

# Measurement of Total Labor Productivity Growth by using Eora MRIO and OECD WIOD

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## **1. Introduction**

We measure productivity growths of Japan, China, USA and South Korea by using the indicator of total labor productivity (TLP, ratio of output to total labor). Total labor includes direct and indirect labor. Indirect labor means labor used for production of raw material, machine, etc.

As an indicator of productivity growth, TLP is better than TFP (traditional total factor productivity) in the respect that TLP is productivity which includes efficiency growth of input factors. Input factors of TFP are defined by service quantity (or utility of input), therefore when efficiencies of input factor improve, both input and output increase by the same quantity, and TFP does not change. Labor quantity in TLP is defined by burden quantity (or disutility of labor or toil), therefore when efficiency of input factor improve, total labor quantity decreases or output increases, and TLP rises. Besides TFP growth is usually calculated by using income share of input factors as weight of input factors' increase rate. But income share may not be determined optimally according to production technique. The assumptions of neoclassical economics such as perfect competition, etc. may not be real in actual world, especially in developing countries and transiting countries. Income share may be determined by various factors such as power relations of labor and capital. So, results of TFP may be influenced by various factors which include non-technique factors. In calculating TLP, income share is not used. TLP can be measured regardless assumptions of neoclassical economics such as perfect competition, etc.

Until the last paper, we measured TLP by using national input-output tables. In this paper we will measure TLP not only by them but also by using international input-output tables and will compare them.

The research questions are improvements in method for measurement of productivity growth and more accurate measurement results of productivity growths of Japan, China, USA and South Korea.

## 2. The calculation of total labor quantity

We use two methods to calculate total labor quantity. One method is the use of national input-output table and another method is the use of international input-output table.

### 2.1 The calculation of total labor quantity by using national input-output table

When we calculate total labor quantity by using national input-output tables, labor quantity inputted in imported goods is calculated by using average inputted labor quantity of exported goods, thinking that in order to import goods, foreign currencies are necessary and in order to get foreign currencies, exporting goods is necessary, so labor quantity necessary to get imported goods is labor quantity necessary for production of exported goods.

This time we use the national input-output tables of Japan, China, USA and South Korea taken out from the simplified Eora26 MRIOs. We use not the I-O tables published by each country's statistical bureau but the I-O tables taken out from Eora MRIOs, because the aim is the comparison of the results of two methods i.e. the use of national input-output table and the use of international input-output table.

We aggregated 26 sectors tables of Eora MAIOs into 20 sectors tables. Because Eora MAIOs are current price data and the end of our calculation is TLP growth, therefore the deflators are necessary. We use the deflators taken out from OECD WIOD. For that purpose we have compiled 20 common sectors from 26 sectors Eora MARIO and 35 sectors OECD WIOD.

We have calculated direct labor coefficient by using OECD WIOD (both employment and output), for we think the employment data of OECD WIOD is more suitable for our purpose than the employment data of Eora MARIO.

In measurement of total labor quantity by using national input-output tables (in case of using national input-output tables where the number of intermediate sectors is 20), we used the following expression.

$t_j$ : total labor per dollar, a row vector

$a_{ij}$ : domestic input coefficient, a matrix

$e_i$ : share of export commodity, a column vector

$m_i$ : input coefficient of import commodity, a row vector

$\tau_j$ : direct labor coefficient, a row vector

$i$  denotes the  $i$ -th sector to supply commodities

$j$  denote the  $j$ -th sector to demand commodities

$i$ : 1~20: Intermediate Input 21: Capital Consumption

$j$ : 1~20: Intermediate Demand 21: fixed capital formation

$$t_j = \sum_{i=1}^n t_i a_{ij} + \sum_{i=1}^n t_i e_i m_i + \tau_j \quad (1)$$

In this expression, total labor quantity of imported commodities is the weighted average of total labor quantities of exported commodities.

The results of this calculation are show as **Total labor quantity by using national I-O table in Table 1. Embodied labor quantity by industry in Japan, Table 3. Embodied labor quantity by industry in China, Table 5. Embodied labor quantity by industry in USA and Table 7. Embodied labor quantity by industry in Korea.**

## 2.2 The calculation of total labor quantity by using international input-output table

When we calculate total labor quantity by using international input-output tables, labor quantity inputted in imported goods is calculated as labor quantity necessary for production of that goods in the country where they are produced.

We use the international input-output tables of 189 countries (regions) & 20 sectors which are aggregated from the simplified Eora26 MRIOs into.

Direct labor coefficients of 40 countries whose data are in OECD WIOD are calculated by using them and those of the other 149 countries (regions) are calculated by using Eora data.

The following is the formula that we used this time.

$t_j^\beta$ : total labor quantity per dollar, a row vector

$a_{ij}^{\alpha\beta}$ : input coefficient , a matrix

$\tau_j$ : direct labor coefficient, a row vector

$\alpha$  denotes a code of the country to supply commodities

$\beta$  denotes a code of the country to demand commodities

$i$  denotes the  $i$ -th sector of country  $\alpha$

$j$  denotes the  $j$ -th sector of country  $\beta$

$m$  is the number of sectors

in  $\alpha=190$  (=R.O.W),  $m=1$

else  $m=21$

$i$ : 1~20; Intermediate sector 21; Capital Consumption

$j$ : 1~20; Intermediate sector 21; fixed capital formation

$$t_j^\beta = \sum_{\alpha=1}^{190} \sum_{i=1}^m t_i^\alpha a_{ij}^{\alpha\beta} + \tau_j^\beta \quad (2)$$

The results of this calculation are **Total labor quantity by using international I-O table in Table 1. Embodied labor quantity by sector in Japan, Table 3. Embodied labor quantity by sector in China, Table 5. Embodied labor quantity by sector in USA and Table 7. Embodied labor quantity by sector in Korea.**

The results of Japan and USA show that the total labor quantity by using international I-O tables are larger than those by using national I-O tables. But the results of China show that the total labor quantities by using international I-O tables are smaller than those by using national I-O tables.

The directions of differences of results of the two calculation methods were as we had supposed, but we could know the differences were so large by seeing the results.

The reason why the results of Japan and The USA show the total labor quantities by using international I-O tables were larger than those by using national I-O table is that total labor quantity necessary for production of imported goods were larger than average total labor quantity of exported goods per dollar. Those large reason is that Japan and USA are advanced countries and their productivities are higher than those of the developing countries. When the USA and Japan import from developing countries, imported goods involve more labor than domestic goods. The total labor quantities of China by using international I-O tables is smaller than those by using national I-O table because China are developing country and the imported goods from other countries involved less labor than domestic goods. This means imported materials of China from developed countries were more than from the developing countries.

The ratios of imported production goods to domestic output (imported input coefficient) are small in comparison with those of domestic production goods and direct labor. So before calculation, we thought that differences in methods concerning total labor quantity of imported production goods might not cause so large differences in results of total labor quantities of domestic output. But the results are very different. The reason is: First, the total labor quantities per USD (in current price) of the exports from developed countries to developing countries is very different from those of the imports from developing countries to developed countries. And the total labor quantities per USD (in current price) of the exports from developing countries to developed countries is very different from those of the imports from developed countries to developing countries. (Scores times) Second, although the imported input coefficient might be small, but when the imports are used for the intermediate inputs, that

products also may become intermediate inputs for other domestic products. The effects are not only direct but also indirect.

### 3. The calculation of total labor productivity growth

We calculate total labor productivity growths by using the above total labor quantities. The calculation of productivity growth needs the data in constant price, but the above total labor quantities are in current prices. We use the data of OECD to estimate the deflators and convert the total labor quantities from current prices to previous years' prices, and then calculate the productivity growths.

The following is the formula that we used to calculate total labor productivity growth.

**G** : Total labor productivity growth

**T** : This years' total labor quantity per USD in previous years' price

**P** : Previous years' total labor quantity per USD in previous years' price

$$G = \left( \frac{1}{T} - \frac{1}{P} \right) \bigg/ \frac{1}{P} \quad (3)$$

The results of this calculation are **Table.2 Labor Productivity Growth by Industry in Japan, Table.4 Labor Productivity Growth by Industry in China, Table.6 Labor Productivity Growth by Industry in the USA and Table.8 Labor Productivity Growth by Industry in South Korea.**

The differences between the results by using national I-O tables and those by using International I-O tables are large. We need to think about the respective meanings concerning total labor productivity growths calculated by using national I-O table and international I-O table.

The total labor productivity growth calculated by using national I-O table shows the productivity growth of each country, but it changes when exchange rate or other market conditions change although the process of production does not change. In this calculation, the average total labor quantity of exports is treated as the total labor quantity of imports. As the result, even if the production process and the physical properties of domestic product do not change, the results of the calculation may change if exchange rates or other market factors change. In this point, there is some problem as productivity indicator in total labor productivity growth calculated by using national I-O table.

The total labor productivity growth of Japan, China, etc. calculated by using international I-O table means the total labor productivity growth of the product whose final production process is done in Japan, China, etc. and reflects the total labor productivity growth of all production processes which may be done

over borders. It reflects not only one country's productivity growth, but also the productivity growth of the many linked countries.

Why are the results of total labor productivity between by using national I-O table and by using international I-O table different? One reason is that the total labor productivity growth of the exports is different from that of the imports in the country where they are produced. The second is the change of exchange rate. Exchange rate influences result of the total labor productivity by using national I-O table. For example, Japan's currency appreciate, the total labor quantity of exports of Japan per USD will become less (the total labor quantity of exports per Yen will be the same), and total labor quantity of imports in case of using national I-O table is the weighted average of total labor quantities of exports, so the total labor quantity of the imports will become less, therefore the total labor productivity growth of products which use the imported good as intermediate input will be higher. But the total labor productivity growth in case of using international I-O table will not change even if the exchange rate changes. It changes only when the production process changes.

#### **4. Some points which the calculated results of TLP growth show**

From the results, we can know the following things. See **Chart 1 TLP GROWTH by using National I-O tables Average of total industries** and **Chart 2 TLP GROWTH by using International I-O tables Average of total industries**.

First, the total labor productivity growth of China was higher than the other three countries in this period. It is shown in the results both by using national I-O tables and by using international I-O tables. In China in this period, not only economic growth but also productivity growth was high.

The total labor productivity growth of China in 2009 fell down. Concerning this point, we will continue to research, getting data after 2009.

