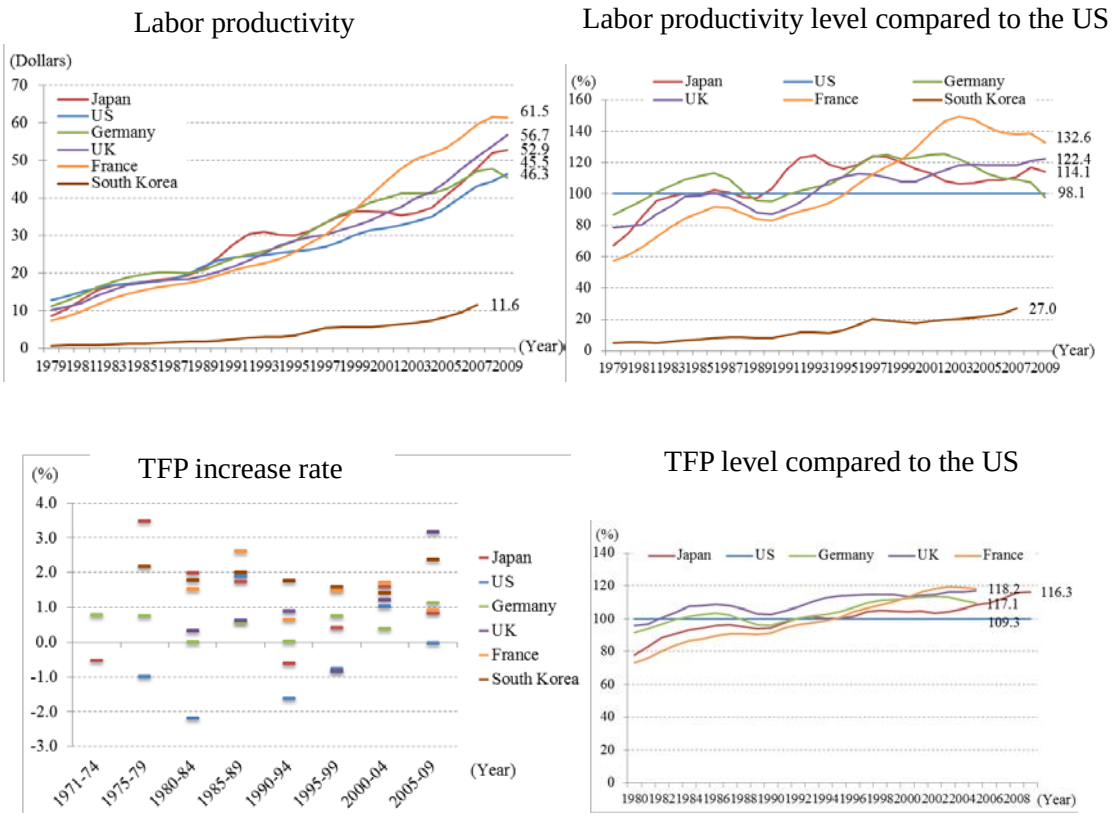
Addendum 1　Changes in labor productivity by industry and TFP

In this addendum, labor productivity and TFP changes as well as recent trends regarding representative industries in Japan are looked at from a bird's eye perspective. Regarding individual industry productivity trends, the manufacturing industry is displayed in Addendum Figures 1-1 to 1-9, and the non-manufacturing industry is displayed in Addendum Figures 1-10 to 1-15.[1]

Productivity trends of each industry within the manufacturing industry

Addendum Figure 1-1　General machine industry labor productivity and TFP



Notes: A moving average was taken for the previous three years for labor productivity level as well as labor productivity and TFP levels compared to the United States in order to even out the variation for a single year for labor productivity levels. The total labor time for the United States for the period between 2008 and 2009 was calculated by applying the rate of change of the total labor time index (year of 2005 = 100) for the period between 2008 and 2009 to the 2007 total labor time. Below is the same as Addendum Figure 1-2 to 1-15.

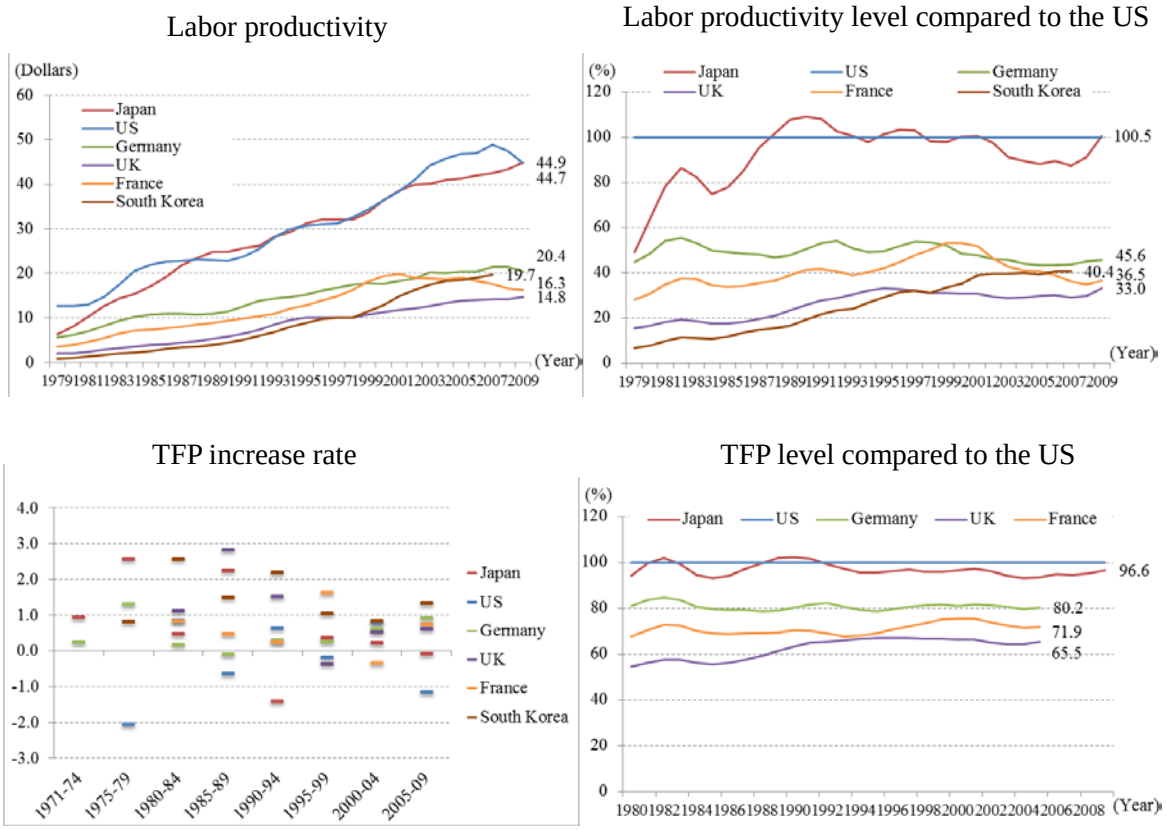
Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Within the general equipment industry, labor productivity and TFP level was higher than the United States from the beginning to the middle of the 1990s and continues to advance. The 2009 labor productivity was 52.9 dollars and 114% compared to the United States. Japan's labor productivity is

[1] Each industry's purchase power parity evaluation rate is used for labor productivity dollar conversion. Refer to Supplementary Note 7 for details regarding specific elongation methods for purchase power parity. Refer to Appendix 2 in Inklaar and Timmer (2008) for more detailed purchase power parity evaluation rate extrapolation methods. Also, in Ken (2011), purchase power parity is achieved using the same method.

higher than the United States, but is neck and neck with other countries and is not exceptionally high. On the other hand, TFP level was 116.3% in 2009 compared to the United States and rivals the main countries in Europe including Germany, United Kingdom, and France (all in 2005).

