905357	69329686	79013110	90675055	96536969	101845010	100966070	109945640	119569290	120611540	128069080
33	17580110	16219727	17897361	19591059	21180172	21075856	21852641	22673430	22772751	23414233	24411642	25560572	27320033	28802657	27708642	30013894	31127266	30229237	30938772
Total	320639961	339199099	384485218	439153298	486722926	514332649	569375422	622993128	657019991	696337659	754081411	829403401	905645388	978100718	918702111	1034498739	1162277023	1241611992	1363414587

**Table A-2. GDP in 33 Sectors (Unit : million won)**

**(1995 constant price)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	21350517	19776749	21565676	20800910	20167144	18782265	19141802	20056707	20563736	19580158	17812960	20999339	21490408	23189132	19299154	17933389	22529327	22892622	22157593
2	657502	627982	595729	599148	607742	626314	570277	519372	516062	433399	293947	130912	166151	188137	272683	274107	271352	233504	197643
3	726842	734659	767975	863750	991015	1179693	1232988	1335850	1655633	1842742	1842801	2144762	2063710	1769538	1280609	1315441	1176091	1041730	919738
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	14769859	14516092	17955789	21195264	24062996	25604819	26541791	27679772	28618874	30825281	34092272	30153273	30789076	30084991	39965971	36108383	32099481	27519251	22604177
6	3472056	3593886	3679287	3643518	3578424	3309011	5193164	5048777	4563483	4013955	3526962	6981468	6849868	6937920	6041644	5155585	6588269	6001493	5472002
7	3452835	3160505	3160278	3040930	3627301	3804591	4980402	4362530	3635609	3054501	2817057	4885894	5804908	6670622	7583059	7700432	8283967	6487327	5784911
8	2705030	3287185	3549855	3980806	3756634	3580479	4471045	3762894	3127808	2567032	2141090	3722171	3670405	4062336	3770688	3532895	2650789	1385402	984766
9	482146	464695	475650	455625	462352	477336	782505	820292	767864	541321	516474	895825	878815	779731	526409	398878	537099	536674	578309
10	381982	494087	612316	749741	821575	964244	1289019	1294471	1205908	1095558	1084447	1235480	1118429	1040745	861724	1105546	1616114	1315785	1473127
11	691894	825336	956236	1093815	1214763	1318530	1705229	1817302	2004663	2335014	2496411	2708680	2723678	2914746	2108057	2241891	2456428	2428483	2158622
12	952101	982451	1053636	1322679	1639770	1931513	2144780	2306525	2379994	2368950	2177758	2991908	2877631	2704963	2633889	2001790	1941553	2120436	2088018
13	3139800	3276372	3525219	3997770	4597818	4530688	6622420	7790774	8625201	9415714	9942993	10847825	13667528	15901242	11507439	13138978	13342854	12185588	11938614
14	1303515	1201500	615171	292304	938654	1585003	2231353	1223900	1421445	1441548	1318620	2970105	3543459	3754819	2155706	2792067	2481876	2671871	3209295
15	612625	799712	1040841	1248735	1496311	1688529	1961515	1721272	1287047	1011678	701502	1157762	966500	835575	687039	684512	814760	606044	593081
16	1311567	1576064	1865760	2122293	2237376	2400875	3368124	3752233	4215883	4621541	5888487	5642762	5685159	5719125	4431248	4292661	4408808	3744256	3140612
17	691316	730349	841714	875502	930752	1142205	1403358	1536794	1805266	1949539	2262531	2084963	2638267	2993153	2004323	1651392	1856109	1558256	1092095
18	3208523	4388284	5065934	6317483	7408030	8272017	9053103	9889925	9906733	10467301	11225892	11810905	11777637	12171769	10672078	10717745	10906078	9835714	9705538
19	1260358	1516793	2118937	3166742	3886660	4222815	4499822	5533727	6008724	6659793	7985248	8595904	8269998	7781873	6183503	8173302	7875861	8634706	10252534
20	2154401	2460192	3863811	5944649	7446642	9093032	8097755	10632939	11676244	13007390	14764632	20217272	25870571	34222989	31491203	45315622	61940636	101445880	133905030
21	764561	837043	1524014	2471136	3572975	4771573	4662948	5801228	6625509	7435264	9096789	7981558	7635870	6890498	5974908	8773156	9733439	9362850	11722948
22	1196382	1192710	1616074	1923275	1823588	1745006	1080447	1076969	1276664	1341038	1665574	2589000	2784287	2774669	2802949	3197944	3026664	3332132	3163386
23	157213	250849	285809	413366	522811	594304	543786	704963	798480	922914	1053503	1178284	1169090	1094497	814634	996225	1028334	562695	646323
24	780807	1082606	1462346	1518460	1868098	1948295	2759165	3141918	3236021	3454068	3731093	4328475	4117139	4430707	3176229	3504616	4675237	4151789	4851193
25	927380	827056	1021622	1227085	1402413	1457223	1888484	1737966	1508596	1342659	1256356	1446736	1431167	1234147	1012742	1098423	1001165	968226	970789
26	10069309	9078772	9145165	9945496	10833453	10438964	12466443	13638825	14316397	14634797	15893521	16420200	18749853	21075963	17497975	18918276	18590139	18326253	17653607
27	1035882	1240465	1492213	1722284	2053378	2522700	2975317	3708331	4447001	5315033	6550921	7700833	10017222	13891372	16079896	21478376	25343870	32329999	40467098
28	1686876	2352960	2441695	2534230	2656306	2953977	3917845	4503565	4643873	5150424	5789710	6029548	7269422	8353021	7465372	7363328	8877824	9232180	10033029
29	268649	315880	338408	381842	404937	530487	691541	815148	923989	950848	1133957	1151050	1540962	2178295	1566626	1715641	1825842	1886222	2283038
30	16306323	17201467	19376636	21777335	24714754	26557415	29075598	31782872	33258445	35211877	37970979	38834757	41020943	42492155	37903637	46393363	48257687	56821207	69177692
31	15653397	19054689	21886152	25773006	28235307	29788943	31124076	34867030	36352193	39884093	42723906	47378655	52452603	57525963	63329330	68055825	76091582	81471734	84336218
32	22271425	26588147	29010205	31993600	34724612	34968793	34525558	40274721	44024009	49058300	55508240	58643754	61287649	63342714	63150035	68022524	71988112	72257579	75763509
33	12339330	11677396	12761562	13687201	14780153	14530116	14177268	14525967	14284873	14587356	14947229	16036445	16796476	17028387	16646136	17303734	20657213	19522575	19225638
Total	146782405	156112933	175671178	197079979	217464742	227221752	245178928	267665558	279682227	296521087	320213860	349896500	377124879	406035794	390868893	431356045	474874560	522873463	578550172

**Table A-3. Capital Input in 33 Sectors (Unit : billion won)**

**(1995 constant price)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	11691	13262	14943	16858	19058	21499	24301	27226	29911	32383	34844	37462	40004	42033	43127	44016	45592	48215	51700
2	709	791	883	985	1068	1117	1162	1190	1187	1148	1075	966	812	602	489	512	543	581	623
3	925	1032	1152	1286	1393	1458	1516	1553	1549	1499	1403	1260	1060	785	638	668	708	758	813
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5767	6123	6490	6921	8080	10164	12902	16453	20599	25216	30541	36844	44324	52734	60199	65452	69781	74587	79978
6	5459	6029	6785	7671	8468	9129	9839	10600	11338	12126	12960	13828	14690	15413	16106	16938	17997	19283	20677
7	9070	9595	10320	11133	11834	12383	12924	13451	13858	14225	14529	14740	14797	14558	14698	15457	16424	17597	18869
8	1339	1438	1572	1725	1849	1933	2014	2090	2143	2184	2210	2214	2185	2100	2091	2199	2336	2503	2684
9	869	648	629	598	613	686	770	863	963	1077	1204	1348	1504	1682	1782	1874	1992	2134	2288
10	190	212	225	226	283	406	561	720	845	991	1200	1430	1580	1668	1693	1784	2031	2238	2400
11	1462	1602	1787	2004	2313	2727	3208	3761	4372	5077	5885	6809	7841	8921	9695	10195	10833	11607	12445
12	983	1044	1129	1225	1360	1539	1743	1974	2222	2504	2822	3179	3572	3969	4267	4487	4768	5108	5478
13	6478	7141	8018	9045	10302	11809	13543	15528	17693	20178	23017	26248	29839	33558	36277	38150	40536	43432	46571
14	1875	2002	2175	2373	2818	3550	4404	5392	6497	7770	9232	10904	12776	14745	16122	16954	18015	19301	20696
15	1392	1633	1945	2319	2549	2592	2615	2614	2564	2478	2345	2153	1886	1523	1348	1417	1506	1613	1730
16	5672	6417	7390	8545	9420	9917	10405	10878	11247	11571	11828	11986	11988	11711	11769	12377	13151	14091	15109
17	11371	11890	12624	13427	14508	15920	17502	19271	21117	23194	25519	28112	30917	33688	35883	37736	40096	42961	46066
18	1935	2143	2417	2740	3145	3639	4209	4861	5574	6393	7327	8389	9570	10792	11681	12284	13052	13985	14995
19	4655	5312	6169	7189	8094	8826	9628	10505	11388	12355	13405	14537	15712	16794	17714	18629	19794	21208	22741
20	7520	8934	10759	12951	14847	16309	17930	19724	21570	23618	25878	28355	30984	33504	35546	37382	39720	42557	45633
21	4444	5027	5789	6693	7629	8574	9648	10861	12157	13627	15285	17148	19188	21249	22806	23983	25483	27304	29277
22	2189	2476	2852	3297	4176	5578	7278	9316	11686	14514	17866	21827	26415	31458	34893	36695	38990	41775	44794
23	318	375	449	537	616	679	750	828	910	1000	1101	1212	1330	1445	1536	1616	1717	1839	1972
24	1415	1547	1722	1926	2217	2607	3060	3582	4160	4828	5595	6473	7457	8489	9227	9704	10311	11047	11846
25	792	876	1003	1166	1273	1309	1332	1370	1448	1530	1572	1618	1763	1961	2164	2272	2279	2379	2551
26	19194	21544	23805	26328	29323	32654	36012	38700	40920	42956	44241	44550	44175	42938	41279	40097	39675	41194	44172
27	4262	5082	5890	6915	8276	9447	10575	11496	12112	12631	13686	15051	16241	16814	17394	19793	23654	26669	28597
28	12739	14125	15860	17776	19617	20991	22074	23453	25267	27024	29048	31755	33695	35118	37057	39009	40891	43410	46548
29	1197	1335	1479	1656	1990	2919	4468	5978	7100	8357	9386	9966	11633	13723	16504	19797	22564	24918	26718
30	14208	15695	17184	19014	22284	27122	32928	39443	46369	54152	63251	73632	84934	96367	101319	102218	106571	113349	121541
31	81036	88713	96048	105086	114788	125107	140283	162932	186143	205507	225330	246864	269132	289255	299589	306428	317190	334144	352934
32	12571	14215	15931	18020	20982	24886	29770	35535	41606	48085	55487	64184	73888	84007	90063	92476	96027	101640	108986
33	39720	43108	45895	48463	53761	62805	74329	87583	101362	115041	129276	145848	165468	186804	213080	237500	255357	273885	293680
Total	273246	301366	331320	366098	408891	460284	523683	599730	677878	755237	838348	930893	1031360	1130389	1208037	1270100	1339583	1427315	1530471

**Table A-4. Labor Input in 33 Sectors (Unit : 10000 Hour)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	9266	8767	8338	8473	9304	9440	9047	8433	8016	7453	7268	7173	6980	6849	6934	6539	6568	6389	6175
2	311	311	377	355	278	201	165	129	97	74	46	22	16	16	46	39	39	39	39
3	66	85	89	95	78	80	78	73	77	89	81	67	62	68	28	25	26	30	30
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2641	2608	2459	2665	3046	3249	3783	4339	4571	4719	5022	5293	5473	5417	3863	3628	3955	3979	4381
6	887	941	921	1015	1109	1066	1122	1100	1048	1044	1092	1137	1161	1130	984	1009	1049	1072	1070
7	1670	1684	1767	1958	1934	1940	1702	1668	1592	1482	1694	1575	1463	1304	1159	1259	1348	1305	1302
8	955	1116	1070	1170	1047	1020	1036	994	867	962	861	873	823	777	611	616	670	666	665
9	307	279	237	300	304	329	274	248	264	303	268	256	233	205	123	123	131	165	165
10	196	225	214	199	238	253	261	289	234	323	260	372	432	321	223	238	311	304	304
11	279	337	361	389	330	275	298	321	335	233	237	234	224	194	162	165	179	200	200
12	299	339	341	369	336	315	340	359	359	480	495	473	474	454	367	365	385	407	406
13	508	408	466	571	591	579	590	661	692	416	402	426	417	380	380	360	393	385	384
14	78	71	76	85	68	103	74	111	74	43	43	39	38	23	45	38	42	42	42
15	589	468	592	846	908	818	850	860	782	708	506	417	357	314	251	308	292	273	272
16	387	383	365	457	491	536	559	598	573	585	617	605	590	524	399	399	406	392	391
17	323	348	372	385	351	331	315	302	292	287	304	340	323	297	292	270	259	257	256
18	508	644	661	653	617	649	716	670	643	956	865	877	892	888	672	725	795	802	800
19	409	422	441	572	610	705	677	840	813	804	886	907	881	836	757	710	793	772	771
20	1013	980	1155	1614	1672	1535	1436	1502	1435	1194	1198	1412	1439	1388	1216	1375	1522	1483	1480
21	181	196	297	445	478	490	565	600	675	636	661	717	759	752	757	796	898	885	883
22	351	286	254	239	232	215	165	175	197	239	234	274	288	274	282	295	321	354	353
23	97	95	96	140	95	126	117	102	129	149	147	137	151	130	108	116	140	142	141
24	586	691	752	891	848	737	766	658	622	386	407	414	404	382	336	353	388	393	392
25	486	606	670	869	824	780	733	730	683	632	666	515	407	416	317	339	315	308	307
26	1876	1941	2002	2075	2307	2405	2510	2667	2720	2778	2762	2885	2940	3052	2878	2973	3063	3153	3255
27	255	264	272	282	313	327	341	362	369	314	301	334	372	349	392	387	405	479	519
28	89	95	91	98	117	125	130	121	123	152	154	152	144	141	128	101	107	97	87
29	10	16	16	20	26	23	52	48	49	20	28	28	40	39	36	51	57	52	47
30	10805	11450	11544	12318	12160	12375	12562	12965	13279	15051	15856	16379	17166	17572	16183	16435	16508	16820	17143
31	1088	1181	1231	1361	1470	1600	1687	1745	2002	2082	2216	2388	2513	2580	2576	2541	2615	2650	2783
32	4110	4801	4914	5328	5568	6010	6354	6724	6987	6751	7076	7643	7972	8472	8045	8476	9834	10618	11346
33	1085	1080	1115	1116	1170	1272	1284	1337	1483	1623	1682	1732	1694	1706	1937	2210	1846	1714	1832
Total	41711	43116	43556	47350	48921	49911	50585	51736	52080	52971	54336	56097	57127	57246	52486	53264	55659	56627	58221

\*The sum of the labor input of industries 26 and 27 during the period of 1984~1992 is allocated in proportion to the year 1993.

