Japanese Productivity Growth in International Perspective

- Productivity Growth in the Service Sector and the Role of Intangible Assets -

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Contents

1. The Purpose of the Presentation (1)

- Productivity growth is the primal economy policy agenda under the declining population in Japan.
- We are able to compare Japanese productivity growth to those in other developed countries by using EUKLEMS database (http://www.euklems.net/) which was constructed by van Ark, economists in Groningen University, and economic institutions in EU countries. We also joined the EU KLEMS consortium and supplied original data of Japan Industry Productivity database for the EU KLEMS project.

1. The Purpose of the Presentation (2)

- As for productivity issues, many economists have recognized that intangible investment is a key factor for productivity growth in ICT using industries.
- Following Corrado, Hulten and Sichel (2005; 2006), we measure of intangible investment in Japan.

2. The Recovery of the Japanese Economy (1)

- The Japanese economy has been recovering since 2002 following more than a decade of stagnation.
- The current recovery was brought about by growth in corporate investment and exports.
- The expansion period is likely to be the longest after the World War II.

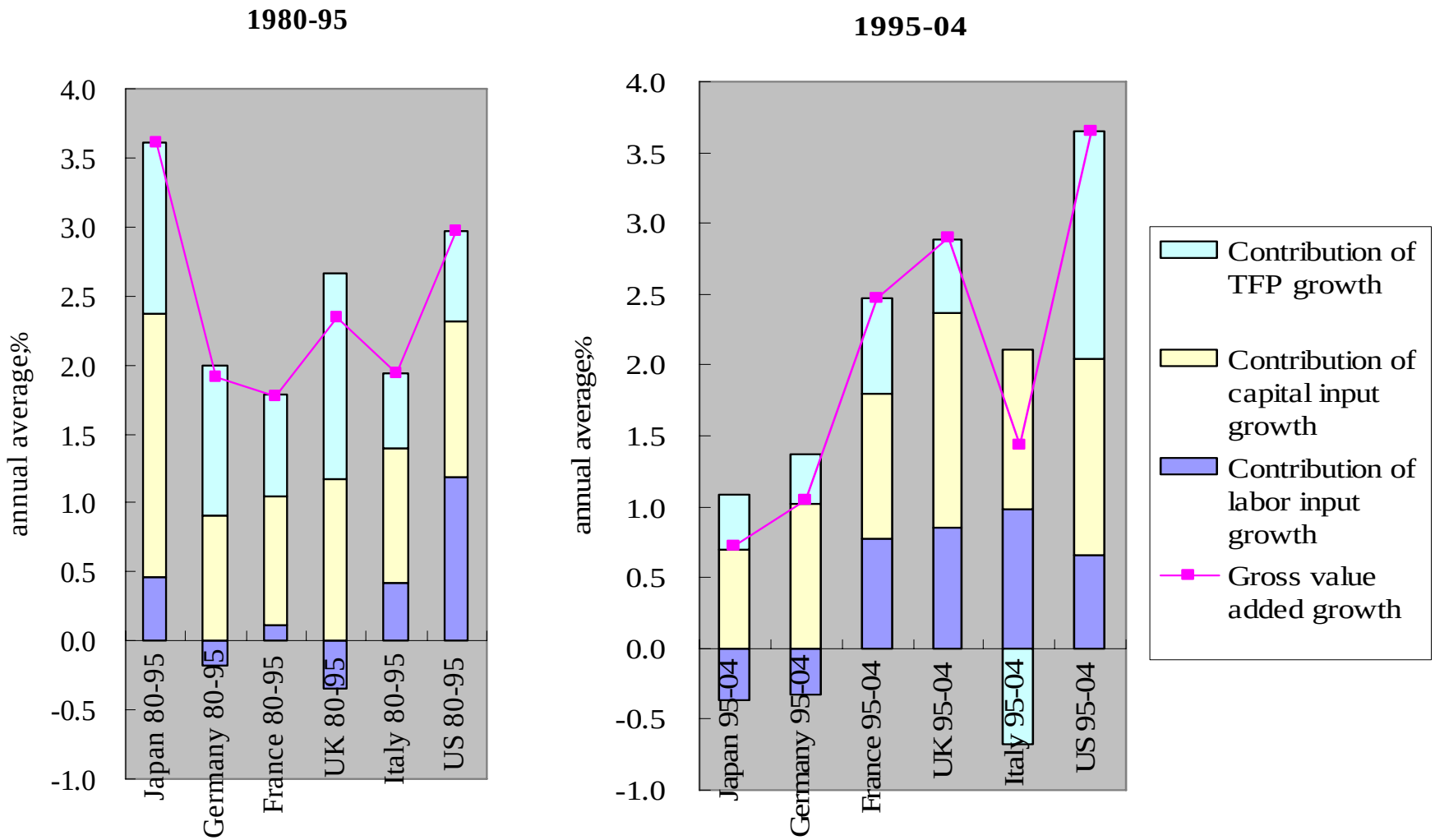
2. The Recovery of the Japanese Economy (2)

- However, the growth rate during the current expansion is the lowest in 30 years.
- The average growth rate since 2000 is 1.5%, which is lower than Japan's estimated potential growth rate (2%).
- Among the major developed countries, Japan's growth rate is the lowest.

GDP Growth in Japan's Business Cycles

	Expansion	Recession
1980:1-1983:1		2.5
1983:1-1985:2	3.6	
1985:2-1986:4		3.4
1986:4-1991:1	5.4	
1991:1-1993:4		0.3
1993:4-1997:1	2.9	
1997:1-1999:2		-0.5
1999:2-2000:4	2.8	
2000:4-2002:1		-2.4
2002:1-2007:1	2.1	

Growth Accounting for the Market Sector in Japan, the US, and the Major EU Economies



Source: EU KLEMS Database, March 2007.