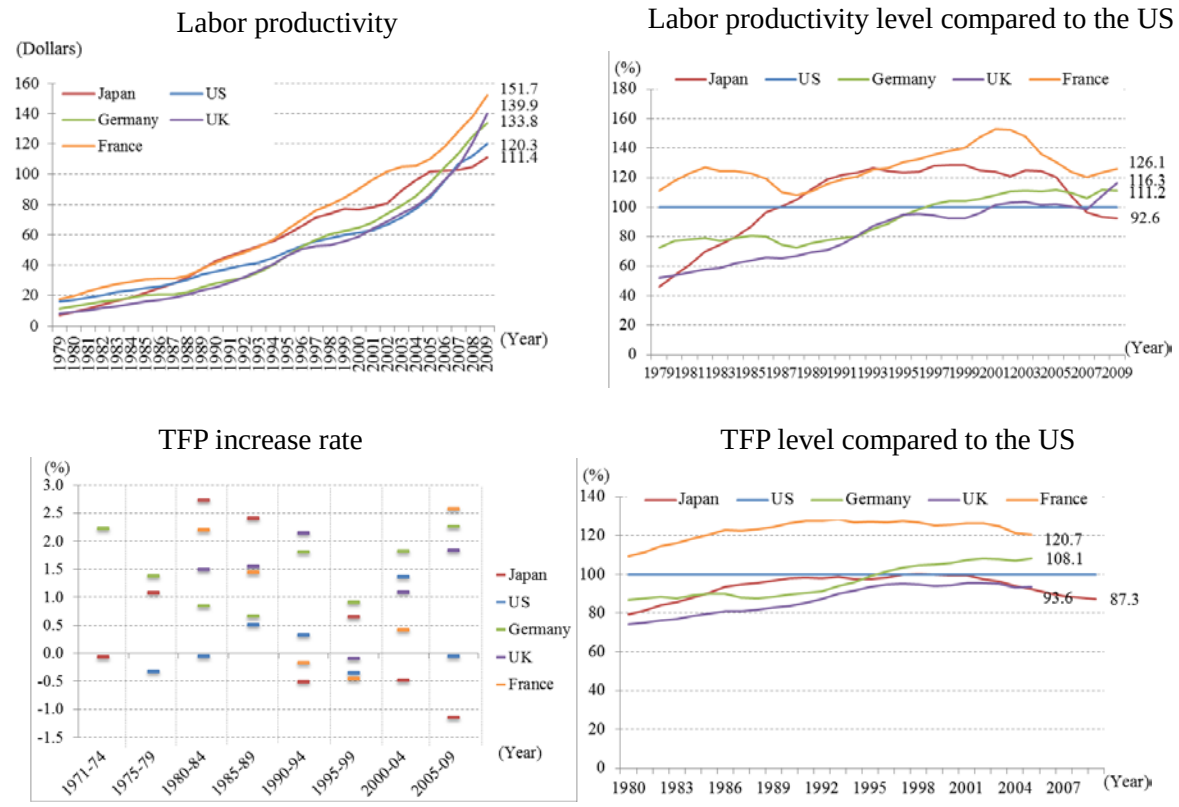
Addendum Figure 1-2　Transportation device industry labor productivity and TFP



Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Transportation equipment industry labor productivity increased to the same level as the United States in the second half of the 1980s, and the level of Japan and the United States has since pulled ahead of other countries. Japan's 2009 labor productivity was 44.9 dollars and 100.5% compared to the United States. A discrepancy close to double exists with Japan; however, South Korea's rise is remarkable. From 1980, which is the beginning of the analysis period, levels rivaled those of the United States and the TFP level discrepancy with the United States was 96.6% in 2009. The main European countries have TFP levels lower than Japan and productivity levels close to those of Japan and the United States.

Addendum Figure 1-3　Chemical industry labor productivity and TFP

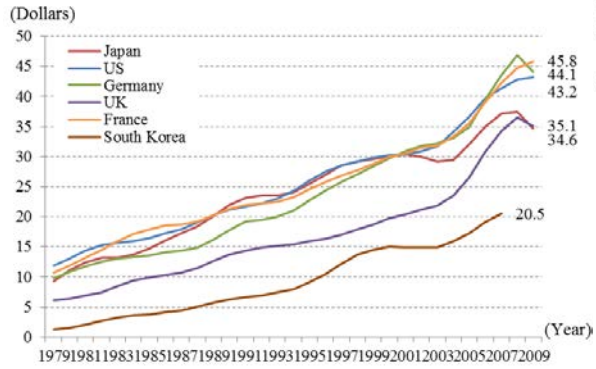


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

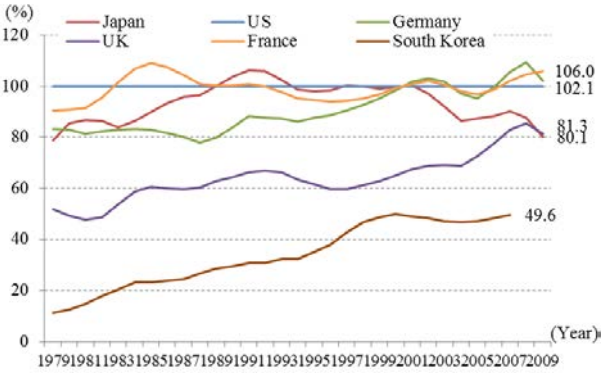
Within the chemical industry, Japan's labor productivity compared to the United States continued to rise from the early stages, rose above the United States in the second half of the 1980s, and continued to be high in the mid 2000s. It then declined and was 111.4 dollars in 2009 and 92.6% compared to the United States. On the other hand, when TFP level is compared to the United States, as with labor productivity, it rose from the early stages until the second half of the 1980s and then plateaued, and gradually declined from the beginning of the 2000s. TFP level was 87.3% in 2009 compared to the United States, and low when compared to the main European countries in 2005 (France: 120.7%, Germany: 108.1%, United Kingdom: 93.6%). TFP increase rate continues to be negative from 2000.

Addendum Figure 1-4　Metal industry labor productivity and TFP

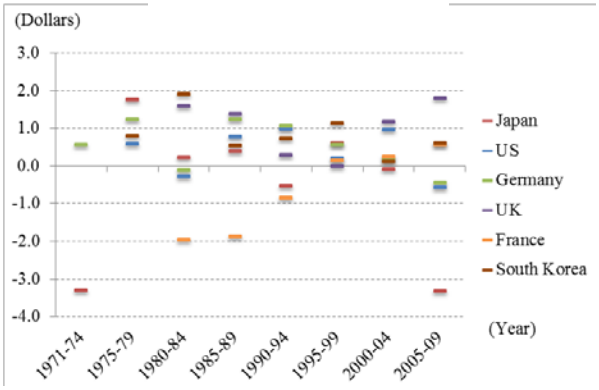
Labor productivity



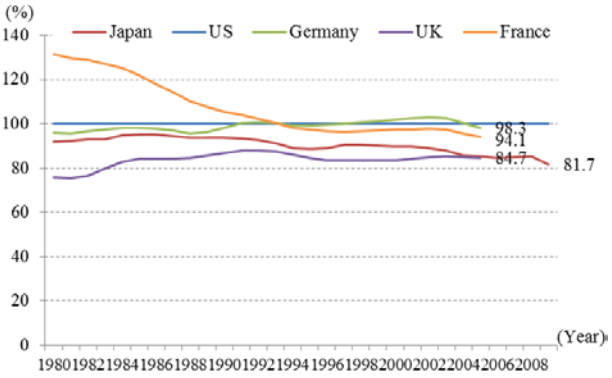
Labor productivity level compared to the US