Second, concerning Japan in most years, the total labor productivity growths by using international I-O tables were higher than those by using national I-O tables. The reason is that the productivity growths of imported production goods were higher than those of exported goods. But in 2000, 2003 and 2004, the total labor productivity growths of Japan by using national I-O tables were higher than those by using international I-O tables. This reason is that Japanese Yen appreciated in these years.

Third, the total labor productivity growths of South Korea by using national I-O tables fell down rapidly in 2008. The reason is that South Korean Won depreciated rapidly both to Japanese Yen and to US Dollar in this year. In 1998, South Korean Won depreciated rapidly to US Dollar, but it did not depreciate so rapidly to Japanese Yen.

Forth, differences between TLP growths by using national I-O table and those by using international I-O table in Japan and South Korea were larger than those in USA and China. The reason is that the rates of imported production goods to output of Japan and South Korea are larger than those of USA and China.

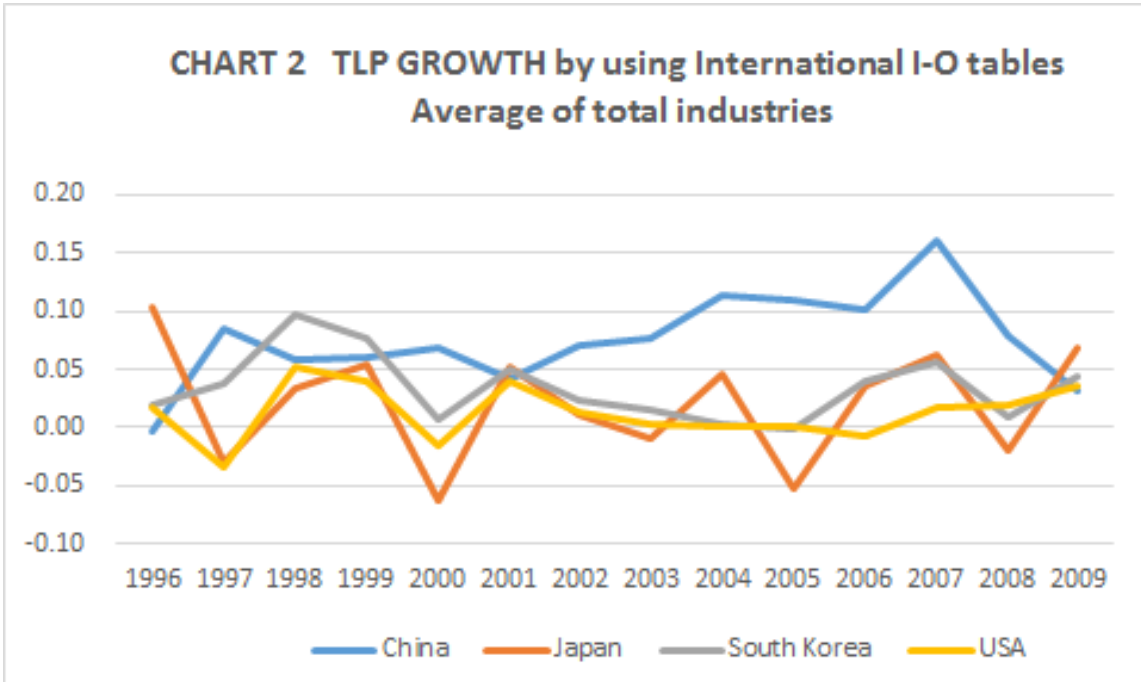
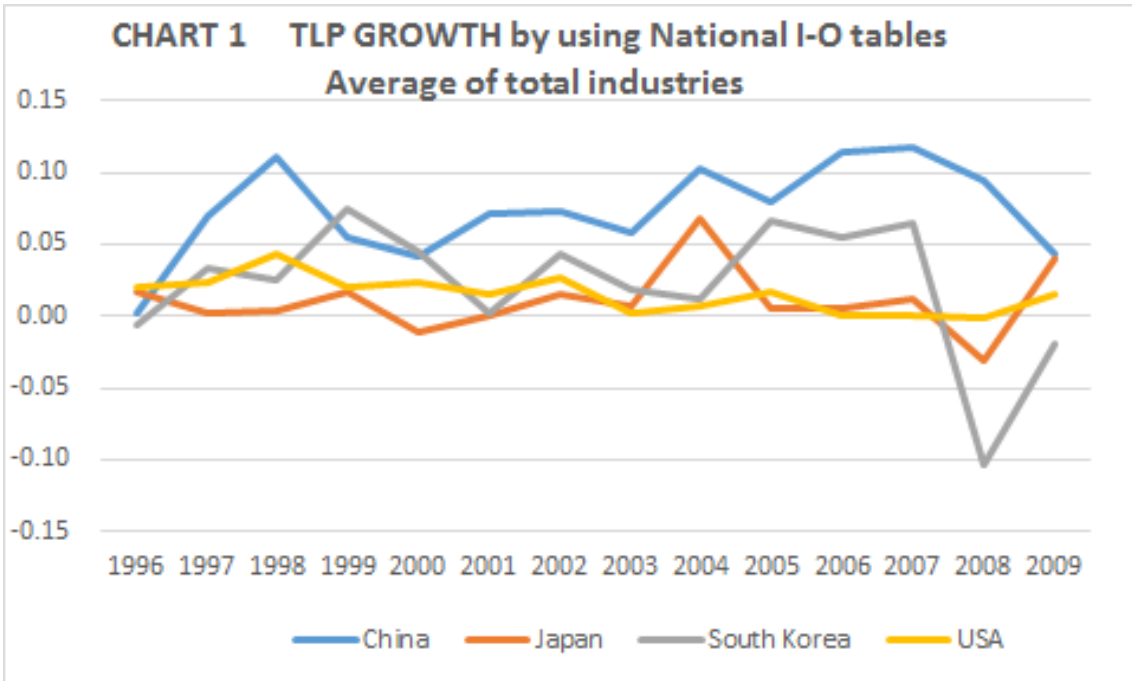
## 5. Conclusion

The total labor productivity growth by using international I-O tables is more accurate indicator of productivity growth of products produced in international labor division and linkage than the total labor productivity growth by using national I-O tables.

The combined use of the total labor productivity growth by using international I-O tables and the total labor productivity growth by using national I-O tables is effective in many-sided analysis of productivity growth.

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**Table 1. Embodied labor quantity by industry in Japan**