3. Why Did Japan's Economic Growth Slow Down? (1)

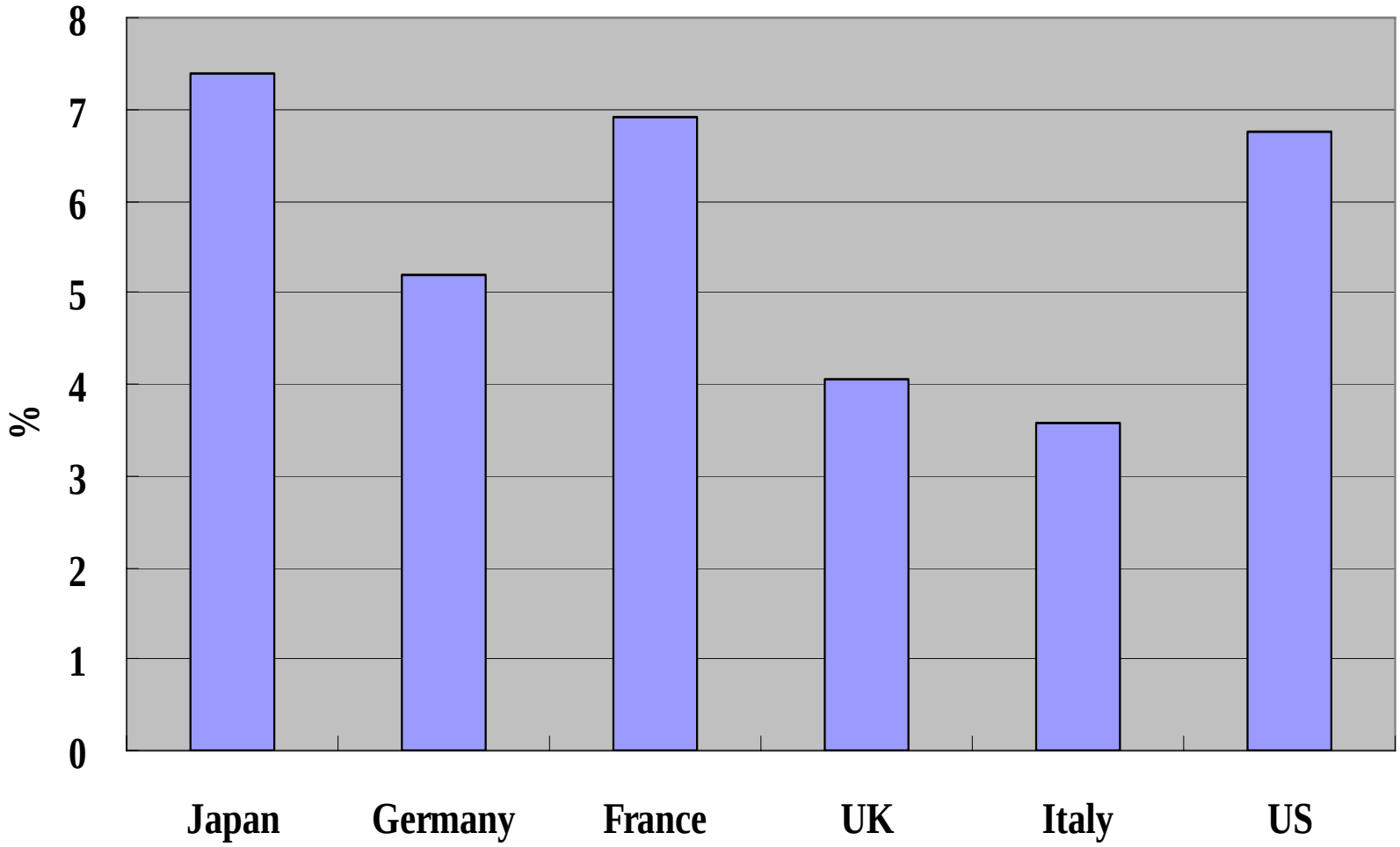
- According to a growth accounting analysis of the major six developed countries, only the US accomplished an exceptional acceleration in TFP growth after 1995.
- The EU countries maintained their rate of growth through the accumulation of capital and an increase in labor input.
- In Japan, all growth factors declined after 1995.

3. Why Did Japan's Economic Growth Slow Down? (2)

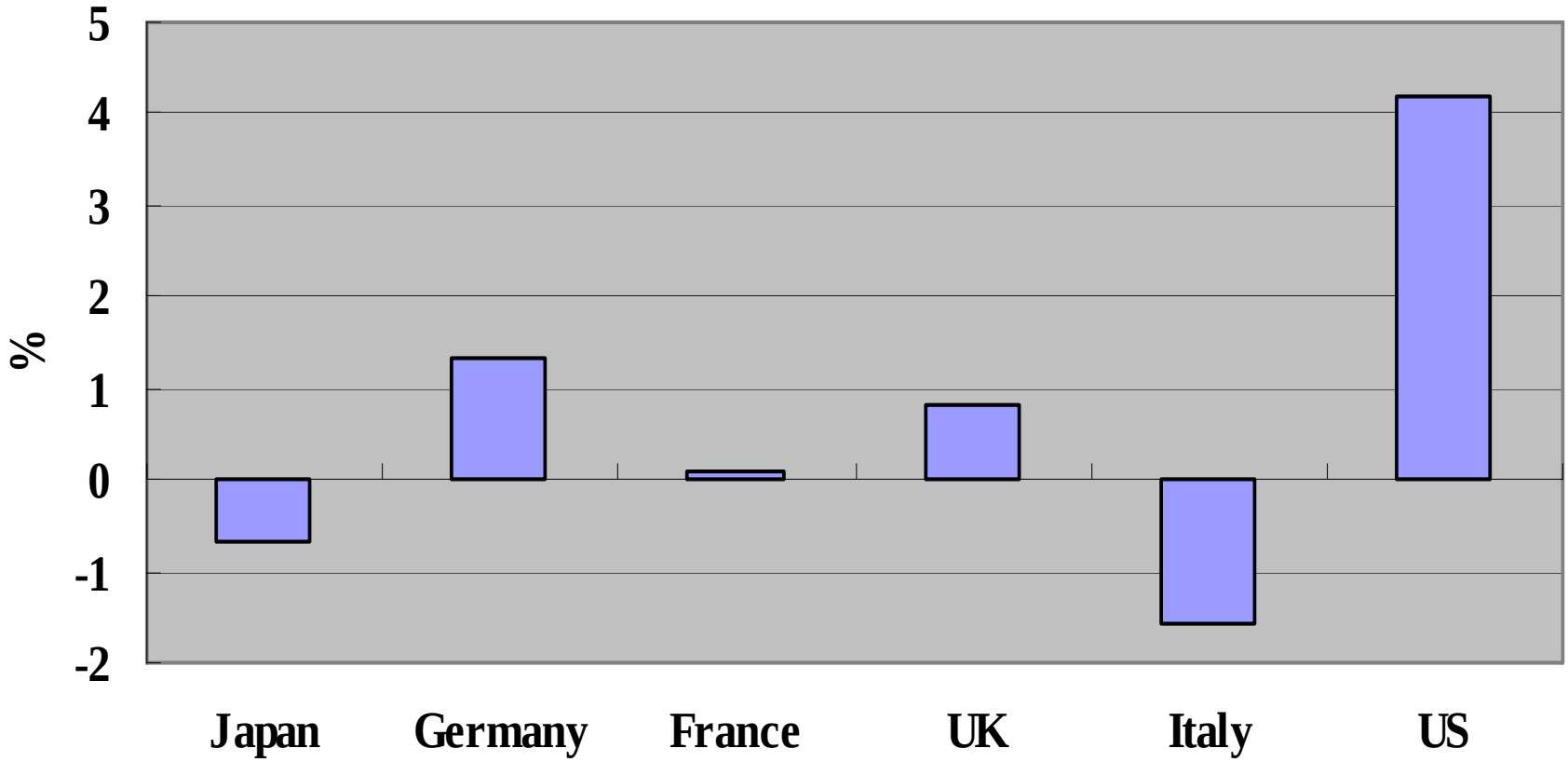
- TFP growth in Japan's ICT industry registered the highest rate of TFP growth among the major developed economies for the period from 1995 to 2004.
- However, this TFP growth in the ICT industry did not contribute much to total TFP growth, because the labor input share of the ICT industry in the economy as a whole is only about 5%.

