



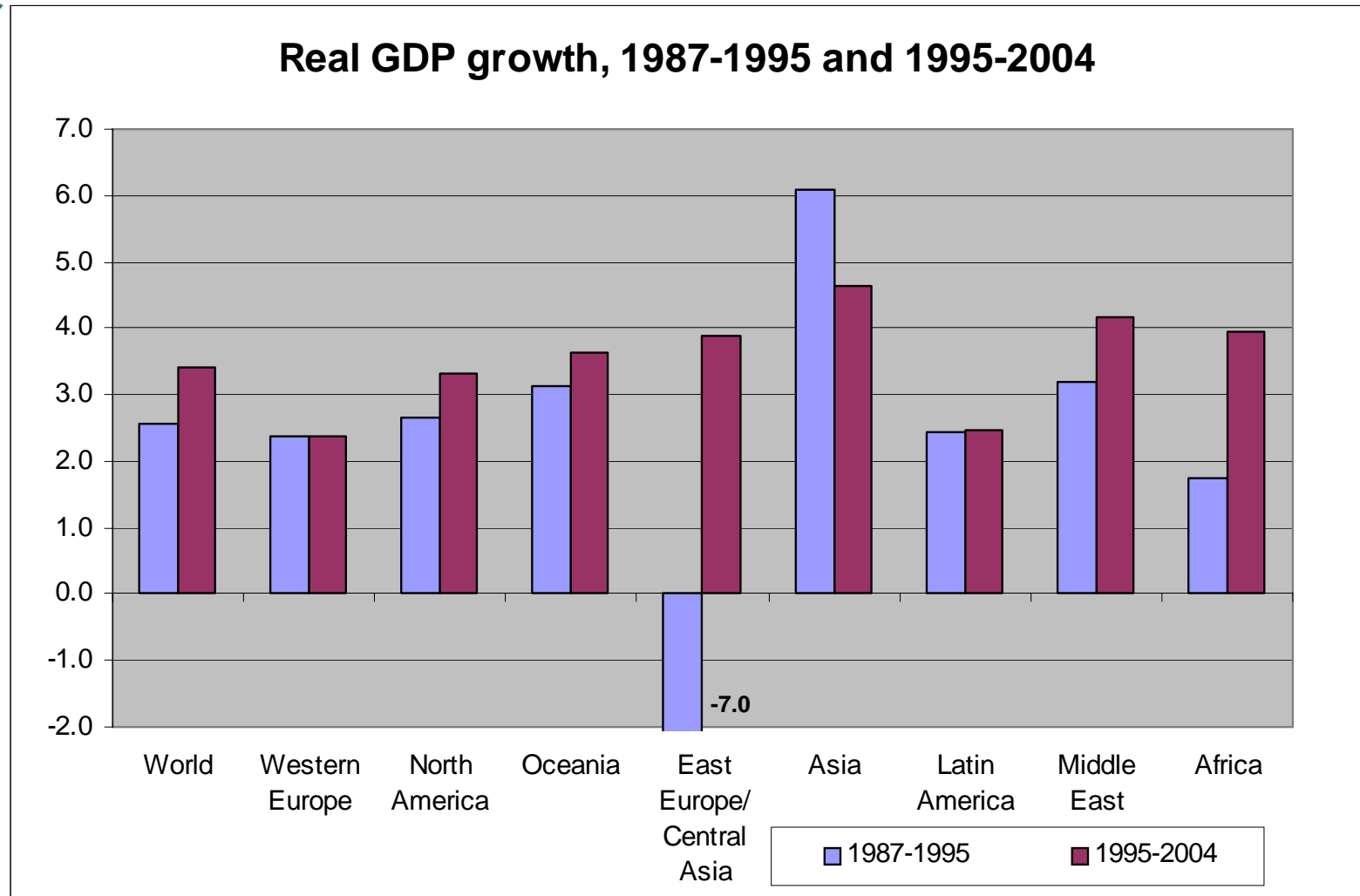
The World's Productivity Performance: How do Countries Compare?

Bart van Ark
University of Groningen
and The Conference Board

PRODUCTIVITY PERSPECTIVES 2006
Australian Bureau of Statistics and the Productivity Commission