**Table A-5. Energy Input in 33 Sectors (Unit : million won)**

**(1995 constant price)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	432365	470583	557543	639892	724170	747239	613210	639458	633781	617988	606851	726103	748077	688769	963136	1024992	1027857	1041891	1091340
2	81787	72983	80245	88187	93033	90384	47463	45264	38271	31501	24041	20219	24759	28759	17722	17485	16345	14262	13020
3	80083	110659	138266	170241	203899	229665	131366	149358	159687	172455	191480	222526	210055	179681	193517	200996	207056	194346	188473
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	514459	524862	749113	1005884	1331349	1630869	988290	1109254	1208887	1309684	1442791	1568465	1507713	1415060	1404994	1400412	1462135	1285265	1127075
6	463347	396590	446449	478689	521815	526832	417797	417068	382456	350776	320720	656775	679373	669367	816821	793532	811303	766828	764067
7	478084	387735	454095	521801	605023	652968	496942	507518	474017	445813	419345	656550	731458	780818	972741	950591	807093	706814	648201
8	145952	192593	225719	258275	297015	318745	223584	215238	188306	163733	139941	170229	183753	188273	264154	242991	179338	136988	100771
9	49436	33208	38573	43798	50368	54164	54101	57744	56590	56162	56132	85741	78431	67373	94110	97397	103989	100305	103381
10	26057	21983	30692	41832	56811	71401	45755	50786	52785	55746	60090	57296	52284	44711	58783	73298	88197	99340	117970
11	187055	197206	248874	306462	379591	440333	245289	280462	299130	325268	361680	441598	441318	423419	593277	629740	595667	581569	603390
12	40041	23944	30437	38254	47808	55698	36294	43288	48716	55485	64511	100214	97706	90808	108632	125411	132241	138781	156388
13	1504682	1549139	1953735	2370142	2967915	4832897	2253190	2550466	2755215	2981670	3280244	4226280	4686115	4850257	6899031	7603311	8690183	8834177	9453269
14	12470885	10467403	10934116	11582677	10606277	8879445	7896572	8624607	9481964	10547724	11545946	11512589	14247788	16609906	21061734	24082162	30161476	33292153	34866904
15	37084	32157	43535	56134	72351	86094	56557	53155	45263	37821	30609	49202	45344	39319	57248	56794	56553	51987	49999
16	940314	839178	1137113	1615259	2275913	2595219	944139	1111545	1258340	1437261	1662802	3762840	3490842	3135650	3496487	3351194	3391887	2909701	2411241
17	779138	730077	971514	1233709	1587472	1891982	1338313	1520767	1646373	1788547	1974761	3368154	3659389	3799699	5150799	4524899	3987110	2997316	2069182
18	632220	510779	694675	920357	1223728	1523653	662119	766262	825351	908411	1023509	1483492	1536080	1523864	1715688	1706554	1955972	1758625	1678236
19	166741	151652	216198	298412	407793	518152	229754	270796	298982	336083	386680	478935	464062	426835	596360	735126	709408	795129	948884
20	232100	181306	268379	383128	539605	706696	345348	417906	470458	540366	634515	701328	781098	829625	989249	1254890	1195481	1379815	1692982
21	102134	72113	127155	205586	318441	448519	241170	287965	321705	365339	423867	516209	472076	406583	506534	714838	754761	934768	1215650
22	115942	61692	73177	84438	95542	100127	43544	51983	58473	66676	77594	86353	99059	108129	134795	141704	155360	145657	143859
23	19644	22771	29537	38024	48548	58549	28871	35107	39447	45447	53637	64316	65430	64282	65268	78975	76655	84749	100552
24	125493	139431	176842	219918	274577	317313	214636	244407	258531	278764	306793	412154	428214	423647	510027	589846	643268	684055	779260
25	78180	46135	57335	69581	84441	94213	66523	68788	65881	63213	60720	101475	100278	94703	103851	111869	117539	115187	120310
26	3220808	3014299	3752757	4398098	5078590	5456581	3143924	3589252	4000871	4414298	4952507	4703327	5229017	5399453	5757037	6401341	7578788	7542821	7839273
27	65146	73918	90840	113370	136999	158678	86134	101400	110566	123369	142260	146015	181560	210103	242442	313839	305311	356888	443511
28	2497716	1647452	2012789	2501947	3036041	3120246	2090574	2379874	2557164	2793885	3119885	3802588	4209672	4359235	4809039	5226373	4873242	5070392	5430280
29	200332	234586	310912	413259	542967	678285	915856	1087913	1240673	1442727	1689992	2130965	2704403	3207368	4365461	4942822	6017959	6494871	6769289
30	1308272	1053909	1316997	1640211	2000243	2315727	1584654	1785820	1902372	2041137	2249602	2405635	2454443	2328582	2383983	3299953	3895028	4676567	5914948
31	265544	395366	505157	662719	843718	1033352	747100	884530	964286	1079712	1249884	1363826	1542919	1663073	1719920	2025088	1929987	2092860	2442648
32	622443	689895	860891	1067294	1280273	1443255	997703	1235761	1441771	1695500	2035631	1865038	2028364	2124440	3022721	3568957	3688895	3923659	4482572
33	692666	538926	712778	893952	1086549	1214327	542109	599979	646652	695966	762757	885809	950762	1002062	1414178	1652258	1200248	1243191	1386004
Total	28576151	24884530	29246438	34361533	38818862	42291610	27728880	31183724	33932962	37268527	41351776	48772246	54131841	57183852	70489738	77939639	86816333	90450953	95152928

**Table A-6. Material Input in 33 Sectors (Unit : million won)**

**(1995 constant price)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	7432857	8254695	9027773	10115726	10604346	10858143	9581435	10643735	11513640	12246102	13358281	11680264	12331497	12461920	13281516	13905162	11446424	11186792	11112837
2	354701	367989	370191	375814	352725	313649	295779	274095	241285	197232	151114	136728	172809	211682	142325	136795	110123	95619	84595
3	170455	281525	307155	346001	364956	370002	516358	559704	582938	609125	662669	683875	670840	617783	433119	421530	432440	377065	339712
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	14046175	15706844	18341159	22179825	25363322	27611426	32209906	34234433	35729956	37729819	41269710	52019050	56863391	62141080	47814703	50393743	52578079	47423295	43788700
6	23434106	24006126	26590835	28577381	29721166	29882157	29139209	31319534	32875146	33250984	33657896	31550633	34672387	38343899	36408611	37516922	37437277	36604681	36101402
7	9424044	8482510	9577053	10752279	11926366	12710086	13953235	14808284	15055156	15109819	15361137	13114902	14905751	16498272	14255038	15584102	15006502	14571665	15230887
8	6657626	8694410	9280390	10200401	11015913	11446812	12052447	12234785	11773232	11144135	10609153	7949691	8643165	9350995	8100893	8388118	8495442	7081027	6044349
9	1673931	1358936	1567618	1749017	1898108	2005676	2026009	2254665	2457892	2574292	2752901	2610418	2531706	2425886	1923892	2066638	1983903	2008505	2067911
10	813123	854618	1041395	1281442	1516732	1729972	2064672	2220712	2316197	2365282	2561072	2542941	2462202	2346634	1807150	2304921	2663060	3061663	3650100
11	2686771	2618397	2975077	3514979	3943748	4254358	5019760	5523107	5817720	6091672	6549136	6882897	7384032	7918762	6858783	7447456	7524738	7580024	7797697
12	1346999	1404699	1622320	1942949	2192025	2367093	2748345	3138277	3433867	3734209	4170776	4617642	4692959	4786429	4106424	4607826	5242517	5435353	5814378
13	7797852	8091361	9606854	11155400	12731347	12743493	16980578	19100218	20902237	22818484	25388416	26056839	29758443	31920459	30035063	33192368	32190418	32520139	34426919
14	648775	660797	423140	176608	176033	159558	1114613	1199450	1241033	1285551	1358706	1514565	2230086	3052290	1914011	2326773	2417656	2795058	3429215
15	2193761	2028500	2479709	3119989	3771744	4341887	5670956	5748928	5529728	5219790	4932511	3933908	3869569	3766038	2748951	2966668	3106718	2978152	3054237
16	2460797	2612116	2815335	3092947	3184201	3345827	5011967	5617547	6242081	7070014	8166814	9267980	9900504	10179213	8086017	8372961	8052905	7607821	7198563
17	3843097	4091567	4491559	5064204	5501680	5843569	7742203	8526765	8938968	9419948	10165313	10106271	12113463	13886075	12596922	12908376	11941530	10756430	9182124
18	11027543	11392941	13033329	15362199	17335176	18852472	24852720	27260936	28521095	29707203	31819227	33700233	37166002	40451592	33732233	38702925	40402983	40988674	42844655
19	4387318	5237517	6183405	7555593	8802908	9708629	12743457	14111133	15116690	16078244	17538478	20776064	21769901	22820199	17806613	23862068	30163676	34968111	42764406
20	9448931	10578299	12937610	16256530	19459221	22016637	30800254	34522582	37440528	40471916	44859670	47300853	55374809	64278207	63052141	83324750	106660830	122363540	147249330
21	2471006	3427241	5008356	7112573	9372769	11433760	14675775	16769545	18560383	20508770	23455745	29770979	30110704	29634524	22398566	30582602	42064733	48813187	60037302
22	2647422	3720018	3766265	3906943	3843951	3544360	4000822	4547315	4996974	5456654	6114465	6697168	8146740	9864373	8104116	9125851	10796313	10394131	10482439
23	668154	857487	962111	1120706	1246914	1320360	1739655	1961182	2142439	2340490	2623231	3129265	3315402	3513970	3005433	3745734	4909088	5416138	6318758
24	2191942	2866436	3542781	4267239	5070020	5752781	6344177	7120945	7813733	8571148	9594692	10059339	10856638	11161484	10327291	12338933	12756821	13791999	15670053
25	2156962	2015399	2190702	2459191	2671484	2794724	2984434	3055519	3015513	2958484	2965028	2593693	2678389	2717312	2168317	2458295	2859742	2928085	3161586
26	4046001	4466612	4692599	5116203	5244620	5180599	7066644	7798300	8340387	8923837	9907513	13135109	14986173	16677289	16770681	17244414	17440861	16500009	16441215
27	483053	457733	493214	567380	606562	632090	875226	960650	1017207	1070902	1171205	1681084	2135113	2582786	3448434	4199114	8960844	9926877	11453625
28	665322	719504	701963	689056	621574	584051	1372176	1464564	1520525	1601391	1736752	2161179	2468172	2669339	2590298	2835039	3127388	3167081	3336337
29	142793	143503	172499	211948	246064	272826	298656	338056	368329	404938	453464	536559	769827	1031069	628324	741547	930591	1025044	1195511
30	6421481	6928720	7504435	8612765	9176320	9535057	12017672	12817022	13124258	13508770	14323658	18329605	18991483	19036379	19087974	23327467	37672408	43198725	50595794
31	3590054	5262046	6066980	7321637	8074192	8557918	11041698	11935520	12494885	13372042	14666148	17390339	19622763	21385070	19240001	20761899	28048032	28828903	30686722
32	5400239	6609187	7370232	8496953	9083048	9317552	12393514	14528858	16439577	18575886	21469239	30166264	33220955	36377853	34793314	38354159	43892287	44430302	47822996
33	4548113	4003405	4423021	5009905	5313471	5331413	7133265	7547484	7841226	8130912	8701656	8638318	9572795	10772208	9648328	11057902	9269805	9463471	10327130
Total	145281401	158201637	179567062	207711784	230432704	244818939	296467614	324143847	343404803	362548044	392515776	430734654	474388669	514881070	457315482	525203057	600586133	628287566	689711484