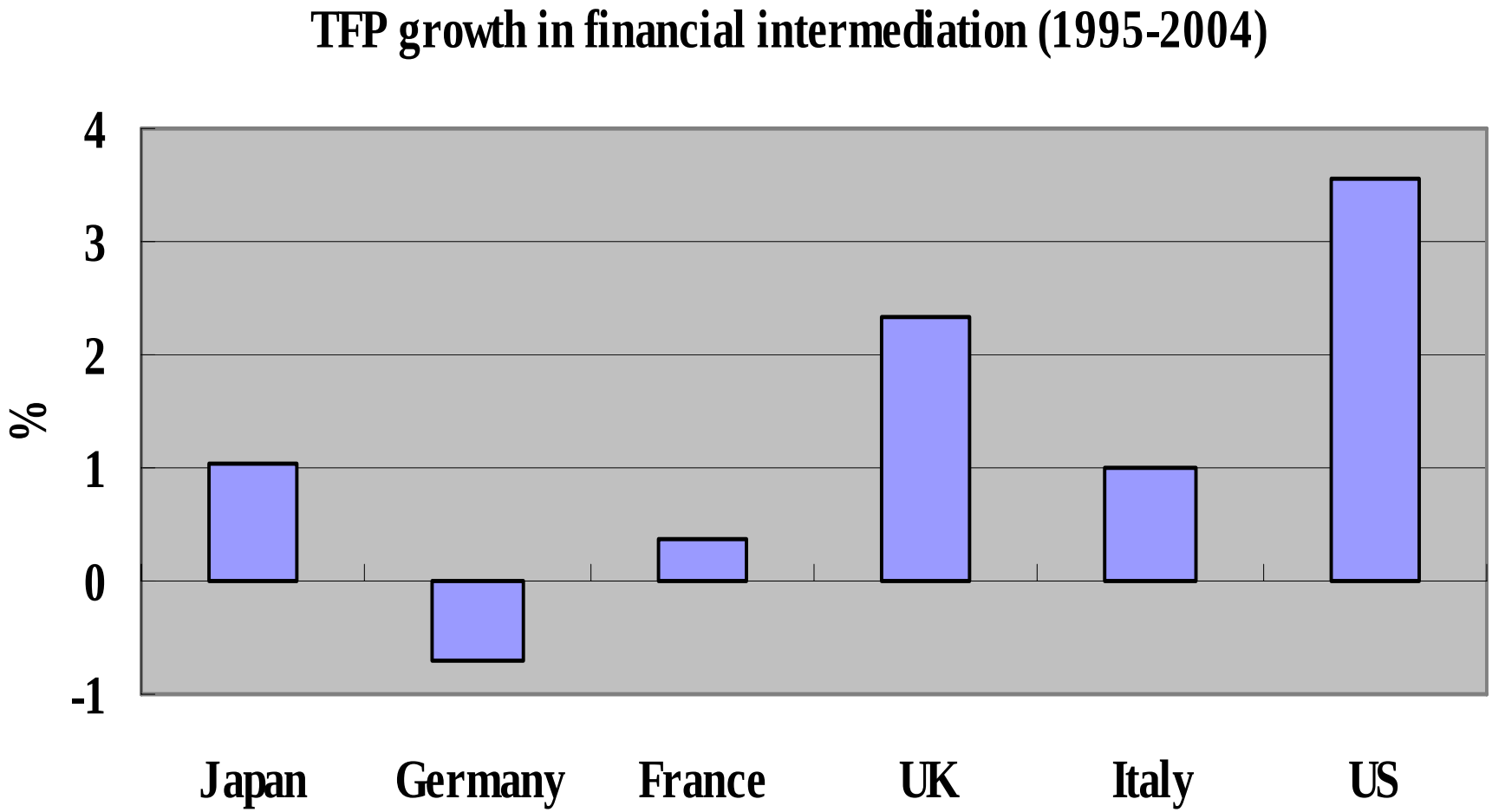
- There is a large gap in TFP growth in the service sector between the US and the other countries, including Japan.
- Especially in the retail sector and financial intermediation, TFP growth in the US is extremely high.

TFP growth in ICT industries (1995-2004)



TFP growth in retail industry (1995-2004)

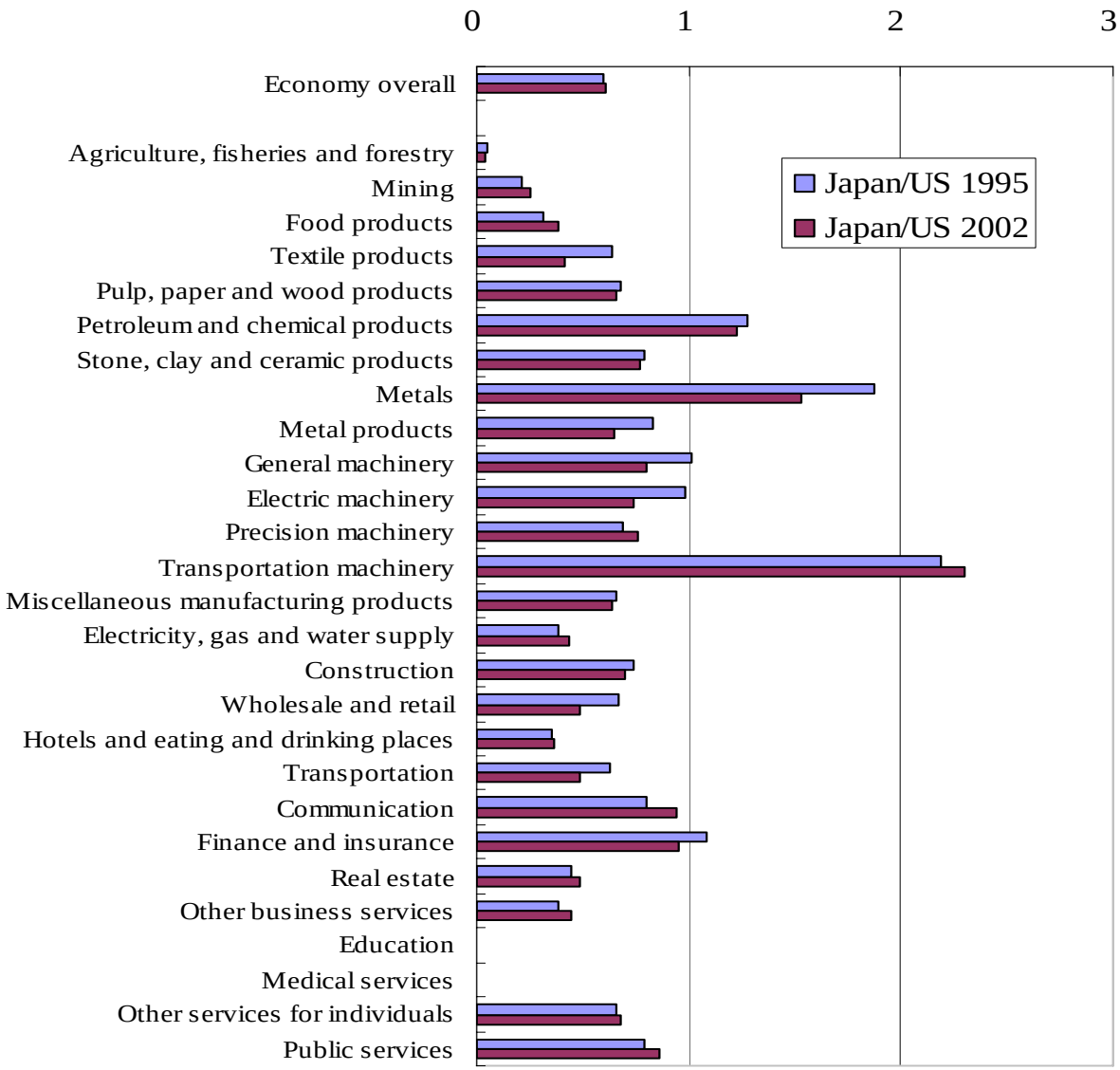



TFP growth in financial intermediation (1995-2004)
%
4
3
2
1
0
-1
Japan
Germany
France
UK
Italy
US

3. Why Did Japan's Economic Growth Slow Down? (3)

- It is also important to note that labor productivity levels in Japanese industries, with the exception of a few manufacturing industries, were much lower than those in the US.

