

# *Fed Forum*



## **Global Productivity: Developments, and Implications for the United States**

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## Three questions:

- How has global productivity evolved in recent decades?
- How does growth in foreign productivity affect the United States?
- What should we expect ahead?

## Key facts: The U.S. productivity overtaking

- Productivity has grown rapidly in the United States since 1995, recovering from a previous slowdown
- Productivity in other industrial countries has not grown as fast as in the United States since 1995
- Productivity growth in developing countries has been very diverse: very fast in some areas (Asia), slow in others (Africa, Latin America)

# Productivity growth in major industrials

GDP per hour worked

	US	G-7
1970-1980	1.6	2.9
1980-1990	1.5	2.2
1990-1995	1.2	1.9
1995-2000	2.2	2.2
2000-2005	2.5	2.0

Source: This and following data based on research by Amiti and Stiroh (FRBNY)

## Key facts: The U.S. productivity overtaking

- U.S. productivity growth surged from 1.5% in 1970-1995 to 2.3% in 1995-2005
- In the G7 as a whole, productivity growth fell from 2.4% in 1970-1995 to 2.1% in 1995-2005, reflecting mostly a drop in Europe and Japan

## Key facts: Europe's productivity slowdown

- The Euro area recorded fast productivity growth in the wake of the post-WWII reconstruction: annual rates in the 1950s-1960s approached 6%
- In the 1970s and 1980s, productivity growth slowed to still high values of 4% and 2.5%, respectively
- After recording 2.3% in 1987-1995, productivity growth has slowed to 1.1% in 2000-2004
- Recently, there are signs of a possible revival in productivity growth (see later)

# Decomposing productivity growth

Let us describe production by the simple function

$$Y = A \times K^\alpha \times L^{1-\alpha}$$

We can attribute growth in labor productivity to:

- Investment,  $K \uparrow$ : “capital deepening”
- Technical progress,  $A \uparrow$ : “total factor productivity”

Which these two channels is responsible for the U.S.-Europe productivity overtaking?

# Decomposing productivity growth

- In the Euro area, a slump in “total factor productivity” accounts for 2/3 of the slowdown, while “capital deepening” accounts for 1/3
- In the United States, a surge in “total factor productivity” accounts for 2/3 of the productivity boom, while “capital deepening” accounts for 1/3
- Surprisingly, the IT sector accounts for a small part of the change in both areas



# Decomposing productivity growth

1987-1995

1995-2000

2000-2004

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	European Union-15		
<b>Average Labor Productivity</b>	2.3	1.8	1.1
<b>Contribution of Capital Deepening</b>	1.2	1.0	0.8
<b>Information Technology</b>	0.4	0.6	0.3
<b>Non-information Technology</b>	0.8	0.4	0.5
<b>Total Factor Productivity</b>	1.1	0.8	0.2
<b>Information Technology</b>	0.2	0.4	0.2
<b>Non-information Technology</b>	0.9	0.4	0.0
	United States		
<b>Average Labor Productivity</b>	1.2	2.3	2.8
<b>Contribution of Capital Deepening</b>	0.6	1.2	1.1
<b>Information Technology</b>	0.5	1.0	0.6
<b>Non-information Technology</b>	0.1	0.2	0.5
<b>Total Factor Productivity</b>	0.6	1.1	1.7
<b>Information Technology</b>	0.4	0.7	0.3
<b>Non-information Technology</b>	0.2	0.4	1.4

## Key facts: The rest of the world

Very diverse experiences are featured elsewhere in the developing world. Common themes:

- In Africa and in Latin America, productivity growth continues to stagnate
- Much of Asia and of Eastern Europe display booming or reviving productivity growth
- Recent global changes in productivity also mostly reflect “technical progress” (total factor productivity).