**Table A-7. Average Shares of Capital Inputs (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	56.42	54.92	54.10	52.77	51.23	51.74	52.57	51.16	49.76	47.85	50.30	53.07	52.42	47.83	42.62	46.61	50.57	50.04
2	19.37	16.09	16.44	16.37	15.97	16.91	18.01	17.86	17.92	17.84	20.16	22.05	21.75	30.74	39.85	41.98	43.32	42.94
3	24.58	23.68	24.17	24.11	23.62	36.73	50.19	50.33	50.80	51.12	49.09	46.19	45.82	46.38	46.95	46.69	45.62	45.32
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.47	12.11	12.71	13.06	13.26	13.86	14.47	14.57	14.84	15.03	13.13	10.87	10.66	13.16	15.63	14.21	12.44	12.09
6	5.41	5.32	5.00	4.62	4.27	4.91	5.54	5.11	4.68	4.20	5.95	7.70	7.43	7.90	8.06	8.82	9.63	9.20
7	8.74	9.02	8.89	8.62	8.30	8.38	8.46	7.96	7.48	6.88	8.15	9.56	9.53	13.23	16.42	15.77	14.78	13.56
8	5.80	6.09	6.05	5.90	5.72	5.63	5.47	5.05	4.65	4.16	7.22	10.29	10.23	11.89	13.04	8.61	4.25	3.78
9	5.51	5.55	5.32	5.01	4.70	5.37	6.08	5.76	5.44	5.05	7.01	8.86	8.51	8.18	7.71	9.79	11.66	11.10
10	7.78	8.71	9.11	9.36	9.52	10.20	10.83	10.81	10.88	10.88	10.89	10.54	10.18	9.40	8.58	10.89	12.91	12.46
11	10.23	11.41	11.58	11.61	11.60	11.95	12.36	12.32	12.40	12.40	13.25	13.69	13.25	11.94	10.59	11.92	12.98	12.61
12	9.90	10.42	10.63	10.64	10.54	10.47	10.50	10.52	10.66	10.75	10.75	10.41	10.17	8.77	7.34	8.10	8.64	8.49
13	13.91	14.23	14.32	14.19	13.35	13.33	14.11	14.04	14.08	14.03	14.93	15.60	15.52	14.49	13.17	12.81	12.25	11.91
14	7.03	6.00	3.36	0.99	0.02	2.12	4.23	4.23	4.26	4.26	9.16	14.69	16.32	14.43	11.70	10.47	9.17	9.56
15	5.61	7.73	7.65	7.44	7.18	5.81	4.43	4.02	3.61	3.14	4.91	6.64	6.29	7.60	8.73	6.91	5.12	4.80
16	15.58	17.09	16.92	16.10	15.55	16.86	18.31	18.43	18.73	18.94	16.79	14.39	14.48	14.53	14.19	14.41	14.26	13.47
17	8.82	9.23	9.63	9.89	10.18	9.85	9.48	9.61	9.82	9.98	9.30	8.48	8.56	7.38	5.82	6.24	6.47	5.77
18	9.62	11.90	12.67	13.28	13.86	12.85	11.73	11.90	12.19	12.42	12.56	12.28	12.04	13.12	13.83	13.73	13.33	12.36
19	12.27	13.80	14.73	15.42	15.97	14.55	13.03	13.19	13.49	13.72	12.20	10.26	9.98	10.24	10.54	11.15	11.51	11.38
20	10.74	11.72	12.68	13.43	14.06	11.93	9.70	9.92	10.24	10.50	14.40	17.85	17.77	15.88	14.11	15.03	15.69	16.09
21	12.08	11.38	12.27	12.98	13.59	12.66	11.62	11.83	12.16	12.40	9.86	6.86	6.39	5.75	5.42	6.16	6.78	7.04
22	11.14	10.60	11.21	11.62	11.88	9.02	6.15	6.22	6.37	6.48	7.74	8.70	8.52	13.23	17.98	14.74	11.17	10.97
23	10.78	12.91	13.65	14.16	14.53	12.25	9.96	10.13	10.41	10.63	9.69	8.47	8.37	9.44	10.59	9.56	8.30	8.38
24	10.25	11.64	11.70	11.59	11.36	12.57	13.94	13.78	13.72	13.54	13.54	13.37	13.22	11.88	10.36	12.22	13.84	13.51
25	12.00	10.83	11.07	11.10	11.02	11.95	12.86	12.58	12.35	11.93	12.54	13.07	12.84	13.73	14.45	13.55	12.33	11.79
26	20.85	19.37	19.49	19.29	18.95	19.01	19.31	19.38	19.66	19.86	19.16	18.01	17.88	19.10	20.19	18.00	15.39	15.05
27	48.45	52.96	53.73	53.67	52.89	50.92	49.41	49.41	49.86	50.16	49.07	47.19	47.17	48.03	48.86	43.59	37.62	37.96
28	41.36	48.86	46.60	42.92	40.43	42.10	44.38	44.58	45.04	45.36	42.87	40.11	40.66	39.49	37.89	40.40	42.39	42.33
29	20.43	21.13	21.49	21.55	21.49	19.88	18.45	18.52	18.75	18.88	17.89	17.14	18.11	18.73	18.85	17.99	17.01	17.48
30	48.55	49.90	50.48	50.47	50.09	49.12	48.47	48.54	48.97	49.25	43.43	36.89	36.76	34.53	32.26	28.96	24.97	24.87
31	45.69	47.10	47.82	47.86	47.39	45.64	44.27	44.40	44.91	45.28	43.37	40.73	40.79	45.12	49.40	49.27	48.30	48.33
32	19.38	20.08	20.49	20.37	19.81	18.77	18.07	18.07	18.32	18.48	18.56	18.18	18.13	18.68	19.15	18.55	17.41	17.22
33	1.24	1.17	1.21	1.21	1.18	1.40	1.64	1.65	1.68	1.70	2.03	2.29	2.29	2.84	3.40	11.71	19.62	19.29
Total	20.56	21.05	21.03	20.78	20.46	20.10	19.93	19.90	20.05	20.11	19.87	19.29	19.24	19.68	20.12	20.27	20.06	20.21

**Table A-8. Average Shares of Labor Inputs (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	9.16	8.65	8.32	8.28	8.56	9.81	10.89	10.70	10.28	9.81	9.26	9.10	8.95	8.38	7.82	8.02	8.65	8.78
2	38.95	42.28	42.20	42.88	44.54	46.14	47.09	47.15	46.70	46.16	34.37	23.04	22.64	23.19	23.88	24.47	25.87	26.32
3	43.03	39.74	39.62	40.34	42.06	30.37	17.91	18.14	18.07	18.05	20.68	23.63	23.35	21.89	20.69	19.67	19.33	19.71
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	22.60	22.65	23.24	24.37	26.34	27.65	28.29	28.75	28.90	29.06	26.97	24.84	24.29	25.05	25.88	25.79	26.34	26.28
6	5.77	5.50	5.04	4.75	4.67	6.11	7.41	6.90	6.25	5.56	7.52	9.80	9.43	8.35	7.13	7.22	7.76	7.61
7	10.37	9.70	9.33	9.23	9.46	10.86	11.99	11.41	10.58	9.66	12.79	16.58	16.46	14.35	11.96	12.97	14.24	13.43
8	17.37	16.27	15.79	15.71	16.21	17.76	18.60	17.35	15.76	14.02	16.99	21.05	20.83	18.91	16.52	16.77	17.25	15.76
9	8.37	9.05	8.48	8.14	8.12	10.47	12.67	12.12	11.31	10.41	12.83	15.62	14.96	13.38	11.82	12.03	12.69	12.41
10	11.71	13.12	13.40	14.05	15.23	16.52	17.36	17.49	17.39	17.26	19.22	21.15	20.36	19.63	19.06	18.41	18.30	18.14
11	9.96	10.37	10.29	10.52	11.19	12.20	12.98	13.08	12.99	12.89	12.83	12.80	12.34	11.42	10.63	10.22	10.15	10.12
12	23.44	24.06	23.97	24.49	25.82	26.61	27.01	27.32	27.34	27.35	27.70	28.04	27.32	25.97	24.90	22.34	20.38	20.56
13	8.18	7.86	7.73	7.82	7.81	9.15	10.80	10.85	10.74	10.63	10.52	10.60	10.51	9.04	7.56	7.41	7.52	7.50
14	1.69	1.37	0.75	0.22	0.01	2.24	4.54	4.59	4.56	4.53	4.49	4.84	5.34	4.30	3.08	2.89	2.83	3.03
15	15.11	15.10	14.60	14.48	14.88	15.08	14.60	13.40	11.89	10.26	12.49	15.38	14.54	14.97	15.26	15.79	16.90	16.29
16	12.99	12.89	12.46	12.10	12.44	15.96	19.38	19.69	19.76	19.84	17.75	15.91	15.94	14.85	13.57	13.27	13.33	12.93
17	3.01	2.98	3.04	3.19	3.49	4.17	4.77	4.88	4.93	4.97	4.90	4.91	4.94	4.10	3.15	3.40	3.71	3.40
18	8.66	8.93	9.29	9.95	11.05	11.34	11.25	11.53	11.66	11.79	12.17	12.54	12.25	11.23	10.09	10.36	10.91	10.40
19	14.66	14.50	15.12	16.16	17.83	18.67	18.95	19.37	19.56	19.75	19.01	18.14	17.58	16.49	15.66	15.11	15.01	15.23
20	11.57	12.21	12.91	13.97	15.57	14.85	13.59	14.03	14.30	14.56	13.05	11.57	11.47	10.22	9.22	8.80	8.66	9.11
21	12.01	12.17	12.84	13.87	15.46	15.22	14.42	14.82	15.03	15.23	14.47	13.34	12.40	12.39	13.20	11.86	10.75	11.44
22	17.02	16.54	17.11	18.09	19.71	18.97	17.68	18.06	18.26	18.44	18.59	18.67	18.23	17.04	16.02	15.47	15.37	15.49
23	15.82	16.57	17.14	18.15	19.82	19.54	18.72	19.23	19.50	19.76	19.07	18.36	18.08	16.72	15.63	14.49	13.75	14.23
24	12.00	11.04	10.84	10.96	11.42	13.05	14.55	14.53	14.28	13.99	14.69	15.67	15.43	14.37	13.28	13.17	13.53	13.56
25	16.42	18.51	18.48	18.91	19.98	20.01	19.51	19.28	18.68	17.91	19.48	21.56	21.11	20.71	20.27	18.57	17.39	17.07
26	24.47	23.95	23.55	23.78	24.86	28.11	31.09	31.50	31.55	31.64	30.59	29.75	29.43	25.80	22.32	22.66	23.59	23.70
27	31.17	29.08	28.82	29.37	30.82	32.67	33.98	34.32	34.19	34.15	33.55	33.47	33.32	29.61	26.27	23.73	22.08	22.86
28	9.26	8.86	8.25	7.74	7.77	8.74	9.66	9.80	9.77	9.77	9.87	10.23	10.32	9.55	8.79	8.12	7.77	7.96
29	12.17	13.07	12.98	13.29	14.11	14.54	14.72	14.92	14.91	14.90	14.06	13.85	14.55	11.64	8.53	7.77	7.37	7.77
30	18.17	17.81	17.60	17.96	18.98	19.80	20.24	20.47	20.39	20.35	24.00	28.02	27.80	27.09	26.67	26.12	26.31	26.89
31	26.00	23.85	23.66	24.16	25.47	26.48	27.01	27.36	27.32	27.34	28.84	30.81	30.72	27.59	24.71	23.25	22.61	23.22
32	48.42	48.63	48.47	49.18	50.90	50.98	50.53	51.02	51.07	51.14	48.62	46.42	46.11	44.56	43.24	43.15	44.03	44.69
33	50.60	52.98	53.49	54.62	56.69	56.94	56.64	57.31	57.64	57.93	59.21	60.55	60.17	58.43	56.89	53.45	50.81	51.30
Total	17.43	17.56	17.66	18.22	19.40	20.49	21.26	21.73	21.95	22.21	22.44	22.74	22.53	21.28	20.18	19.77	19.91	20.25

**Table A-9. Average Shares of Energy Inputs (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	2.49	2.61	2.67	2.75	2.78	2.47	2.12	2.04	1.95	1.85	1.99	2.16	2.11	2.72	3.38	3.48	3.65	3.76
2	10.92	10.47	10.62	10.64	10.40	7.87	5.43	5.33	5.26	5.17	6.08	6.96	6.84	5.47	4.20	4.37	4.52	4.56
3	12.79	14.05	14.41	14.59	14.44	10.69	7.01	6.96	6.90	6.86	7.07	7.26	7.13	8.58	10.29	11.17	12.09	12.41
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	3.05	3.09	3.31	3.51	3.64	2.77	1.83	1.83	1.83	1.83	1.85	1.76	1.57	1.57	1.66	1.80	1.93	1.90
6	2.52	2.25	2.12	1.99	1.86	1.54	1.24	1.13	1.01	0.90	1.26	1.63	1.55	1.76	1.95	1.95	2.01	1.97
7	5.80	5.41	5.30	5.18	5.00	4.07	3.14	2.93	2.70	2.45	2.92	3.48	3.42	3.94	4.40	4.15	3.87	3.63
8	2.91	2.96	2.93	2.88	2.81	2.24	1.65	1.51	1.36	1.20	1.28	1.42	1.39	1.75	2.07	1.91	1.72	1.59
9	3.78	3.36	3.20	3.03	2.85	2.53	2.25	2.11	1.96	1.79	2.05	2.33	2.22	3.05	3.88	4.01	4.16	4.06
10	3.40	3.06	3.21	3.36	3.45	2.63	1.76	1.74	1.72	1.70	1.59	1.45	1.38	1.82	2.31	2.41	2.50	2.49
11	8.21	8.44	8.61	8.76	8.84	6.54	4.19	4.14	4.09	4.04	4.21	4.28	4.04	5.08	6.23	6.10	5.94	5.86
12	2.36	1.77	1.81	1.84	1.84	1.41	0.98	0.97	0.97	0.96	1.13	1.28	1.23	1.48	1.78	1.83	1.88	1.90
13	14.84	14.85	15.16	15.66	19.66	16.28	9.15	9.02	8.88	8.74	9.47	10.16	9.93	12.34	14.92	16.25	17.62	17.74
14	86.96	88.79	93.80	98.17	99.95	90.83	81.64	81.69	81.80	81.96	77.02	70.28	66.77	71.40	77.64	79.42	81.01	80.04
15	2.00	1.82	1.81	1.80	1.76	1.33	0.88	0.79	0.70	0.60	0.75	0.92	0.86	1.17	1.48	1.50	1.52	1.47
16	21.84	21.26	24.67	29.43	32.50	21.60	10.20	10.18	10.19	10.20	15.18	19.10	17.24	18.93	21.13	21.52	21.57	20.19
17	18.55	18.19	19.36	20.59	21.71	17.78	13.38	13.44	13.49	13.54	17.61	20.87	19.46	22.40	24.98	23.55	21.81	19.09
18	5.94	5.34	5.71	6.07	6.39	4.45	2.37	2.38	2.39	2.41	2.79	3.11	3.02	3.38	3.72	4.06	4.35	4.12
19	3.63	3.27	3.51	3.74	3.93	2.73	1.44	1.45	1.45	1.46	1.53	1.57	1.51	1.99	2.53	2.43	2.31	2.34
20	2.43	2.09	2.27	2.43	2.56	1.82	1.02	1.03	1.05	1.06	1.05	1.02	1.00	1.11	1.28	1.24	1.18	1.24
21	3.18	2.40	2.60	2.79	2.95	2.12	1.22	1.23	1.24	1.25	1.30	1.30	1.20	1.47	1.87	1.87	1.85	1.97
22	3.09	1.93	2.04	2.13	2.19	1.57	0.93	0.93	0.94	0.94	0.93	0.90	0.88	0.98	1.12	1.25	1.37	1.38
23	3.14	2.97	3.12	3.25	3.33	2.38	1.39	1.40	1.41	1.42	1.45	1.45	1.42	1.52	1.68	1.65	1.60	1.65
24	5.28	4.65	4.66	4.67	4.60	3.54	2.52	2.47	2.41	2.35	2.55	2.76	2.70	3.16	3.66	3.76	3.86	3.87
25	3.20	2.56	2.65	2.73	2.75	2.23	1.68	1.63	1.57	1.49	1.95	2.41	2.34	2.66	3.01	3.11	3.18	3.12
26	27.95	28.05	29.00	29.73	29.99	22.97	15.77	15.67	15.62	15.58	14.65	13.56	13.27	14.03	15.19	17.52	19.81	20.23
27	3.83	3.79	3.84	3.87	3.83	2.80	1.76	1.74	1.73	1.72	1.62	1.53	1.52	1.62	1.76	1.67	1.58	1.63
28	40.21	32.95	36.61	41.66	44.72	37.48	29.64	29.47	29.24	29.08	30.38	31.42	30.58	32.42	34.79	32.97	31.33	31.49
29	48.04	49.02	49.25	49.35	49.07	50.97	52.82	52.69	52.63	52.64	54.26	54.34	51.53	56.75	63.16	64.24	64.99	63.83
30	7.75	6.81	6.96	7.12	7.17	5.71	4.19	4.16	4.12	4.09	4.06	4.01	3.95	4.30	4.80	4.95	5.06	5.17
31	3.66	3.91	3.93	3.93	3.89	3.06	2.23	2.21	2.20	2.19	2.12	2.06	2.04	2.13	2.26	2.16	2.06	2.09
32	4.84	4.69	4.79	4.82	4.72	3.70	2.70	2.68	2.66	2.65	2.35	2.03	2.00	2.53	3.13	3.21	3.25	3.31
33	8.05	7.77	8.19	8.45	8.42	5.79	3.19	3.17	3.17	3.17	3.32	3.41	3.35	4.25	5.27	4.65	3.93	3.97
<b>Total</b>	11.77	10.71	10.69	10.64	10.49	8.05	5.66	5.62	5.59	5.56	5.71	5.90	5.92	6.92	7.90	8.07	8.21	8.14