Labor Productivity: Japan-US Comparison



Source: JEF-JCER (2007).

4. Contribution of ICT Capital Input to Economic Growth (1)

- Previous studies:

→Jorgenson (2001) and Jorgenson and Stiroh (2000): ICT investment accelerated economic growth in the US in the second half of the 1990s.

→Van Ark et al. (2003): Due to the slow growth in ICT investment, economic growth in the EU countries lagged behind that in the US.

→Shinozaki (1999), Miyagawa, Ito, and Harada (2004), and others: Slow productivity growth in Japan was caused by the lack of the accumulation in ICT assets.

4. Contribution of ICT Capital Input to Economic Growth (2)

We compare ICT investment of the six major developed countries using the EU KLEMS database.

We found that the six countries can be categorized into the following three groups:

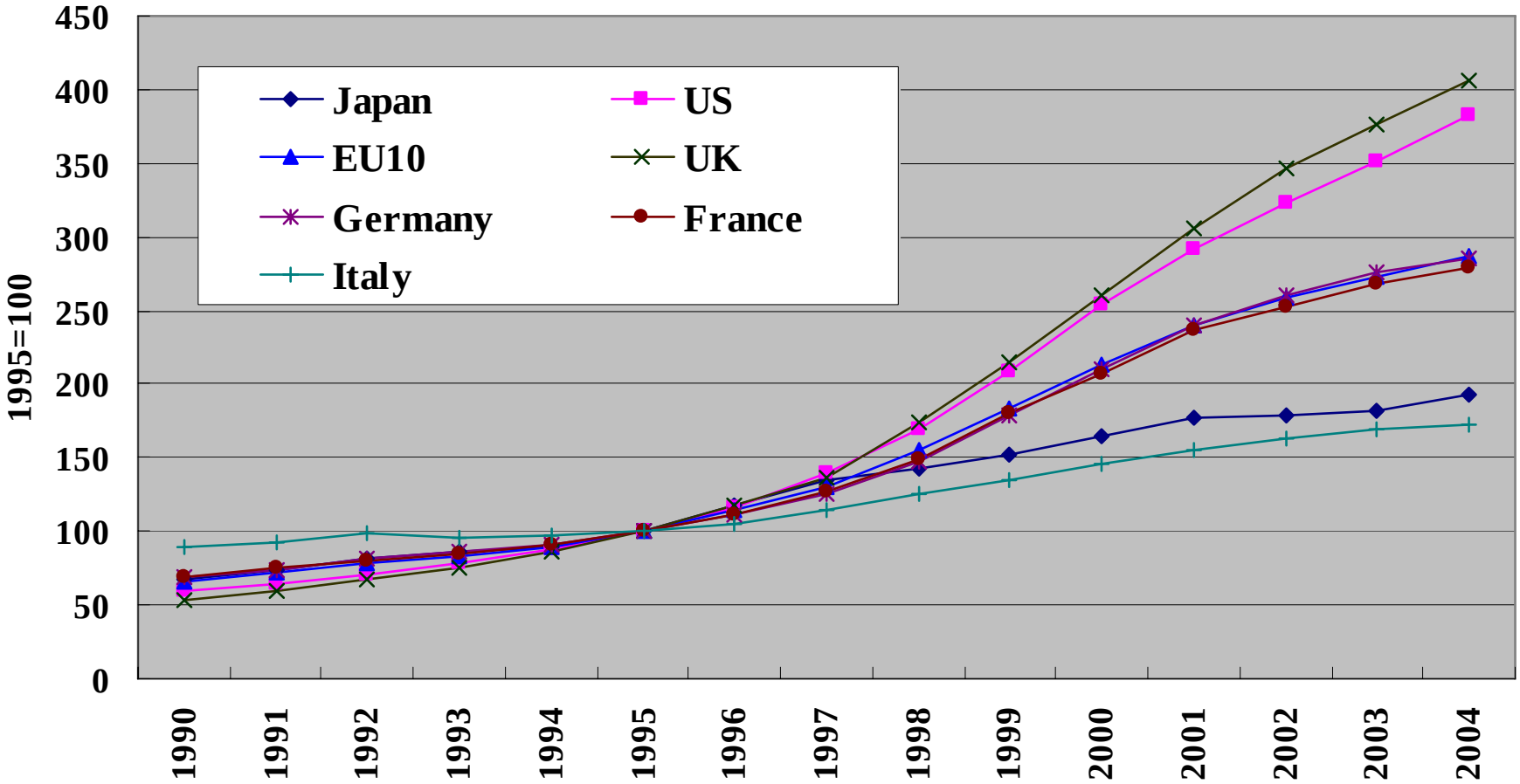
(1) Front runners: the US and the UK→16-17% growth in ICT capital service input per annum from 1995 to 2004.

(2) Intermediate group: Germany and France→12% growth per annum from 1995 to 2004.

(3) Laggards: Japan and Italy →ICT capital service input level in 2004 was less than twice as high as the 1995 level →Japan did not catch up the trend of downsizing in the 90s.

The contribution of ICT capital service input to economic growth in Japan was lower than in the other countries except Italy.

Growth in ICT service (Market Economy)



Contributions of ICT Capital Service Input to Economic Growth

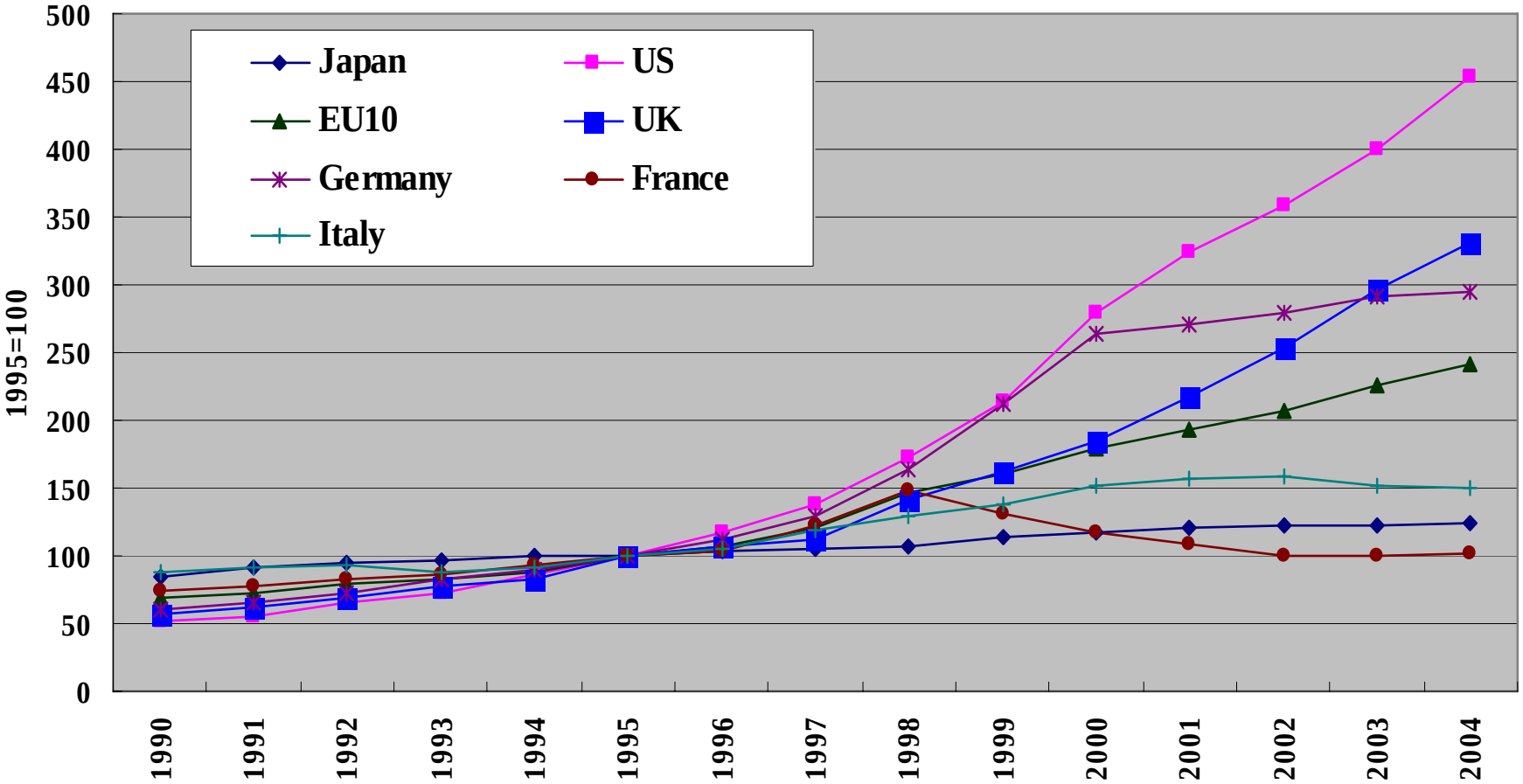
	1995-2004					
	Japan	US	France	Germany	Italy	UK
Market economy total	0.3	0.8	0.5	1.0	0.2	1.0
Electrical machinery, post and communication	1.0	1.5	0.8	2.7	0.2	2.7
Manufacturing, excluding electrical	0.1	0.4	0.3	0.5	0.1	0.5
Other goods-producing industries	0.1	0.2	0.2	0.1	0.0	0.1
Distribution services	0.1	1.0	0.3	0.8	0.2	0.8
Finance and business services	1.2	1.2	1.0	1.8	0.7	1.8
Personal and social services	0.2	0.4	0.0	0.5	0.3	0.5