	UNIT: person-year/1000 US Dollar in current price																			
	AGRICULTURE AND FISHERY	Mining and Quarrying	Food & Beverages	Textiles and Wearing Apparel	Wood and Paper	Petroleum, Chemical and Non-Metallic Mineral Products	Metal Products	Electrical Machinery	Transport Equipment	Other Manufacturing and Recycling	Electricity, Gas and Water	Construction	Wholesale and Retail Trade, Maintenance, and Repair	Hotels and Restaurants	Transport and Telecommunications	Post and Telecommunications	Financial Intermediation and Business Activities	Public Administration	Education, Health and Others	Re-export and Re-import
1995	0.283	0.027	0.039	0.109	0.062	0.030	0.039	0.043	0.026	0.066	0.017	0.073	0.093	0.141	0.077	0.045	0.048	0.065	0.100	0.000
Total Labor by using National I-O Table	0.382	0.109	0.180	0.223	0.162	0.123	0.140	0.143	0.142	0.174	0.104	0.160	0.139	0.239	0.145	0.109	0.113	0.144	0.158	0.144
Total Labor by using international I-O Table	0.485	0.373	0.354	0.428	0.291	0.304	0.289	0.246	0.246	0.307	0.227	0.265	0.202	0.368	0.227	0.161	0.164	0.199	0.213	0.268
1996	0.318	0.028	0.045	0.128	0.070	0.033	0.046	0.048	0.030	0.072	0.020	0.083	0.109	0.158	0.096	0.045	0.055	0.075	0.115	0.000
Total Labor by using National I-O Table	0.433	0.129	0.205	0.261	0.184	0.141	0.165	0.164	0.163	0.198	0.120	0.185	0.160	0.269	0.174	0.119	0.128	0.164	0.180	0.166
Total Labor by using international I-O Table	0.527	0.375	0.396	0.479	0.301	0.311	0.288	0.257	0.252	0.324	0.233	0.268	0.206	0.406	0.246	0.163	0.171	0.212	0.226	0.1569
1997	0.346	0.033	0.049	0.145	0.077	0.035	0.049	0.052	0.032	0.079	0.022	0.093	0.118	0.176	0.104	0.046	0.060	0.082	0.130	0.000
Total Labor by using National I-O Table	0.471	0.145	0.221	0.289	0.200	0.154	0.182	0.180	0.178	0.216	0.132	0.202	0.175	0.297	0.190	0.125	0.140	0.179	0.201	0.181
Total Labor by using international I-O Table	0.585	0.449	0.446	0.553	0.341	0.355	0.338	0.297	0.288	0.368	0.271	0.308	0.229	0.455	0.286	0.182	0.193	0.237	0.257	0.2492
1998	0.360	0.037	0.050	0.156	0.085	0.039	0.056	0.059	0.035	0.087	0.024	0.104	0.131	0.193	0.111	0.048	0.066	0.086	0.143	0.000
Total Labor by using National I-O Table	0.490	0.157	0.227	0.302	0.214	0.167	0.193	0.194	0.192	0.232	0.144	0.219	0.194	0.320	0.209	0.136	0.152	0.190	0.219	0.196
Total Labor by using international I-O Table	0.601	0.459	0.454	0.557	0.353	0.362	0.342	0.309	0.303	0.377	0.280	0.314	0.249	0.483	0.304	0.193	0.202	0.245	0.274	0.2704
1999	0.308	0.034	0.044	0.145	0.077	0.034	0.052	0.053	0.031	0.076	0.021	0.092	0.114	0.169	0.098	0.038	0.057	0.075	0.124	0.000
Total Labor by using National I-O Table	0.419	0.137	0.196	0.270	0.188	0.145	0.170	0.170	0.168	0.202	0.126	0.193	0.169	0.280	0.183	0.116	0.132	0.166	0.190	0.171
Total Labor by using international I-O Table	0.504	0.405	0.366	0.479	0.297	0.310	0.294	0.260	0.252	0.321	0.238	0.266	0.212	0.409	0.247	0.154	0.170	0.208	0.230	0.2617
2000	0.290	0.026	0.043	0.138	0.072	0.032	0.046	0.045	0.028	0.072	0.020	0.088	0.108	0.163	0.093	0.035	0.053	0.067	0.117	0.000
Total Labor by using National I-O Table	0.395	0.136	0.185	0.254	0.180	0.142	0.158	0.160	0.158	0.194	0.121	0.185	0.163	0.272	0.183	0.115	0.128	0.158	0.185	0.163
Total Labor by using international I-O Table	0.483	0.445	0.361	0.488	0.293	0.332	0.295	0.266	0.282	0.327	0.245	0.271	0.213	0.407	0.282	0.160	0.173	0.217	0.236	0.2095
2001	0.325	0.032	0.049	0.156	0.081	0.035	0.053	0.056	0.032	0.077	0.022	0.100	0.122	0.182	0.106	0.040	0.039	0.060	0.134	0.000
Total Labor by using National I-O Table	0.445	0.157	0.213	0.299	0.204	0.161	0.182	0.188	0.182	0.216	0.138	0.211	0.185	0.306	0.204	0.130	0.146	0.180	0.211	0.188
Total Labor by using international I-O Table	0.538	0.429	0.404	0.534	0.322	0.335	0.312	0.288	0.274	0.347	0.252	0.291	0.232	0.454	0.274	0.171	0.189	0.229	0.255	0.2423
2002	0.318	0.032	0.050	0.162	0.083	0.034	0.055	0.060	0.032	0.079	0.023	0.106	0.127	0.185	0.106	0.038	0.062	0.079	0.138	0.000
Total Labor by using National I-O Table	0.439	0.163	0.213	0.299	0.210	0.165	0.190	0.199	0.188	0.222	0.143	0.220	0.191	0.313	0.211	0.132	0.150	0.188	0.217	0.196
Total Labor by using international I-O Table	0.537	0.429	0.415	0.555	0.329	0.343	0.324	0.314	0.297	0.359	0.257	0.302	0.241	0.465	0.282	0.175	0.196	0.239	0.263	0.2524
2003	0.299	0.029	0.047	0.149	0.076	0.030	0.049	0.052	0.029	0.074	0.021	0.099	0.117	0.171	0.099	0.036	0.057	0.076	0.129	0.000
Total Labor by using National I-O Table	0.413	0.149	0.200	0.275	0.194	0.151	0.173	0.178	0.171	0.207	0.133	0.203	0.178	0.291	0.197	0.123	0.140	0.179	0.203	0.178
Total Labor by using international I-O Table	0.525	0.382	0.443	0.529	0.309	0.311	0.297	0.276	0.262	0.338	0.235	0.282	0.227	0.453	0.265	0.164	0.183	0.228	0.247	0.2136
2004	0.272	0.024	0.043	0.136	0.069	0.027	0.041	0.045	0.026	0.071	0.020	0.089	0.107	0.160	0.090	0.034	0.055	0.074	0.122	0.000
Total Labor by using National I-O Table	0.373	0.128	0.177	0.235	0.167	0.133	0.152	0.152	0.152	0.183	0.118	0.175	0.156	0.266	0.169	0.112	0.126	0.132	0.184	0.155
Total Labor by using international I-O Table	0.485	0.337	0.415	0.507	0.280	0.284	0.270	0.244	0.238	0.313	0.216	0.249	0.205	0.428	0.237	0.150	0.168	0.161	0.225	0.2314
2005	0.282	0.020	0.043	0.140	0.069	0.024	0.037	0.044	0.026	0.070	0.019	0.089	0.105	0.161	0.088	0.035	0.057	0.078	0.124	0.000
Total Labor by using National I-O Table	0.385	0.125	0.179	0.240	0.168	0.133	0.151	0.154	0.156	0.183	0.120	0.175	0.157	0.266	0.169	0.112	0.130	0.139	0.188	0.158
Total Labor by using international I-O Table	0.528	0.363	0.494	0.549	0.286	0.305	0.290	0.263	0.261	0.332	0.232	0.260	0.211	0.446	0.254	0.164	0.180	0.194	0.240	0.2012
2006	0.295	0.020	0.048	0.146	0.074	0.025	0.036	0.046	0.026	0.075	0.020	0.091	0.111	0.165	0.092	0.039	0.061	0.085	0.130	0.000
Total Labor by using National I-O Table	0.405	0.141	0.188	0.247	0.179	0.144	0.162	0.162	0.164	0.197	0.129	0.183	0.163	0.277	0.179	0.123	0.138	0.141	0.196	0.165
Total Labor by using international I-O Table	0.559	0.354	0.521	0.569	0.299	0.310	0.288	0.260	0.259	0.337	0.238	0.266	0.216	0.464	0.259	0.168	0.185	0.173	0.242	0.1899
2007	0.299	0.019	0.048	0.138	0.071	0.023	0.034	0.045	0.026	0.070	0.020	0.090	0.111	0.164	0.091	0.040	0.061	0.085	0.132	0.000
Total Labor by using National I-O Table	0.412	0.138	0.187	0.237	0.174	0.142	0.160	0.160	0.162	0.192	0.130	0.180	0.162	0.275	0.176	0.121	0.137	0.141	0.198	0.163
Total Labor by using international I-O Table	0.542	0.303	0.482	0.519	0.274	0.275	0.273	0.247	0.246	0.310	0.217	0.251	0.207	0.427	0.250	0.160	0.178	0.169	0.238	0.1083
2008	0.248	0.015	0.041	0.127	0.060	0.018	0.026	0.038	0.022	0.056	0.014	0.078	0.095	0.145	0.081	0.036	0.052	0.075	0.116	0.000
Total Labor by using National I-O Table	0.353	0.124	0.167	0.215	0.152	0.124	0.141	0.141	0.143	0.160	0.116	0.158	0.146	0.236	0.159	0.108	0.121	0.123	0.179	0.143
Total Labor by using international I-O Table	0.467	0.254	0.402	0.459	0.240	0.233	0.234	0.218	0.214	0.260	0.188	0.219	0.187	0.362	0.223	0.140	0.155	0.146	0.212	0.0499
2009	0.223	0.014	0.038	0.127	0.065	0.018	0.026	0.035	0.022	0.054	0.017	0.078	0.090	0.137	0.073	0.037	0.043	0.067	0.109	0.000
Total Labor by using National I-O Table	0.315	0.106	0.149	0.203	0.148	0.108	0.128	0.125	0.130	0.147	0.106	0.148	0.148	0.217	0.139	0.100	0.104	0.112	0.165	0.123
Total Labor by using international I-O Table	0.407	0.223	0.338	0.396	0.218	0.205	0.209	0.191	0.191	0.229	0.167	0.198	0.166	0.312	0.191	0.126	0.132	0.131	0.193	0.0848