**Table A-10. Average Shares of Material Inputs (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	31,93	33,82	34,90	36,19	37,43	35,98	34,42	36,09	38,01	40,49	38,45	35,67	36,53	41,07	46,18	41,89	37,13	37,42
2	30,76	31,16	30,74	30,12	29,09	29,08	29,48	29,65	30,12	30,83	39,39	47,95	48,76	40,60	32,07	29,18	26,29	26,18
3	19,60	22,52	21,80	20,96	19,87	22,21	24,89	24,58	24,22	23,97	23,16	22,92	23,70	23,15	22,07	22,46	22,96	22,57
4	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
5	61,88	62,15	60,74	59,05	56,76	55,72	55,41	54,85	54,43	54,09	58,05	62,53	63,48	60,21	56,84	58,21	59,29	59,73
6	86,30	86,93	87,83	88,64	89,20	87,44	85,81	86,86	88,06	89,34	85,27	80,86	81,59	81,99	82,86	82,00	80,60	81,21
7	75,08	75,88	76,49	76,98	77,24	76,69	76,42	77,70	79,24	81,01	76,14	70,37	70,59	68,48	67,21	67,11	67,12	69,39
8	73,92	74,68	75,24	75,51	75,27	74,37	74,28	76,09	78,24	80,61	74,51	67,24	67,55	67,46	68,36	72,71	76,78	78,88
9	82,35	82,04	82,99	83,82	84,34	81,63	78,99	80,01	81,29	82,75	78,12	73,19	74,31	75,39	76,59	74,18	71,49	72,43
10	77,11	75,10	74,27	73,24	71,79	70,65	70,04	69,96	70,00	70,16	68,30	66,85	68,08	69,15	70,06	68,29	66,30	66,90
11	71,60	69,78	69,52	69,10	68,37	69,32	70,47	70,46	70,52	70,67	69,71	69,23	70,37	71,56	72,55	71,76	70,92	71,41
12	64,29	63,75	63,59	63,03	61,80	61,51	61,51	61,18	61,03	60,94	60,42	60,28	61,28	63,77	65,98	67,73	69,10	69,05
13	63,07	63,06	62,79	62,33	59,19	61,24	65,95	66,09	66,29	66,60	65,09	63,64	64,04	64,12	64,35	63,53	62,60	62,85
14	4,32	3,85	2,09	0,62	0,01	4,81	9,59	9,49	9,38	9,26	9,33	10,20	11,57	9,86	7,58	7,23	6,99	7,37
15	77,29	75,35	75,94	76,29	76,18	77,79	80,09	81,79	83,80	86,01	81,85	77,06	78,30	76,26	74,53	75,81	76,46	77,44
16	49,59	48,76	45,95	42,36	39,51	45,58	52,11	51,69	51,32	51,03	50,28	50,60	52,34	51,69	51,10	50,81	50,83	53,41
17	69,62	69,61	67,98	66,34	64,62	68,21	72,37	72,06	71,76	71,51	68,19	65,74	67,05	66,12	66,05	66,82	68,01	71,74
18	75,78	73,83	72,32	70,70	68,70	71,36	74,66	74,19	73,75	73,39	72,48	72,07	72,69	72,27	72,36	71,85	71,41	73,12
19	69,44	68,43	66,64	64,68	62,28	64,05	66,58	65,99	65,49	65,06	67,25	70,03	70,94	71,28	71,27	71,32	71,18	71,04
20	75,26	73,97	72,14	70,18	67,82	71,41	75,69	75,01	74,41	73,88	71,50	69,56	69,77	72,79	75,39	74,93	74,47	73,57
21	72,73	74,05	72,28	70,35	68,00	69,99	72,74	72,12	71,57	71,12	74,37	78,50	80,01	80,40	79,51	80,11	80,61	79,55
22	68,74	70,92	69,64	68,16	66,22	70,44	75,25	74,78	74,44	74,14	72,74	71,73	72,37	68,75	64,88	68,54	72,09	72,15
23	70,25	67,55	66,09	64,44	62,31	65,83	69,92	69,23	68,67	68,18	69,79	71,72	72,13	72,32	72,10	74,31	76,35	75,74
24	72,47	72,68	72,79	72,78	72,62	70,84	68,99	69,22	69,58	70,11	69,21	68,21	68,65	70,59	72,71	70,84	68,77	69,07
25	68,39	68,10	67,81	67,27	66,25	65,81	65,95	66,51	67,40	68,67	66,04	62,96	63,71	62,90	62,27	64,77	67,10	68,03
26	26,73	28,63	27,95	27,19	26,21	29,91	33,83	33,46	33,17	32,93	35,59	38,68	39,42	41,07	42,31	41,82	41,21	41,02
27	16,55	14,17	13,61	13,10	12,46	13,62	14,86	14,53	14,22	13,97	15,76	17,81	17,99	20,74	23,11	31,01	38,72	37,55
28	9,17	9,34	8,55	7,68	7,08	11,68	16,33	16,16	15,95	15,79	16,88	18,24	18,43	18,54	18,53	18,50	18,51	18,23
29	19,36	16,77	16,28	15,82	15,33	14,60	14,01	13,87	13,72	13,58	13,79	14,68	15,81	12,88	9,47	9,99	10,64	10,92
30	25,53	25,48	24,95	24,45	23,77	25,37	27,10	26,83	26,53	26,31	28,51	31,07	31,50	34,07	36,27	39,97	43,65	43,07
31	24,64	25,14	24,60	24,04	23,25	24,82	26,48	26,03	25,58	25,19	25,67	26,40	26,44	25,16	23,63	25,32	27,02	26,36
32	27,36	26,60	26,26	25,63	24,57	26,55	28,69	28,23	27,95	27,72	30,46	33,37	33,76	34,23	34,48	35,09	35,31	34,78
33	40,11	38,08	37,11	35,73	33,72	35,87	38,52	37,87	37,52	37,21	35,44	33,75	34,18	34,47	34,44	30,19	25,64	25,44
Total	50,24	50,69	50,62	50,36	49,65	51,36	53,15	52,75	52,41	52,12	51,98	52,07	52,31	52,12	51,80	51,89	51,83	51,40

**Table A-11. Capital Price Index (1995=100)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	49.35	50.89	52.30	53.65	56.99	61.28	67.74	76.89	85.08	90.26	94.31	100.00	102.22	107.47	113.25	115.97	115.93	115.24	114.15
2	49.52	51.07	52.48	53.84	57.10	61.41	67.79	76.94	85.20	90.46	94.47	100.00	101.92	106.78	113.29	115.97	115.93	115.24	114.15
3	49.52	51.07	52.48	53.84	57.10	61.41	67.79	76.94	85.20	90.46	94.47	100.00	101.92	106.78	113.29	115.97	115.93	115.24	114.15
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	49.24	50.76	52.18	53.53	57.00	61.26	67.88	77.07	85.14	90.19	94.27	100.00	102.35	107.66	113.38	115.97	115.93	115.24	114.15
6	49.35	50.89	52.31	53.66	56.95	61.23	67.66	76.82	85.06	90.26	94.32	100.00	102.21	107.47	113.30	115.97	115.93	115.24	114.15
7	49.38	50.91	52.34	53.69	56.97	61.26	67.65	76.80	85.07	90.31	94.35	100.00	102.15	107.36	113.30	115.97	115.93	115.24	114.15
8	49.40	50.93	52.36	53.71	56.98	61.27	67.66	76.81	85.08	90.32	94.36	100.00	102.13	107.32	113.30	115.97	115.93	115.24	114.15
9	49.28	50.78	52.23	53.53	56.94	61.22	67.69	76.86	85.06	90.23	94.29	100.00	102.27	107.55	113.30	115.97	115.93	115.24	114.15
10	49.27	50.82	52.19	53.52	57.23	61.39	68.05	77.01	85.03	90.22	94.31	100.00	102.20	107.51	113.19	115.97	115.93	115.22	114.13
11	49.28	50.82	52.23	53.58	56.98	61.24	67.75	76.92	85.09	90.21	94.28	100.00	102.30	107.60	113.30	115.97	115.93	115.24	114.15
12	49.29	50.82	52.25	53.59	56.95	61.22	67.70	76.87	85.07	90.23	94.29	100.00	102.27	107.56	113.30	115.97	115.93	115.24	114.15
13	49.29	50.83	52.25	53.60	56.96	61.22	67.72	76.88	85.07	90.22	94.28	100.00	102.29	107.58	113.30	115.97	115.93	115.24	114.15
14	49.26	50.79	52.21	53.55	57.05	61.27	67.83	76.99	85.12	90.21	94.28	100.00	102.32	107.62	113.30	115.97	115.93	115.24	114.15
15	49.50	51.06	52.47	53.83	57.04	61.35	67.70	76.85	85.14	90.42	94.43	100.00	101.98	106.99	113.30	115.97	115.93	115.24	114.15
16	49.40	50.95	52.36	53.72	56.97	61.27	67.66	76.81	85.08	90.31	94.35	100.00	102.14	107.35	113.30	115.97	115.93	115.24	114.15
17	49.31	50.83	52.26	53.60	56.94	61.22	67.66	76.83	85.06	90.24	94.30	100.00	102.25	107.53	113.30	115.97	115.93	115.24	114.15
18	49.29	50.83	52.24	53.60	56.96	61.23	67.73	76.89	85.08	90.22	94.28	100.00	102.29	107.58	113.30	115.97	115.93	115.24	114.15
19	49.34	50.89	52.30	53.66	56.94	61.23	67.66	76.83	85.06	90.25	94.31	100.00	102.23	107.50	113.30	115.97	115.93	115.24	114.15
20	49.34	50.90	52.30	53.66	56.94	61.22	67.67	76.84	85.06	90.24	94.30	100.00	102.24	107.52	113.30	115.97	115.93	115.24	114.15
21	49.31	50.86	52.27	53.62	56.95	61.22	67.69	76.86	85.07	90.23	94.29	100.00	102.27	107.56	113.30	115.97	115.93	115.24	114.15
22	49.24	50.79	52.19	53.55	57.09	61.29	67.90	77.04	85.14	90.19	94.26	100.00	102.35	107.67	113.30	115.97	115.93	115.24	114.15
23	49.34	50.89	52.29	53.65	56.94	61.22	67.67	76.84	85.06	90.24	94.30	100.00	102.25	107.53	113.30	115.97	115.93	115.24	114.15
24	49.28	50.82	52.23	53.58	56.97	61.23	67.75	76.91	85.09	90.21	94.28	100.00	102.30	107.60	113.30	115.97	115.93	115.24	114.15
25	49.37	50.91	52.34	53.69	56.92	61.21	67.55	76.78	85.11	90.28	94.30	100.00	102.29	107.54	113.39	115.97	115.93	115.25	114.18
26	49.42	50.95	52.36	53.72	57.05	61.34	67.76	76.88	85.15	90.35	94.38	100.00	102.14	107.34	113.19	115.97	115.93	115.24	114.15
27	49.35	50.93	52.29	53.69	57.01	61.27	67.69	76.79	85.00	90.22	94.35	100.00	102.23	107.40	113.33	115.97	115.93	115.24	114.15
28	49.33	50.87	52.29	53.63	56.94	61.19	67.58	76.78	85.06	90.21	94.31	100.00	102.19	107.49	113.31	115.97	115.93	115.24	114.15
29	49.35	50.89	52.29	53.66	57.11	61.63	68.30	77.18	85.16	90.36	94.29	100.00	102.40	107.58	113.57	115.97	115.93	115.24	114.15
30	49.28	50.81	52.22	53.58	57.00	61.27	67.81	76.95	85.09	90.21	94.29	100.00	102.30	107.59	113.22	115.97	115.93	115.24	114.15
31	49.33	50.85	52.27	53.63	56.92	61.23	67.74	77.01	85.09	90.25	94.31	100.00	102.24	107.51	113.25	115.97	115.93	115.24	114.15
32	49.29	50.82	52.23	53.59	56.97	61.25	67.79	76.96	85.08	90.20	94.27	100.00	102.30	107.60	113.26	115.97	115.93	115.24	114.15
33	49.30	50.82	52.24	53.58	56.97	61.26	67.79	76.95	85.10	90.22	94.28	100.00	102.29	107.59	113.43	115.97	115.93	115.24	114.15
Total	49.32	50.85	52.26	53.62	56.95	61.24	67.73	76.92	85.08	90.23	94.30	100.00	102.26	107.54	113.30	115.97	115.93	115.24	114.15