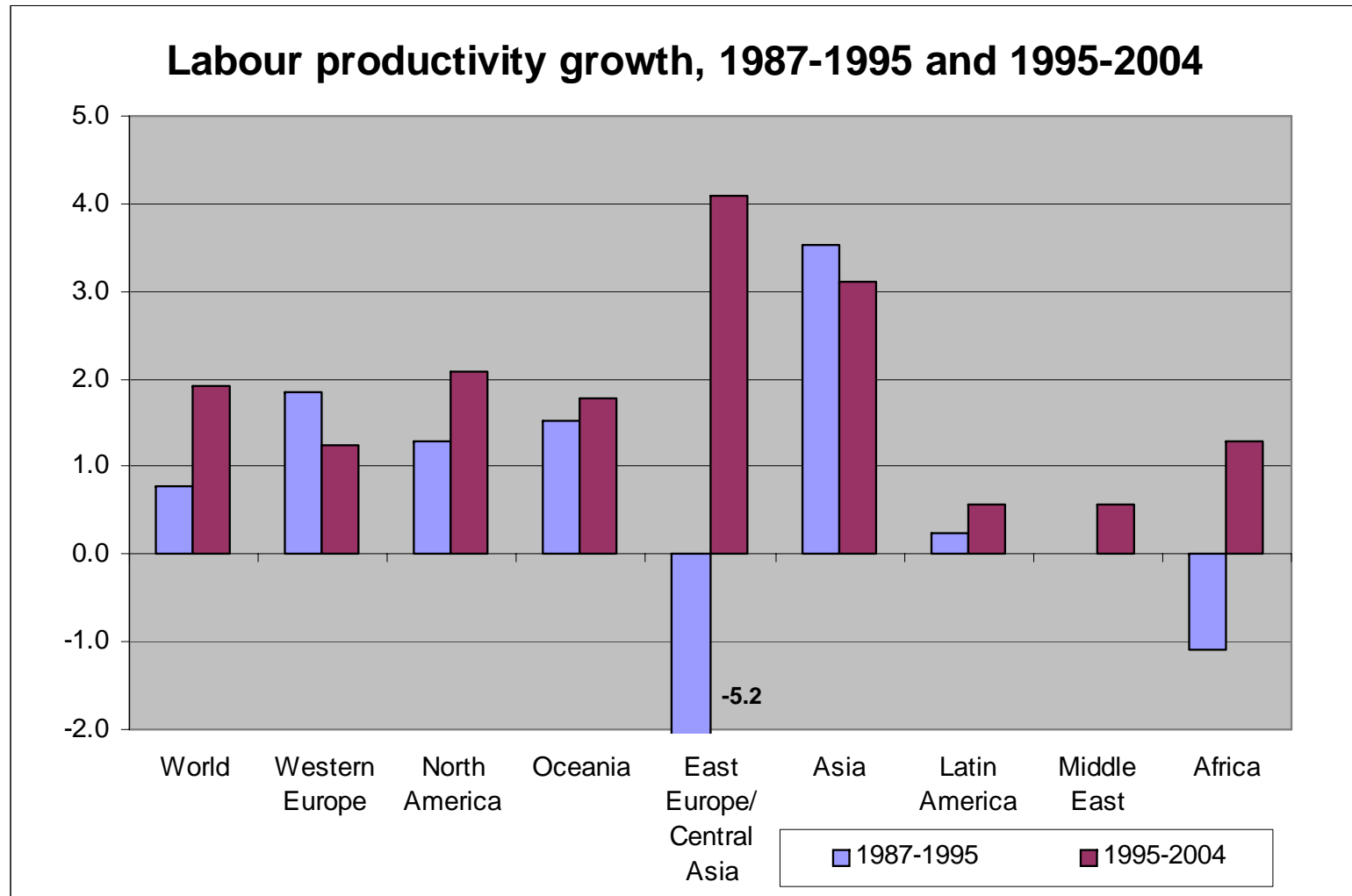
23 March 2006, Canberra

Since Mid-1990s GDP Growth Significantly Improved in Most Regions of the World



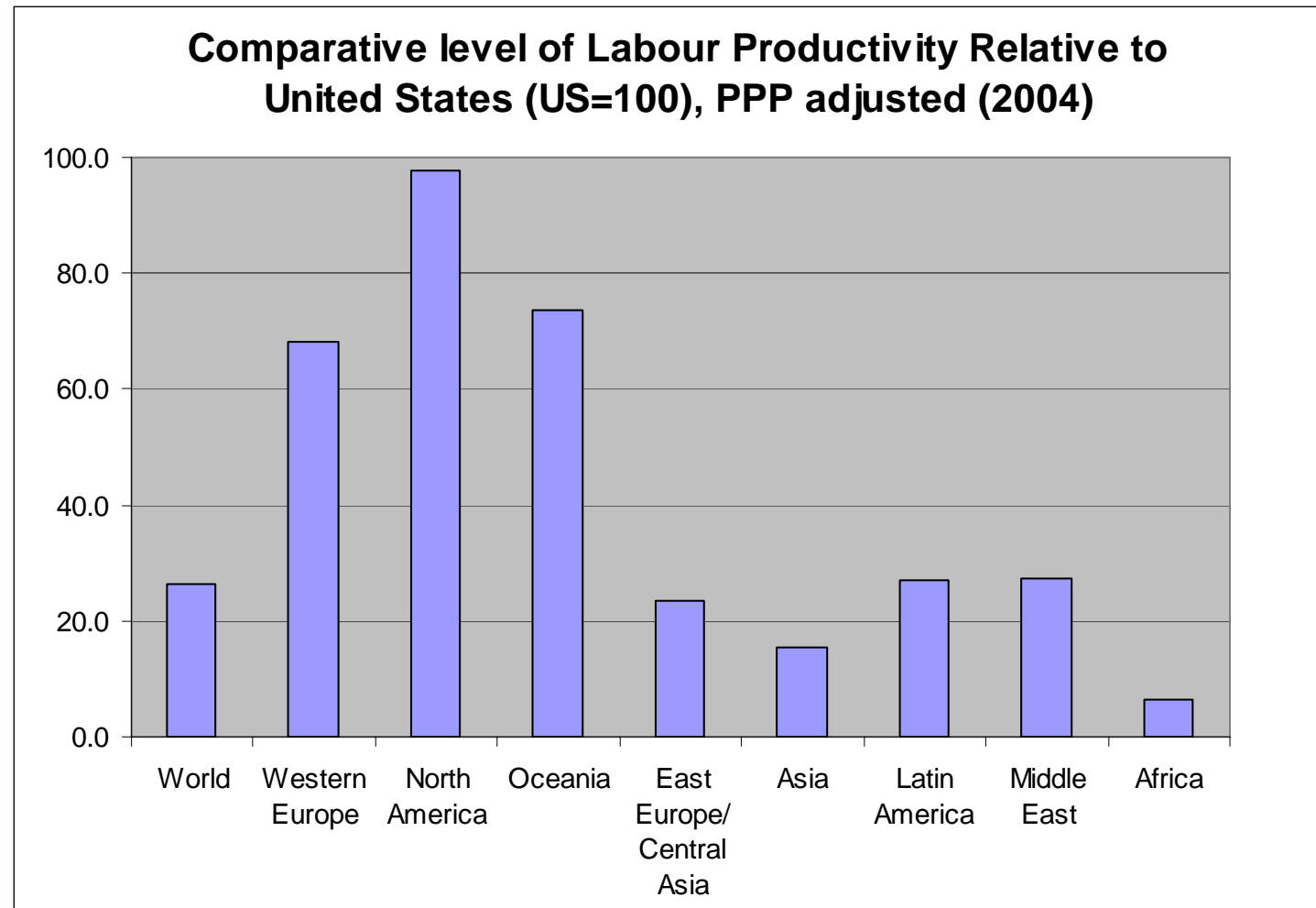
Source: TCB/GGDC Total Economy Database

Productivity Growth Shows Much More Diversity Across Regions



Source: TCB/GGDC Total Economy Database

Productivity Levels show Big Divide between Advanced and Developing Countries



Source: TCB/GGDC Total Economy Database



Productivity is Key to Higher Living Standards World-Wide

- ➔ The trade off between productivity and employment is a fallacy in the long run
- ➔ New capital vintages and technology (ICT) enhances the capabilities of labour primarily through more efficient use
- ➔ Market services are the key to furthering productivity growth in advanced countries
- ➔ Unit labor cost comparisons in manufacturing show continued benefits from globalization
- ➔ Innovation and reform policies drive allocation of resources to more productive use world-wide



Pre-EU KLEMS Databases Used (<http://www.ggdc.net/dseries/>)

- ➔ GGDC/TCB Total Economy Database:
 - ⊙ GDP, Employment, Hours, Labour Productivity
 - ⊙ 100 countries, 1950-2005 (link to Maddison's historical data)
 - ⊙ PPP-converted (2002 EKS PPP & 1990 GK PPP)
 - ⊙ The Conference Board, Performance 2005, EA 2006
- ➔ GGDC 60-Industry Database
 - ⊙ Value Added, Employment, Hours, Labour Productivity
 - ⊙ 57 industries, +/- 25 OECD countries, 1979-2003 (linked to OECD STAN)
 - ⊙ Harmonized deflation for ICT production and aggregation
 - ⊙ Van Ark, Inklaar & McGuckin (GD-60) and EU Report (O'Mahony and van Ark, 2003)

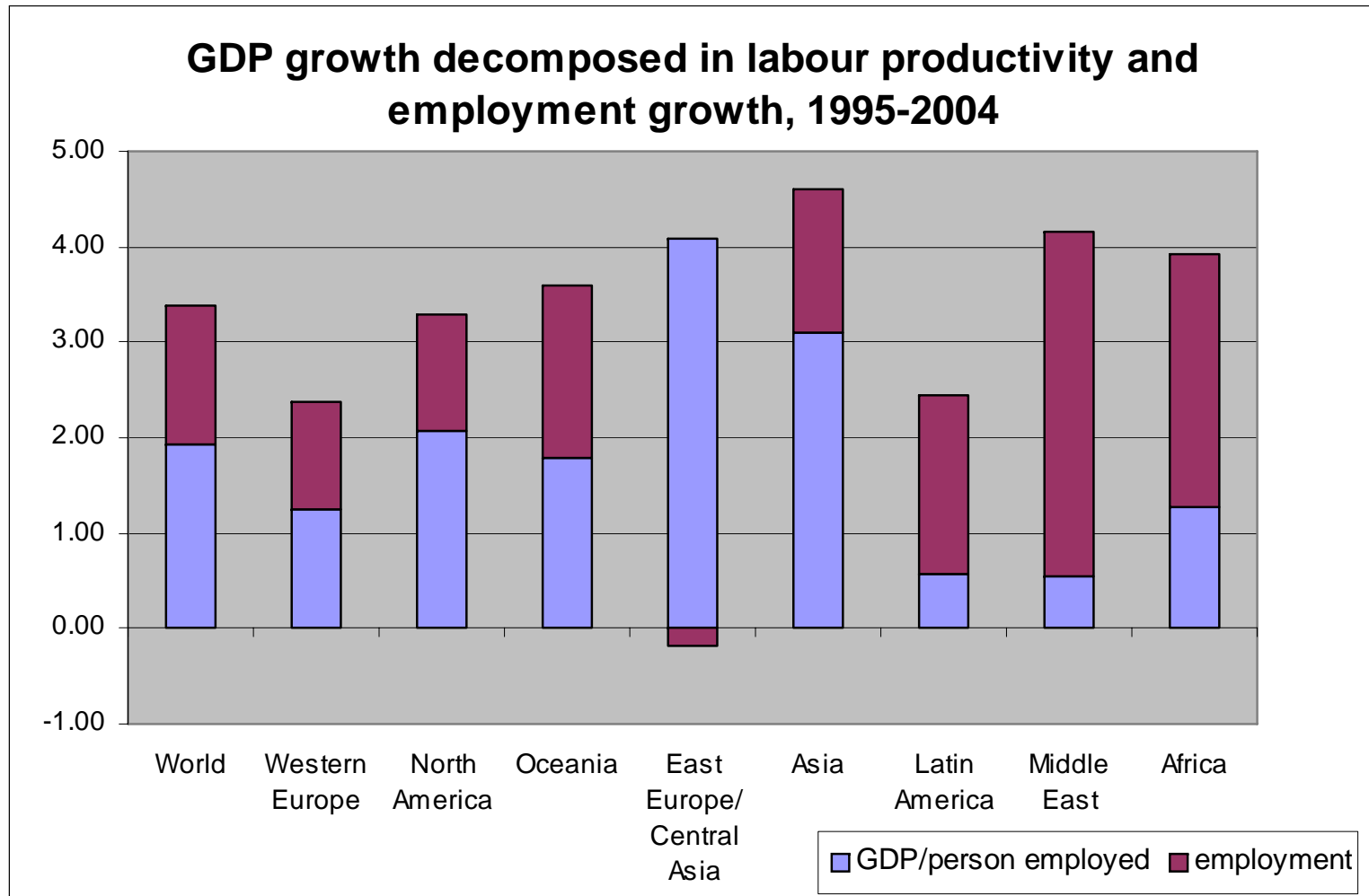


Pre-EU KLEMS Databases Used (<http://www.ggdc.net/dseries/>)