Table.2 Labor Productivity Growth by Industry in Japan		Labor productivity growth = $\frac{I(t)}{I(t-1)}$ (this years' labor quantity per USD in previous years' price) - 1 / $\frac{I(t-1)}{I(t-2)}$ (previous years' labor quantity per USD in previous years' price)														Average of total industries					
Year	Industry	AGRICULTURE AND FISHERIES	Mining and Quarrying	Food and Beverages	Textiles and Wearing Apparel	Wood and Paper	Petroleum, Chemical and Non-Metallic Mineral Products	Metal Products	Electrical and Machinery	Transport Equipment	Other Manufacturing and Recycling	Electricity, Gas and Water	Construction	Wholesale and Retail Trade, Main Business, Repair	Hotels and Restaurants	Transport and Telecommunications	Financial and Business Activities	Public Administration	Education, Health and Others	Average of total industries	
1996	Direct Labor Productivity Growth	0.401	0.1234	-0.0058	-0.0112	0.0366	0.0646	0.0065	0.0728	-0.0040	0.0747	0.0296	0.1008	0.0168	0.0371	-0.0652	0.1687	0.0253	0.0148	0.0038	0.0170
	TLP Growth by using Internal I-O table	0.0310	0.0048	0.0188	-0.0113	0.0225	0.0114	0.0028	0.0426	0.0004	0.0133	0.0237	-0.0013	0.0270	0.0312	-0.0362	0.0891	0.0208	0.0161	0.0080	0.0171
1997	Direct Labor Productivity Growth	0.389	-0.0380	0.0074	-0.0368	-0.0006	0.0060	0.0242	0.0621	0.0313	0.0252	-0.0132	-0.0237	0.0105	-0.0307	0.0121	0.1589	0.0044	-0.0003	-0.0315	-0.0067
	TLP Growth by using Internal I-O table	0.402	-0.0088	0.0196	-0.0158	0.0109	-0.0180	-0.0159	0.0387	0.0040	0.0208	-0.0313	-0.0025	0.0075	-0.0216	0.0077	0.1127	0.0110	0.0069	-0.0161	0.0021
1998	Direct Labor Productivity Growth	0.287	-0.0227	0.0571	-0.0275	-0.0059	-0.0085	-0.0119	-0.0378	-0.0285	-0.0308	-0.0133	-0.0128	-0.0130	-0.0206	-0.0210	0.0057	-0.0256	-0.0188	-0.0368	-0.0309
	TLP Growth by using Internal I-O table	0.281	0.0087	0.0455	0.0386	0.0308	0.0202	0.0345	0.0164	-0.0100	0.0130	0.0182	0.0157	-0.0184	-0.0033	-0.0200	0.0545	-0.0031	0.0087	-0.0062	0.0031
1999	Direct Labor Productivity Growth	0.551	-0.0015	-0.0078	-0.0426	-0.0190	0.0122	-0.0265	0.0171	0.0192	0.0289	0.0192	-0.0031	0.0176	-0.0022	-0.0074	0.1501	0.0188	0.0448	0.0105	0.0135
	TLP Growth by using Internal I-O table	0.551	0.0529	0.0086	-0.0085	0.0082	0.0163	0.0268	0.0445	0.0385	0.0386	0.0237	0.0099	0.0139	-0.0023	-0.0006	0.0682	0.0155	0.0403	0.0090	0.0161
2000	Direct Labor Productivity Growth	0.394	0.2793	-0.0129	0.0019	0.0109	-0.0221	0.0773	0.1465	0.1026	0.0136	-0.0020	-0.0106	0.0077	-0.0115	-0.0070	0.0567	0.0168	0.0646	0.0036	0.0132
	TLP Growth by using Internal I-O table	0.401	0.0028	0.0106	-0.0152	-0.0195	-0.0728	0.1813	0.0539	0.0419	0.0003	-0.0283	-0.0173	-0.0114	-0.0186	-0.0570	-0.0088	-0.0211	0.0002	-0.0236	-0.0112
2001	Direct Labor Productivity Growth	0.192	-0.0723	-0.0003	-0.0008	0.0094	0.0171	-0.0172	-0.0386	-0.0093	0.0661	0.0019	0.0013	0.0130	0.0145	0.0174	0.0802	0.0084	0.0280	-0.0104	0.0048
	TLP Growth by using Internal I-O table	0.140	-0.0176	0.0053	-0.0041	-0.0003	-0.0136	-0.0116	0.0094	-0.0206	0.0197	-0.0148	0.0022	0.0101	0.0064	0.0055	0.0647	0.0016	-0.0024	-0.0107	0.0006
2002	Direct Labor Productivity Growth	0.954	0.0255	0.0046	0.0046	0.0124	0.0513	-0.0196	0.0225	0.0383	0.0338	0.0129	-0.0097	0.0109	0.0132	0.0208	0.1013	0.0152	-0.0136	0.0080	0.0128
	TLP Growth by using Internal I-O table	0.836	-0.0005	0.0236	0.0053	0.0162	0.0095	-0.0152	0.0406	0.0031	0.0296	0.0166	0.0108	0.0142	0.0121	0.0142	0.0614	0.0168	0.0009	0.0106	0.0158
2003	Direct Labor Productivity Growth	-0.0503	0.0264	-0.0075	0.0151	0.0155	0.0263	0.0120	0.1608	0.0255	-0.0110	0.0136	-0.0136	0.0046	-0.0023	-0.0042	0.0034	0.0179	-0.0179	0.0027	0.0054
	TLP Growth by using Internal I-O table	-0.0492	0.0162	-0.0130	0.0148	0.0021	-0.0034	-0.0092	0.1185	0.0306	0.0028	0.0198	-0.0029	0.0014	-0.0075	-0.0026	0.0104	0.0158	-0.0025	-0.0103	0.0074
2004	Direct Labor Productivity Growth	-0.0128	-0.0023	0.0165	0.0214	0.0254	0.0276	0.0337	0.1376	0.0590	-0.0253	0.0253	0.0257	0.0174	-0.0076	0.0209	0.0056	0.0111	-0.0335	-0.0100	0.0025
	TLP Growth by using Internal I-O table	-0.0060	-0.0549	0.0424	0.0970	0.0817	0.0208	-0.0319	0.1499	0.0667	0.0494	0.0538	0.0672	0.0566	0.0148	0.0830	0.0441	0.0434	0.2814	0.0321	0.0678
2005	Direct Labor Productivity Growth	0.0257	0.0376	0.0128	-0.0146	-0.0222	0.0274	-0.0120	-0.0644	0.1126	0.0434	0.0044	0.0185	0.0369	0.0252	-0.0184	0.0418	0.0370	0.0303	0.3369	0.0463
	TLP Growth by using Internal I-O table	0.0257	0.0376	0.0128	-0.0146	-0.0222	0.0274	-0.0120	-0.0644	0.1126	0.0434	0.0044	0.0185	0.0369	0.0252	-0.0184	0.0418	0.0370	0.0303	0.3369	0.0463
2006	Direct Labor Productivity Growth	0.0299	-0.1087	0.0170	-0.0082	0.0173	-0.0575	-0.0825	0.0502	-0.0032	0.0291	0.0193	0.0021	0.0077	0.0144	0.0110	0.0230	0.0012	-0.0310	0.0032	0.0056
	TLP Growth by using Internal I-O table	-0.0243	-0.1948	-0.1363	-0.0641	0.0042	-0.1283	-0.1302	-0.1118	-0.0710	-0.0315	-0.0323	-0.0375	-0.0175	-0.0242	-0.0578	-0.0601	-0.0377	-0.1530	-0.0435	-0.0526
2007	Direct Labor Productivity Growth	-0.0003	0.0189	-0.0396	0.0014	-0.0149	-0.0185	0.0313	0.0378	0.0240	-0.0201	-0.0015	0.0119	-0.0072	0.0258	0.0056	-0.0047	-0.0344	0.0090	0.0030	0.0061
	TLP Growth by using Internal I-O table	-0.0068	-0.1005	0.0093	0.0093	-0.0123	-0.0899	-0.0632	0.0111	-0.0114	-0.0284	-0.0427	-0.0055	0.0014	-0.0102	-0.0057	-0.0306	0.0039	0.0336	0.1442	0.0061
2008	Direct Labor Productivity Growth	0.0096	0.0437	-0.0007	0.0441	0.0302	0.0261	0.0170	0.0732	0.0142	0.0730	0.0213	0.0079	0.0072	0.0120	0.0124	-0.0114	0.0004	0.0073	-0.0099	0.0023
	TLP Growth by using Internal I-O table	0.0059	0.0044	-0.0010	0.0324	0.0162	-0.0092	-0.0333	0.0694	0.0153	0.0282	-0.0036	0.0111	0.0039	0.0129	0.0086	0.0419	0.0155	0.0040	0.0014	0.0126
2009	Direct Labor Productivity Growth	0.0152	-0.0733	-0.0599	-0.0709	-0.0378	-0.0864	-0.1382	0.0207	0.0039	0.0083	-0.0640	-0.0467	-0.0550	-0.0087	-0.0249	-0.0083	-0.0085	-0.0198	-0.0549	-0.0306
	TLP Growth by using Internal I-O table	0.0377	0.0213	-0.0019	-0.0352	-0.0452	-0.0387	-0.0553	-0.1140	0.0316	0.0177	0.0057	-0.0386	-0.0406	-0.0591	0.0031	-0.0136	0.0018	-0.0090	-0.0396	-0.0196
2009	Direct Labor Productivity Growth	0.0462	0.0660	0.0267	0.0475	0.0178	0.2376	0.1836	0.0718	-0.0032	0.0766	-0.0038	0.0081	0.0287	0.0223	0.0889	0.0093	0.0597	0.0376	0.0230	0.0400
	TLP Growth by using Internal I-O table	0.0741	0.0356	0.0911	0.1424	0.0876	0.2421	0.2063	0.0801	0.0151	0.1242	0.0361	0.0466	0.0626	0.0916	0.0905	0.0391	0.0726	0.0493	0.0399	0.0690

note: Average of total industries is total labor quantity embodied in net product by industry.