# Key facts: The rest of the world

	Growth in GDP per Capita			
	1900-1950	1950-1990	1990-2001	2001-2030
<b>West</b>	1.3	3.1	1.7	1.6
<b>Eastern Europe</b>	0.8	2.4	0.9	2.5
<b>Former USSR</b>	1.7	2.2	-2.9	2.5
<b>Latin America</b>	1.6	1.8	1.3	1.5
<b>China</b>	-0.4	3.7	6.2	4.0
<b>India</b>	0.1	1.9	3.7	4.0
<b>Other Asia</b>	0.3	3.1	4.3	4.0
<b>Africa</b>	0.8	1.2	0.3	1.0
<b>Rest</b>	0.8	2.3	2.0	3.2
<b>World</b>	1.0	2.3	1.5	2.3

# How does foreign productivity affect the U.S.?

## *Terms of trade effects:*

- If foreigner productivity gains occur in sectors in which the U.S. imports, U.S. consumers and U.S. producers will benefit from lower prices of imported goods and inputs
- If foreign productivity gains occur in sectors in which the U.S. exports, competition may require a fall in the price of U.S. exports in order to preserve U.S. market shares

# How does foreign productivity affect the U.S.?

## *Profit effects:*

- Foreign productivity gains benefit U.S. firms attempting to relocate abroad or already located abroad, by lowering production costs and increasing their profits
- U.S. GNP will rise, although U.S. GDP may be stable or fall
- Poses distributional issues: displaced workers may suffer during transition

# How does foreign productivity affect the U.S.?

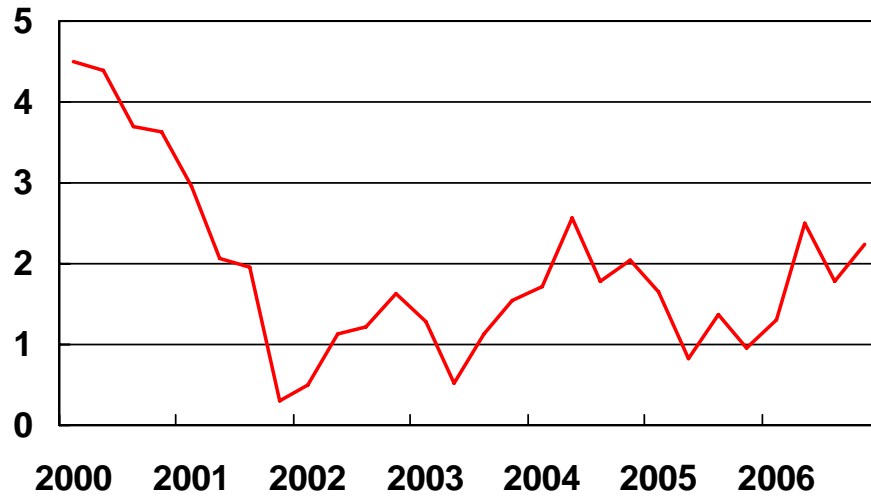
## *Broader Export Markets:*

- Stronger foreign productivity growth sustains faster foreign income growth, increasing demand for U.S. products

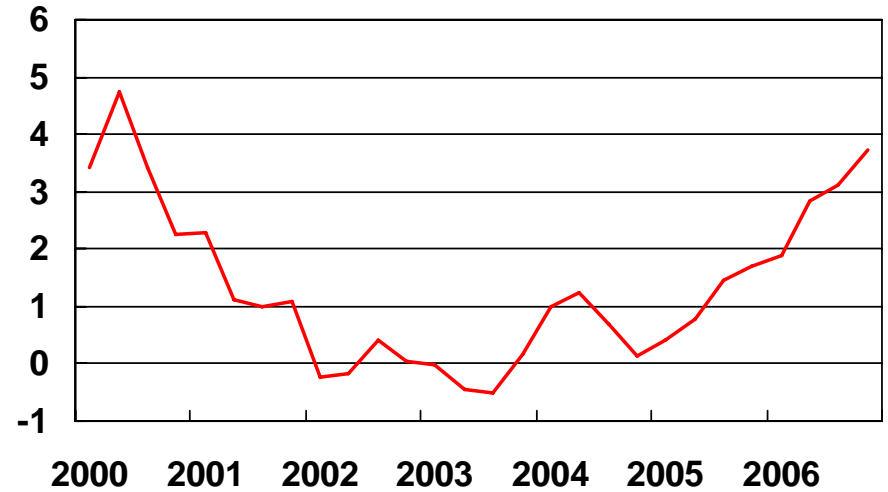
# Looking ahead: Foreign industrials' revival?