TFP increase rate



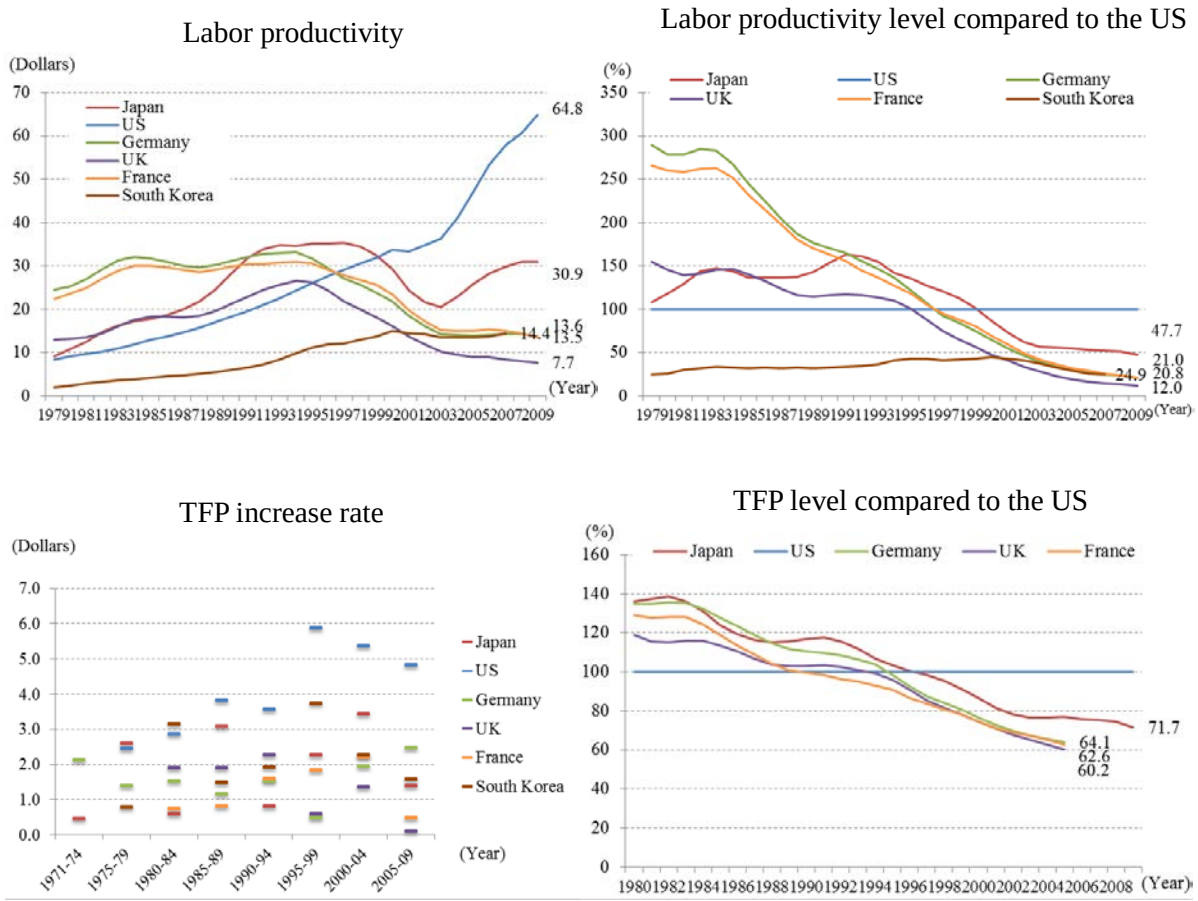
TFP level compared to the US



Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Within the metal industry, along with France and Germany, the same labor productivity as the United States was maintained from the beginning of the analysis period; however, it is slightly declining recently. Labor productivity was 34.6 dollars in 2009 and 80.1% compared to the United States. South Korea's labor productivity was 49.6% compared to the United States in 2007 and, as before, there is a discrepancy (around 1.6 times) with Japan. A declining trend was seen regarding Japan's TFP level compared to the United States from the mid 1980s and is 81.7% in 2009.

Addendum Figure 1-5　Electrical equipment industry labor productivity and TFP

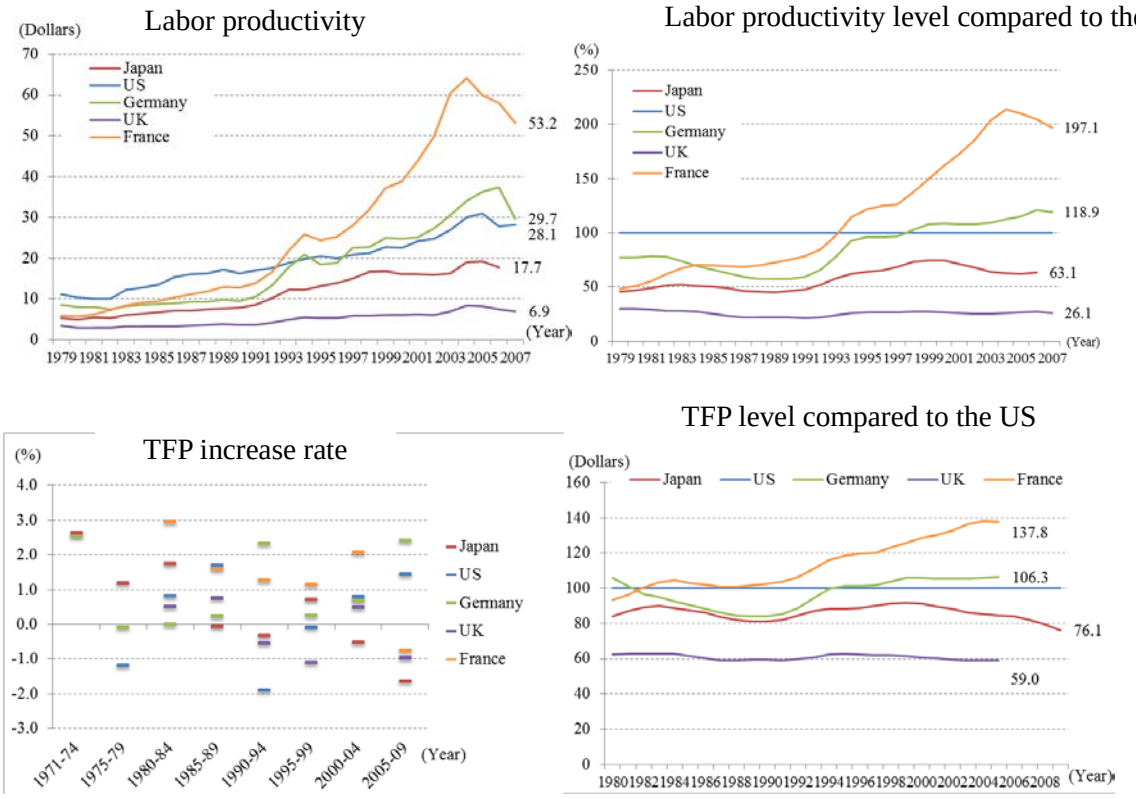


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Even while the labor productivity within the electrical equipment industry repeatedly fluctuates, until the mid 1990s, above 100% compared to the United States was maintained; however, the subsequent loss of traction was dramatic and declined from 163% compared to the United States during the peak in the second half of the 1991 to 47.7% in 2009. Labor productivity in South Korea has an increasing trend and the discrepancy with Japan is shrinking little by little; however, Japan nevertheless has the fifth strongest level. Japan's TFP level compared to the United States since the 1982 peak of 138.6% continues to decline consistently and is above each European country (In 2005: Germany 64.1%, France 62.6%, United Kingdom 60.2%); however, it has declined to 71.7% in 2009. When TFP increase rate is looked at, Japan’s TFP increase rate is not exactly low when compared to countries other than the United States; however, after 1985-89, the increase rate of other countries is consistently overwhelmed by that of the United States, and Japan’s corresponding TFP level decline is largely influenced by the rapid growth of the electrical equipment industry in the United States. Within electrical equipment, at one time from the second half of the 1980s to the first half of the 1990s, Japan’s productivity level was the highest out of each country; however, after that, as a result of the productivity increase rate in the United States rapidly increasing, together with Europe, there is a wide

separation with the United States.[2]

Addendum Figure 1-6　Wood product industry labor productivity and TFP



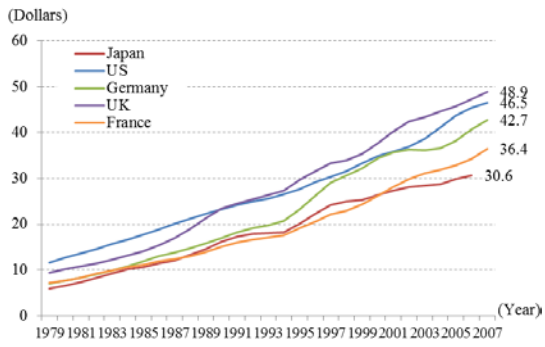
Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

There was a gradual rising trend within the wood product industry from the beginning of the 1990s, and was 17.7 dollars in 2006 and 63.1% compared to the United States. France's wood product labor productivity is the highest and is 197.1% compared to the United States. On the other hand, Japan's TFP level compared to the United States was almost within a constant range during the analysis period and 76.1% in 2009.

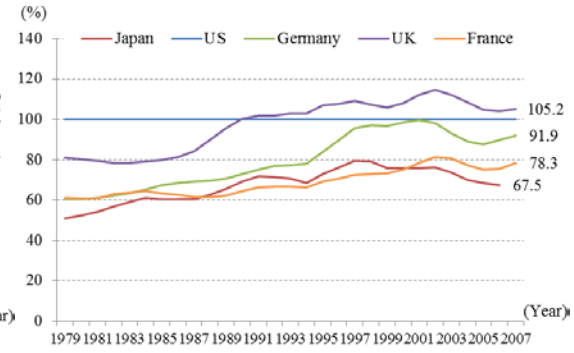
[2] Research exists that emphasizes the large contribution of electrical equipment within the TFP increase rate in the United States (Timmer, Ypma and van Ark (2003)).