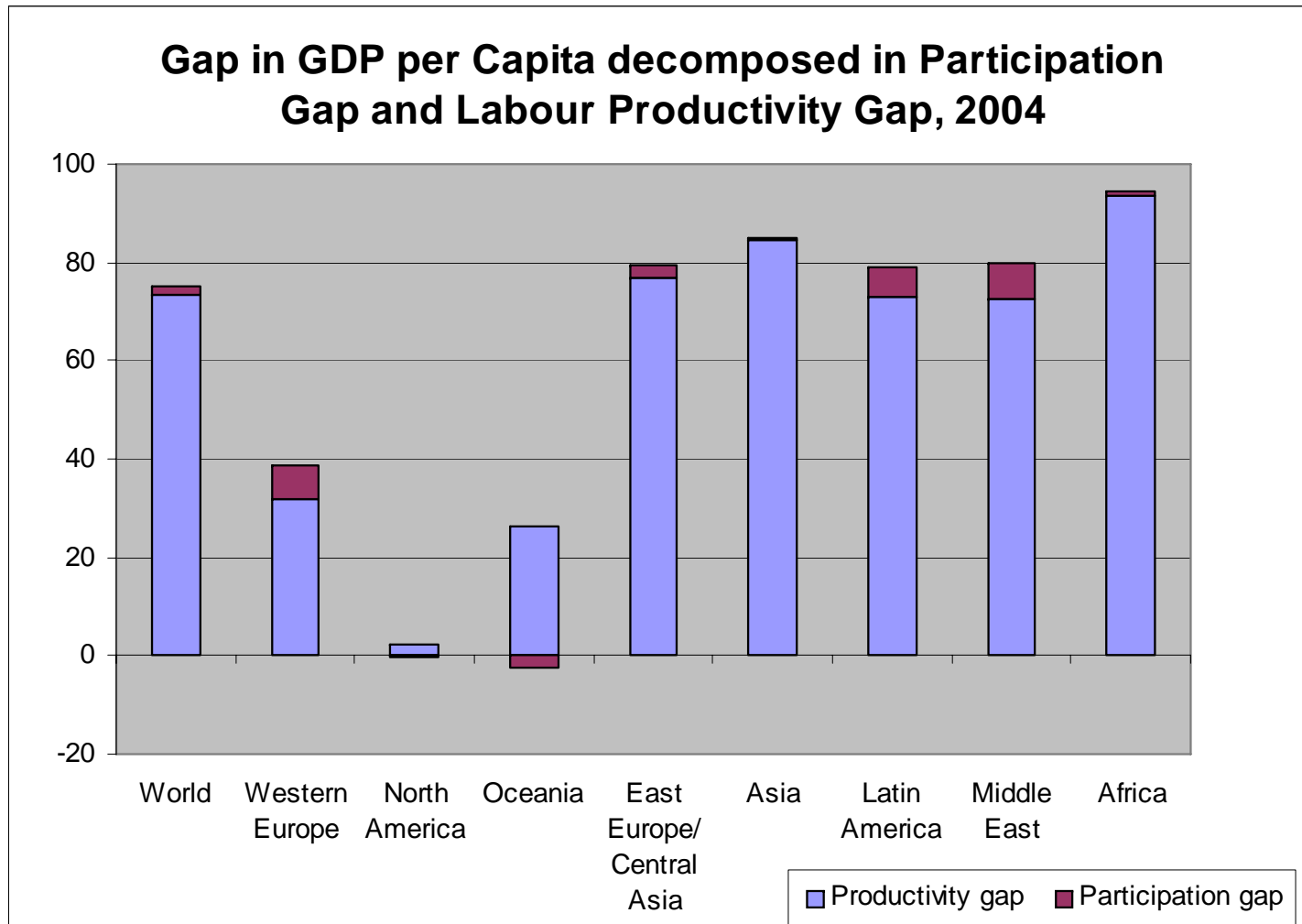
- ➔ GGDC Total Economy Growth Accounting Database
 - ⊙ Macro growth accounting, incl. ICT breakout in capital and TFP
 - ⊙ EU-15 countries and US, 1980-2004
 - ⊙ Timmer, Ypma and van Ark (GD-67); Timmer and Van Ark (2005)

- ➔ Industry Growth Accounting Database
 - ⊙ Industry growth accounting, incl. ICT breakout in capital and labour quality
 - ⊙ France, Germany, Netherlands, UK, US, 1979-2003; now also Australia and Canada
 - ⊙ EU Report (O'Mahony and van Ark, 2003) and Inklaar, O'Mahony and Timmer (GD-68)

Employment Dominates GDP Growth in Developing Countries (except in Asia) ...



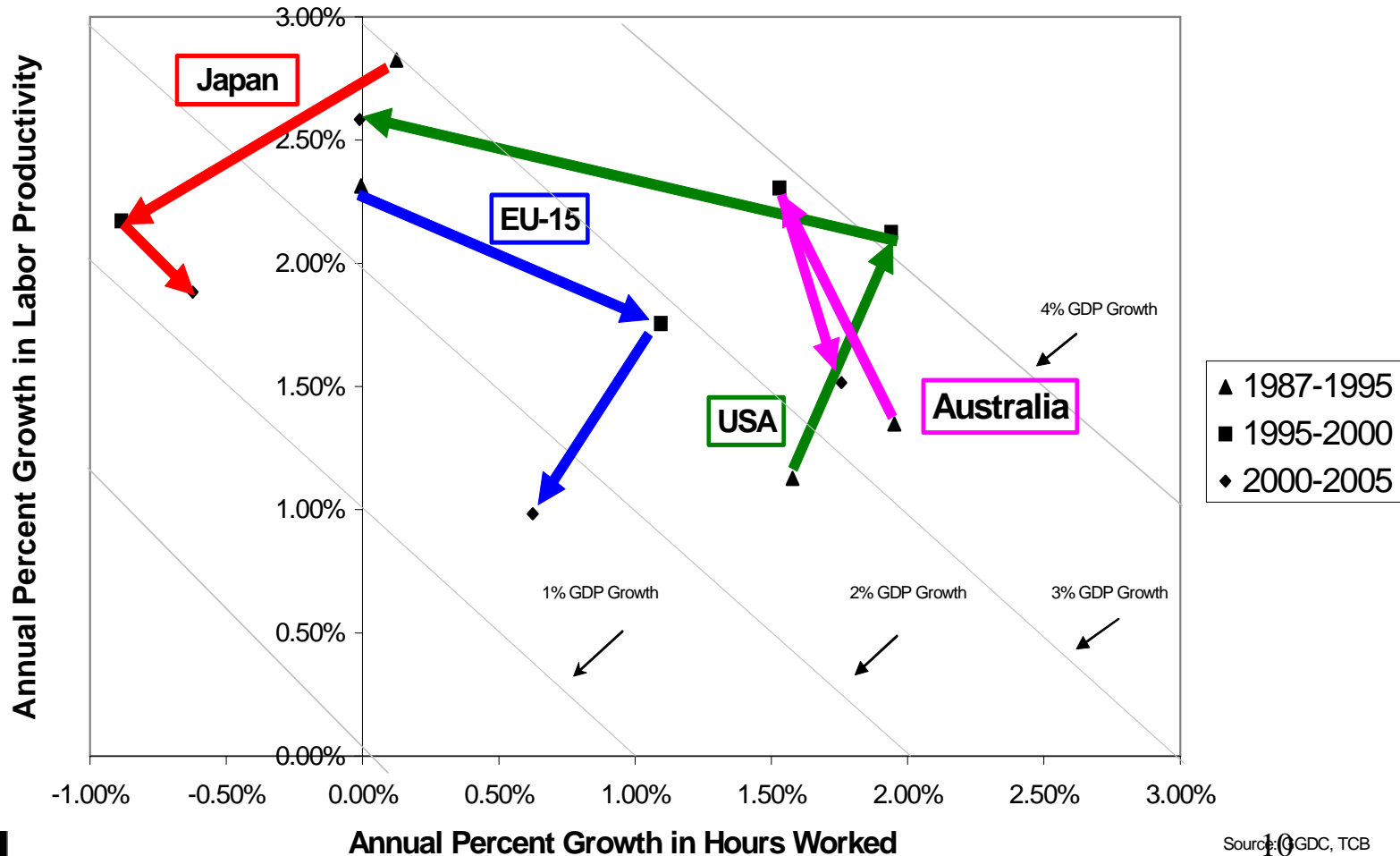
... but Productivity Gap is Main Explanation for Lower Living Standards World-Wide