Source: EU KLEMS Database, March 2007.

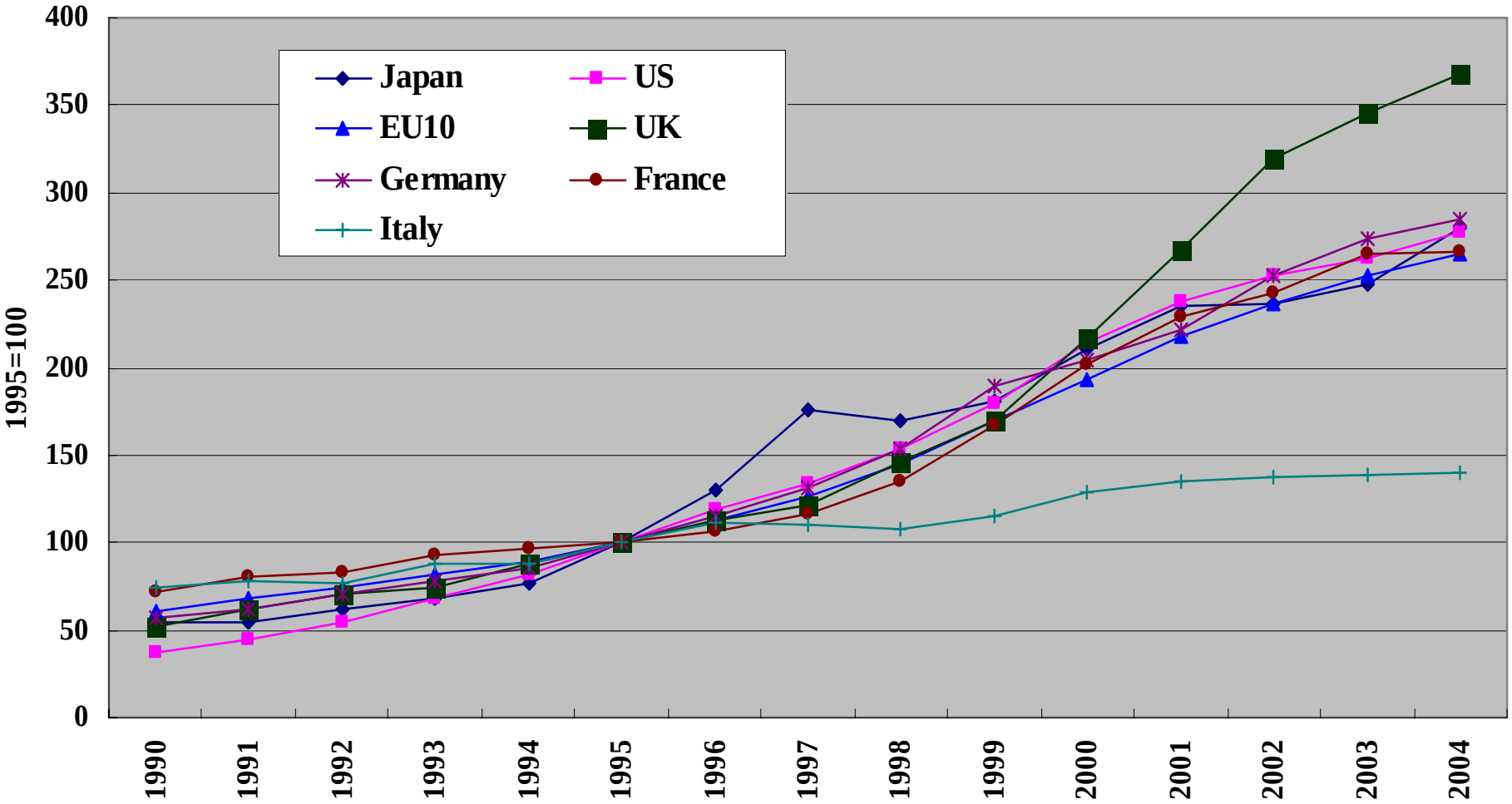
4. Contribution of ICT Capital Input to Economic Growth (3)

- Retail industry: The increase of ICT capital input in the US was extremely high. In contrast, the growth rate of ICT capital service input in Japan was very low.
- Financial intermediation sector: The UK showed the highest accumulation of ICT capital. ICT capital accumulation in the other countries except Italy was almost the same.

Growth rate in ICT service (Retail)