Addendum Figure 1-7　Paper / pulp labor productivity and TFP

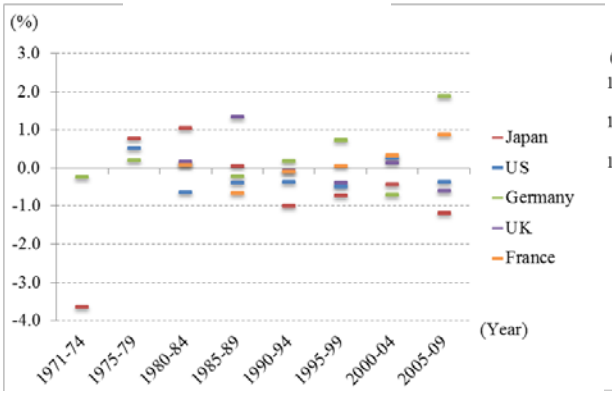
Labor productivity



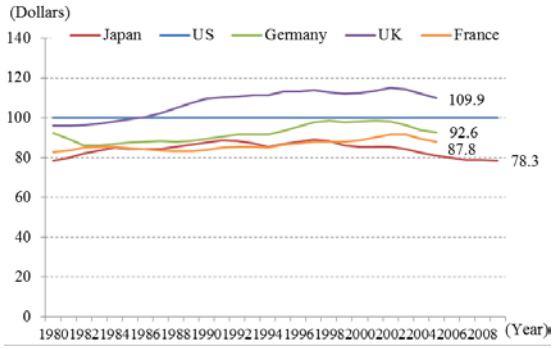
Labor productivity level compared to the US



TFP increase rate



TFP level compared to the US

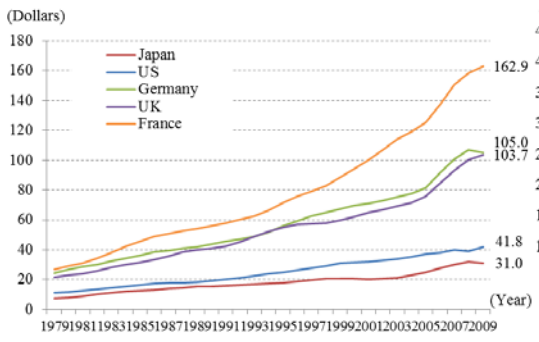


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

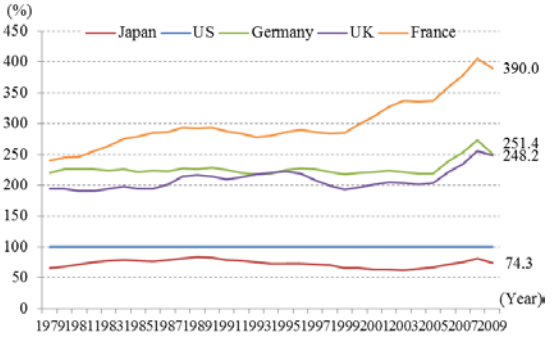
There is a gradual rising trend within the paper / pulp industry from the beginning of the 1990s, and was 30.6 dollars in 2006 and 67.5% compared to the United States. TFP level compared to the United States was 78.3% in 2009 and TFP increase rate has not been recorded as being positive since 1990.

Addendum Figure 1-8　Rubber / plastic and ceramic / soil and stone industry labor productivity and TFP

Labor productivity



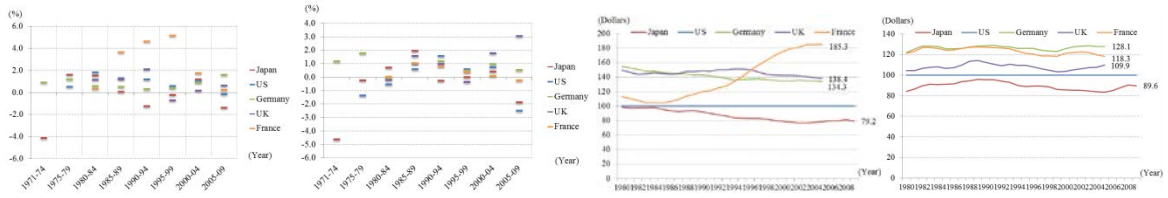
Labor productivity level compared to the US



TFP increase rate

TFP level compared to the US

Rubber / plastic　　Ceramics　　Rubber / plastic　　Ceramic



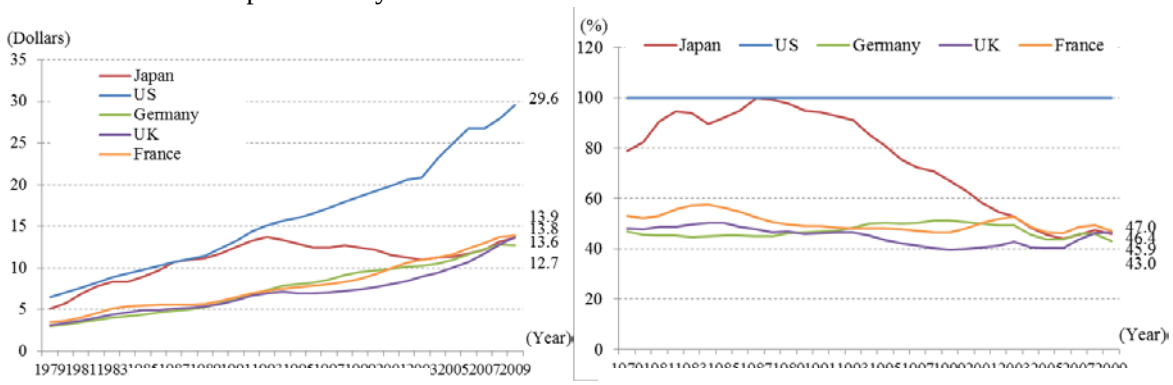
Notes: Industry classifications changed as a result of EU KLEMS2012 and rubber / plastic and soil and stone were integrated. Rubber / plastic purchase power parity evaluation rate is used in dollar conversion.

Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

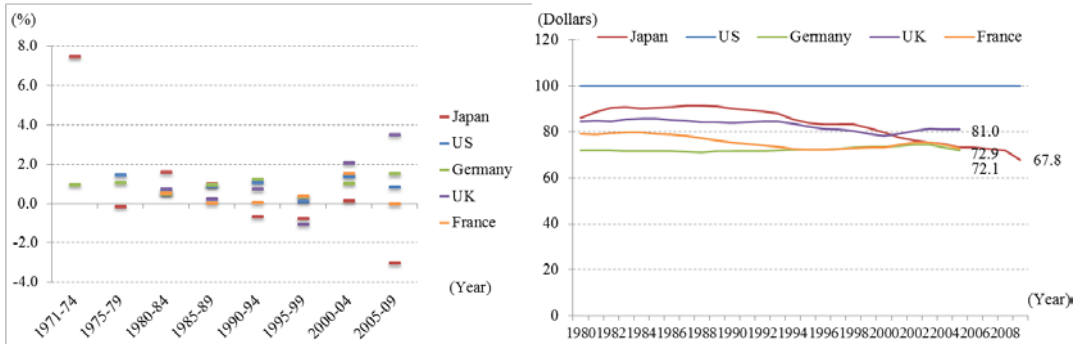
Japan's labor productivity within the rubber / plastic, ceramic / soil and stone industry was 31.0 dollars in 2009 and 74.3% compared to the United States. The labor productivity discrepancy with Europe is wider than the United States regarding this industry. Rubber / plastic and ceramics / soil and stone TFP are displayed separately. Rubber / plastic TFP level was 79.2% compared to the United States in 2009 and ceramics / soil and stone were 89.6%. Negative TFP increase rate values have been recorded during many periods after 1990-94.