Source: TCB/GGDC Total Economy Database

Among advanced countries employment-productivity trade-offs are not the rule

Contribution of Labor Productivity and Total Hours Worked to GDP Growth



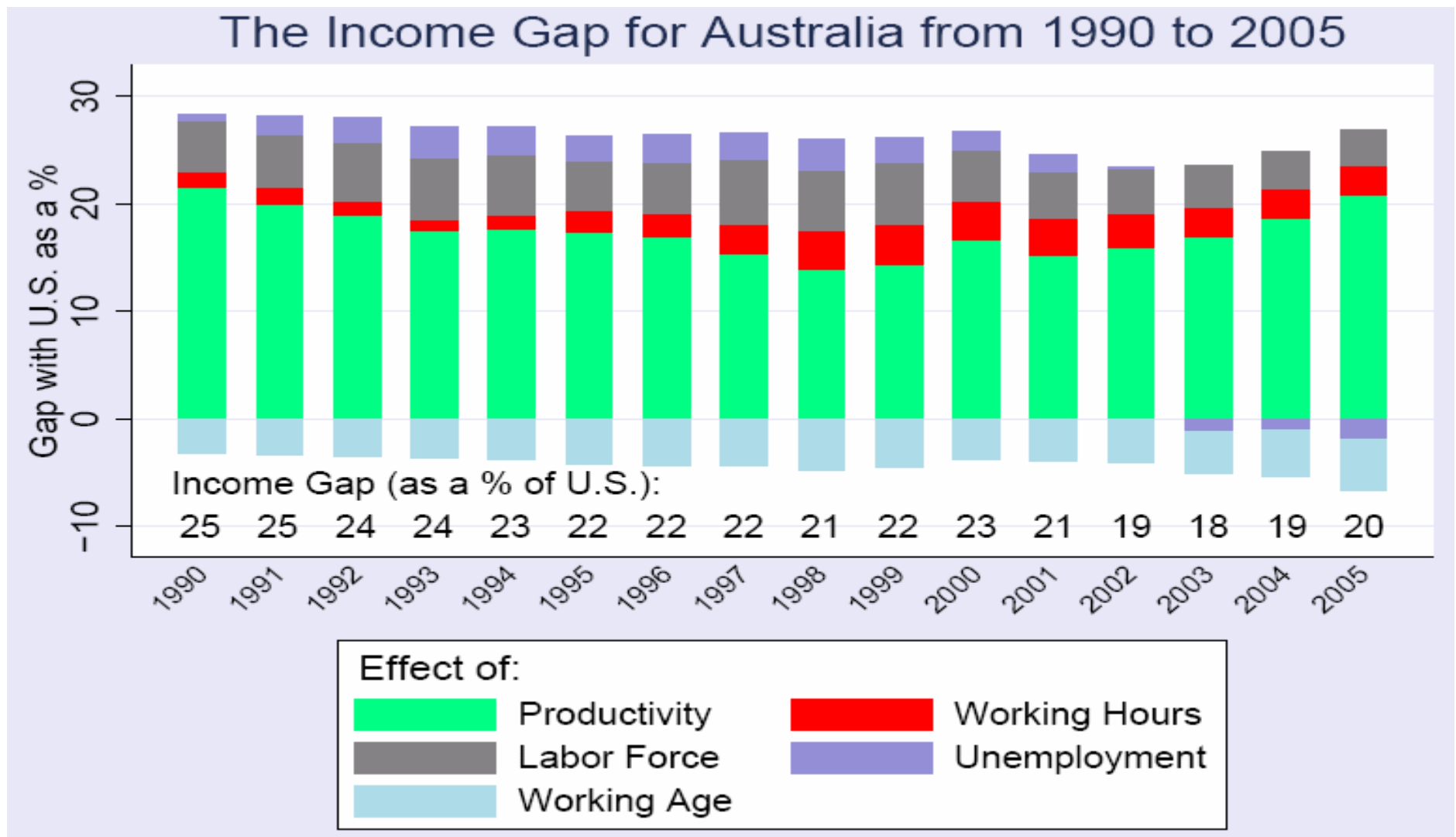
In the short run productivity – employment trade offs are more frequent

	US	EU-15	Japan	Australia	US	EU-15	Japan	Australia	US	EU-15	Japan	Australia
	Real GDP				Total Hours				Labour Productivity			
2001	0.8	2.0	1.8	3.9	-1.2	1.1	-1.2	0.1	1.9	0.9	1.4	3.7
2002	1.6	1.1	0.4	3.2	-1.3	-0.3	-1.9	1.2	3.0	1.4	1.6	1.9
2003	2.7	1.1	0.3	3.8	-0.5	0.4	-0.1	1.7	3.2	0.7	1.4	2.0
2004	4.2	2.3	1.2	3.0	1.2	0.8	-0.5	2.2	3.0	1.5	3.2	0.8
2005	3.6	1.5	0.2	2.6	1.8	1.1	0.5	3.6	1.8	0.5	1.9	-0.9
<i>acceleration</i> 2005 over 2004	-0.6	-0.8	-1.1	-0.4	0.6	0.3	0.9	1.4	-1.2	-1.0	-1.3	-1.7

Australia: figures are for 2000-2001 to 2004-2005

University of Groningen and Conference Board, 2005

Despite larger productivity gap, income gap narrowed relative to U.S.