**Table A-12-1. Capital Input Price (Building and Structure)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	0.64	0.61	0.58	0.55	0.48	0.48	0.47	0.44	0.41	0.39	0.46	0.44	0.44	0.33	0.32	0.39	0.35	0.33
2	0.14	0.13	0.13	0.12	0.10	0.11	0.11	0.10	0.09	0.07	0.07	0.10	0.17	0.43	0.40	0.39	0.32	0.27
3	0.15	0.16	0.17	0.19	0.20	0.49	0.57	0.65	0.76	0.94	1.13	1.27	1.63	1.71	1.61	1.45	1.23	1.06
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.26	0.33	0.40	0.46	0.42	0.45	0.41	0.37	0.33	0.31	0.21	0.18	0.16	0.21	0.18	0.12	0.09	0.06
6	0.09	0.08	0.06	0.09	0.07	0.12	0.11	0.09	0.07	0.06	0.17	0.16	0.17	0.20	0.16	0.22	0.18	0.16
7	-0.01	-0.01	-0.01	0.03	0.03	0.04	0.03	0.03	0.02	0.01	0.06	0.07	0.09	0.23	0.20	0.17	0.12	0.09
8	0.22	0.23	0.23	0.26	0.25	0.27	0.26	0.23	0.20	0.17	0.52	0.57	0.68	0.93	0.76	0.19	0.11	0.05
9	0.02	0.03	0.05	0.09	0.07	0.12	0.11	0.10	0.08	0.07	0.19	0.15	0.12	0.07	0.06	0.13	0.11	0.10
10	0.23	0.30	0.40	0.45	0.36	0.37	0.33	0.31	0.28	0.26	0.25	0.20	0.17	0.11	0.13	0.24	0.24	0.26
11	0.08	0.09	0.10	0.14	0.12	0.13	0.13	0.12	0.11	0.10	0.13	0.10	0.09	0.04	0.03	0.06	0.05	0.04
12	0.06	0.07	0.08	0.13	0.12	0.13	0.14	0.15	0.16	0.17	0.19	0.15	0.13	0.04	0.05	0.08	0.07	0.08
13	0.13	0.13	0.14	0.17	0.14	0.16	0.16	0.16	0.15	0.15	0.19	0.18	0.19	0.14	0.13	0.13	0.11	0.10
14	0.27	0.16	0.05	-0.02	-0.03	0.04	0.03	0.01	0.00	-0.01	0.13	0.16	0.21	0.11	0.14	0.10	0.11	0.14
15	0.01	0.02	0.02	0.06	0.07	0.05	0.04	0.03	0.02	0.01	0.11	0.12	0.16	0.26	0.23	0.11	0.09	0.07
16	0.03	0.04	0.03	0.06	0.06	0.09	0.11	0.12	0.14	0.17	0.14	0.13	0.13	0.10	0.07	0.06	0.02	0.00
17	-0.04	-0.04	-0.04	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.02	-0.02	-0.02	-0.03	-0.04
18	0.44	0.52	0.58	0.69	0.70	0.60	0.62	0.62	0.61	0.62	0.65	0.59	0.56	0.62	0.56	0.55	0.45	0.38
19	0.04	0.06	0.08	0.14	0.15	0.13	0.15	0.16	0.17	0.19	0.15	0.12	0.11	0.09	0.11	0.15	0.16	0.18
20	0.03	0.05	0.06	0.13	0.15	0.10	0.11	0.13	0.14	0.16	0.36	0.37	0.41	0.29	0.36	0.45	0.49	0.55
21	0.00	0.03	0.06	0.13	0.15	0.15	0.17	0.17	0.18	0.20	0.10	0.07	0.05	0.01	0.03	0.07	0.09	0.12
22	0.06	0.06	0.05	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.05	0.02	0.01	0.01
23	0.19	0.21	0.22	0.27	0.27	0.19	0.22	0.24	0.26	0.29	0.26	0.23	0.23	0.27	0.31	0.24	0.25	0.27
24	0.14	0.16	0.17	0.22	0.20	0.27	0.27	0.25	0.24	0.23	0.24	0.21	0.20	0.12	0.12	0.22	0.21	0.22
25	0.15	0.16	0.16	0.20	0.20	0.28	0.29	0.28	0.26	0.25	0.30	0.27	0.25	0.23	0.23	0.21	0.19	0.18
26	0.04	0.04	0.04	0.06	0.05	0.05	0.06	0.06	0.07	0.08	0.09	0.11	0.13	0.17	0.18	0.13	0.12	0.10
27	0.14	0.15	0.15	0.17	0.16	0.16	0.18	0.20	0.22	0.24	0.25	0.30	0.38	0.43	0.47	0.36	0.37	0.42
28	0.12	0.11	0.10	0.10	0.09	0.10	0.11	0.12	0.12	0.13	0.12	0.14	0.15	0.14	0.14	0.17	0.17	0.17
29	0.04	0.06	0.07	0.09	0.07	0.04	0.04	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.05	0.04	0.04	0.05
30	0.44	0.48	0.51	0.52	0.46	0.44	0.43	0.41	0.39	0.38	0.29	0.25	0.23	0.18	0.24	0.22	0.25	0.28
31	0.05	0.06	0.07	0.08	0.08	0.09	0.09	0.09	0.10	0.11	0.11	0.11	0.12	0.15	0.17	0.19	0.20	0.21
32	0.19	0.20	0.21	0.22	0.19	0.18	0.19	0.20	0.21	0.23	0.25	0.24	0.25	0.25	0.27	0.26	0.26	0.27
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03
Total	0.10	0.11	0.12	0.14	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16

**Table A-12-2. Capital Input Price (Transportation Equipment)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	0.77	0.75	0.72	0.63	0.56	0.57	0.57	0.55	0.53	0.52	0.60	0.58	0.58	0.49	0.48	0.55	0.51	0.49
2	0.27	0.27	0.26	0.19	0.18	0.20	0.21	0.21	0.21	0.20	0.20	0.24	0.32	0.59	0.56	0.55	0.48	0.43
3	0.28	0.30	0.31	0.27	0.28	0.58	0.67	0.76	0.87	1.06	1.26	1.41	1.78	1.87	1.77	1.61	1.39	1.22
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.39	0.47	0.54	0.53	0.50	0.53	0.51	0.48	0.45	0.44	0.34	0.32	0.30	0.37	0.34	0.28	0.25	0.22
6	0.22	0.21	0.20	0.16	0.15	0.21	0.21	0.20	0.19	0.18	0.30	0.30	0.32	0.35	0.32	0.38	0.34	0.32
7	0.12	0.13	0.13	0.11	0.11	0.13	0.13	0.14	0.14	0.14	0.19	0.21	0.24	0.39	0.36	0.33	0.28	0.25
8	0.35	0.36	0.37	0.33	0.33	0.36	0.36	0.34	0.32	0.29	0.65	0.71	0.83	1.09	0.92	0.35	0.27	0.21
9	0.15	0.17	0.18	0.16	0.15	0.21	0.21	0.21	0.20	0.20	0.32	0.29	0.26	0.23	0.22	0.30	0.27	0.26
10	0.36	0.44	0.54	0.52	0.44	0.46	0.43	0.42	0.40	0.38	0.38	0.34	0.32	0.26	0.29	0.40	0.40	0.42
11	0.21	0.22	0.23	0.21	0.20	0.22	0.23	0.23	0.23	0.23	0.26	0.24	0.23	0.19	0.19	0.22	0.21	0.20
12	0.19	0.21	0.22	0.21	0.20	0.22	0.24	0.26	0.28	0.29	0.32	0.29	0.28	0.20	0.21	0.24	0.23	0.24
13	0.26	0.27	0.27	0.25	0.22	0.25	0.26	0.27	0.27	0.28	0.32	0.32	0.33	0.30	0.29	0.29	0.27	0.26
14	0.40	0.29	0.18	0.06	0.05	0.13	0.13	0.13	0.12	0.11	0.26	0.30	0.36	0.27	0.30	0.26	0.27	0.30
15	0.15	0.15	0.16	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.25	0.26	0.31	0.42	0.39	0.28	0.25	0.23
16	0.16	0.17	0.17	0.14	0.14	0.18	0.21	0.23	0.26	0.29	0.27	0.27	0.28	0.25	0.23	0.22	0.18	0.15
17	0.09	0.09	0.10	0.07	0.08	0.09	0.10	0.11	0.11	0.12	0.12	0.14	0.15	0.14	0.14	0.14	0.13	0.12
18	0.57	0.65	0.72	0.76	0.78	0.69	0.72	0.73	0.73	0.75	0.78	0.72	0.71	0.77	0.72	0.71	0.61	0.54
19	0.17	0.20	0.22	0.21	0.23	0.22	0.25	0.27	0.29	0.32	0.28	0.26	0.26	0.25	0.27	0.32	0.32	0.34
20	0.16	0.18	0.20	0.20	0.23	0.19	0.21	0.24	0.26	0.28	0.49	0.51	0.56	0.45	0.52	0.61	0.65	0.71
21	0.13	0.16	0.19	0.20	0.23	0.24	0.27	0.29	0.30	0.32	0.23	0.21	0.19	0.16	0.19	0.23	0.25	0.28
22	0.19	0.20	0.19	0.15	0.13	0.09	0.10	0.11	0.12	0.13	0.15	0.15	0.16	0.21	0.21	0.18	0.17	0.17
23	0.32	0.34	0.35	0.34	0.35	0.28	0.32	0.35	0.38	0.42	0.39	0.37	0.38	0.42	0.47	0.40	0.41	0.43
24	0.27	0.29	0.31	0.30	0.28	0.36	0.37	0.36	0.36	0.36	0.37	0.35	0.34	0.27	0.28	0.38	0.37	0.38
25	0.29	0.30	0.30	0.27	0.28	0.37	0.39	0.39	0.37	0.37	0.43	0.41	0.39	0.39	0.39	0.37	0.35	0.34
26	0.17	0.17	0.17	0.13	0.13	0.14	0.16	0.17	0.19	0.21	0.22	0.25	0.28	0.33	0.34	0.29	0.28	0.26
27	0.28	0.28	0.29	0.24	0.24	0.25	0.28	0.31	0.34	0.37	0.39	0.44	0.52	0.58	0.63	0.52	0.53	0.58
28	0.25	0.24	0.23	0.17	0.17	0.19	0.21	0.23	0.24	0.26	0.26	0.28	0.30	0.29	0.30	0.33	0.33	0.33
29	0.18	0.19	0.21	0.17	0.15	0.13	0.14	0.15	0.15	0.16	0.17	0.19	0.21	0.21	0.21	0.20	0.20	0.21
30	0.57	0.61	0.65	0.59	0.54	0.53	0.53	0.52	0.51	0.51	0.42	0.39	0.38	0.33	0.40	0.38	0.41	0.44
31	0.18	0.19	0.20	0.15	0.16	0.17	0.19	0.20	0.22	0.23	0.24	0.25	0.27	0.31	0.33	0.35	0.36	0.37
32	0.32	0.34	0.35	0.29	0.27	0.27	0.29	0.31	0.33	0.36	0.39	0.38	0.39	0.40	0.43	0.42	0.42	0.42
33	0.13	0.13	0.14	0.07	0.08	0.09	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16	0.16	0.19	0.19	0.18
Total	0.24	0.25	0.26	0.21	0.21	0.22	0.24	0.25	0.26	0.27	0.28	0.28	0.30	0.30	0.31	0.32	0.32	0.32

**Table A-12-3. Capital Input Price (Machinery)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	0.71	0.68	0.65	0.59	0.51	0.52	0.52	0.49	0.47	0.45	0.53	0.51	0.51	0.40	0.40	0.46	0.43	0.40
2	0.21	0.20	0.20	0.15	0.14	0.15	0.16	0.15	0.14	0.13	0.13	0.16	0.24	0.50	0.47	0.47	0.40	0.34
3	0.22	0.23	0.24	0.23	0.23	0.53	0.62	0.70	0.81	0.99	1.19	1.33	1.70	1.79	1.69	1.52	1.30	1.14
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.33	0.40	0.47	0.49	0.46	0.49	0.45	0.42	0.39	0.37	0.27	0.24	0.23	0.29	0.26	0.19	0.16	0.14
6	0.16	0.15	0.14	0.12	0.11	0.16	0.15	0.14	0.13	0.11	0.23	0.23	0.24	0.27	0.24	0.30	0.26	0.23
7	0.06	0.06	0.07	0.07	0.06	0.08	0.08	0.08	0.07	0.07	0.12	0.13	0.16	0.30	0.27	0.25	0.20	0.17
8	0.28	0.30	0.30	0.29	0.28	0.32	0.31	0.28	0.25	0.22	0.58	0.63	0.75	1.01	0.84	0.27	0.19	0.13
9	0.09	0.10	0.12	0.12	0.11	0.16	0.16	0.15	0.14	0.13	0.25	0.21	0.19	0.14	0.14	0.21	0.19	0.18
10	0.29	0.37	0.48	0.48	0.40	0.41	0.38	0.36	0.34	0.31	0.31	0.26	0.24	0.18	0.20	0.32	0.32	0.33
11	0.15	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.16	0.19	0.17	0.16	0.11	0.11	0.14	0.13	0.12
12	0.12	0.14	0.16	0.17	0.16	0.17	0.19	0.20	0.21	0.23	0.25	0.21	0.20	0.12	0.12	0.16	0.15	0.15
13	0.19	0.20	0.21	0.21	0.17	0.20	0.21	0.21	0.21	0.21	0.25	0.25	0.26	0.21	0.21	0.20	0.18	0.18
14	0.33	0.23	0.12	0.02	0.01	0.08	0.08	0.07	0.06	0.05	0.19	0.23	0.28	0.19	0.21	0.17	0.19	0.21
15	0.08	0.09	0.09	0.10	0.11	0.09	0.09	0.09	0.08	0.07	0.18	0.19	0.23	0.33	0.30	0.19	0.16	0.14
16	0.10	0.11	0.10	0.10	0.10	0.13	0.15	0.17	0.19	0.23	0.20	0.19	0.20	0.17	0.15	0.14	0.10	0.07
17	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.06	0.05	0.06	0.07	0.06	0.05	0.05	0.04	0.04
18	0.51	0.59	0.66	0.72	0.73	0.64	0.67	0.67	0.67	0.68	0.71	0.65	0.63	0.69	0.63	0.63	0.53	0.46
19	0.11	0.13	0.15	0.17	0.19	0.17	0.19	0.21	0.23	0.25	0.21	0.19	0.18	0.17	0.19	0.23	0.24	0.25
20	0.10	0.12	0.14	0.16	0.18	0.14	0.16	0.18	0.19	0.22	0.42	0.44	0.48	0.37	0.43	0.52	0.56	0.63
21	0.06	0.10	0.13	0.16	0.19	0.19	0.21	0.23	0.24	0.26	0.16	0.13	0.11	0.08	0.10	0.15	0.17	0.19
22	0.13	0.13	0.13	0.11	0.09	0.04	0.05	0.05	0.06	0.06	0.08	0.08	0.08	0.13	0.13	0.09	0.09	0.08
23	0.26	0.28	0.29	0.30	0.31	0.23	0.26	0.29	0.32	0.35	0.32	0.30	0.30	0.34	0.38	0.32	0.33	0.35
24	0.21	0.23	0.25	0.26	0.24	0.31	0.31	0.31	0.29	0.29	0.30	0.28	0.27	0.19	0.20	0.29	0.29	0.30
25	0.22	0.23	0.23	0.23	0.24	0.32	0.34	0.33	0.31	0.30	0.36	0.33	0.31	0.31	0.31	0.29	0.27	0.25
26	0.10	0.11	0.11	0.09	0.09	0.09	0.10	0.11	0.12	0.14	0.15	0.17	0.20	0.25	0.26	0.21	0.19	0.18
27	0.21	0.22	0.22	0.20	0.20	0.20	0.22	0.25	0.27	0.30	0.31	0.36	0.45	0.50	0.55	0.43	0.45	0.50
28	0.19	0.18	0.17	0.13	0.12	0.14	0.16	0.17	0.18	0.19	0.19	0.20	0.22	0.21	0.22	0.25	0.24	0.24
29	0.11	0.13	0.14	0.13	0.11	0.08	0.08	0.09	0.09	0.09	0.10	0.11	0.13	0.13	0.13	0.12	0.12	0.13
30	0.51	0.55	0.58	0.55	0.50	0.48	0.48	0.46	0.45	0.44	0.35	0.32	0.30	0.25	0.31	0.30	0.32	0.36
31	0.12	0.13	0.14	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.23	0.25	0.26	0.27	0.28
32	0.26	0.27	0.28	0.25	0.23	0.22	0.24	0.25	0.27	0.29	0.32	0.31	0.32	0.32	0.35	0.34	0.34	0.34
33	0.07	0.07	0.07	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.10	0.10	0.10
Total	0.17	0.18	0.19	0.17	0.17	0.18	0.19	0.19	0.19	0.20	0.21	0.21	0.22	0.22	0.23	0.24	0.23	0.24