Addendum Figure 1-9　Textile industry labor productivity and TFP

Labor productivity　　Labor productivity level compared to the US



TFP increase rate　　TFP level compared to the US

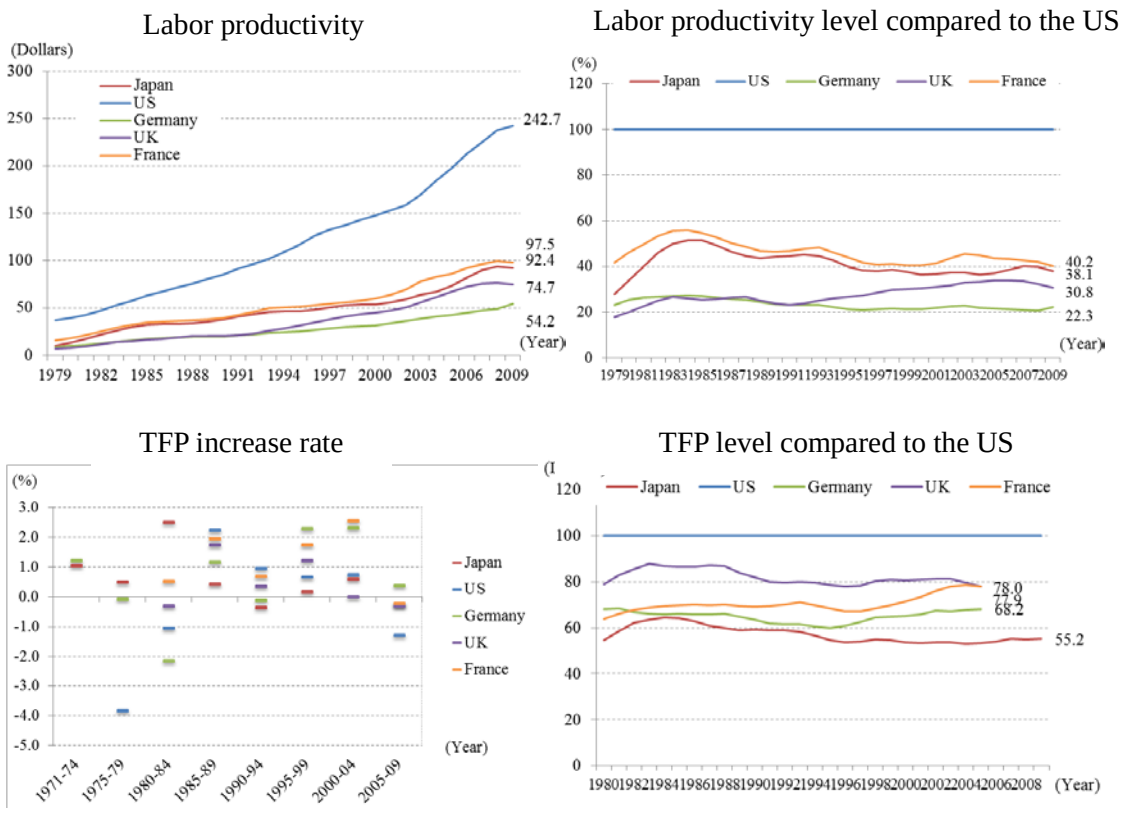


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Textile industry labor productivity was second behind the United States until 2003; however, the decline from the first half of the 1990s was drastic, and the textile industry was overtaken by the United Kingdom and France in 2009 and, compared to the United States, declined to 45.9% in 2009 from 99.8% in 1987. There is also a similar trend regarding TFP level compared to the United States and the discrepancy expanded widely from the first half of the 1990s. A trend is displayed whereby TFP increase rate declines each year.

Productivity trends of each industry within the non-manufacturing industry

Addendum Figure 1-10　Electric / gas / water industry labor productivity and TFP

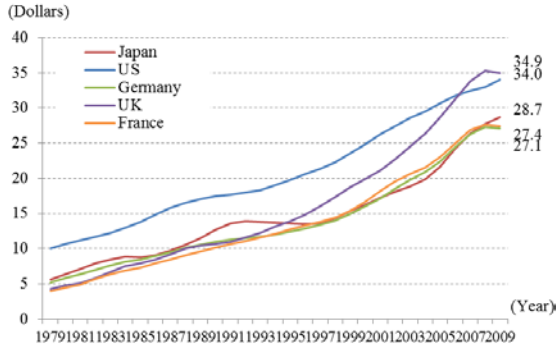


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

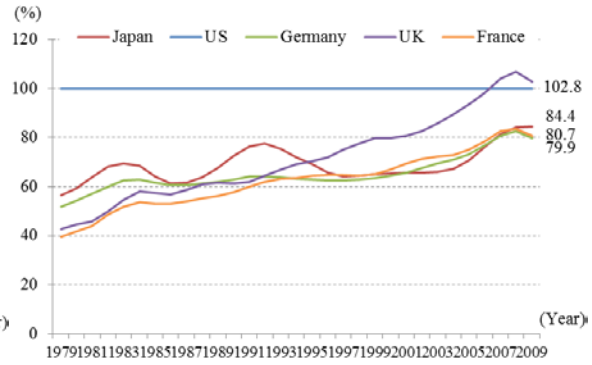
Electric / gas / water industry labor productivity was 92.4 dollars in 2009 and 38.1% compared to the United States. Reversely, TFP level was 55.2% compared to the United States and was lowest out of the five main European countries. Positive TFP increase rates have been recorded during many periods and TFP level discrepancies between the main European countries have been reduced.

Addendum Figure 1-11　Construction industry labor productivity and TFP

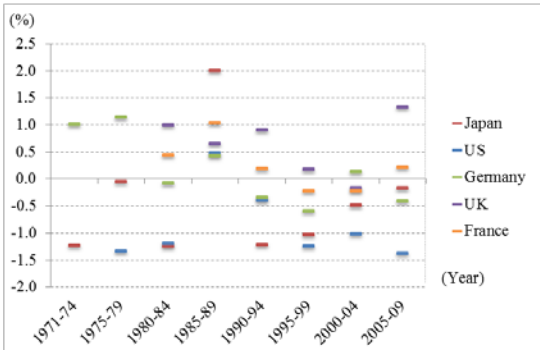
Labor productivity



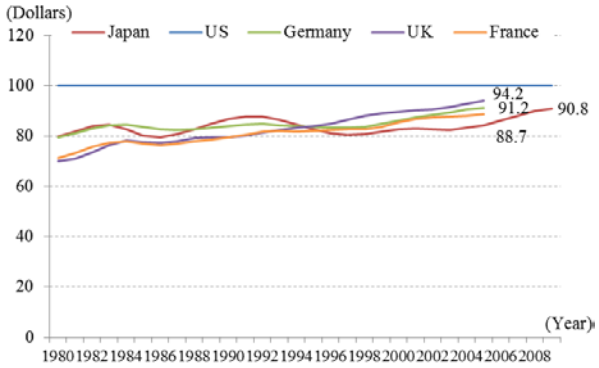
Labor productivity level compared to the US



TFP increase rate



TFP level compared to the US

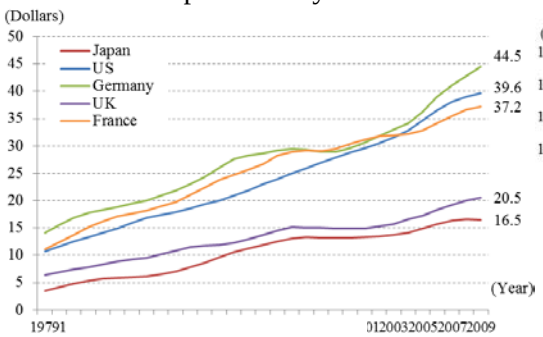


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

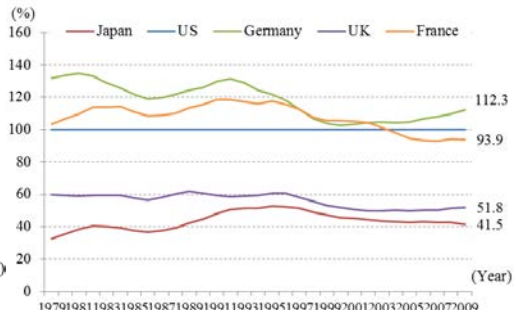
The construction industry labor productivity compared to the United States for all five major European countries has a declining trend. TFP levels of four countries rival those of the United States, and Japan's was 90.8% in 2009. TFP increase rate continues to recover from 1990; however, as before, a negative growth rate continues.