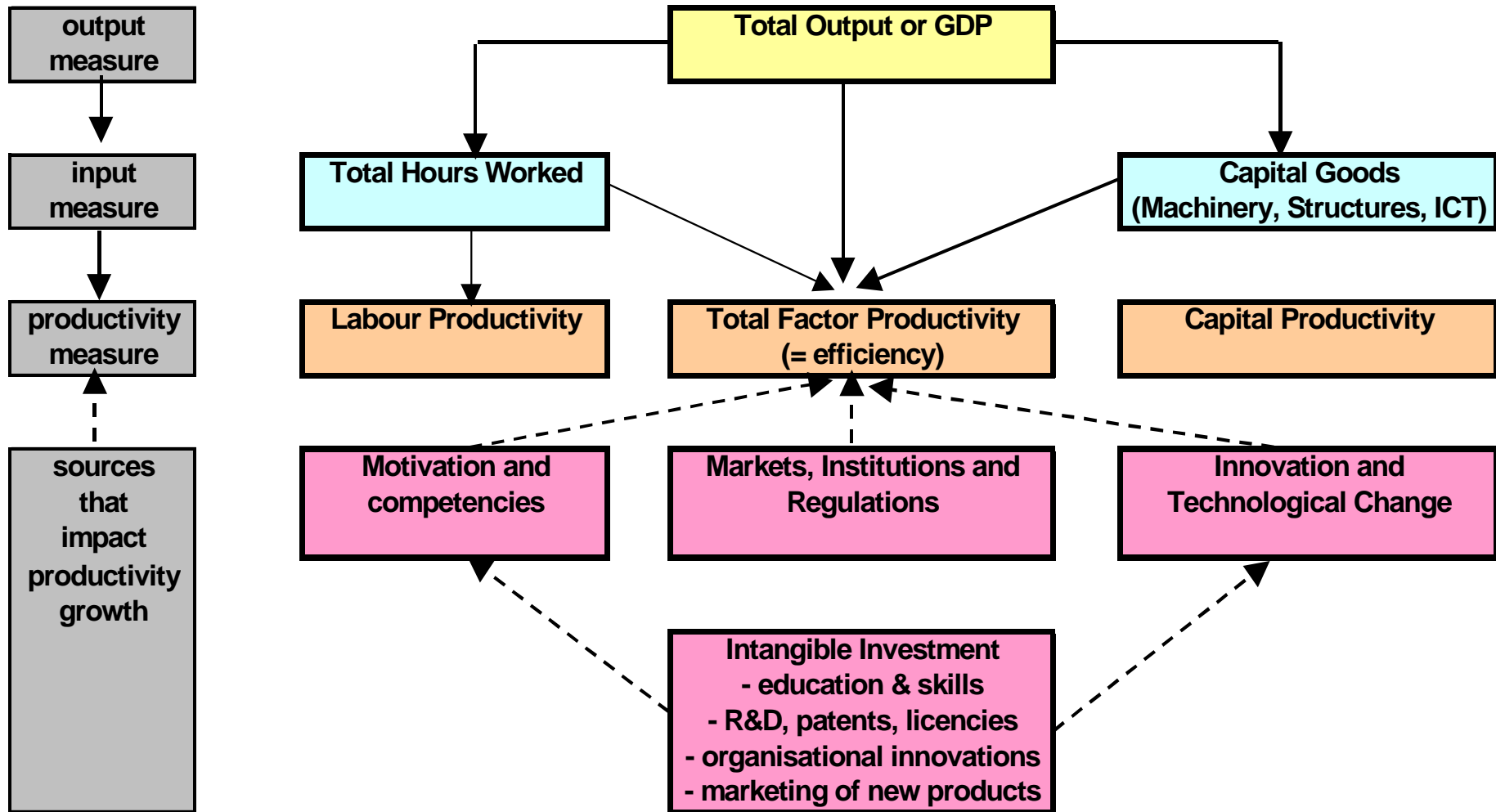




The Productivity-Employment Trade-Off is Not the Fundamental Problem

- ➔ Elasticity of increase in employment-population rate on productivity across OECD is -0.3%
- ➔ But employment-productivity trade-offs are temporary, and disappear within three to five years
- ➔ Australia's slowdown in productivity growth is more than fully compensated by falling unemployment and declining share of dependent population
- ➔ To improve living standards countries need more jobs, but in particular more productive jobs

Measures of Productivity, Input Variables and Sources of Growth

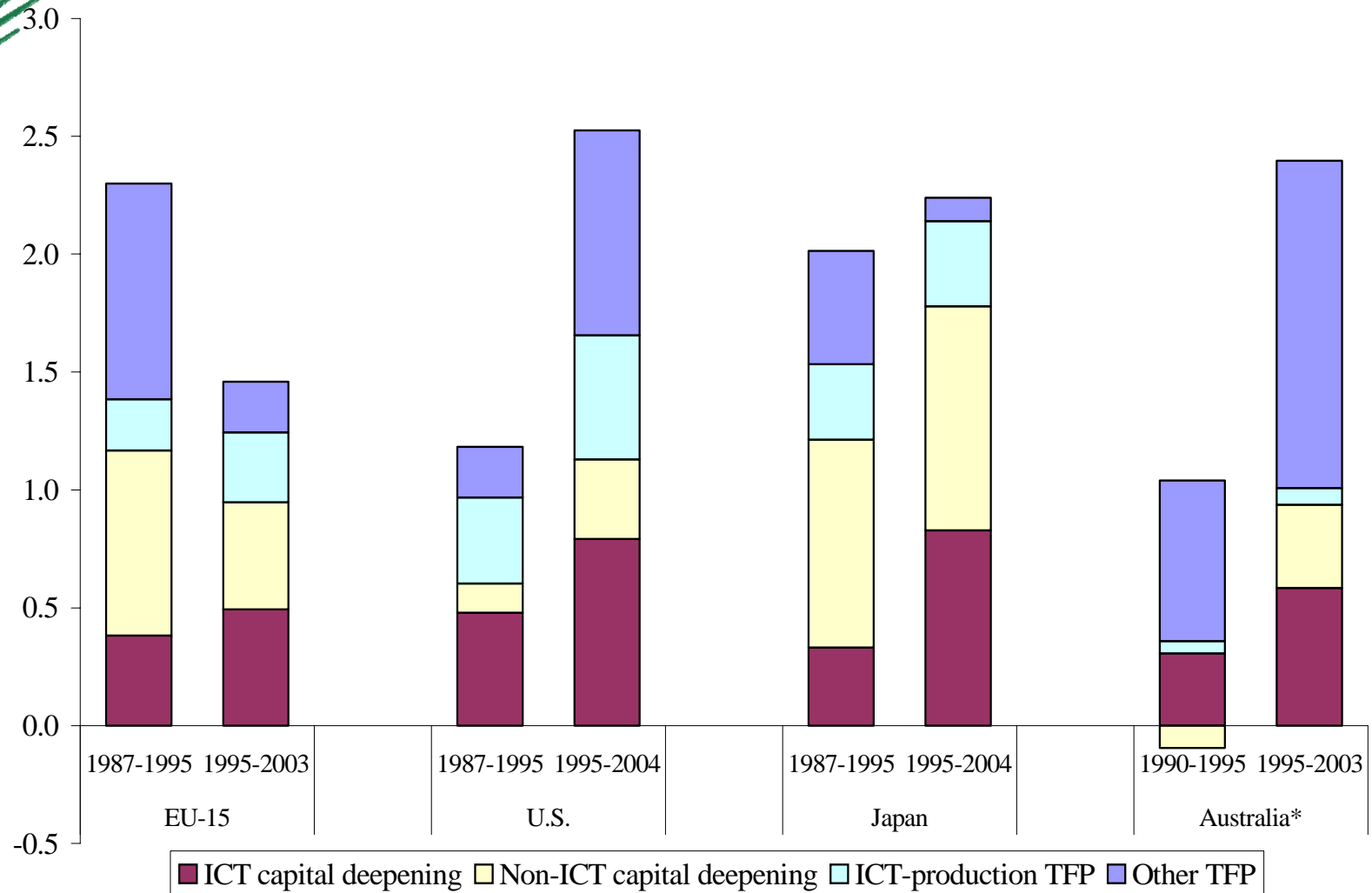


ICT is the Key Input to Accelerate Productivity in Advanced Countries

Three channels through which Information and Communication Technology (ICT) impacts on productivity growth:

- ⊙ 1st channel: Effect of ICT investment on labour productivity growth through ICT capital deepening
- ⊙ 2nd channel: Rapid technological change in ICT producing industries leading to TFP growth
- ⊙ 3rd channel: Total Factor Productivity (TFP) growth in industries that make intensive use of ICT (knowledge spillovers)

Faster TFP Growth Accounts for the U.S. and Australian Productivity Acceleration ...