**Table A-12-4. Capital Input Price (Total Asset)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	1.31	1.22	1.12	1.03	0.85	0.80	0.73	0.61	0.50	0.45	0.51	0.46	0.43	0.32	0.28	0.31	0.28	0.25
2	0.29	0.27	0.25	0.25	0.22	0.25	0.25	0.20	0.13	0.10	0.10	0.12	0.18	0.41	0.34	0.31	0.25	0.20
3	0.32	0.33	0.34	0.39	0.38	0.82	0.87	0.86	0.90	1.04	1.19	1.27	1.54	1.54	1.39	1.22	1.04	0.90
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.54	0.66	0.78	0.87	0.75	0.75	0.65	0.52	0.41	0.36	0.25	0.20	0.17	0.22	0.16	0.08	0.04	0.02
6	0.19	0.17	0.13	0.19	0.16	0.25	0.24	0.18	0.11	0.08	0.21	0.19	0.19	0.20	0.14	0.17	0.13	0.10
7	-0.01	-0.01	-0.01	0.09	0.09	0.13	0.15	0.11	0.05	0.03	0.09	0.09	0.11	0.23	0.17	0.12	0.08	0.05
8	0.45	0.46	0.44	0.50	0.46	0.49	0.45	0.35	0.26	0.20	0.57	0.59	0.66	0.85	0.66	0.14	0.07	0.01
9	0.06	0.08	0.09	0.19	0.17	0.25	0.25	0.19	0.13	0.10	0.23	0.17	0.13	0.09	0.05	0.09	0.07	0.06
10	0.47	0.60	0.78	0.84	0.65	0.64	0.54	0.45	0.36	0.30	0.29	0.22	0.18	0.12	0.11	0.18	0.18	0.19
11	0.17	0.18	0.19	0.29	0.25	0.28	0.27	0.22	0.16	0.13	0.17	0.13	0.11	0.06	0.03	0.03	0.01	0.01
12	0.13	0.15	0.17	0.27	0.25	0.27	0.29	0.26	0.21	0.20	0.23	0.17	0.14	0.07	0.04	0.05	0.04	0.04
13	0.27	0.27	0.27	0.34	0.27	0.32	0.32	0.27	0.21	0.19	0.23	0.21	0.20	0.15	0.12	0.08	0.07	0.06
14	0.55	0.32	0.09	0.00	0.00	0.14	0.14	0.09	0.03	0.01	0.16	0.19	0.22	0.13	0.12	0.06	0.07	0.09
15	0.04	0.05	0.05	0.15	0.17	0.15	0.16	0.12	0.06	0.03	0.15	0.15	0.17	0.26	0.20	0.07	0.05	0.03
16	0.08	0.08	0.07	0.15	0.15	0.21	0.24	0.22	0.19	0.20	0.18	0.16	0.15	0.11	0.06	0.03	-0.01	-0.04
17	-0.07	-0.07	-0.07	0.03	0.04	0.07	0.09	0.07	0.03	0.02	0.03	0.02	0.03	0.01	-0.02	-0.04	-0.06	-0.07
18	0.90	1.03	1.13	1.28	1.22	0.99	0.93	0.83	0.74	0.70	0.70	0.60	0.55	0.57	0.48	0.45	0.36	0.30
19	0.10	0.13	0.15	0.28	0.30	0.27	0.30	0.27	0.23	0.23	0.19	0.15	0.13	0.11	0.10	0.11	0.11	0.12
20	0.07	0.10	0.13	0.27	0.29	0.22	0.25	0.23	0.19	0.19	0.41	0.39	0.41	0.29	0.31	0.36	0.39	0.45
21	0.00	0.06	0.11	0.26	0.30	0.30	0.32	0.29	0.24	0.24	0.13	0.09	0.07	0.04	0.02	0.04	0.05	0.07
22	0.14	0.13	0.11	0.17	0.13	0.08	0.10	0.08	0.03	0.02	0.05	0.04	0.04	0.08	0.04	-0.01	-0.02	-0.03
23	0.40	0.42	0.42	0.52	0.51	0.36	0.39	0.36	0.33	0.34	0.30	0.26	0.24	0.27	0.26	0.19	0.19	0.21
24	0.29	0.32	0.34	0.44	0.38	0.48	0.46	0.38	0.31	0.27	0.28	0.23	0.21	0.13	0.11	0.16	0.15	0.16
25	0.32	0.33	0.31	0.39	0.38	0.50	0.49	0.41	0.33	0.29	0.34	0.29	0.25	0.24	0.20	0.16	0.14	0.12
26	0.08	0.08	0.07	0.14	0.13	0.15	0.18	0.15	0.11	0.11	0.13	0.13	0.15	0.18	0.16	0.09	0.07	0.06
27	0.30	0.30	0.30	0.34	0.31	0.31	0.34	0.31	0.28	0.28	0.29	0.32	0.38	0.40	0.41	0.28	0.29	0.34
28	0.25	0.22	0.19	0.21	0.19	0.23	0.25	0.22	0.17	0.16	0.16	0.16	0.17	0.15	0.12	0.12	0.12	0.11
29	0.10	0.12	0.14	0.20	0.16	0.14	0.15	0.12	0.07	0.06	0.07	0.08	0.08	0.08	0.05	0.01	0.01	0.01
30	0.90	0.95	0.99	0.97	0.82	0.74	0.68	0.57	0.48	0.44	0.33	0.28	0.24	0.19	0.20	0.17	0.19	0.22
31	0.11	0.12	0.13	0.17	0.18	0.20	0.22	0.19	0.14	0.13	0.14	0.14	0.14	0.16	0.15	0.14	0.14	0.15
32	0.39	0.41	0.41	0.42	0.37	0.34	0.36	0.32	0.28	0.27	0.30	0.26	0.25	0.25	0.23	0.20	0.20	0.20
33	0.01	0.01	0.00	0.03	0.05	0.08	0.10	0.07	0.03	0.02	0.03	0.03	0.03	0.03	0.00	0.00	-0.01	-0.01
Total	0.22	0.23	0.24	0.29	0.27	0.28	0.29	0.24	0.19	0.18	0.19	0.17	0.16	0.16	0.13	0.11	0.11	0.11

**Table A-13. Energy Price Index (1995=100)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	83.96	90.71	83.06	83.33	80.72	79.34	78.57	82.72	85.03	86.91	90.72	100.00	101.94	108.78	123.63	117.07	127.52	128.65	125.36
2	96.65	103.08	98.41	96.72	91.94	87.27	84.64	87.21	92.86	94.34	96.49	100.00	104.14	109.17	125.38	123.96	134.41	140.56	137.39
3	90.34	97.86	91.39	90.63	86.82	83.67	81.01	84.54	88.16	89.90	93.06	100.00	102.92	108.96	124.34	119.77	129.73	132.38	129.10
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	86.58	92.26	84.42	84.46	81.46	79.64	78.56	82.71	85.01	86.90	90.70	100.00	101.55	105.04	119.48	115.01	123.02	124.14	123.99
6	90.80	96.51	90.13	89.39	85.68	82.63	81.81	85.14	89.18	90.87	93.82	100.00	103.17	108.65	124.09	120.09	129.96	133.12	130.23
7	94.20	100.12	94.66	93.37	89.04	85.06	82.79	85.84	90.46	92.09	94.75	100.00	103.34	108.99	124.63	121.47	132.00	136.33	133.13
8	92.38	99.63	94.03	92.82	88.60	84.77	82.76	85.81	90.41	92.04	94.71	100.00	102.63	108.91	124.10	118.86	128.39	130.10	126.81
9	92.54	100.76	95.59	94.16	89.69	85.48	82.76	85.82	90.42	92.05	94.72	100.00	103.38	109.04	124.65	121.01	131.61	135.62	132.40
10	92.15	98.94	93.24	92.19	88.09	84.44	81.92	85.20	89.32	91.01	93.92	100.00	102.81	108.61	124.03	119.24	129.20	131.75	128.77
11	91.17	97.65	91.46	90.61	86.74	83.47	82.22	85.44	89.70	91.36	94.20	100.00	103.29	108.20	123.54	120.86	130.17	134.34	132.41
12	90.69	99.29	93.60	92.51	88.40	84.72	81.45	84.90	88.72	90.42	93.48	100.00	103.12	109.00	124.40	120.03	130.86	134.32	131.08
13	89.83	94.49	87.49	87.14	83.82	81.39	79.67	83.57	86.43	88.25	91.78	100.00	102.28	108.56	123.36	117.13	127.96	129.65	126.64
14	65.89	72.68	75.89	79.07	81.21	83.39	86.32	93.37	94.58	93.74	97.91	100.00	101.05	102.52	113.05	111.93	109.35	109.16	116.47
15	91.26	95.84	89.15	88.57	85.02	82.23	82.16	85.38	89.64	91.31	94.15	100.00	103.03	108.76	123.99	119.54	129.46	132.20	129.22
16	81.80	87.97	85.77	86.56	84.95	83.53	82.19	86.54	89.54	90.68	94.11	100.00	101.62	104.32	117.63	115.03	118.23	119.26	122.34
17	88.29	93.72	86.96	86.62	83.47	81.17	79.69	83.59	86.45	88.26	91.79	100.00	101.79	105.62	117.91	114.93	116.76	117.66	121.59
18	92.31	80.57	75.78	74.95	71.91	69.29	82.41	85.58	89.95	91.60	94.38	100.00	103.58	108.99	124.86	122.21	132.70	137.63	134.54
19	92.31	97.22	90.90	90.14	86.36	83.23	82.04	85.30	89.48	91.16	94.04	100.00	103.02	108.88	124.25	119.99	130.53	133.86	130.74
20	93.14	98.63	92.65	91.65	87.61	84.08	82.47	85.61	90.03	91.68	94.44	100.00	103.49	108.74	124.40	121.39	132.17	136.86	133.94
21	94.24	97.89	91.76	90.88	86.98	83.65	81.91	85.20	89.31	91.00	93.91	100.00	103.26	109.01	124.47	120.36	131.19	134.91	131.68
22	91.67	99.60	93.85	92.70	88.50	84.73	81.47	84.87	88.75	90.46	93.49	100.00	103.03	108.89	124.22	119.61	130.60	133.92	130.73
23	94.34	101.28	96.01	94.58	90.05	85.82	83.33	86.23	91.16	92.75	95.26	100.00	103.67	109.05	124.72	121.52	132.15	136.57	133.36
24	95.07	99.13	93.29	92.21	88.07	84.40	82.47	85.61	90.04	91.69	94.45	100.00	103.29	109.02	124.47	120.36	131.47	135.40	132.20
25	92.00	97.23	91.19	90.43	86.67	83.50	81.93	85.21	89.33	91.02	93.93	100.00	103.42	108.97	124.56	121.21	131.42	135.45	132.38
26	84.97	90.37	82.17	82.43	79.80	78.51	77.98	82.28	84.28	86.20	90.15	100.00	101.69	108.75	123.22	115.52	126.90	127.61	124.29
27	91.84	100.30	94.40	93.29	89.08	85.35	83.12	86.08	90.88	92.49	95.06	100.00	103.72	109.10	124.78	121.54	132.83	137.76	134.55
28	82.66	84.81	80.45	81.63	80.36	79.98	82.94	86.87	90.54	91.73	94.84	100.00	102.77	107.56	120.56	118.66	125.16	127.98	128.36
29	94.87	102.70	97.86	96.18	91.42	86.81	85.13	89.88	93.25	93.64	96.85	100.00	101.90	104.64	116.05	114.76	112.80	113.40	119.62
30	89.24	96.65	89.90	89.35	85.77	82.97	80.62	84.26	87.64	89.40	92.68	100.00	102.72	108.93	124.09	118.80	130.69	134.05	130.84
31	92.12	103.27	98.34	96.68	91.90	87.28	83.60	86.42	91.51	93.09	95.51	100.00	104.05	109.16	125.35	123.87	134.40	140.55	137.39
32	90.36	99.31	93.24	92.26	88.21	84.69	81.70	85.05	89.04	90.74	93.71	100.00	103.04	108.98	124.28	119.58	130.57	133.82	130.57
33	83.24	93.06	85.47	85.41	82.38	80.45	79.42	83.36	86.11	87.95	91.53	100.00	102.95	108.91	124.23	119.57	130.79	134.22	131.01
Total	77.93	84.31	82.25	83.50	82.50	81.92	82.40	87.10	89.81	90.76	94.34	100.00	102.08	106.30	119.12	115.93	119.99	121.21	123.44