Addendum Figure 1-12　Wholesale / retail industry labor productivity and TFP

Labor productivity

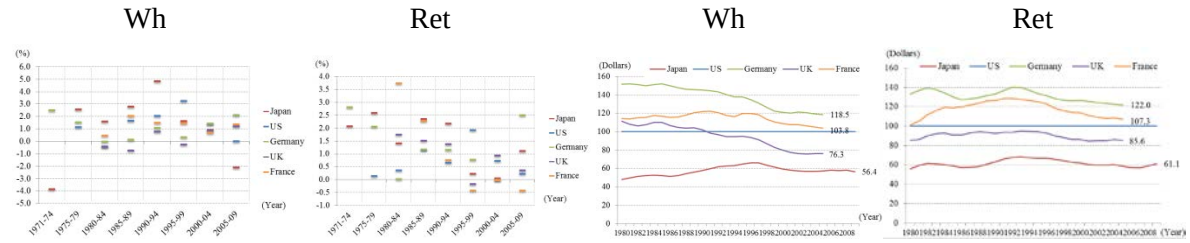


Labor productivity level compared to the US



TFP increase rate

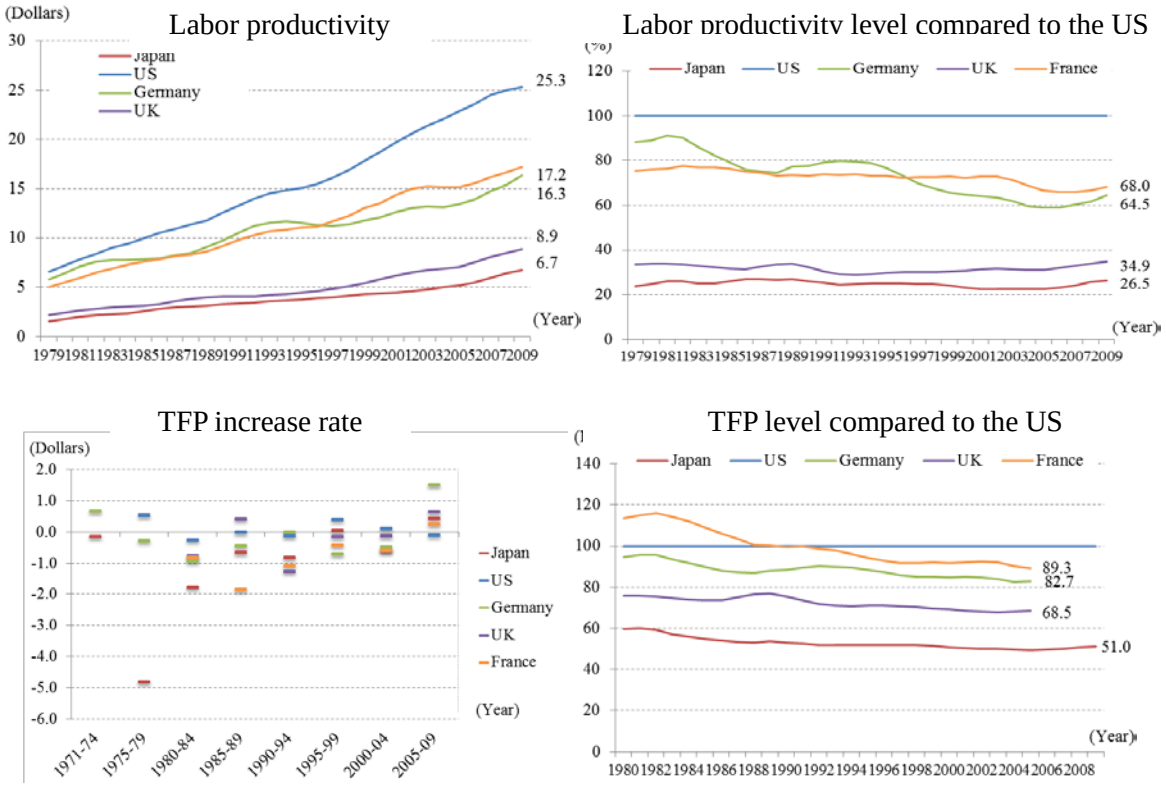
TFP level compared to the US



Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

While German and French wholesale and retail labor productivity is above or roughly the same as the United States, Japan and the United Kingdom are below. Even within this, Japan's labor productivity is the lowest (16.5% in 2009 and 41.5% compared to the United States). This trend increased from the early stages to the mid 1990s and then gradually declined. Wholesale and retail TFP is displayed separately.[3] Even when looking at TFP, Japan's wholesale and retail productivity are both the lowest among five advanced countries and wholesale was 56.4% in 2009 and retail was 61.1%. However, TFP increase rate is clearly not weak compared to other countries.

Addendum Figure 1-13 Food and beverage / lodging industry labor productivity and TFP

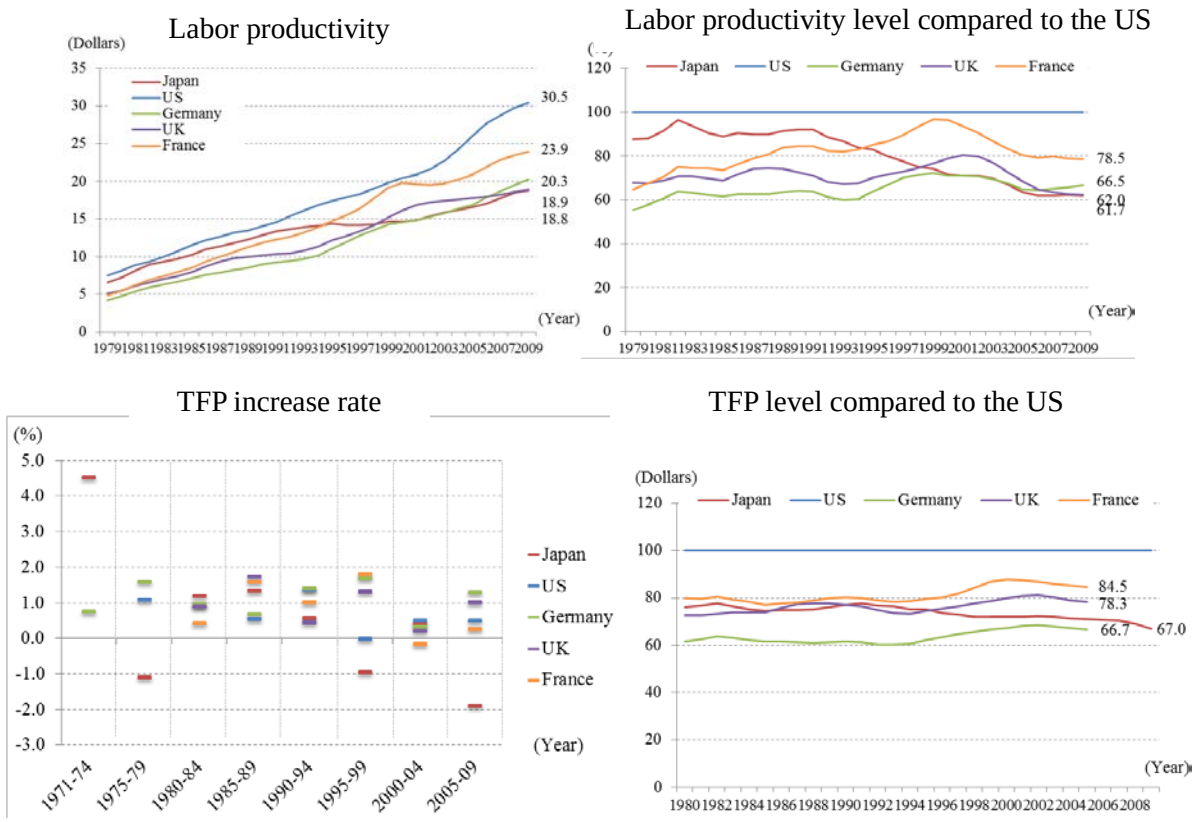


Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

[3] The TFP level of wholesale and retail in comparison to the United States have been calculated individually with the assumption that the benchmark value (0.64) of the whole distribution industry in 1997 is equivalent for wholesale and retail respectively.

Japan's food and beverage / lodging labor production was 6.7 dollars in 2009 and 26.5% compared to the United States, which is the lowest level among five advanced nations. Similarly, TFP level was 51.0% compare to the United Sates and still ranked the lowest. TFP increase rate tends to increase with time; however, increase rate in the United States is higher and Japan's increase rate tends to be low in comparison.

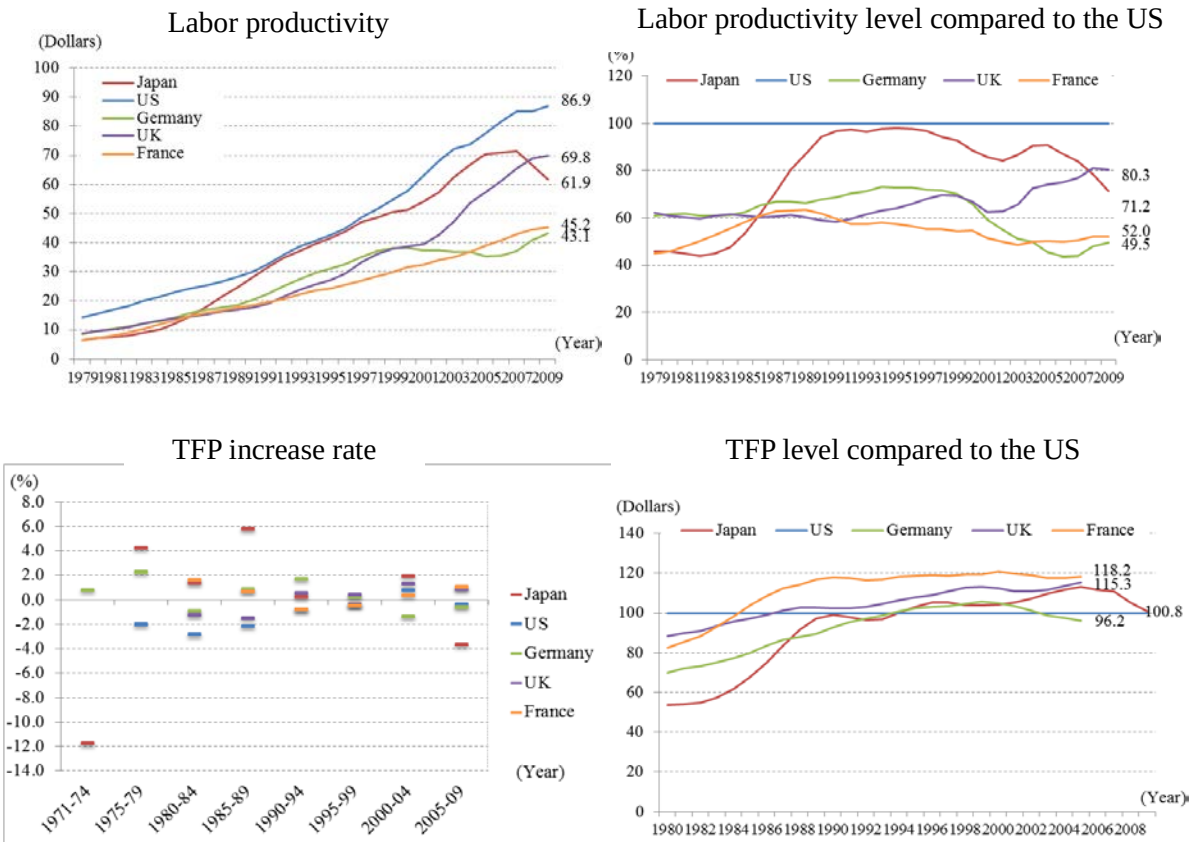
Addendum Figure 1-14　Transport / storage industry labor productivity and TFP



Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Transportation / storage industry labor productivity maintained a 90% scale compared to the United States from the early stages until the beginning of the 1990s; however, there is an expanding discrepancy trend. Labor productivity is 18.8 dollars in 2009 and 61.7% compared to the United States which is roughly the same level as the United Kingdom (62.0%). TFP level was the same 67.0% compared to the United States and Germany's TFP was the lowest (66.7% in 2005). TFP increase rate was consistently below the United States from 1990-94 and there is an expanding discrepancy trend.