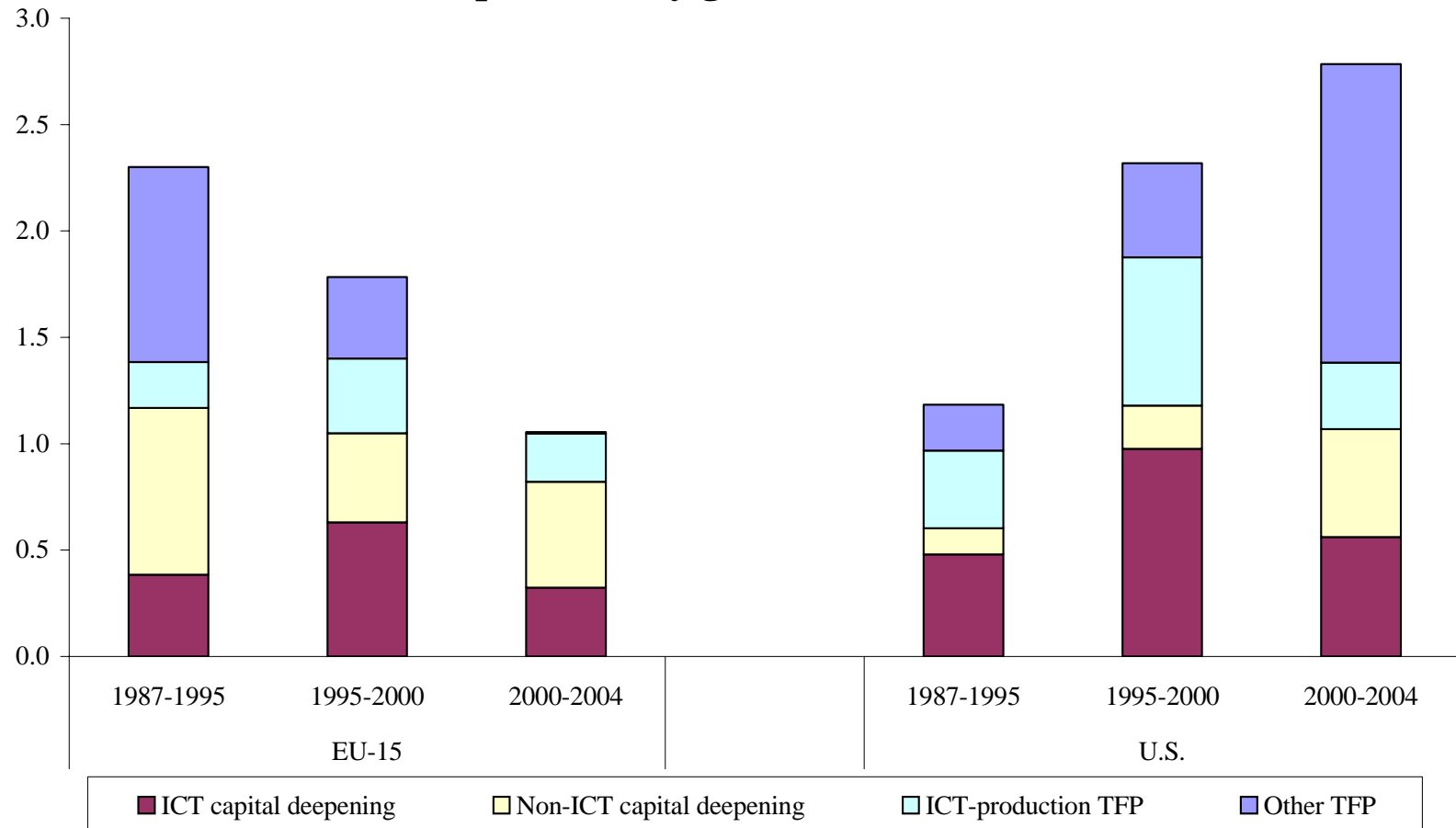


Source: GGDC Total Economy Growth Accounting Database (2005)

* Australia: year indicated starts on 1 July(2005)