**Table A-14. Material Price Index (1995=100)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	62.20	66.88	66.68	69.20	72.28	75.09	78.51	83.61	86.29	89.74	95.27	100.00	104.48	107.09	120.43	119.95	118.09	120.65	121.69
2	58.57	61.39	62.06	64.37	67.06	69.31	73.04	79.00	83.00	87.82	93.30	100.00	104.61	107.52	120.72	119.69	116.87	120.98	120.69
3	59.05	62.68	63.14	64.72	66.96	69.27	73.41	79.97	85.11	89.26	93.97	100.00	104.41	108.12	122.43	119.28	120.72	126.58	127.37
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	61.82	60.57	61.44	62.44	64.09	65.73	73.15	80.79	86.05	89.59	93.69	100.00	102.66	102.99	119.88	110.03	104.36	104.53	101.20
6	56.41	60.08	60.41	64.38	68.85	72.44	77.68	82.55	84.62	88.73	95.74	100.00	103.43	103.44	112.95	113.05	111.71	113.39	115.61
7	57.87	63.64	63.79	66.52	67.92	69.01	69.04	74.84	79.60	84.46	91.32	100.00	103.74	107.50	125.54	116.88	118.03	120.10	115.33
8	51.98	55.55	58.08	60.98	62.86	64.22	65.72	72.07	78.06	83.91	91.42	100.00	104.83	107.74	128.74	117.98	115.34	118.17	112.69
9	54.99	58.70	59.00	63.25	67.59	70.67	74.88	79.80	82.27	87.50	94.00	100.00	103.99	104.78	117.51	115.57	116.67	118.36	120.09
10	60.96	63.54	64.33	66.41	68.58	69.80	71.77	77.88	82.29	87.83	91.87	100.00	104.37	106.12	122.20	115.56	112.91	114.00	112.72
11	57.67	61.58	62.24	62.75	64.49	65.96	67.20	73.37	78.94	84.59	91.71	100.00	103.97	104.76	123.85	119.54	121.93	124.26	126.19
12	58.78	61.68	62.21	62.82	64.57	66.19	67.48	73.69	79.39	84.99	91.88	100.00	104.13	105.28	123.29	120.22	122.24	125.33	127.24
13	72.71	77.92	74.22	75.13	74.73	75.05	75.60	81.06	84.24	86.91	91.42	100.00	102.45	108.03	122.08	115.88	122.98	124.88	123.11
14	56.58	61.57	62.22	63.29	65.42	67.14	72.06	78.61	83.37	87.71	93.29	100.00	102.95	105.20	120.18	114.56	114.05	115.82	113.30
15	56.26	62.85	64.56	66.44	68.33	70.07	70.13	76.20	81.49	86.48	92.99	100.00	105.06	107.73	125.51	119.09	116.19	118.52	115.48
16	64.83	69.40	70.59	71.78	73.60	75.13	79.31	87.34	91.41	92.70	95.73	100.00	102.39	104.55	119.25	115.09	111.43	113.99	116.22
17	63.09	67.35	68.83	70.94	73.75	75.11	74.84	80.25	85.05	88.77	93.89	100.00	101.85	104.34	119.95	113.47	111.60	112.29	114.51
18	60.59	51.11	51.90	53.03	54.72	55.94	69.70	75.42	80.64	85.73	92.07	100.00	101.23	100.82	120.22	107.42	101.85	100.04	96.08
19	59.11	61.44	62.45	63.44	64.82	66.60	68.54	75.02	80.11	85.24	91.89	100.00	100.82	98.34	118.69	102.81	95.74	92.95	86.96
20	60.30	62.81	63.67	64.60	65.92	67.57	69.26	75.91	81.03	85.86	92.10	100.00	101.14	99.40	118.90	103.40	96.37	93.69	87.82
21	67.48	66.98	68.00	69.42	70.96	72.81	80.86	86.55	90.07	92.86	95.95	100.00	102.88	104.58	126.27	114.55	106.79	108.25	104.78
22	61.34	62.63	63.68	64.94	66.60	68.61	72.20	78.38	83.03	87.53	93.23	100.00	101.63	100.63	121.26	106.21	99.59	97.99	92.59
23	59.12	62.78	63.68	64.63	66.11	67.85	69.94	76.77	82.01	86.62	92.56	100.00	102.75	102.79	119.30	107.00	100.50	99.15	94.13
24	66.36	74.37	71.21	72.53	72.43	72.76	75.53	81.43	84.79	87.40	91.68	100.00	102.29	106.73	121.84	114.42	118.08	119.56	117.48
25	58.84	59.93	61.63	63.71	65.50	66.90	70.44	77.00	82.15	86.70	92.35	100.00	103.38	105.60	122.47	115.02	112.23	113.72	111.77
26	58.41	63.50	64.65	66.06	68.63	70.62	74.57	81.12	86.17	90.44	95.13	100.00	103.35	106.66	119.95	117.49	116.31	119.82	118.98
27	59.38	61.95	62.92	63.82	65.91	67.61	69.51	76.25	81.77	87.15	93.40	100.00	103.47	105.70	119.02	114.87	114.57	117.02	115.33
28	54.72	59.26	59.57	61.03	63.56	66.31	69.74	77.62	83.25	87.13	92.32	100.00	103.94	108.06	120.09	115.59	116.52	119.52	119.29
29	61.24	58.34	59.04	60.52	63.12	65.94	69.41	76.56	82.25	86.59	92.68	100.00	103.73	106.48	120.23	115.40	116.96	120.39	119.43
30	52.49	55.72	57.27	58.87	62.09	64.92	68.78	75.87	81.92	86.99	93.61	100.00	104.46	107.97	120.40	123.54	118.82	122.85	125.04
31	47.74	50.27	51.74	53.54	57.54	61.74	67.49	75.75	82.64	87.09	93.28	100.00	105.42	110.45	120.35	123.27	123.76	130.80	134.84
32	57.83	59.62	60.39	61.89	64.44	66.98	69.93	76.48	82.04	86.67	92.77	100.00	104.90	108.81	121.26	120.52	121.22	125.96	126.23
33	61.78	63.54	64.25	65.70	67.87	70.34	73.12	79.62	84.47	88.76	93.94	100.00	102.96	104.79	121.44	114.42	111.67	113.81	111.45
Total	59.40	61.49	62.11	64.05	66.33	68.36	72.31	78.62	83.26	87.54	93.25	100.00	102.88	104.26	120.35	112.77	109.48	110.15	107.49

**Table A-15. Price Index of Commodities from V-Table (1995=100)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	53.10	55.73	55.89	60.89	66.01	69.88	77.87	81.92	82.72	87.33	96.00	100.00	102.17	100.48	106.99	108.27	108.56	109.62	112.31
2	64.99	70.39	74.03	77.33	79.72	82.12	87.01	94.36	95.48	94.37	98.57	100.00	100.96	102.01	112.39	111.60	108.30	108.00	115.82
3	64.99	70.39	74.03	77.33	79.72	82.12	87.01	94.36	95.48	94.37	98.57	100.00	100.96	102.01	112.39	111.60	108.30	108.00	115.82
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	45.35	47.35	47.63	49.09	53.12	58.17	67.21	78.18	85.39	88.58	92.58	100.00	105.10	111.96	118.90	117.22	119.05	123.02	128.59
6	71.13	75.49	76.30	75.62	78.41	82.02	87.31	91.44	93.38	95.12	98.25	100.00	107.07	109.42	124.10	125.42	118.87	120.47	123.54
7	50.17	52.57	55.53	58.69	60.44	61.54	63.46	69.63	75.91	82.42	90.76	100.00	105.28	108.02	133.82	117.80	114.32	116.52	108.40
8	50.17	52.57	55.53	58.69	60.44	61.54	63.46	69.63	75.91	82.42	90.76	100.00	105.28	108.02	133.82	117.80	114.32	116.52	108.40
9	62.74	65.07	66.20	69.73	72.57	72.27	72.81	77.33	80.25	88.38	89.92	100.00	106.77	108.21	125.33	120.76	124.29	126.18	129.56
10	56.41	59.00	59.86	59.87	61.54	62.87	64.76	70.76	76.71	83.20	91.11	100.00	104.14	103.56	125.07	114.53	110.85	114.37	114.51
11	56.41	59.00	59.86	59.87	61.54	62.87	64.76	70.76	76.71	83.20	91.11	100.00	104.14	103.56	125.33	120.76	124.29	126.18	129.56
12	56.41	59.00	59.86	59.87	61.54	62.87	64.76	70.76	76.71	83.20	91.11	100.00	104.14	103.56	125.33	120.76	124.29	126.18	129.56
13	84.50	87.68	79.54	79.88	77.40	76.29	77.63	82.02	83.84	85.77	89.81	100.00	101.56	108.72	123.13	115.18	126.67	127.23	123.91
14	84.50	87.68	79.54	79.88	77.40	76.29	77.63	82.02	83.84	85.77	89.81	100.00	101.56	108.72	123.13	115.18	126.67	127.23	123.91
15	50.17	52.57	55.53	58.69	60.44	61.54	63.46	69.63	75.91	82.42	90.76	100.00	105.28	108.02	133.82	117.80	114.32	116.52	108.40
16	78.12	80.13	80.15	79.40	80.35	80.63	88.51	101.03	105.37	101.40	97.71	100.00	102.84	105.60	122.02	115.58	108.57	113.04	116.10
17	63.19	65.22	66.26	68.25	71.41	72.38	72.43	76.71	82.10	87.01	92.55	100.00	101.66	104.41	122.43	113.65	112.03	112.35	113.42
18	59.75	61.22	62.17	62.87	63.82	65.36	67.10	73.38	78.37	83.92	91.22	100.00	99.70	95.39	117.93	98.19	89.62	85.40	78.41
19	59.75	61.22	62.17	62.87	63.82	65.36	67.10	73.38	78.37	83.92	91.22	100.00	99.70	95.39	117.93	98.19	89.62	85.40	78.41
20	59.75	61.22	62.17	62.87	63.82	65.36	67.10	73.38	78.37	83.92	91.22	100.00	99.70	95.39	117.93	98.19	89.62	85.40	78.41
21	85.91	89.31	89.93	93.93	95.72	97.62	100.25	101.79	101.46	101.39	100.51	100.00	103.98	108.60	135.05	123.57	113.90	118.94	117.13
22	85.91	89.31	89.93	93.93	95.72	97.62	100.25	101.79	101.46	101.39	100.51	100.00	103.98	108.60	135.05	123.57	113.90	118.94	117.13
23	59.75	61.22	62.17	62.87	63.82	65.36	67.10	73.38	78.37	83.92	91.22	100.00	99.70	95.39	117.93	98.19	89.62	85.40	78.41
24	78.12	80.13	80.15	79.40	80.35	80.63	88.51	101.03	105.37	101.40	97.71	100.00	102.84	105.60	122.02	115.58	108.57	113.04	116.10
25	56.41	59.00	59.86	59.87	61.54	62.87	64.76	70.76	76.71	83.20	91.11	100.00	104.14	103.56	125.07	114.53	110.85	114.37	114.51
26	61.32	64.72	65.26	65.65	67.55	68.11	72.29	78.45	82.76	88.68	94.58	100.00	99.80	101.23	116.68	112.88	112.72	113.73	111.59
27	61.32	64.72	65.26	65.65	67.55	68.11	72.29	78.45	82.76	88.68	94.58	100.00	99.80	101.23	116.68	112.88	112.72	113.73	111.59
28	100.02	105.51	102.55	99.90	94.21	88.18	85.19	87.57	93.59	95.06	97.01	100.00	104.49	109.23	125.79	125.67	136.28	143.95	140.83
29	100.02	105.51	102.55	99.90	94.21	88.18	85.19	87.57	93.59	95.06	97.01	100.00	104.49	109.23	125.79	125.67	136.28	143.95	140.83
30	53.06	55.59	57.04	59.65	62.21	65.22	69.44	77.39	83.53	88.12	93.79	100.00	104.10	107.53	116.33	109.09	109.56	112.49	114.15
31	42.37	45.54	47.98	50.26	54.83	58.93	66.05	73.33	80.41	85.22	93.57	100.00	106.48	111.50	121.65	132.62	127.49	137.01	142.61
32	49.72	53.34	54.65	56.09	58.94	62.78	69.24	76.30	83.85	88.80	93.85	100.00	107.56	113.95	121.18	122.82	129.58	140.45	143.60
33	42.66	45.43	47.72	50.60	54.19	59.27	65.98	73.95	80.65	83.55	91.49	100.00	106.62	113.07	121.24	122.83	129.10	137.36	145.13