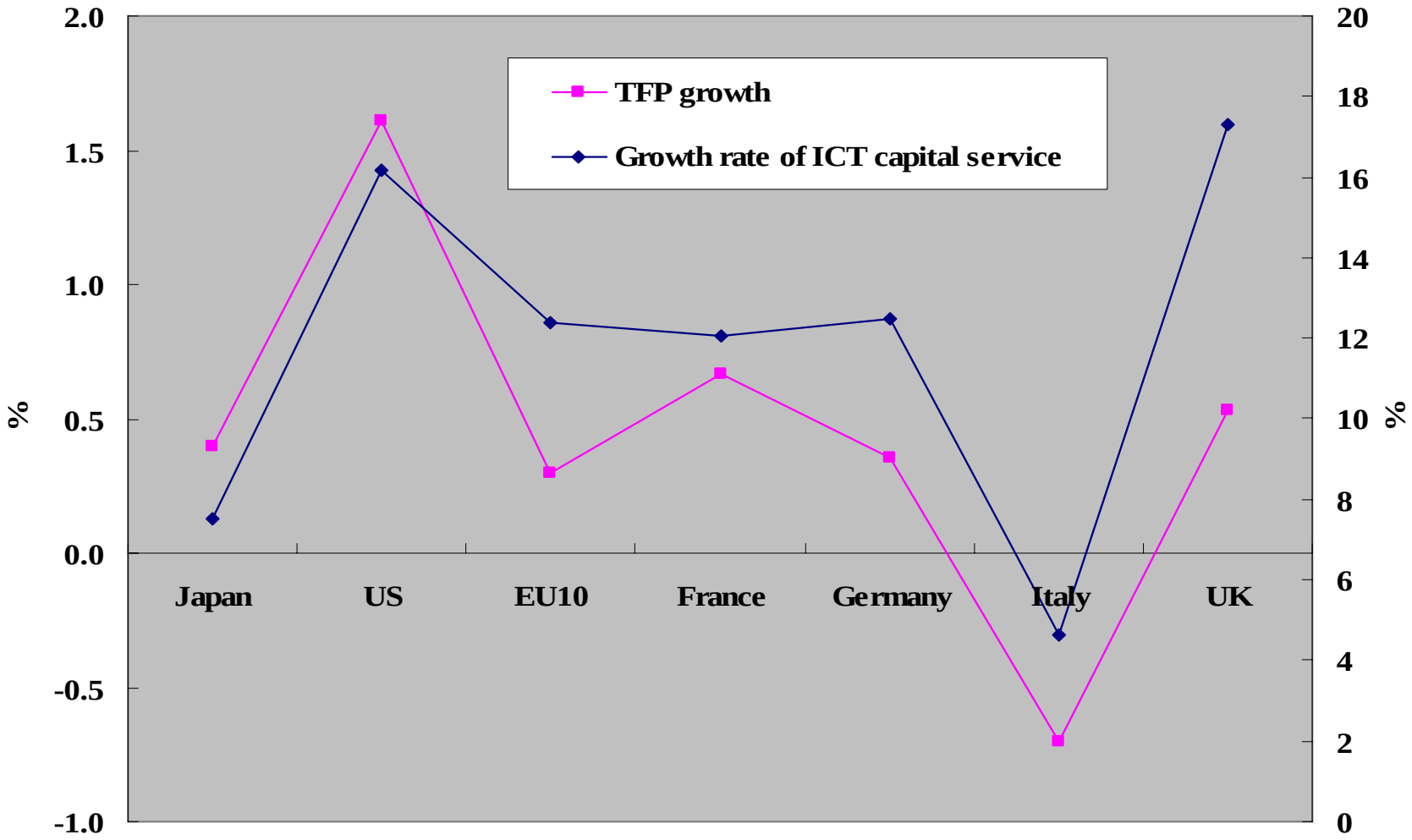
Growth rate in ICT service (Financial intermediation)



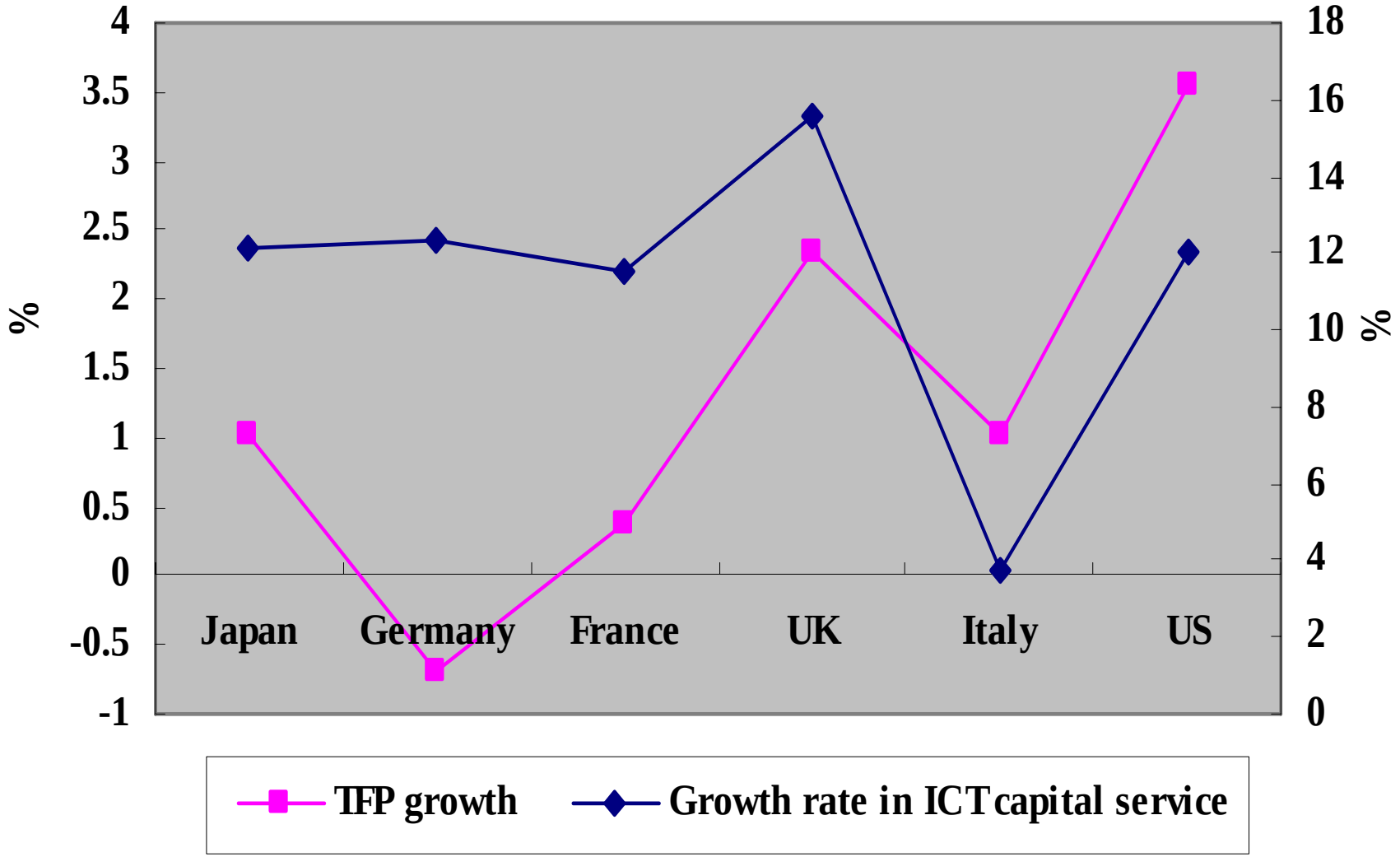
5. The Role of Intangible Assets (1)

- TFP growth seems to be positively correlated to the growth rate of ICT capital.
- However, the extent of the effects of ICT capital on TFP growth differs (e.g., US vs. UK).
- Especially in financial intermediation, TFP growth in Japan was lower than in the US, although the growth rate of ICT capital was about the same in both countries.

TFP groath rate and growth rate of ICT capital sevice (Market economy)



TFP growth and growth rate in ICT capital service (Financial intermediation)



5. The Role of Intangible Assets (2)

- Some economists have argued that intangible assets play a complementary role in the effects of ICT capital on TFP growth.
- Recent discussions about intangible assets

(1) van Ark (2004) classified knowledge capital which plays complementary role on ICT capital.