	<b>Table.4 Labor Productivity Growth by Industry in China</b>										Average of total industries								
	Labor productivity growth = $\frac{I(t)}{I(t-1)}$ (previous years' price) / $\frac{P(t)}{P(t-1)}$ (previous years' price) - (previous years' labor quantity per USD in previous years' price) / (previous years' labor quantity per USD in previous years' price)																		
	AGRICULTURE AND FISHERY	Mining and Quarrying	Food & Beverages	Textiles and Wearing Apparel	Wood and Paper	Petroleum, Chemical and Non-Metallic Mineral Products	Metal Products	Electrical Machinery	Transport Equipment	Other Manufacturing and Recycling	Electricity, Gas and Water	Construction	Wholesale and Retail Trade/Main Tenance, Repair	Hotels and Restaurants	Transportation	Post and Telecommunications	Financial Intermediation and Business Activities	Public Administration	Education, Health and Others
	Direct Labor Productivity Growth	0.881	0.491	0.1671	0.1119	0.1580	0.1186	0.1048	0.0566	-0.0167	0.0345	-0.0244	-0.0171	0.0561	0.2045	0.0239	0.0525	0.1008	0.0856
1996	TLP Growth by using National I-O table	0.0238	0.180	-0.0248	-0.0135	0.0506	-0.0114	0.1190	0.0862	0.0128	-0.0254	0.0143	-0.0152	-0.0129	0.0366	0.0197	-0.0288	0.0248	0.0012
	TLP Growth by using International I-O table	0.155	-0.0335	-0.0589	-0.0702	0.0518	-0.0635	0.0623	0.0429	0.0343	-0.0262	-0.0635	-0.0886	-0.0533	-0.0243	-0.0440	-0.0247	-0.0368	-0.0038
1997	Direct Labor Productivity Growth	0.0493	0.0872	-0.0243	0.0098	0.0294	0.1136	0.1433	0.1531	0.1664	0.2115	0.0599	-0.0175	0.0148	0.0948	0.3372	0.0824	0.1933	0.1510
	TLP Growth by using National I-O table	0.0566	0.0615	0.0575	0.0633	0.1100	0.1128	0.1293	0.1232	0.1265	0.1471	-0.0176	0.0400	0.0319	0.0186	0.0873	0.1762	0.0351	0.0871
	TLP Growth by using International I-O table	0.0601	0.0791	0.0534	0.0922	0.1261	0.1479	0.1218	0.1335	0.1413	0.1817	-0.0235	0.0371	0.0200	0.0085	0.0731	0.2778	0.0256	0.1264
1998	Direct Labor Productivity Growth	0.0307	0.1634	-0.0753	-0.0021	-0.0054	0.1537	0.1831	0.3234	0.3606	-0.1865	0.1895	0.0860	0.0499	0.1175	0.1327	0.2583	0.0678	0.0592
	TLP Growth by using National I-O table	0.0747	0.2522	0.1620	0.0519	0.1529	0.1185	0.1347	0.1002	0.0533	-0.0286	0.0163	0.0741	0.1340	0.0625	0.1658	0.0785	0.3836	0.0490
	TLP Growth by using International I-O table	0.0464	0.1698	0.1141	0.0519	0.1529	0.1185	0.1347	0.1002	0.0533	-0.0286	0.0163	0.0741	0.1340	0.0625	0.1658	0.0785	0.3836	0.0490
1999	Direct Labor Productivity Growth	0.0165	0.1860	0.0368	0.0938	0.0110	0.1445	0.1270	0.1523	0.0263	0.2461	0.0161	0.0378	0.0643	0.0785	0.1492	0.2646	0.0145	0.0454
	TLP Growth by using National I-O table	0.0298	0.1058	0.0514	0.0820	0.0700	0.0961	0.1293	0.1119	0.0953	0.1727	0.0657	0.0659	0.0336	0.1042	0.1384	0.0464	0.0233	0.0358
	TLP Growth by using International I-O table	0.0309	0.1176	0.0573	0.0891	0.0845	0.1094	0.1453	0.1343	0.1067	0.1863	0.0718	0.0634	0.0712	0.0382	0.1121	0.1559	0.0526	0.0370
2000	Direct Labor Productivity Growth	0.0216	0.1886	0.1423	0.0904	0.0671	0.0672	0.0976	0.2189	0.1458	0.2472	-0.0129	0.0718	0.0692	0.0906	0.0728	0.1329	0.0967	0.1237
	TLP Growth by using National I-O table	0.0265	-0.0262	0.0707	0.0293	0.0648	-0.0181	0.0746	0.1046	0.0971	0.1587	0.2292	0.0491	0.0659	0.0349	0.0001	0.0163	0.0629	0.0237
	TLP Growth by using International I-O table	0.0380	0.0652	0.1000	0.0816	0.0942	0.0740	0.1382	0.1840	0.1777	0.1882	0.1071	0.1004	0.0922	0.0540	0.0380	0.0679	0.0814	0.0690
2001	Direct Labor Productivity Growth	0.0202	0.0085	0.0775	0.1039	0.0816	0.0756	0.0926	0.1588	0.2520	0.3372	0.1097	0.0725	0.0845	0.0924	0.1142	0.2649	0.0694	0.0344
	TLP Growth by using National I-O table	0.0334	0.0956	0.0728	0.1107	0.1043	0.1438	0.1434	0.1668	0.1862	0.2171	0.1118	0.0963	0.0899	0.0597	0.1019	0.1389	0.0806	0.0415
	TLP Growth by using International I-O table	0.0187	0.0141	0.0378	0.0507	0.0696	0.0500	0.0905	0.1034	0.1234	0.2063	0.0370	0.0478	0.0628	0.0361	0.0723	0.1096	0.0347	0.0301
2002	Direct Labor Productivity Growth	0.0244	0.0090	0.1623	0.1296	0.1294	0.1418	0.1121	0.2106	0.2894	0.3162	0.1118	0.1397	0.0311	0.0849	0.0601	0.1957	0.0775	0.1267
	TLP Growth by using National I-O table	0.0505	0.0483	0.0886	0.1537	0.0908	0.1355	0.1297	0.1501	0.1623	0.1967	0.0974	0.0995	0.0475	0.0711	0.0440	0.1030	0.0594	0.0863
	TLP Growth by using International I-O table	0.0480	0.0407	0.0848	0.1526	0.0919	0.1376	0.1151	0.1534	0.1925	0.2051	0.0935	0.0959	0.0401	0.0697	0.0372	0.1015	0.0501	0.0718
2003	Direct Labor Productivity Growth	0.0328	0.1018	0.2705	0.0601	0.1712	0.0983	0.2579	0.1470	0.2966	0.1288	0.2197	0.1521	0.0929	0.0904	0.0310	0.1359	0.0614	0.0579
	TLP Growth by using National I-O table	0.0327	0.1112	0.0593	0.0503	0.0885	0.0453	0.0460	0.0973	0.1287	0.1014	0.0746	0.0589	0.0374	0.0505	0.0600	0.0876	0.0375	0.0412
	TLP Growth by using International I-O table	0.0372	0.0557	0.0708	0.0749	0.1164	0.0886	0.1229	0.1784	0.1851	0.1232	0.1280	0.0998	0.0577	0.0635	0.0918	0.1442	0.0868	0.0704
2004	Direct Labor Productivity Growth	0.001	0.2955	-0.0179	-0.0800	-0.0127	0.0515	0.1261	0.1265	0.0648	-0.2217	0.4707	0.1501	-0.0022	-0.0104	0.1021	0.0484	0.0293	0.0552
	TLP Growth by using National I-O table	0.0884	0.0785	0.1495	0.0990	0.1074	0.0611	0.0203	0.1454	0.1434	-0.0299	0.1610	0.1107	0.0557	0.1277	0.1217	0.1124	0.0928	0.1025
	TLP Growth by using International I-O table	0.0943	0.1211	0.1615	0.1083	0.1164	0.0981	0.0631	0.1884	0.1787	-0.0423	0.2076	0.1329	0.0598	0.1373	0.1452	0.1308	0.1174	0.1086
2005	Direct Labor Productivity Growth	0.0911	-0.0201	0.0189	0.1569	-0.0289	0.0849	0.1193	0.1564	0.1888	0.2071	0.2380	0.1365	0.0801	0.0239	0.0917	0.0189	0.0914	0.0985
	TLP Growth by using National I-O table	0.1168	-0.1874	0.0885	0.1010	0.0007	-0.0490	-0.0248	0.0419	0.0397	0.1025	-0.0377	0.0601	0.0970	0.0665	-0.0556	-0.0346	-0.0041	0.0486
	TLP Growth by using International I-O table	0.1254	-0.1067	0.1073	0.1214	0.0346	-0.0129	0.0159	0.0800	0.1034	0.1413	0.0946	0.0940	0.1800	0.0844	-0.0038	0.0079	0.0325	0.0757
2006	Direct Labor Productivity Growth	0.0940	0.0209	0.2341	0.1807	0.0715	0.1208	0.2389	0.2277	0.0911	0.5802	-0.0809	0.0850	0.1147	0.0488	0.0884	0.0180	0.340	0.0824
	TLP Growth by using National I-O table	0.0967	0.0762	0.1156	0.1372	0.1393	0.1728	0.1606	0.2051	0.2073	0.3250	0.1309	0.1226	0.1718	0.0961	0.1392	0.1202	0.315	0.1301
	TLP Growth by using International I-O table	0.0857	-0.0359	0.0906	0.1041	0.0759	0.0691	0.1063	0.1092	0.0957	0.3013	0.0551	0.0769	0.0812	0.0658	0.1460	0.0453	0.0730	0.0933
2007	Direct Labor Productivity Growth	0.0725	0.1394	0.1586	0.1262	0.1146	0.1815	0.1187	0.0901	0.2566	0.1897	0.2831	0.0685	0.1763	0.0663	0.1460	0.0760	0.1862	0.0605
	TLP Growth by using National I-O table	0.1149	0.1163	0.2010	0.1901	0.1326	0.1389	-0.0040	0.1282	0.1225	0.1678	0.1059	0.1289	0.1800	0.1396	0.1396	0.1481	0.0827	0.2165
	TLP Growth by using International I-O table	0.1197	0.1631	0.2212	0.2007	0.1557	0.1668	0.0044	0.1263	0.1421	0.1989	0.1305	0.1685	0.1963	0.1517	0.1743	0.1684	0.1446	0.2233
2008	Direct Labor Productivity Growth	0.0727	-0.0534	0.0785	0.1580	0.0898	0.0404	0.0900	0.0823	0.1810	0.1658	0.0616	0.1462	0.0421	0.0389	0.1194	0.0534	0.1057	0.1057
	TLP Growth by using National I-O table	0.0647	-0.0882	0.0728	0.1308	0.0792	0.0983	0.1827	0.1705	0.1667	0.1683	0.0683	0.1319	0.0740	0.1134	0.1396	0.1255	0.1201	0.1164
	TLP Growth by using International I-O table	0.0750	0.2358	0.0163	0.0232	0.0396	0.0786	0.1778	0.0448	0.0118	0.0078	-0.0120	0.1541	0.0837	0.0196	0.0029	0.0369	0.0803	0.0376
2009	Direct Labor Productivity Growth	0.0700	0.2776	0.0689	0.0535	0.0684	0.1174	0.2220	0.0895	0.0490	0.0264	0.0230	0.0675	0.0747	0.0304	0.0360	0.0547	0.0138	0.0066
	TLP Growth by using National I-O table	0.0643	0.2207	0.0524	0.0268	0.0341	0.0593	0.1447	0.0107	-0.0206	-0.0018	-0.0283	0.0325	0.0516	0.0140	-0.0029	0.0116	-0.0313	-0.0129

note : Average of total industries is weighted average whose weight is total labor quantity in net product by industry.