**Table A-16. Price Index of Gross Output Deflators by 33 Industries (1995=100)**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	52.40	55.98	55.15	59.92	64.53	67.91	76.21	80.72	81.98	86.60	95.87	100.00	102.44	100.02	104.88	107.77	104.69	102.51	104.42
2	63.35	65.72	69.83	72.42	74.45	72.29	80.13	87.82	84.25	86.00	96.41	100.00	102.58	108.09	123.75	119.11	123.01	128.23	132.58
3	63.65	67.11	71.34	73.74	75.37	72.74	80.51	88.41	84.66	86.09	96.48	100.00	101.50	108.46	124.50	118.82	124.40	129.74	133.91
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	48.78	51.49	52.44	54.87	58.72	63.01	70.71	79.75	85.80	89.28	93.27	100.00	104.04	106.80	113.97	110.11	107.73	109.52	109.93
6	56.16	58.42	58.80	62.36	66.63	70.12	76.32	81.39	83.99	88.37	95.30	100.00	104.66	105.41	115.90	116.95	116.17	118.48	121.48
7	54.88	58.10	59.65	63.51	63.53	64.13	65.34	72.99	79.63	85.95	92.29	100.00	102.36	104.71	118.44	109.76	111.29	117.60	114.31
8	49.67	52.16	54.02	55.54	59.58	62.28	64.32	72.45	79.04	85.21	92.07	100.00	107.66	109.31	127.96	116.83	114.08	125.91	121.04
9	50.30	51.72	52.76	57.29	61.41	63.51	67.43	71.91	75.59	86.45	92.91	100.00	102.33	103.62	117.13	120.82	124.15	125.21	124.30
10	51.70	52.00	53.26	55.53	60.03	61.52	62.13	69.26	76.00	84.21	90.19	100.00	104.96	105.49	116.41	108.10	104.30	117.18	117.01
11	59.44	62.00	62.54	63.25	65.59	67.19	68.62	75.54	80.24	83.43	90.08	100.00	104.17	103.90	123.00	118.36	122.77	124.94	130.34
12	52.41	54.96	57.49	56.77	57.24	57.41	60.90	68.79	76.02	84.55	98.23	100.00	105.07	107.42	112.61	124.08	126.66	128.27	133.17
13	72.61	75.53	73.93	74.74	74.47	74.52	75.33	79.69	82.34	84.73	89.86	100.00	99.12	102.07	118.09	110.17	116.88	120.68	120.33
14	65.09	70.05	74.58	76.53	79.07	79.43	74.25	89.22	90.12	90.81	96.75	100.00	104.39	109.93	121.70	119.20	115.55	116.21	122.92
15	54.72	58.20	58.41	60.05	61.99	63.76	65.17	71.58	78.71	84.06	92.74	100.00	107.42	110.93	134.36	126.74	119.30	126.75	123.02
16	69.01	71.82	71.59	72.21	74.47	76.25	81.41	90.25	94.48	97.64	97.62	100.00	103.01	105.12	119.82	115.73	113.96	116.82	119.97
17	66.47	69.06	70.06	72.79	75.73	75.87	76.20	81.80	85.30	88.76	92.78	100.00	100.75	103.65	118.32	113.78	113.21	112.89	115.89
18	58.54	58.58	60.68	61.86	64.61	66.77	66.87	72.90	79.20	84.34	90.76	100.00	102.91	103.24	122.85	111.48	109.48	108.68	104.14
19	64.33	66.35	66.40	65.02	67.49	71.32	74.67	80.26	85.93	91.04	95.79	100.00	102.14	101.39	120.84	104.87	104.61	103.09	97.39
20	63.84	66.11	65.27	64.25	66.72	68.79	71.44	76.38	81.88	86.82	93.06	100.00	97.85	92.27	103.50	88.93	80.81	69.30	63.53
21	71.03	69.33	68.75	69.05	70.93	72.90	82.91	87.69	91.14	94.28	96.14	100.00	102.31	103.86	122.42	110.67	105.29	111.46	108.54
22	62.41	64.40	61.97	61.49	65.52	68.40	74.59	83.80	87.80	93.72	98.01	100.00	104.27	107.18	137.43	119.87	106.72	101.92	97.77
23	64.91	68.86	70.95	69.15	70.34	72.54	74.80	80.19	85.46	89.60	95.68	100.00	104.19	106.83	127.71	115.55	106.99	116.41	111.49
24	65.09	71.48	66.95	70.37	70.02	71.59	74.60	79.88	84.34	87.20	91.55	100.00	105.35	108.01	124.13	117.65	121.47	128.70	125.32
25	58.75	60.33	60.16	60.62	62.20	64.33	64.69	73.00	80.39	86.37	91.93	100.00	103.92	110.72	131.05	122.90	120.97	123.40	122.26
26	55.94	58.05	60.10	61.21	62.23	65.65	68.20	75.22	80.82	87.35	93.26	100.00	101.85	103.53	118.78	112.39	112.56	113.28	113.46
27	97.77	106.86	105.37	108.04	108.41	102.05	102.79	104.56	103.68	101.92	100.22	100.00	99.85	90.92	88.45	81.88	75.55	71.93	69.35
28	87.55	90.54	89.65	89.24	86.85	83.73	79.07	83.77	90.37	92.24	95.65	100.00	99.70	101.90	112.07	115.59	115.95	117.84	117.53
29	66.12	69.20	73.76	77.44	82.02	78.71	77.26	82.77	86.61	91.79	94.71	100.00	103.84	104.49	121.98	121.69	118.17	121.38	125.13
30	55.83	57.82	59.59	62.16	64.59	66.93	71.13	77.74	83.41	87.81	93.63	100.00	101.19	101.76	105.96	109.63	113.41	116.82	117.55
31	37.07	40.80	43.62	46.30	51.83	57.17	64.98	72.25	80.29	84.60	93.20	100.00	106.06	111.05	114.80	120.76	119.86	125.54	135.68
32	39.66	42.17	44.34	47.14	50.63	55.33	62.35	69.95	77.57	83.57	91.14	100.00	107.85	114.13	121.47	121.63	124.93	132.70	136.63
33	38.46	39.81	41.69	45.11	48.49	53.86	61.18	69.68	77.10	82.55	90.24	100.00	107.01	112.95	123.32	121.88	128.96	139.91	147.08
Total	54.27	56.56	57.78	60.17	63.31	66.33	70.52	77.34	82.71	87.26	93.33	100.00	103.20	104.71	115.57	110.97	108.76	108.56	107.69

**Table A-17. Growth rate of the quality of capital input (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
2	-0.04	0.00	0.08	0.00	0.00	0.28	-0.01	-0.24	-0.04	0.01	0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.01
3	-0.04	0.00	0.08	0.00	0.00	0.28	-0.01	-0.24	-0.04	0.01	0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01
6	0.60	0.68	0.64	0.03	-0.32	-0.44	-0.55	-0.46	-0.35	-0.31	-0.34	-0.32	-0.28	-0.12	0.00	0.00	0.07	0.18
7	-0.27	-0.31	-0.34	-0.44	-0.55	-0.69	-0.79	-0.64	-0.46	-0.43	-0.52	-0.55	-0.50	-0.24	0.00	0.00	0.07	0.07
8	-1.04	-1.21	-1.28	-0.64	-0.17	-0.16	-0.10	0.02	0.09	0.19	0.45	0.77	1.07	0.62	0.00	0.00	0.07	0.08
9	0.29	0.44	0.58	-0.22	-0.97	-1.23	-1.39	-1.10	-0.74	-0.70	-0.91	-0.99	-0.93	-0.42	0.00	0.00	0.07	0.12
10	-0.44	-0.44	-0.46	-0.65	-0.68	-0.95	-1.15	-0.95	-0.70	-0.66	-0.82	-0.87	-0.85	-0.39	0.00	0.00	0.07	0.08
11	-0.62	-0.65	-0.67	-0.20	0.06	0.05	0.04	0.00	-0.01	-0.04	-0.12	-0.17	-0.19	-0.09	0.00	0.00	0.06	0.03
12	0.19	0.14	0.20	0.15	-0.06	-0.05	-0.02	0.00	0.03	0.02	-0.04	-0.08	-0.09	-0.04	0.00	0.00	0.06	0.06
13	0.48	0.50	0.50	-0.22	-0.79	-0.99	-1.13	-0.91	-0.65	-0.62	-0.76	-0.80	-0.75	-0.33	0.00	0.00	0.07	0.02
14	-6.09	-7.00	-8.42	3.73	10.12	9.71	8.69	5.47	3.29	2.57	2.50	2.22	1.81	0.75	0.00	0.00	0.05	0.01
15	-1.03	-0.93	-0.86	-0.74	-0.73	-1.02	-1.31	-1.16	-0.96	-1.06	-1.51	-2.04	-2.87	-2.04	0.00	0.00	0.07	0.06
16	-0.79	-0.75	-0.75	0.53	1.61	2.47	3.44	3.32	2.97	3.28	4.40	5.43	6.15	3.27	0.00	0.00	0.01	0.15
17	1.65	1.82	2.06	-0.03	-1.91	-2.56	-3.13	-2.69	-2.08	-2.04	-2.55	-2.77	-2.67	-1.23	0.00	0.00	0.08	0.02
18	-0.78	-0.78	-0.80	-0.63	-0.44	-0.63	-0.79	-0.67	-0.50	-0.47	-0.58	-0.63	-0.60	-0.27	0.00	0.00	0.07	0.08
19	-0.68	-0.61	-0.61	-0.32	-0.05	-0.06	-0.04	-0.01	0.01	0.04	0.07	0.11	0.13	0.07	0.00	0.00	0.06	0.08
20	0.01	0.02	0.01	-0.11	-0.21	-0.25	-0.28	-0.22	-0.15	-0.14	-0.16	-0.16	-0.14	-0.06	0.00	0.00	0.06	0.02
21	-0.25	-0.23	-0.23	-0.36	-0.46	-0.59	-0.68	-0.55	-0.40	-0.38	-0.48	-0.52	-0.49	-0.22	0.00	0.00	0.07	0.07
22	-0.25	-0.23	-0.23	-5.34	-7.55	-8.24	-8.21	-5.36	-3.03	-2.40	-2.65	-2.49	-2.01	-0.81	0.00	0.00	0.06	0.04
23	0.05	0.04	0.04	-0.25	-0.47	-0.62	-0.74	-0.60	-0.43	-0.41	-0.50	-0.54	-0.51	-0.23	0.00	0.00	0.07	0.06
24	-0.64	-0.69	-0.71	-0.64	-0.64	-0.77	-0.84	-0.68	-0.48	-0.46	-0.58	-0.63	-0.60	-0.27	0.00	0.00	0.07	0.04
25	-0.44	-0.46	-0.46	-0.57	-0.69	-0.96	-1.19	-0.97	-0.69	-0.65	-0.83	-0.91	-0.84	-0.38	0.00	0.00	0.07	0.08
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.01
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.01
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Total	0.04	0.06	0.11	0.03	0.01	-0.11	-0.04	-0.04	-0.08	-0.06	-0.06	-0.08	-0.08	-0.08	-0.06	-0.03	0.00	0.06

**Table A-18. Growth rate of the quality of labor input (Unit : %)**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	1.87	2.39	0.37	0.97	2.44	1.26	1.96	2.93	2.17	0.95	1.29	1.56	1.47	2.60	6.96	-0.63	-0.27	1.24
2	-1.34	-1.18	0.34	-1.21	0.84	-0.27	1.91	0.11	1.26	0.84	-0.05	-0.19	-0.70	0.41	-0.46	0.25	-3.51	-5.36
3	-1.34	-1.18	0.34	-1.21	0.84	-0.27	1.91	0.11	1.26	0.84	-0.05	-0.19	-0.70	0.41	-0.46	0.25	-3.51	-5.36
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	3.66	-0.84	2.36	-1.22	2.87	-1.05	0.86	1.43	-2.75	0.89	-1.56	1.66	0.18	1.33	-0.61	-0.18	2.46	13.26
6	3.49	0.87	0.40	0.41	-0.46	1.46	1.20	0.44	2.76	0.49	0.26	2.83	1.59	0.69	-0.41	1.93	0.44	-1.18
7	1.52	1.04	1.12	0.39	1.23	4.20	2.18	2.76	5.00	1.72	1.04	1.34	1.34	1.40	-0.17	1.32	-1.52	-7.38
8	-0.71	3.08	-0.69	3.75	0.93	1.62	0.28	2.62	3.12	1.10	3.59	0.12	0.67	2.26	-0.38	1.89	-0.64	-9.96
9	-0.94	0.38	1.09	2.39	-0.24	1.78	-0.31	2.04	0.70	2.61	-0.30	-1.56	1.30	0.73	2.90	-2.18	2.83	-6.54
10	0.33	0.62	1.53	3.07	2.02	-2.37	0.17	1.19	14.17	1.26	2.88	-1.01	-0.60	3.16	-0.85	2.96	0.81	-7.09
11	1.09	0.05	1.29	2.88	-0.10	0.05	-1.09	0.87	16.92	-0.43	3.21	-0.98	1.80	1.00	0.63	2.36	1.06	-2.97
12	-0.03	-0.82	2.48	0.14	-0.46	5.31	-0.86	1.88	-0.70	1.73	0.10	1.64	1.76	1.93	0.17	-1.22	0.44	11.39
13	4.41	3.98	-1.21	-2.08	5.47	-0.19	3.21	-0.82	-1.55	1.19	1.29	1.30	1.60	2.31	0.10	1.98	-0.69	9.75
14	3.19	1.66	1.20	8.09	-3.13	1.56	-0.95	6.28	19.16	0.72	-0.59	3.06	0.41	1.60	-1.25	1.86	1.35	16.48
15	5.26	2.32	-1.36	-0.81	1.86	-0.76	1.27	0.55	13.33	3.13	4.13	-0.41	2.35	5.53	-2.29	2.15	-1.42	-12.41
16	1.24	2.05	0.95	0.01	0.98	1.78	0.30	0.03	4.74	0.25	2.05	0.17	0.95	1.57	0.34	0.87	-0.15	-0.56
17	1.21	1.91	1.83	0.15	-1.63	3.99	0.57	-0.30	-2.66	1.71	0.11	-0.25	1.14	1.69	1.59	-2.26	1.11	-3.74
18	2.60	-0.59	-0.43	0.47	1.35	1.57	-1.51	1.38	-0.28	1.37	0.81	0.78	0.75	2.64	1.86	-0.80	0.52	-4.18
19	3.57	-0.79	1.23	-0.48	1.73	0.23	-1.11	1.72	2.31	0.89	0.54	1.85	1.04	1.26	-6.22	0.12	-2.41	14.43
20	4.96	-2.46	0.74	2.84	3.44	0.51	2.71	2.73	3.22	1.42	2.21	0.61	1.89	2.48	4.02	0.12	-2.41	7.57
21	-0.73	1.85	-0.20	-1.07	0.40	0.01	2.41	-0.89	-1.86	0.68	1.58	-1.90	0.88	2.77	-2.36	1.94	-0.68	-2.14
22	-0.73	1.85	-0.20	-1.07	0.00	0.70	2.41	-0.89	18.96	-0.20	2.10	-1.58	0.93	1.85	1.68	-0.60	0.00	7.76
23	2.36	1.65	0.79	-4.26	7.21	2.42	-3.48	2.81	13.16	1.90	1.66	-0.24	2.09	1.39	2.56	-1.27	-0.52	6.92
24	-5.32	0.90	3.55	3.93	4.34	-0.49	1.52	2.98	-4.50	2.00	0.90	2.79	2.53	0.62	0.74	-1.25	-1.06	-4.01
25	2.00	-0.11	1.68	4.38	4.37	0.78	-0.84	2.58	13.58	-2.99	3.78	-0.94	3.26	-0.34	2.22	2.96	0.81	-7.09
26	1.30	2.16	1.07	1.45	1.59	0.33	0.68	2.62	-5.75	0.34	0.06	1.96	0.46	1.14	0.43	-0.05	0.01	-8.73
27	1.30	2.16	1.07	1.45	1.59	0.33	0.68	2.62	39.15	2.00	1.02	-1.14	-0.45	1.81	-2.04	0.16	0.00	4.52
28	2.17	-0.66	0.53	-2.23	-1.14	3.57	3.66	0.95	1.30	-0.58	2.08	2.54	0.15	0.32	-4.74	0.11	3.00	11.10
29	2.17	-0.66	0.53	-2.23	-1.14	3.57	3.66	0.95	-4.89	-0.61	4.51	-3.29	-0.94	-0.88	3.52	0.11	0.00	0.00
30	0.53	1.75	-0.81	-0.86	0.92	1.10	0.27	2.83	-6.97	0.48	1.24	1.78	1.81	0.74	-0.99	0.82	0.78	11.29
31	-0.47	1.65	0.02	0.43	0.40	-0.06	0.34	0.01	2.90	-1.87	0.44	-1.81	-0.29	1.53	2.73	0.74	1.79	2.06
32	-0.36	6.31	3.65	-3.09	-1.44	-5.28	-0.60	1.49	-0.21	0.01	1.51	1.26	1.26	2.58	1.50	-0.97	0.85	2.34
33	1.87	2.39	0.37	0.97	2.44	1.26	1.96	2.93	1.69	0.95	1.29	1.56	1.47	2.60	-0.15	0.07	-0.03	0.39
Total	1.87	2.39	0.37	0.97	2.44	1.26	1.96	2.93	1.69	0.95	1.29	1.56	1.47	2.60	-0.15	0.07	-0.03	0.39