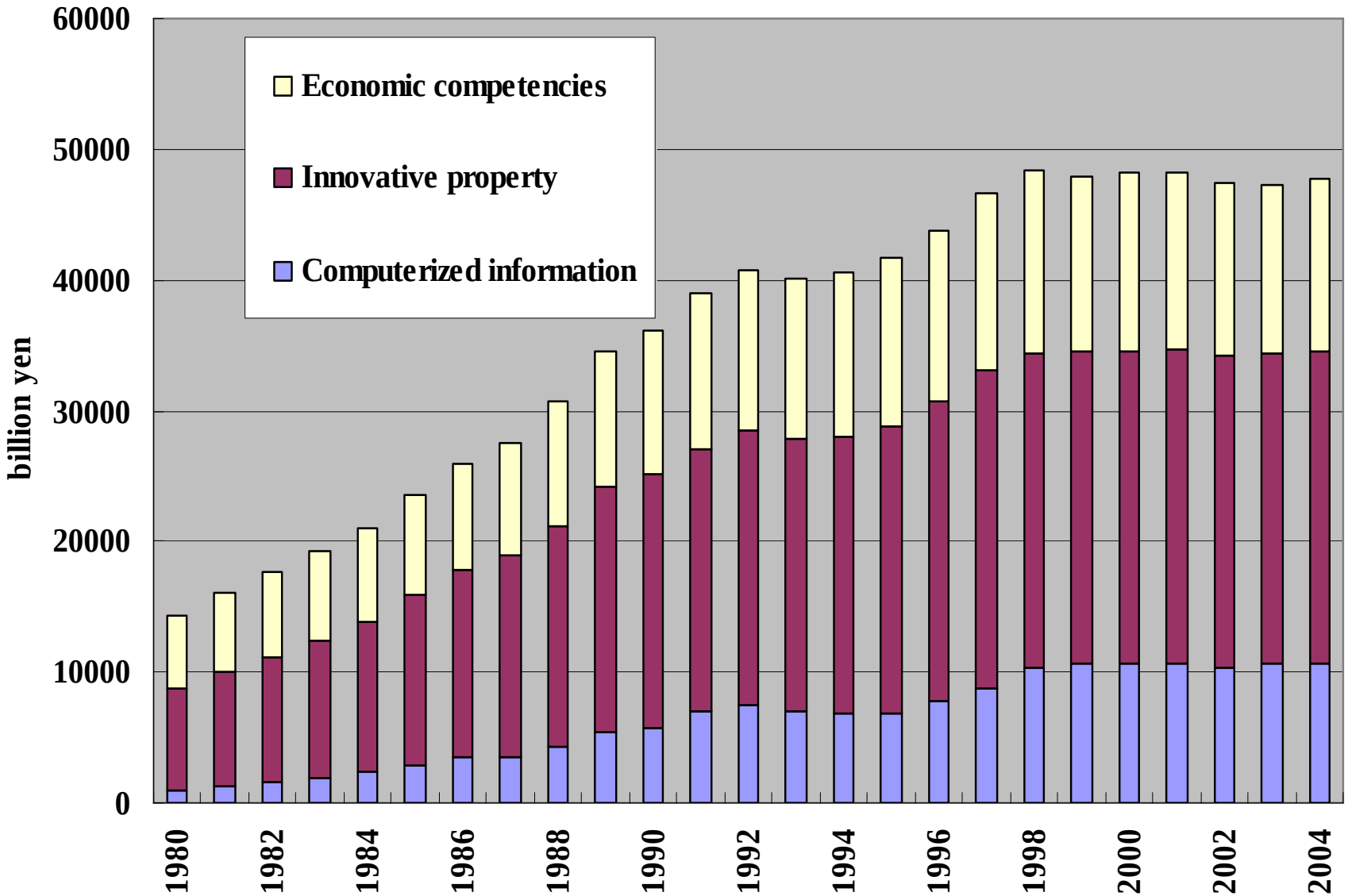
(2) The Economic Report of the President 2007 stressed that the accumulation of intangible capital in the US is a key factor in the long-term growth of the US economy.

(3) Corrado, Hulten and Sichel (2005; 2006) and Marrano and Huskel (2006) measured intangible investment in the US and the UK respectively.

5. The Role of Intangible Assets (3)

- Annual intangible investment in Japan was 48 trillion yen on average from 2000 to 2004.
- The ratio of intangible investment to GDP was 9.2%, which is less than the equivalent figure in the US and the UK.
- Moreover, the ratio of intangible investment to tangible investment was much lower than that in the US.
- As a result, the contribution of intangible assets to economic growth in Japan was less than that in the US.

Intangible investment in Japan



Intangible Asset Investment: Japan, the US and the UK

	Japan (billion yen) (2000-2004)	US (billion US dollars) (1998-2000)	UK (billion pounds) (2004)
Computerized information	**10,630**	**154**	**19.8**
	(2.0)	**(1.7)**	**(1.7)**
Innovative property	**23,841**	**424**	**37.6**
	(4.6)	**(4.6)**	**(3.2)**
Economic competencies	**13,356**	**505**	**69.3**
	(2.6)	**(5.4)**	**(6.0)**
Total	**47,827**	**1085**	**126.7**
Intangible investment /GDP (%)	**9.2**	**11.7**	**10.9**
Intangible investment/tangible investment	**0.5**	**1.2**	

1) Figures in parentheses are GDP share in each item.

2) Sources: Japan-author's calculation, US-Corrado, Hulten and Sichel (2006), UK-Marrano and Huskel (2006)

Source of Labor Productivity Growth

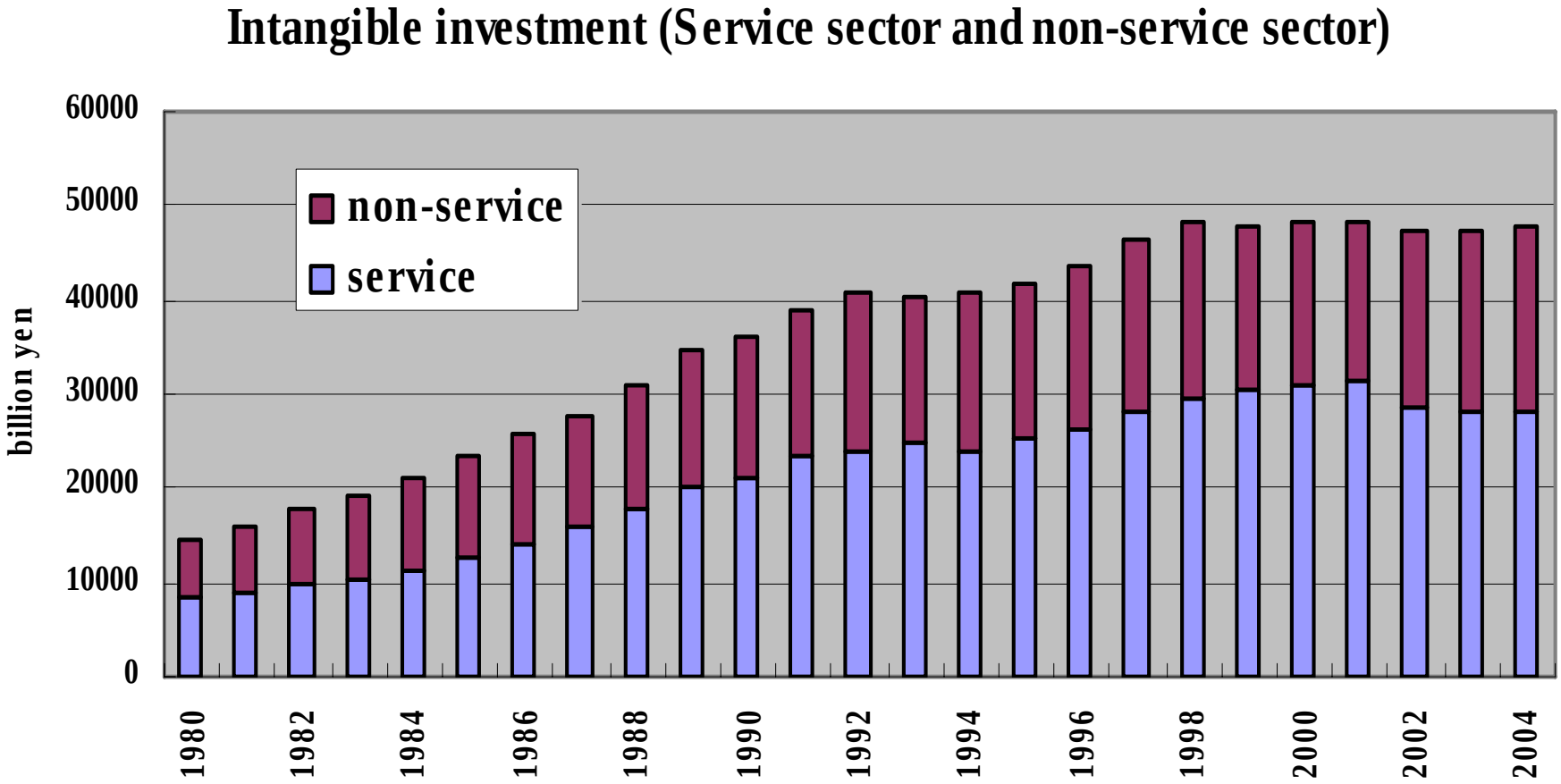
	Japan (1995-2000)	US (1995-2003)
Labor productivity (%)	2.20	3.09
Capital deepning	1.93	1.68
Tangibles	1.35	0.85
Intangibles	0.58	0.84
Labor composition		0.33
TFP	0.27	1.08