Addendum Figure 1-15　Finance / insurance productivity and TFP



Source: EU KLEMS2012 version, EU KLEMS2009 version, EU KLEMS2008 version, GGDC database, JIP database 2012, Bureau of Economic Analysis.

Finance / insurance labor productivity was 61.9 dollars in 2009 and 71.2% compared to the United States, and was third among the five countries after the United States and the United Kingdom. Japan's labor productivity rapidly increased from the second half of the 1980s and, in 1995, increased to 98.0% compared to the United States and then the discrepancy trend expanded. TFP level was 100.8% compared to the United States in 2009 which is roughly the same level. TFP increase rate was the highest from 1975-1979 to 1985-98 among the five countries.

Addendum 2　Variables used in the regression analysis in Chapter 2 Section 1

In the Addendum, the description statistic for each variable that used the regression analysis in Section 1 of Chapter 2 is displayed. Addendum Figure 2-1 and 2-2 summarizes description statistics for variables used in TFP level and TFP increase rate regression analyses.

Addendum Figure 2-1 Description statistics for each variable for TFP level estimate

All samples					
Variable	Observed numbers	Mean value	Standard deviation	Min. value	Max. value
TFP level	193,858	-1.028	1.223	-9.275	5.726
Export intensity (t-1)	155,093	0.026	0.093	0.000	1.000
Overseas investment ratio (t-1)	155,089	0.009	0.04	0.000	4.615
Logarithmic value of total employee (t-1)	155,093	5.236	1.006	3.912	11.791
Logarithmic value of company age	153,825	3.590	0.553	0.000	4.700
Logarithmic value of the squared company age (t-1)	153,825	13.194	3.476	0.000	22.095
Foreign company dummy (t-1)	155,093	0.015	0.121	0.000	1.000
Japanese subsidiary dummy (t-1)	155,093	0.303	0.459	0.000	1.000
R&D intensive number (t-1)	155,093	0.006	0.021	0.000	2.294
Informatization investment ratio (t-1)	155,093	0.001	0.009	0.000	0.855

Addendum Figure 2-2 Description statistics for each variable for TFP increase rate estimate

All samples					
Variable	Observed numbers	Mean value	Standard deviation	Min. value	Max. value
TFP increase rate	193,497	0.000	0.721	-8.622	10.343
TFP level (t-1)	154,865	-1013	1.230	-9.275	5.726
Export intensity (t-1)	155,093	0.026	0.093	0.000	1.000
Overseas investment ratio (t-1)	155,089	0.009	0.040	0.000	4.615
Logarithmic value of total employee (t-1)	155,093	5.236	1.006	3.912	11.791
Logarithmic value of company age	153,825	3.590	0.553	0.000	4.700
Logarithmic value of the squared company age (t-1)	153,825	13.194	3.476	0.000	22.095
Foreign company dummy (t-1)	155,093	0.015	0.121	0.000	1.000
Japanese subsidiary dummy (t-1)	155,093	0.303	0.459	0.000	1.000
R&D intensive number (t-1)	155,093	0.006	0.021	0.000	2.294
Informatization investment ratio (t-1)	155,093	0.001	0.009	0.000	0.855

Supplementary Note 1　Regarding growth accounting

The growth accounting is intended to clarify the growth factors by focusing on the breakdown in performance (GDP growth rate) of the overall economy. Considering the capital and labor as production factors upon production and assuming the production function of the Cobb-Douglas model, it is possible to represent the GDP as follows.

$$Yt \quad = A_t K_t^{\alpha} L_t^{1-\alpha}$$

In the equation, Y is GDP, A is technical level (TFP level), K is capital input, L is labor input, and α is capital share ($1-\alpha$ is labor share). The added the character t represents time. By taking the natural logarithm of both sides it will be shown as follows.

$$ln\, Y_t = ln\, A_t + \alpha\, ln\, K_t + (1-\alpha)\, ln\, L_t$$

By differentiating time t in both sides of the equation it will be shown as follows.

$$\frac{\dot{Y}_t}{Y_t} = \frac{\dot{A}_t}{A_t} + \alpha \frac{\dot{K}_t}{K_t} + (1-\alpha)\frac{\dot{L}_t}{L_t}$$

GDP growth rate is analyzed into three factors; the TFP increase rate ($\frac{\dot{A}_t}{A_t}$), the product of change in capital input and capital share ($\alpha\frac{\dot{K}_t}{K_t}$), and the product of change in labor input and in labor share ($(1-\alpha)\frac{\dot{L}_t}{L_t}$). By this equation it is possible to know the details of economic performance (GDP growth rate), of which factor contributed to the GDP growth rate (Source: RIET web site, http://www.rieti.go.jp/jp/database/JIP2012/ans.html?page=Q4).

Supplementary Note 2　Regarding the real GDP growth rate breakdown per capita

Real GDP is represented as Y, total working hours as H, number of employees as E, total population as P, and working-age population as N, the real GDP per capita can be broken down as follows.

$$\frac{Y_t}{P_t} = \frac{Y_t}{H_t} \times \frac{H_t}{E_t} \times \frac{E_t}{N_t} \times \frac{N_t}{P_t}$$

The left side of the equation shows real GDP per capita and on the right side of the equation the first term is labor productivity, the second term is working hours per employee, the third term is employment rate, and the fourth term is working-age population ratio. By taking the natural logarithm of both sides it will be shown as follows.

$$ln\left(\frac{Y_t}{P_t}\right) = ln\left(\frac{Y_t}{H_t}\right) + ln\left(\frac{H_t}{E_t}\right) + ln\left(\frac{E_t}{N_t}\right) + ln\left(\frac{N_t}{P_t}\right)$$

By taking the difference in the above equation it will be shown as follows.

$$\Delta\, ln\left(\frac{Y_t}{P_t}\right) = \Delta\, ln\left(\frac{Y_t}{H_t}\right) + \Delta\, ln\left(\frac{H_t}{E_t}\right) + \Delta\, ln\left(\frac{E_t}{N_t}\right) + \Delta\, ln\left(\frac{N_t}{P_t}\right)$$

The difference between logarithmic values is almost the same as the change rate value, it can be seen that real GDP growth rate per capita is approximated by the sum of the change rate of labor

productivity, working hours per employee, employment rate, as well as working-age population. For the factor breakdown of real GDP per capita, this chapter has been carried out in a similar way to the Cabinet Office (2010) as well as OECD (2004).

Supplementary Note 3　EU KLEMS database

EU KLEMS database was used in the TFP international comparison and industry labor productivity in Section 3, Chapter 1. Groningen University's growth and development center in the Netherlands played a central role in the construction of the EU KLEM database, and is the database for the production, input (capital, labor, energy, resources, and service) and productivity international comparisons. Also, data can be downloaded free of charge from the EU KLEMS website displayed below.

EU KLMES website:

EU KLEMS database is discussed in detail by O'Mahony and Timmer (2009).

Supplementary Note 4　The productivity determinants of Japanese companies - verification by regression analysis -

Variable definitions, regression model and statistics

In this supplementary note, the examined productivity determinants at the corporate level in Section 1, Chapter 2 for regression analysis will be explained.

The regression models used for estimations are as follows.