## GDP growth

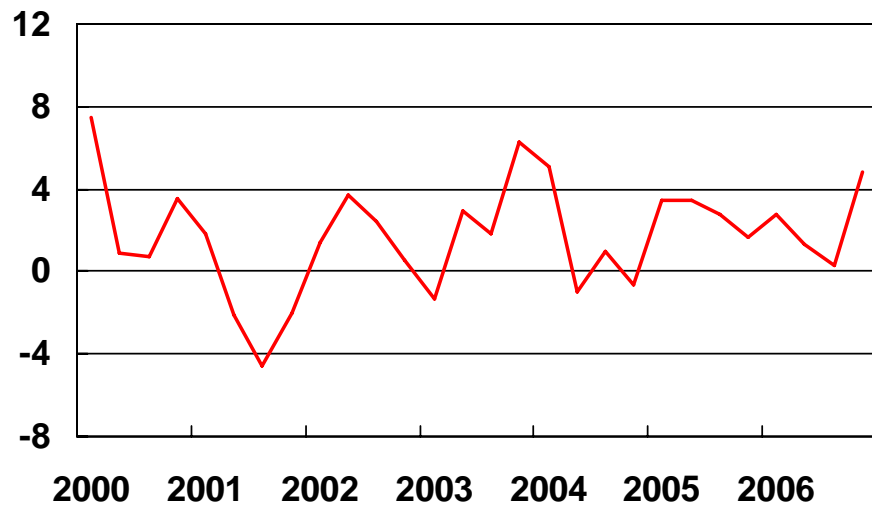
France



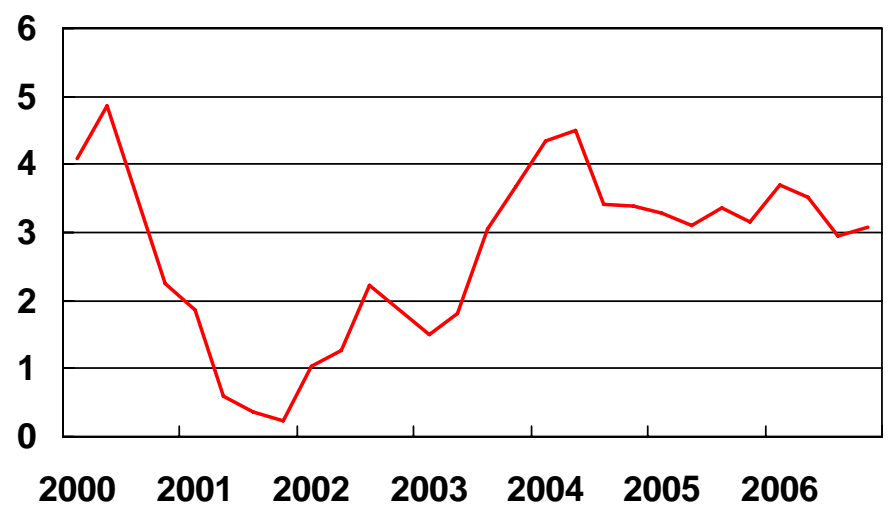
Germany



Japan



United States



## Looking ahead: “Rest” to gain on “West”

- Over the next two decades, productivity in the developed “West” (including Japan) will likely grow more slowly than in than the developing “Rest” (led by China and India):

West: 1.6%

Rest: 3.2%

- The West’s share of world population will also decline from 14% in 2001 to 12% in 2030
- As a result, the West’s share of world GDP will fall from 52% in 2001 to 38% in 2030