... while Europe falls seriously behind on TFP in particular since 2000

Sources of labour productivity growth, EU-15 and U.S., 1987-2004



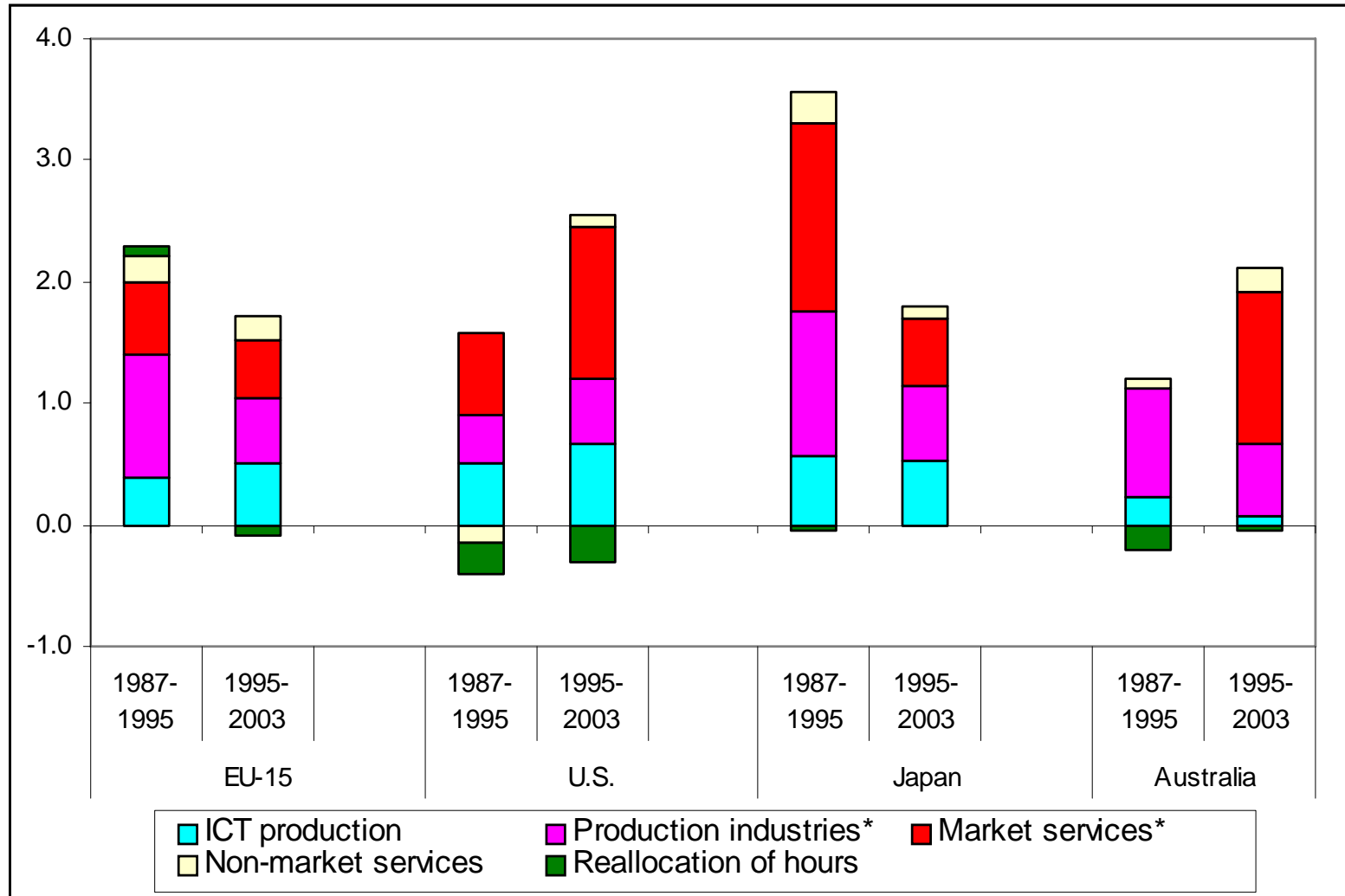


Productive Use of Technology and Innovations is Crucial

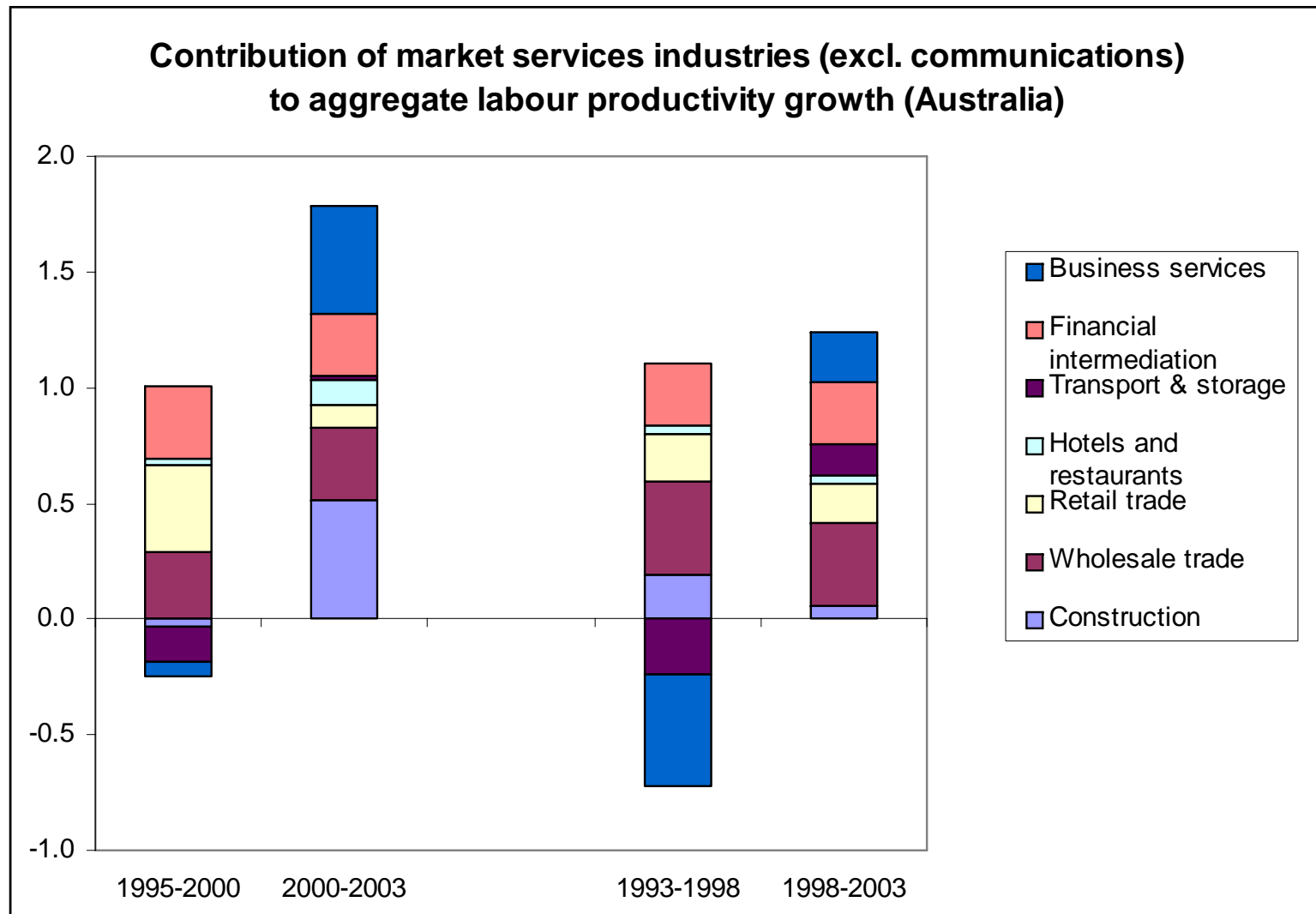
- ➔ Since 2000 IT investment levels have mostly returned to pre-1995 levels
- ➔ U.S. has advantages in exploiting growth benefits from ICT producers but the aggregate impact is small
- ➔ Productive use of new technologies and innovations across the economy are most important
- ➔ A sectoral approach (market services, manufacturing) is needed to understand differences more fully



Market Services are Key to Acceleration of Productivity in U.S. and Australia

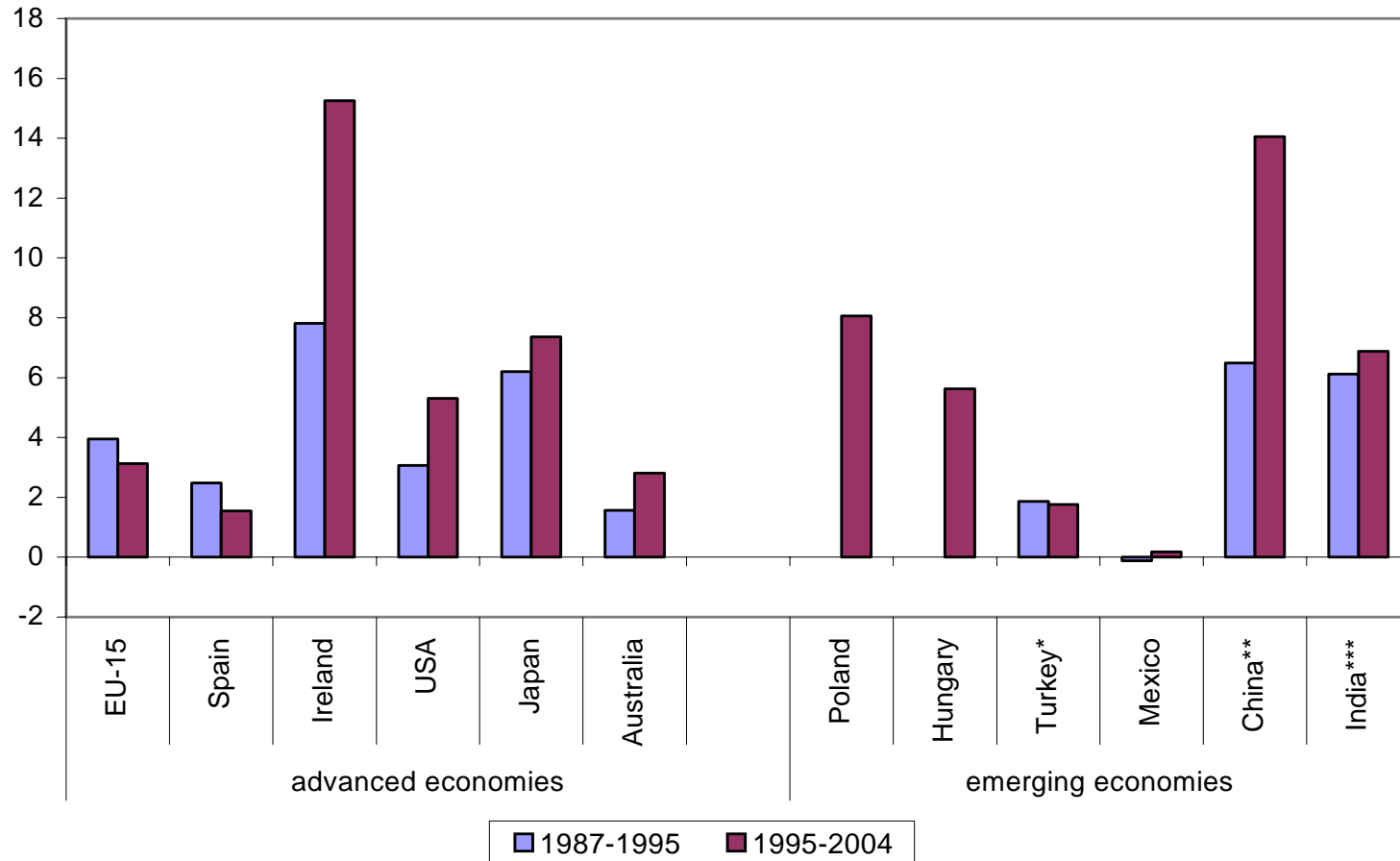


Periodisation is very important for understanding Australia's productivity performance



Manufacturing Productivity Accelerates World Wide (except EU-15), but Growth Performance shows Mixed Picture

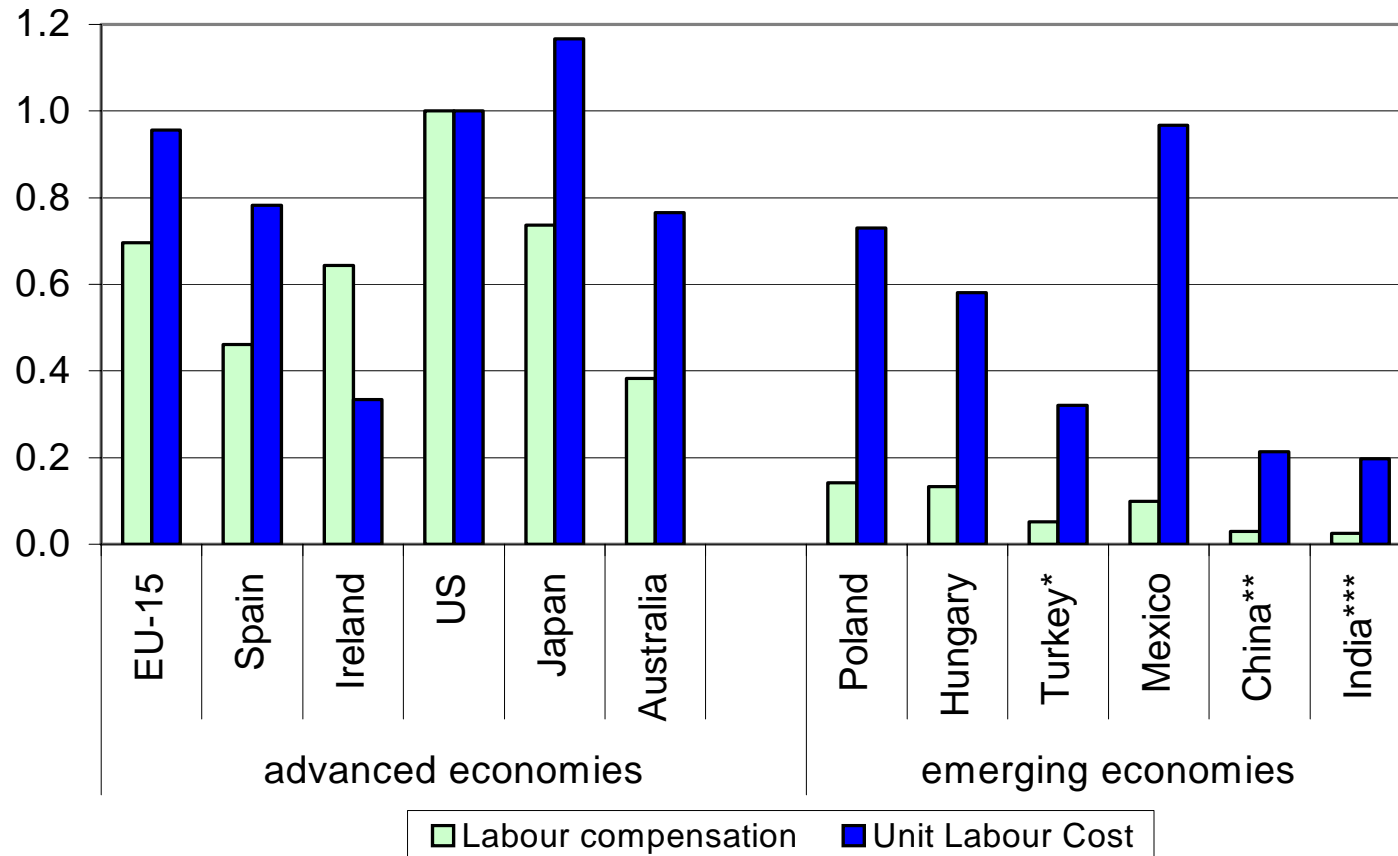
Manufacturing Labour Productivity (per hour),
annual average growth