		UNIT: person-year/1000 US Dollar in current price																				
		Direct Labor	0116	0044	0038	0102	0069	0037	0061	0056	0040	0106	0028	0102	0144	0232	0090	0075	0069	00141	0183	0000
		Total Labor by using National I-O Table	0267	0147	0207	0264	0205	0170	0189	0183	0186	0230	0128	0201	0221	0328	0194	0166	0149	0180	0282	0198
		Total Labor by using International I-O Table	0325	0178	0325	0375	0276	0231	0263	0252	0280	0347	0155	0246	0245	0379	0229	0194	0172	0221	0291	0316
		Direct Labor	0100	0037	0037	0097	0069	0035	0063	0054	0039	0303	0026	0097	0141	0227	0086	0072	0065	0137	0176	0000
		Total Labor by using National I-O Table	0241	0135	0194	0252	0198	0161	0183	0177	0180	0222	0120	0193	0214	0318	0184	0158	0142	0178	0251	0191
		Total Labor by using International I-O Table	0298	0166	0314	0373	0272	0226	0254	0250	0272	0329	0149	0238	0238	0370	0219	0186	0165	0211	0280	0304
		Direct Labor	0098	0036	0036	0090	0066	0034	0059	0051	0036	0097	0024	0094	0137	0218	0080	0069	0062	0132	0171	0000
		Total Labor by using National I-O Table	0232	0128	0185	0230	0186	0153	0173	0165	0170	0209	0111	0183	0205	0302	0170	0149	0134	0197	0244	0185
		Total Labor by using International I-O Table	0308	0174	0325	0397	0278	0235	0288	0264	0290	0338	0153	0238	0236	0360	0218	0183	0164	0241	0277	0335
		Direct Labor	0094	0043	0035	0089	0064	0035	0059	0052	0035	0092	0024	0088	0132	0212	0075	0070	0060	0131	0160	0000
		Total Labor by using National I-O Table	0218	0130	0173	0215	0173	0145	0163	0156	0159	0193	0105	0188	0193	0287	0158	0144	0127	0196	0228	0173
		Total Labor by using International I-O Table	0281	0164	0302	0371	0258	0222	0251	0252	0283	0322	0136	0219	0217	0342	0197	0175	0151	0234	0257	0350
		Direct Labor	0096	0039	0035	0083	0060	0034	0060	0049	0032	0090	0020	0088	0126	0205	0074	0065	0057	0125	0154	0000
		Total Labor by using National I-O Table	0218	0123	0170	0204	0166	0139	0160	0149	0151	0188	0098	0165	0184	0278	0154	0137	0122	0188	0218	0166
		Total Labor by using International I-O Table	0275	0153	0289	0337	0241	0206	0240	0227	0252	0302	0125	0210	0207	0328	0187	0164	0143	0222	0245	0314
		Direct Labor	0096	0028	0034	0081	0058	0030	0058	0045	0034	0088	0017	0084	0122	0194	0071	0062	0053	0122	0146	0000
		Total Labor by using National I-O Table	0213	0108	0163	0194	0158	0130	0153	0139	0147	0180	0090	0158	0177	0263	0147	0130	0115	0181	0208	0157
		Total Labor by using International I-O Table	0272	0143	0269	0356	0245	0212	0242	0236	0287	0311	0123	0209	0203	0315	0187	0160	0139	0224	0238	0386
		Direct Labor	0093	0029	0033	0082	0057	0030	0060	0050	0034	0087	0014	0083	0123	0193	0072	0060	0051	0113	0139	0000
		Total Labor by using National I-O Table	0206	0106	0158	0193	0155	0127	0154	0146	0179	0085	0154	0176	0260	0146	0125	0110	0171	0188	0174	0155
		Total Labor by using International I-O Table	0264	0136	0281	0331	0232	0194	0231	0222	0248	0291	0112	0200	0198	0312	0178	0152	0132	0205	0225	0300
		Direct Labor	0097	0030	0033	0079	0055	0028	0056	0049	0030	0077	0018	0082	0117	0186	0071	0055	0048	0108	0136	0000
		Total Labor by using National I-O Table	0208	0104	0156	0188	0149	0121	0145	0138	0138	0164	0087	0151	0168	0251	0142	0118	0105	0163	0193	0149
		Total Labor by using International I-O Table	0266	0135	0277	0335	0228	0194	0223	0225	0254	0279	0117	0197	0190	0302	0177	0145	0127	0199	0220	0345
		Direct Labor	0083	0023	0030	0074	0052	0025	0053	0045	0028	0073	0017	0079	0112	0179	0065	0051	0046	0102	0131	0000
		Total Labor by using National I-O Table	0190	0097	0150	0181	0146	0118	0143	0133	0134	0161	0085	0148	0164	0244	0135	0115	0103	0158	0189	0146
		Total Labor by using International I-O Table	0250	0128	0280	0317	0222	0188	0215	0210	0233	0271	0113	0193	0186	0297	0162	0142	0125	0193	0216	0284
		Direct Labor	0073	0020	0029	0071	0049	0022	0046	0041	0028	0072	0017	0077	0104	0172	0062	0048	0043	0097	0126	0000
		Total Labor by using National I-O Table	0175	0092	0142	0174	0139	0112	0132	0127	0130	0157	0083	0144	0155	0236	0131	0110	0099	0153	0183	0141
		Total Labor by using International I-O Table	0235	0122	0274	0311	0215	0177	0201	0200	0225	0268	0110	0190	0178	0288	0164	0137	0121	0188	0211	0294
		Direct Labor	0072	0016	0027	0065	0046	0018	0042	0039	0027	0064	0014	0070	0100	0164	0059	0045	0041	0093	0120	0000
		Total Labor by using National I-O Table	0170	0084	0135	0162	0132	0102	0123	0120	0124	0145	0077	0134	0148	0225	0125	0104	0094	0147	0174	0133
		Total Labor by using International I-O Table	0226	0116	0253	0296	0208	0171	0185	0198	0225	0258	0105	0181	0172	0275	0159	0133	0117	0184	0203	0288
		Direct Labor	0074	0016	0026	0065	0044	0016	0038	0037	0026	0061	0014	0069	0095	0159	0055	0044	0039	0089	0115	0000
		Total Labor by using National I-O Table	0170	0082	0134	0161	0128	0089	0118	0116	0121	0140	0076	0132	0143	0219	0119	0101	0091	0142	0169	0130
		Total Labor by using International I-O Table	0231	0114	0269	0295	0203	0165	0187	0192	0218	0249	0103	0178	0166	0272	0153	0130	0114	0178	0197	0278
		Direct Labor	0061	0016	0025	0073	0042	0015	0035	0035	0023	0060	0014	0069	0093	0155	0053	0042	0037	0084	0111	0000
		Total Labor by using National I-O Table	0151	0080	0125	0169	0122	0096	0113	0112	0116	0137	0074	0130	0140	0214	0115	0099	0088	0137	0164	0126
		Total Labor by using International I-O Table	0205	0110	0243	0286	0188	0153	0176	0181	0203	0233	0099	0172	0182	0260	0146	0125	0109	0170	0189	0251
		Direct Labor	0055	0014	0023	0076	0040	0013	0032	0034	0026	0057	0012	0068	0092	0152	0051	0041	0036	0080	0108	0000
		Total Labor by using National I-O Table	0141	0077	0119	0168	0118	0092	0108	0109	0115	0131	0071	0128	0137	0208	0112	0095	0086	0131	0159	0122
		Total Labor by using International I-O Table	0185	0102	0214	0268	0175	0136	0163	0171	0193	0217	0091	0165	0166	0248	0139	0118	0104	0161	0181	0226
		Direct Labor	0060	0020	0023	0081	0038	0015	0036	0037	0024	0055	0014	0067	0097	0151	0059	0039	0034	0079	0106	0000
		Total Labor by using National I-O Table	0146	0082	0119	0174	0115	0093	0110	0110	0112	0128	0073	0128	0141	0206	0118	0092	0082	0128	0155	0121
		Total Labor by using International I-O Table	0185	0104	0206	0262	0166	0133	0161	0166	0183	0204	0091	0158	0157	0241	0142	0112	0098	0154	0175	0215