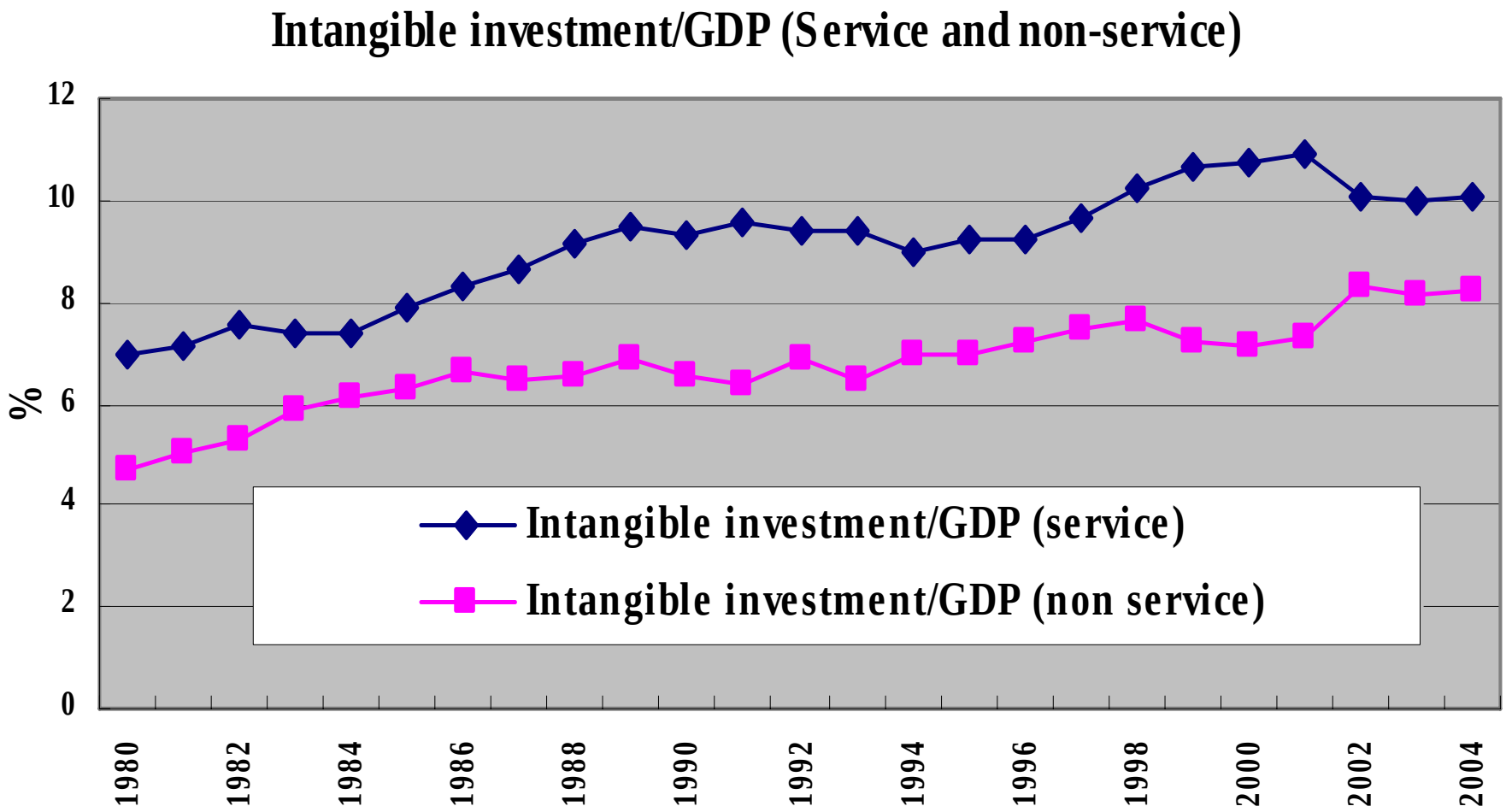
Source: Japan - author's calculation,

US - Corrado, Hulten and Sichel (2006)

5. The Role of Intangible Assets (4)

- We also measure intangible investment in the service sector and the non-service sector separately.
- Intangible investment in the service sector amounted to 29 trillion yen on average from 2000 to 2004 and its share in total intangible investment was about 60%.
- The ratio of intangible investment to value added in the service sector was 10.4%, which was higher than that in the economy as a whole.


Intangible investment (Service sector and non-service sector)
billion yen
60000
50000
40000
30000
20000
10000
0
non-service
service
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004


Intangible investment/GDP (Service and non-service)
12
10
8
6
4
2
0
%
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Intangible investment/GDP (service)
Intangible investment/GDP (non service)

6. Policy Implications (1)

(1) The Japanese government should promote ICT capital accumulation, which lags behind other developed countries.

(2) To fill the gap in TFP growth between Japan and the US, Japan should focus on closing the TFP level in the service sector.→Globalization in service sector.

6. Policy Implications (2)

(3) A requirement for the acceleration in TFP growth in the service sector seems to be the accumulation of intangible assets. We should especially focus on the growth in human capital and organizational change in order to fully enjoy the potential benefits of the ICT revolution.

(4) The government should introduce accounting guidelines for the valuation of intangible assets in order to facilitate the financing of intangible investment.

6. Policy Implications (3)

(5) It seems that the low intangible investment/tangible investment ratio is a result of the Japanese financial system, where financial intermediaries have played the main role. In this system, firms tend to accumulate tangible assets rather than intangible assets, since the former can be used as collateral to obtain funds from financial intermediaries. A new financial system in which intangible assets can serve as collateral is required.