- Regression model related to TFP level

$$\begin{aligned} ln\,relative\,TFP_{i,t} &= \beta_0 + \beta_1 ex\_ratio_{i,t-1} + \beta_2 abroad\_invest\_ratio_{i,t-1} + \beta_3\, ln\, emp\_total_{i,t-1} \\ &+ \beta_4\, ln\, age_{i,t-1} + \beta_5 foreign_{i,t-1} + \beta_6 jchild_{i,t-1} + \beta_7 R\&D\_sales\_ratio_{i,t-1} \\ &+ \beta_8 information\_invest\_ratio_{i,t-1} + e_t \end{aligned}$$

- Regression model related to TFP increase rate

$$\begin{aligned} ln\,relative\,TFP_{i,t} - ln\,relative\,TFP_{i,t-1} &= \beta_0 + \beta_1 ex\_ratio_{i,t-1} + \beta_2 abroad\_invest\_ratio_{i,t-1} + \beta_3\, ln\, emp\_total_{i,t-1} \\ &+ \beta_4\, ln\, age_{i,t-1} + \beta_5 foreign_{i,t-1} + \beta_6 jchild_{i,t-1} + \beta_7 R\&D\_sales\_ratio_{i,t-1} \\ &+ \beta_8 information\_invest\_ratio_{i,t-1} + \beta_9\, ln\, relative\,TFP_{i,t-1} + e_t \end{aligned}$$

Here e_t is the error term. In addition, the added character i represents corporations and t represents time (year). Furthermore, as mentioned in the White Paper, a domestic independent company is the benchmark in the above regression model.

Next, the definition of each variable is shown. The definitions of the variables used in the regression analysis are as follows. The data has been obtained on the calculation from individual data of Basic Survey of Japanese Business Structure and Activities.

- ln relative TFP: Relative TFP level logarithmic value
- ex_ratio: Export intensity (= company export value/sales amount)
- $abroad\_invest\_ratio$: Overseas investment ratio = (overseas investment balance / total assets)
- ln emp_total: Total number of employees logarithmic value
- ln age: Company age logarithmic value
- $R\&D\_sales\_ratio$: R&D intensity = (R&D costs/sales amount)
- $information\_invest\_ratio$: Information technology investment ratio = (increase and decrease in information technology investments/fixed assets)
- $foreign$: Foreign-affiliated company dummy (dummy variables that take 1 for foreign affiliates and 0 for others)
- $jchild$: Japanese subsidiary company dummy (dummy variables that take 1 for Japanese subsidiaries and 0 for others)

Finally, the following will briefly describe the statistics reported in the White Paper.

The adjusted coefficient of determination is adjusted taking into account the decrease in the degree of freedom due to the addition of explanatory variables. This shows the regression model fits well. It is judged that the regression model becomes more applicable as the value nears 1.

A *P* value is a statistic for the purpose of evaluating a null hypothesis whereby separate regression coefficients are "0", and if the value is less than the previously specified significance level (for example, 0.01 if 1%), then that regression coefficient can be interpreted as being significant at a significance level of 1%.

An *F* value is a statistic for the purpose of evaluating a null hypothesis whereby the estimate parameters within the regression model are all "0" at the same time. In this regression model, the null hypothesis whereby the estimate parameters within the regression model are all "0" at the same time is dismissed as having a significance level of 1% and the fact that the regression models have an overall meaning is displayed.

Supplementary Note 5　Definitions of world region classifications in Chapter 2 of Part II

Definitions of world region classifications used in Chapter 2 of Part II are as displayed in the figure below.

Supplementary Note 5-1 Table　World region classification definitions

Advanced countries
Japan, Hong Kong, Macao, Taiwan, South Korea, United States, Canada, United Kingdom, Germany, France, Italy, Spain, Portugal, Netherlands, Switzerland, Belgium, Finland, Sweden, Norway, Austria, Cyprus, Luxembourg, Malta, San Marino, Denmark, Greece, Iceland, Ireland, Czech Republic, Slovakia, Slovenia, Poland, Hungry, Australia, New Zealand, Albania, Bulgaria, Estonia, Latvia, Serbia, Montenegro, Lithuania, Croatia, Macedonia, Bosnia / Herzegovina, Kosovo, Romania
China
Mainland China
ASEAN
Singapore, Indonesia, Malaysia, Vietnam, Thailand, Laos, Borneo, Myanmar, Philippines, East Timor
South East Asia

India, Bangladesh, Bhutan, Fiji, Kiribati, Maldives, Nepal, Pakistan, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Tonga, Tuvalu, Vanuatu, Mongolia, Marshall Islands, Micronesia
Middle East
Turkey, Bahrain, Israel, Iran, Iraq, Jordan, Lebanon, Syria, Saudi Arabia, UAE, Qatar, Afghanistan, Kuwait, Oman
Russia / CIS
Russia, Moldova, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kirghiz, Turkmenistan, Ukraine, Uzbekistan, Tajikistan
Latin America
Brazil, Antigua and Barbuda, Argentina, Barbados, Belize, Bolivia, Chile, Columbia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela, Bahama, Guiana, Jamaica, Saint Christopher and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago
Africa
South Africa, Egypt, Yemen, Djibouti, Algeria, Angola, Botswana, Burundi, Cameroon, Cape Verde, Central Africa, Chad, Comoros, Republic of Congo, Democratic Republic of the Congo, Benin, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea Bissau, Guinea, Cote d'Ivoire, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Nigeria, Zimbabwe, Rwanda, Sao Tome and Principe, Seychelles, Senegal, Sierra Leone, Namibia, Sudan, South Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Burkina Faso, Zambia

Notes: Regions are included in the term advanced countries.
Source: Ministry of Ministry of Economy, Trade and Industry, Japan.

Supplementary Note 6 A definition of consumer expenditure on services in Euromonitor International

Definition on consumer expenditure on services in Euromonitor International used in Chapter 2, Part 3 are as follows.

●Consumer Expenditure on Services

Services include: Cleaning, repair and hire of clothing; Repair and hire of footwear; Actual rentals paid by tenants; Other actual rentals; Services for the maintenance and repair of the dwelling; Refuse collection; Sewage collection; Other services related to the dwelling not included elsewhere; Repair of furniture, furnishings and floor coverings; Repair of household appliances; Domestic services and household services; Hospital services; Maintenance and repair of personal transport equipment; Passenger transport by railway; Passenger transport by road; Passenger transport by air; Passenger transport by sea and inland waterway; Transport of individuals and groups of persons and luggage by ship, boat, ferry, hovercraft and hydrofoil; Transport of private vehicles; Combined passenger transport; Other purchased transport services; Postal services; Telephone and telefax services; Repair of audio-visual, photographic and information processing equipment; Maintenance and repair of other major durables for recreation and culture; Veterinary and other services for pets; Recreational and sporting services; Repair of audio-visual, photographic and information processing equipment; Maintenance and repair of other major durables for recreation and culture; Veterinary and other services for pets; Recreational and sporting services; Cultural services; Games of chance; Package holidays; Pre-primary and primary education; Secondary education; Post-secondary non-tertiary education; Tertiary education; Education not definable by level; Restaurants, cafés and the like;

Canteens; Accommodation services; Hairdressing salons and personal grooming establishments; Social protection; Life insurance; Insurance connected with the dwelling; Insurance connected with health; Insurance connected with transport; Other insurance; FISIM; Other financial services not included elsewhere.

Supplementary Note 7　Purchase power parity elongation method

In this explanatory note, a specific purchase power parity rate elongation method for each industry is explained for the labor productivity by industry mentioned in the White Paper used for an international comparison.

Purchase power parity rate by industry is calculated and elongated to around 1997 using the value of the 1997 benchmark rate of purchase power parity rate by industry published in the data base of Groningen Growth and Development Center (GGDC) and the price index of the added value base published in EU LKEMS data base.

Specifically, the purchase power parity evaluation rate for year *t* industry *i* is calculated using this formula.

$$PPP_{i,t} = PPP_{i,1997}^{Benchmark} \frac{P_{i,t}^{c} / P_{i,1997}^{c}}{P_{i,t}^{US} / P_{i,1997}^{US}}$$

Here, $PPP_{i,t}$ is the purchase power parity rate of industry *i* in year *t* and $PPP_{1997}^{Benchmark}$ is the benchmark purchase power parity rate of industry *i* in 1997, $P_{i,1997}^{US}$ is the price index of industry *i* in 1997 in the US, $P_{i,t}^{US}$ is the price index of industry *i* of year *t* in the US, and $P_{i,1997}^{c}$ is the price index of industry *i* in 1997 in country *c* and $P_{i,t}^{c}$ is the price index of industry *i* of year *t* in country *c*. The purchase power parity rate calculated using this method is called the Constant PPP Approach.

As stated in Inklaar and Timmer (2008), the above method for calculating purchase power parity evaluation rate is an alternate calculation method and, in theory, calculation of benchmark purchase power parity rate for every year is advisable (Current PPP Approach). However, calculating purchase power parity rate every year is practically difficult and the method used above is widely used.

Furthermore, the purchase power parity rate calculated using the Constant PPP Approach and the purchase purchase power parity rate calculated using the Current PPP Approach generally do not match, and it should be taken into consideration that as the benchmark year (1997 is used as the standard year here) moves farther into the past, the difference between the purchase power parity rates calculated using the two methods widens.

More detailed purchase power parity rate extrapolation methods are explained in Appendix 2 of Inklaar and Timmer (2008). Also, Ken (2011) compares labor productivity by industry for Japan and the US after calculating purchase power rate using Constant PPP Approach.

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