UNIT: person*year/1000 US Dollar in current price																				
Table 7. Embodied labor quantity by industry in South Korea																				
	AGRICULTURE AND FISHERIES	Mining and Quarrying	Food and Beverages	Textiles and Wearing Apparel	Wood and Paper	Petroleum, Chemical and Non-Metallic Mineral Products	Metal Products	Electrical and Machinery	Transport Equipment	Other Manufacturing and Recycling	Electricity, Gas and Water	Construction	Wholesale and Retail Trade, Accommodation and Restaurants	Hotels and Restaurants	Transport	Post and Telecommunications	Finance, Insurance and Real Estate Activities	Public Administration	Education, Health and Others	Re-export and Re-import
1995	0.0546	0.0077	0.0059	0.0202	0.1114	0.0071	0.0065	0.0108	0.0083	0.0148	0.0038	0.0174	0.0466	0.0424	0.0223	0.0090	0.0119	0.0167	0.0332	0.0000
Total Labor by using National I-O Table	0.0739	0.0285	0.0566	0.0571	0.0458	0.0421	0.0394	0.0435	0.0456	0.0475	0.0279	0.0450	0.0631	0.0693	0.0505	0.0259	0.0337	0.0552	0.0491	0.0459
Total Labor by using international I-O Table	0.0871	0.0424	0.0937	0.1029	0.0897	0.0608	0.0627	0.0539	0.0607	0.0780	0.0459	0.0580	0.0726	0.0881	0.0652	0.0325	0.0434	0.0722	0.0554	0.1415
1996	0.0546	0.0077	0.0059	0.0202	0.1114	0.0071	0.0065	0.0108	0.0083	0.0148	0.0038	0.0174	0.0466	0.0424	0.0223	0.0090	0.0119	0.0167	0.0332	0.0000
Total Labor by using National I-O Table	0.0739	0.0285	0.0566	0.0571	0.0458	0.0421	0.0394	0.0435	0.0456	0.0475	0.0279	0.0450	0.0631	0.0693	0.0505	0.0259	0.0337	0.0552	0.0491	0.0459
Total Labor by using international I-O Table	0.0816	0.0315	0.0922	0.1051	0.0799	0.0646	0.0583	0.0544	0.0559	0.0719	0.0489	0.0536	0.0887	0.0979	0.0638	0.0347	0.0412	0.0648	0.0562	0.1238
1997	0.0583	0.0089	0.0059	0.0173	0.1122	0.0066	0.0063	0.0108	0.0090	0.0151	0.0038	0.0181	0.0501	0.0525	0.0231	0.0078	0.0119	0.0167	0.0337	0.0000
Total Labor by using National I-O Table	0.0787	0.0281	0.0602	0.0555	0.0495	0.0450	0.0416	0.0473	0.0483	0.0495	0.0322	0.0468	0.0678	0.0881	0.0557	0.0302	0.0360	0.0578	0.0537	0.0481
Total Labor by using international I-O Table	0.0898	0.0358	0.1026	0.1065	0.0851	0.0652	0.0585	0.0581	0.0587	0.0755	0.0499	0.0566	0.0745	0.1112	0.0684	0.0360	0.0441	0.0693	0.0605	0.1043
1998	0.0903	0.0115	0.0069	0.0207	0.1139	0.0076	0.0074	0.0126	0.0131	0.0183	0.0040	0.0224	0.0711	0.0795	0.0307	0.0098	0.0169	0.0255	0.0487	0.0000
Total Labor by using National I-O Table	0.1169	0.0387	0.0826	0.0891	0.0596	0.0569	0.0515	0.0598	0.0635	0.0623	0.0401	0.0578	0.0937	0.1266	0.0727	0.0386	0.0476	0.0782	0.0732	0.0629
Total Labor by using international I-O Table	0.1282	0.0456	0.1307	0.1176	0.0974	0.0717	0.0669	0.0687	0.0709	0.0873	0.0545	0.0655	0.0991	0.1505	0.0789	0.0421	0.0541	0.0859	0.0782	0.1162
1999	0.0705	0.0089	0.0064	0.0184	0.1136	0.0060	0.0066	0.0092	0.0078	0.0147	0.0031	0.0188	0.0569	0.0610	0.0283	0.0072	0.0146	0.0250	0.0384	0.0000
Total Labor by using National I-O Table	0.0927	0.0304	0.0679	0.0580	0.0542	0.0466	0.0436	0.0484	0.0511	0.0513	0.0329	0.0486	0.0773	0.1015	0.0603	0.0345	0.0410	0.0689	0.0604	0.0510
Total Labor by using international I-O Table	0.1007	0.0368	0.0988	0.0991	0.0854	0.0601	0.0589	0.0581	0.0592	0.0739	0.0461	0.0561	0.0826	0.1209	0.0672	0.0380	0.0468	0.0756	0.0645	0.0884
2000	0.0653	0.0077	0.0061	0.0187	0.1119	0.0053	0.0063	0.0073	0.0078	0.0158	0.0025	0.0193	0.0486	0.0572	0.0229	0.0075	0.0139	0.0194	0.0373	0.0000
Total Labor by using National I-O Table	0.0850	0.0318	0.0615	0.0549	0.0467	0.0422	0.0390	0.0421	0.0461	0.0484	0.0289	0.0460	0.0663	0.0932	0.0534	0.0320	0.0372	0.0581	0.0566	0.0468
Total Labor by using international I-O Table	0.0934	0.0459	0.0921	0.0981	0.0764	0.0588	0.0549	0.0574	0.0624	0.0728	0.0460	0.0548	0.0724	0.1126	0.0652	0.0371	0.0438	0.0689	0.0628	0.0939
2001	0.0917	0.0096	0.0061	0.0197	0.1128	0.0056	0.0075	0.0091	0.0076	0.0190	0.0023	0.0203	0.0533	0.0600	0.0252	0.0084	0.0155	0.0186	0.0389	0.0000
Total Labor by using National I-O Table	0.0971	0.0234	0.0672	0.0599	0.0529	0.0465	0.0454	0.0486	0.0510	0.0557	0.0329	0.0505	0.0738	0.1003	0.0628	0.0365	0.0421	0.0628	0.0610	0.0515
Total Labor by using international I-O Table	0.0996	0.0350	0.0989	0.1027	0.0866	0.0582	0.0591	0.0578	0.0586	0.0780	0.0437	0.0575	0.0789	0.1203	0.0665	0.0398	0.0479	0.0692	0.0649	0.1005
2002	0.0648	0.0082	0.0061	0.0165	0.1116	0.0057	0.0064	0.0078	0.0065	0.0164	0.0019	0.0197	0.0489	0.0532	0.0234	0.0082	0.0126	0.0152	0.0318	0.0000
Total Labor by using National I-O Table	0.0768	0.0234	0.0566	0.0489	0.0451	0.0388	0.0366	0.0392	0.0420	0.0454	0.0280	0.0415	0.0613	0.0818	0.0484	0.0322	0.0351	0.0520	0.0503	0.0425
Total Labor by using international I-O Table	0.0842	0.0288	0.0869	0.0896	0.0736	0.0498	0.0493	0.0502	0.0501	0.0664	0.0380	0.0484	0.0677	0.1005	0.0565	0.0359	0.0411	0.0597	0.0545	0.0989
2003	0.0481	0.0080	0.0052	0.0139	0.1101	0.0042	0.0038	0.0060	0.0050	0.0127	0.0021	0.0149	0.0394	0.0467	0.0168	0.0074	0.0127	0.0137	0.0300	0.0000
Total Labor by using National I-O Table	0.0642	0.0212	0.0490	0.0443	0.0419	0.0350	0.0316	0.0353	0.0379	0.0406	0.0254	0.0373	0.0562	0.0768	0.0433	0.0298	0.0337	0.0473	0.0469	0.0385
Total Labor by using international I-O Table	0.0716	0.0272	0.0788	0.0845	0.0689	0.0455	0.0425	0.0454	0.0451	0.0615	0.0344	0.0435	0.0615	0.0951	0.0506	0.0333	0.0394	0.0542	0.0508	0.1181
2004	0.0433	0.0051	0.0044	0.0113	0.0880	0.0033	0.0032	0.0051	0.0040	0.0097	0.0017	0.0130	0.0327	0.0401	0.0145	0.0071	0.0111	0.0115	0.0260	0.0000
Total Labor by using National I-O Table	0.0564	0.0178	0.0418	0.0352	0.0353	0.0290	0.0255	0.0283	0.0268	0.0340	0.0206	0.0308	0.0440	0.0722	0.0337	0.0220	0.0278	0.0381	0.0384	0.0306
Total Labor by using international I-O Table	0.0643	0.0252	0.0701	0.0756	0.0590	0.0420	0.0397	0.0430	0.0405	0.0560	0.0315	0.0388	0.0494	0.0894	0.0449	0.0266	0.0341	0.0491	0.0432	0.0993
2005	0.0391	0.0053	0.0039	0.0089	0.0772	0.0027	0.0027	0.0045	0.0035	0.0088	0.0015	0.0118	0.0288	0.0348	0.0133	0.0070	0.0103	0.0100	0.0232	0.0000
Total Labor by using National I-O Table	0.0501	0.0180	0.0359	0.0312	0.0315	0.0265	0.0261	0.0255	0.0257	0.0343	0.0190	0.0259	0.0347	0.0649	0.0315	0.0188	0.0242	0.0331	0.0335	0.0287
Total Labor by using international I-O Table	0.0584	0.0252	0.0711	0.0644	0.0807	0.0397	0.0390	0.0400	0.0334	0.0511	0.0288	0.0327	0.0389	0.0796	0.0399	0.0290	0.0305	0.0414	0.0380	0.0853
2006	0.0362	0.0051	0.0035	0.0079	0.0663	0.0024	0.0026	0.0040	0.0031	0.0070	0.0015	0.0106	0.0258	0.0318	0.0117	0.0060	0.0098	0.0091	0.0213	0.0000
Total Labor by using National I-O Table	0.0449	0.0170	0.0310	0.0280	0.0274	0.0239	0.0233	0.0232	0.0222	0.0300	0.0172	0.0229	0.0305	0.0597	0.0292	0.0225	0.0284	0.0225	0.0315	0.0261
Total Labor by using international I-O Table	0.0514	0.0240	0.0623	0.0560	0.0535	0.0359	0.0365	0.0372	0.0323	0.0480	0.0259	0.0292	0.0338	0.0715	0.0355	0.0205	0.0284	0.0384	0.0366	0.0711
2007	0.0392	0.0050	0.0036	0.0086	0.0665	0.0021	0.0023	0.0042	0.0032	0.0080	0.0015	0.0115	0.0288	0.0334	0.0113	0.0067	0.0107	0.0098	0.0229	0.0000
Total Labor by using National I-O Table	0.0509	0.0206	0.0362	0.0338	0.0335	0.0289	0.0277	0.0285	0.0265	0.0359	0.0218	0.0297	0.0360	0.0810	0.0301	0.0207	0.0277	0.0348	0.0366	0.0313
Total Labor by using international I-O Table	0.0563	0.0256	0.0638	0.0581	0.0328	0.0354	0.0354	0.0375	0.0321	0.0506	0.0256	0.0336	0.0384	0.0909	0.0353	0.0228	0.0320	0.0398	0.0400	0.0614
2008	0.0409	0.0060	0.0039	0.0089	0.0777	0.0027	0.0027	0.0049	0.0035	0.0081	0.0017	0.0129	0.0326	0.0376	0.0154	0.0076	0.0123	0.0107	0.0250	0.0000
Total Labor by using National I-O Table	0.0541	0.0241	0.0405	0.0381	0.0398	0.0340	0.0331	0.0331	0.0303	0.0403	0.0248	0.0347	0.0407	0.0890	0.0387	0.0235	0.0324	0.0393	0.0408	0.0361
Total Labor by using international I-O Table	0.0584	0.0282	0.0638	0.0588	0.0565	0.0384	0.0383	0.0400	0.0343	0.0511	0.0273	0.0374	0.0429	0.1061	0.0389	0.0247	0.0357	0.0431	0.0434	0.0659

Table.8 Labor Productivity Growth by Industry in South Korea		Labor productivity growth = $\left(\frac{1}{1/\left(\frac{1}{\text{previous years' price}} - 1\right) \text{ previous years' labor quantity per USD in previous years' price}} - 1\right) / \left(\frac{1}{1/\left(\frac{1}{\text{previous years' price}} - 1\right) \text{ previous years' labor quantity per USD in previous years' price}} - 1\right)$																		
		AGRICULTURE AND FISHERIES	Mining and Quarrying	Food and Beverages	Textiles and Wearing Apparel	Wood and Paper	Petroleum, Chemical and Non-Metallic Mineral Products	Metal Products	Electrical and Machinery	Transport Equipment	Other Manufacturing and Recycling	Electricity, Gas and Water	Construction	Wholesale and Retail Trade	Hotels and Restaurants	Transport and Telecommunications	Financial and Business Activities	Public Administration	Education and Health	Average of total Industries
1996	Direct Labor Productivity Growth	0.029	0.013	-0.034	0.006	0.014	0.013	0.013	0.036	0.009	-0.017	-0.001	-0.003	0.016	0.011	0.079	0.070	-0.053	-0.042	-0.0042
1996	TLP Growth by using National I-O table	0.0291	0.0133	-0.0338	0.0057	0.0136	0.0129	0.0131	0.0361	0.0092	-0.0174	-0.0014	-0.0034	0.0160	0.0107	0.0794	0.0698	-0.0530	-0.0418	-0.0055
1996	TLP Growth by using International I-O table	0.0991	0.3639	-0.184	-0.0158	-0.1375	-0.0471	0.1291	0.0266	0.0960	0.0663	-0.0620	0.0733	0.0737	-0.0906	0.1030	0.0026	-0.0029	0.0947	-0.0557
1997	Direct Labor Productivity Growth	0.0997	-0.0204	0.1540	0.2719	0.0511	0.2031	0.1671	0.1665	0.0013	0.1102	0.1126	0.0450	0.0450	-0.0801	0.0867	0.3704	0.0627	0.0992	0.0702
1997	TLP Growth by using National I-O table	0.1016	0.1546	0.0732	0.1213	0.0446	0.0362	0.0671	0.0719	0.0220	0.0923	-0.0397	0.0449	0.0452	-0.1052	0.0215	0.1176	-0.0045	0.0502	-0.0042
1997	TLP Growth by using International I-O table	0.0657	0.0000	0.0266	0.0769	0.0614	0.0982	0.0822	0.0916	0.0300	0.0822	0.0842	0.0232	0.0366	0.0011	0.0829	0.1448	-0.0086	0.0275	0.0372
1998	Direct Labor Productivity Growth	-0.0597	0.0166	-0.0406	-0.0263	0.0705	0.0168	0.0236	0.0780	-0.0862	0.0287	0.0313	0.1348	-0.0278	0.0134	-0.0572	0.1699	0.0664	0.0251	0.0359
1998	TLP Growth by using National I-O table	-0.0597	0.0166	-0.0406	-0.0263	0.0705	0.0168	0.0236	0.0780	-0.0862	0.0287	0.0313	0.1348	-0.0278	0.0134	-0.0572	0.1699	0.0664	0.0251	0.0359
1998	TLP Growth by using International I-O table	-0.0221	0.1015	0.0324	0.0972	-0.1262	0.1679	0.1139	0.1537	-0.0150	0.1204	0.1769	0.2125	0.0088	0.0765	0.0359	0.2770	0.1511	0.1183	0.0928
1999	Direct Labor Productivity Growth	0.0611	0.1024	0.0344	0.1667	0.0298	0.1267	0.0634	0.2664	0.1577	0.1329	0.0414	0.0375	0.0877	0.1247	0.0950	-0.0382	0.0089	-0.0349	0.0239
1999	TLP Growth by using National I-O table	0.0707	0.0747	0.1131	0.1630	0.0667	0.1012	0.0428	0.2118	0.1144	0.1027	0.1014	0.0375	0.0877	0.1247	0.0950	-0.0382	0.0089	-0.0349	0.0239
1999	TLP Growth by using International I-O table	0.0295	0.1373	0.0580	-0.0341	0.1349	-0.0001	0.0164	0.3160	0.0338	-0.0806	0.0925	-0.0833	0.1112	-0.0085	0.0818	-0.0442	-0.0194	0.1616	-0.0703
2000	Direct Labor Productivity Growth	0.0404	-0.0572	0.1113	0.0423	0.1490	0.0188	0.0767	0.1998	0.1532	0.0445	-0.0299	-0.0665	0.1071	0.0143	0.0666	0.0784	0.0274	0.0673	-0.0384
2000	TLP Growth by using National I-O table	0.0291	-0.2113	0.0915	-0.0050	0.1083	-0.0906	0.0085	0.1045	0.0723	-0.0005	-0.1165	-0.0383	0.0824	-0.0007	-0.0252	0.0246	-0.0034	-0.0145	-0.0740
2000	TLP Growth by using International I-O table	0.0642	-0.0586	0.1144	0.0684	0.0619	0.0717	0.0470	0.0441	0.1217	-0.0685	0.1753	0.0507	0.0082	0.0643	0.0192	0.0411	-0.0293	0.1186	0.0019
2001	Direct Labor Productivity Growth	0.0517	0.2586	0.0303	0.0275	0.0128	0.0128	0.0128	0.0377	-0.0179	-0.0265	0.0081	0.0067	-0.0075	0.0370	0.0029	0.0212	-0.0368	-0.0067	-0.0276
2001	TLP Growth by using National I-O table	0.0635	0.5277	0.0382	0.0721	0.0125	0.1340	0.0895	0.1367	0.0656	0.0462	0.1680	0.0538	0.0132	0.0444	0.0885	0.0879	-0.0037	0.0691	0.0142
2001	TLP Growth by using International I-O table	0.0145	0.0067	-0.0429	-0.0123	0.0054	0.0270	0.0416	0.1519	0.0656	0.0255	-0.2893	0.0504	0.0189	0.0229	0.0494	-0.0170	-0.0207	-0.0395	0.0213
2002	Direct Labor Productivity Growth	0.0139	-0.0605	0.0102	0.1807	0.0658	0.0563	0.0592	0.1636	0.0624	0.0581	0.0783	-0.0160	0.0351	0.0208	0.0498	0.0599	0.0413	0.0120	0.0330
2002	TLP Growth by using National I-O table	0.0041	-0.1189	0.0054	0.1421	0.0277	0.0263	0.0138	0.1025	0.0383	0.0264	0.0371	-0.0366	0.0221	0.0087	0.0184	0.0293	0.0110	-0.0475	0.0024
2002	TLP Growth by using International I-O table	0.0169	0.0984	-0.0096	-0.0123	0.0054	0.0270	0.0416	0.1519	0.0656	0.0255	-0.2893	0.0504	0.0189	0.0229	0.0494	-0.0170	-0.0207	-0.0395	0.0213
2003	Direct Labor Productivity Growth	0.0206	0.0805	0.0358	0.0073	0.0257	-0.0125	-0.0183	0.1301	0.0544	0.0205	-0.0146	0.0123	0.0061	0.0177	-0.0055	0.0423	-0.0082	-0.0256	0.0090
2003	TLP Growth by using National I-O table	0.0213	0.1104	0.0084	-0.0264	0.0673	-0.0101	-0.0085	0.1079	0.0577	0.0079	0.0024	0.0092	0.0021	0.0062	-0.0213	0.0491	-0.0048	-0.0060	0.0206
2003	TLP Growth by using International I-O table	0.1311	0.0465	-0.0099	0.0724	-0.0238	0.0067	0.0949	0.1132	0.0871	0.0834	0.1321	0.0018	0.0205	-0.0499	0.0416	0.0761	-0.0707	0.0157	-0.0213
2004	Direct Labor Productivity Growth	0.1111	-0.0077	0.0417	0.0595	-0.0257	-0.0487	-0.1159	0.0794	0.0410	0.0382	0.0497	0.0008	0.0061	-0.0109	-0.0033	0.0569	-0.0285	0.0026	-0.0085
2004	TLP Growth by using National I-O table	0.0934	-0.0453	-0.0179	0.0198	-0.0349	-0.0613	-0.1145	0.0765	0.0435	-0.0001	0.0491	-0.0002	0.0003	-0.0180	-0.0044	0.0571	-0.0282	0.0045	-0.0082
2004	TLP Growth by using International I-O table	0.0225	-0.0397	0.0312	0.1214	0.1282	0.0698	-0.0134	0.1288	0.1050	0.1489	0.0997	-0.0083	0.0473	0.0049	0.0423	-0.0580	-0.0143	0.0044	-0.0096
2005	Direct Labor Productivity Growth	0.0479	-0.0223	0.0318	0.1411	0.0604	0.0178	0.0400	0.1929	0.2408	0.0448	0.0708	0.0430	0.1118	-0.0801	0.1561	0.2126	0.0483	0.0563	0.0472
2005	TLP Growth by using National I-O table	0.0247	-0.1120	0.0013	0.0130	0.0428	-0.0859	-0.1028	0.0097	0.0616	-0.0366	-0.0469	-0.0337	0.0832	-0.0817	0.0137	0.1166	-0.0031	-0.0608	0.0093
2005	TLP Growth by using International I-O table	0.0325	-0.0961	0.0789	0.2305	0.0532	0.0823	-0.0171	0.1583	0.0481	0.0304	-0.0345	0.0041	0.0480	0.0547	0.0261	-0.0635	-0.0208	0.0436	0.0189
2006	Direct Labor Productivity Growth	0.0502	-0.0740	0.0892	0.0961	0.0600	-0.0132	-0.1176	0.1241	-0.0458	-0.0727	-0.0507	0.0907	0.1665	0.0173	0.0054	0.0921	0.0383	0.0436	0.0395
2006	TLP Growth by using National I-O table	0.0265	-0.0645	-0.0775	0.1391	-0.0790	-0.0451	-0.0800	0.0885	0.0222	0.0230	-0.0450	0.0874	0.1681	0.0283	0.0570	0.0825	0.0118	0.0755	0.0320
2006	TLP Growth by using International I-O table	0.0732	-0.0317	0.0599	0.1043	0.0875	0.0717	0.0246	0.1434	0.0992	0.2174	-0.0601	0.0315	0.0691	0.0453	0.0320	0.0277	0.0520	0.0228	0.0541
2007	Direct Labor Productivity Growth	0.1086	-0.0288	0.1079	0.0966	0.0979	0.0325	0.1016	0.1404	0.0911	0.1108	0.0568	0.0474	0.0915	0.0382	0.0860	0.1191	0.0522	0.0754	0.0006
2007	TLP Growth by using National I-O table	0.1284	-0.0356	0.0915	0.1334	0.0821	0.0301	-0.0365	0.1090	-0.0268	0.0338	0.0673	0.0398	0.1021	0.0642	0.0236	0.0982	0.0496	0.0219	-0.0239
2007	TLP Growth by using International I-O table	0.0262	0.0068	0.0161	-0.0176	-0.0325	0.0255	0.0109	0.0522	-0.0010	0.0208	0.0244	-0.0358	-0.0038	0.0564	0.0385	0.0463	0.0324	0.0263	0.0396
2008	Direct Labor Productivity Growth	-0.0196	-0.1819	-0.1090	-0.1146	-0.1798	-0.2330	-0.2509	-0.1159	-0.1361	-0.0256	-0.1848	-0.1939	-0.0576	-0.1831	-0.1223	-0.0632	-0.0776	-0.0588	-0.0349
2008	TLP Growth by using National I-O table	0.0163	-0.0748	0.0163	0.0290	0.0164	-0.0605	-0.0808	0.0828	0.0384	0.1089	0.0339	-0.0927	-0.0183	-0.1292	0.0049	0.0592	0.0084	0.0717	0.0252
2008	TLP Growth by using International I-O table	0.0919	0.0131	-0.0275	0.0333	-0.0472	-0.0193	0.0015	-0.0509	-0.0083	0.0044	0.0300	-0.0175	0.0300	-0.0175	-0.0061	-0.0933	0.0192	0.0257	0.0304
2009	Direct Labor Productivity Growth	0.0721	0.0366	-0.0492	-0.0531	-0.0530	0.0480	0.0206	-0.0531	-0.0866	-0.0546	0.0121	-0.0115	-0.0182	-0.0741	0.0164	0.0175	0.0033	-0.0108	-0.0198
2009	TLP Growth by using National I-O table	0.0966	0.1074	0.0652	0.0543	0.0520	0.1367	0.1044	0.0372	-0.0225	0.0221	0.0819	0.0367	0.0052	-0.0399	0.0959	0.0692	0.0534	0.0437	0.0572

note : Average of total industries is weighted average whose weight is total labor quantity embodied in net product by industry.