* per person employed; ** per person employed, 1987-1994 and 1994-2002; productivity growth for firms at "township level and above"; *** per person employed, to 2003 productivity growth for registered manufacturing enterprises only

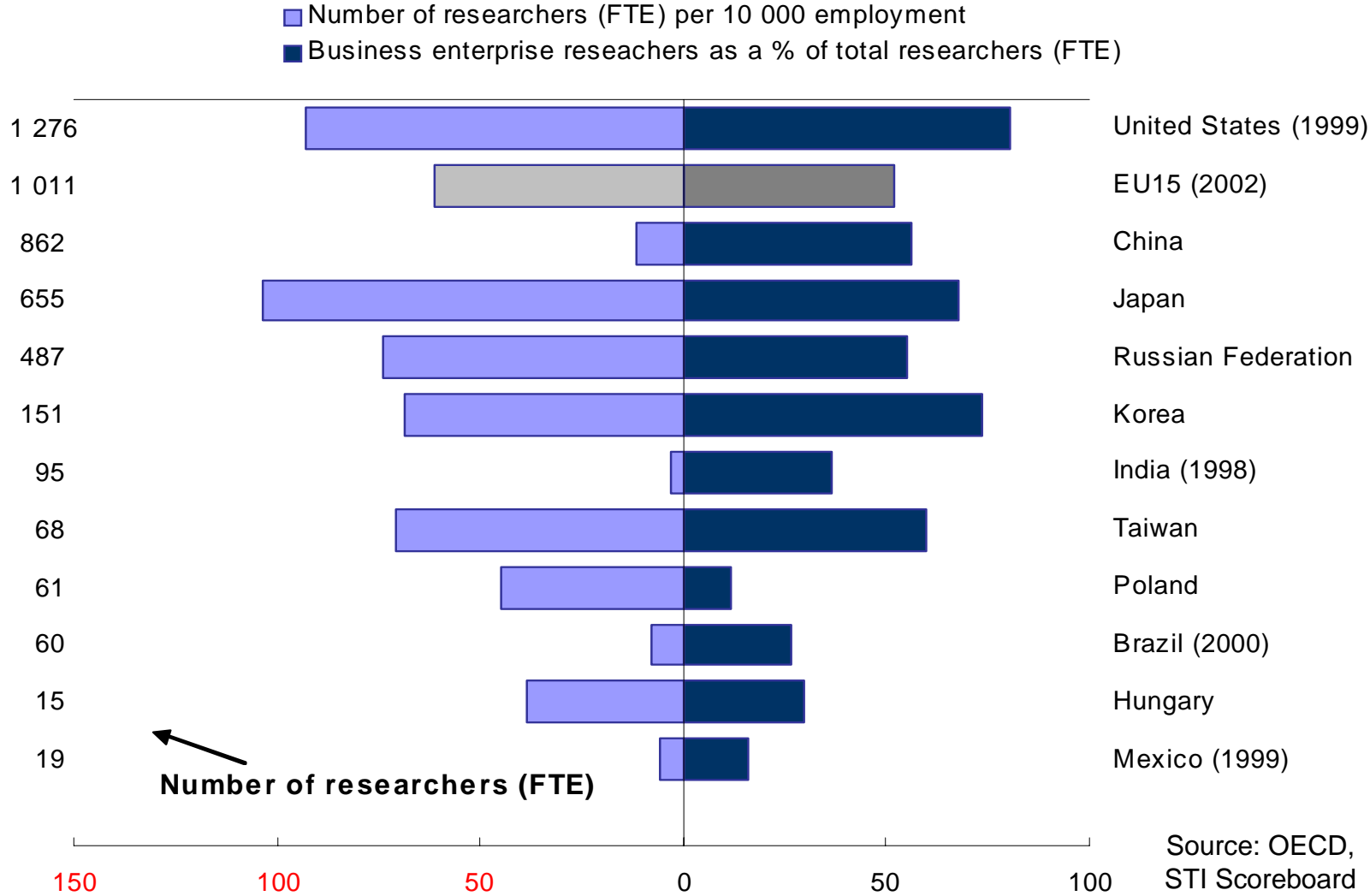
Cost Comparisons also need to take Account of Relative Productivity Levels

Labour Compensation (per Hour) and Unit Labour Cost, USA=1.0, 2002



* labour compensation per person employed; ** labour compensation per person employed; labour compensation as weighted average for urban firms and large firms at township level; productivity for firms at "township level and above"; *** labour compensation per person employed for reg manufacturing enterprises only

Manufacturing Competition from Emerging Economies Changes From Cost to Technology





What remains ...

- ➔ Measurement problems
- ➔ The role of innovation in manufacturing and services
- ➔ The policy framework:
 - ⊙ Macroeconomic management
 - ⊙ Horizontal policies (e.g., human capital, infrastructure)
 - ⊙ Technology and innovation policies
 - ⊙ Reforms in labour, product and capital markets

Measurement problems due to increased share of ICT

	Industry	Services
Output	Primarily computers and other ICT goods. Solvable by using hedonic price indices, which is possible provided data availability	Primarily "customised" services and public services (education, health, etc.). Should be tackled by detailed analysis of multiple dimensions of output by industry. Difficult both in methodological terms as well in terms of data
Input	Primarily semiconductors. Can be solved with hedonic price indices, provided data availability and investment flow matrices.	Primarily ICT capital input. Can be solved by adjusting nominal input series with hedonic price indices. Feasible provided availability of investment flow matrices.

Innovation taxonomies show strongest productivity effects in suppliers manufacturing and value chain in services

Labour productivity by Industry Group on the basis of combined Pavitt/SIID taxonomy, EU and U.S., 1995-2002

	1990-1995		1995-2002	
	EU-15	U.S.	EU-15	U.S.
Total Economy	2.4	1.1	1.6	2.5
<i>Good producing industries</i>				
Supplier dominated manufacturing	2.6	0.0	1.9	1.2
Scale intensive industry	3.8	2.7	1.8	1.2
Specialised suppliers manufacturing	6.6	9.9	6.6	13.3
Science based manufacturing	5.5	2.8	4.2	3.4
<i>Service industries</i>				
Supplier dominated services	2.9	2.3	4.0	6.4
Specialised supplier services	0.5	0.0	0.5	-0.3
Organizational innovative services	2.4	1.1	1.4	2.6
Client led services	1.2	1.3	0.3	4.2
Non-market services	1.2	-0.8	0.8	-0.4



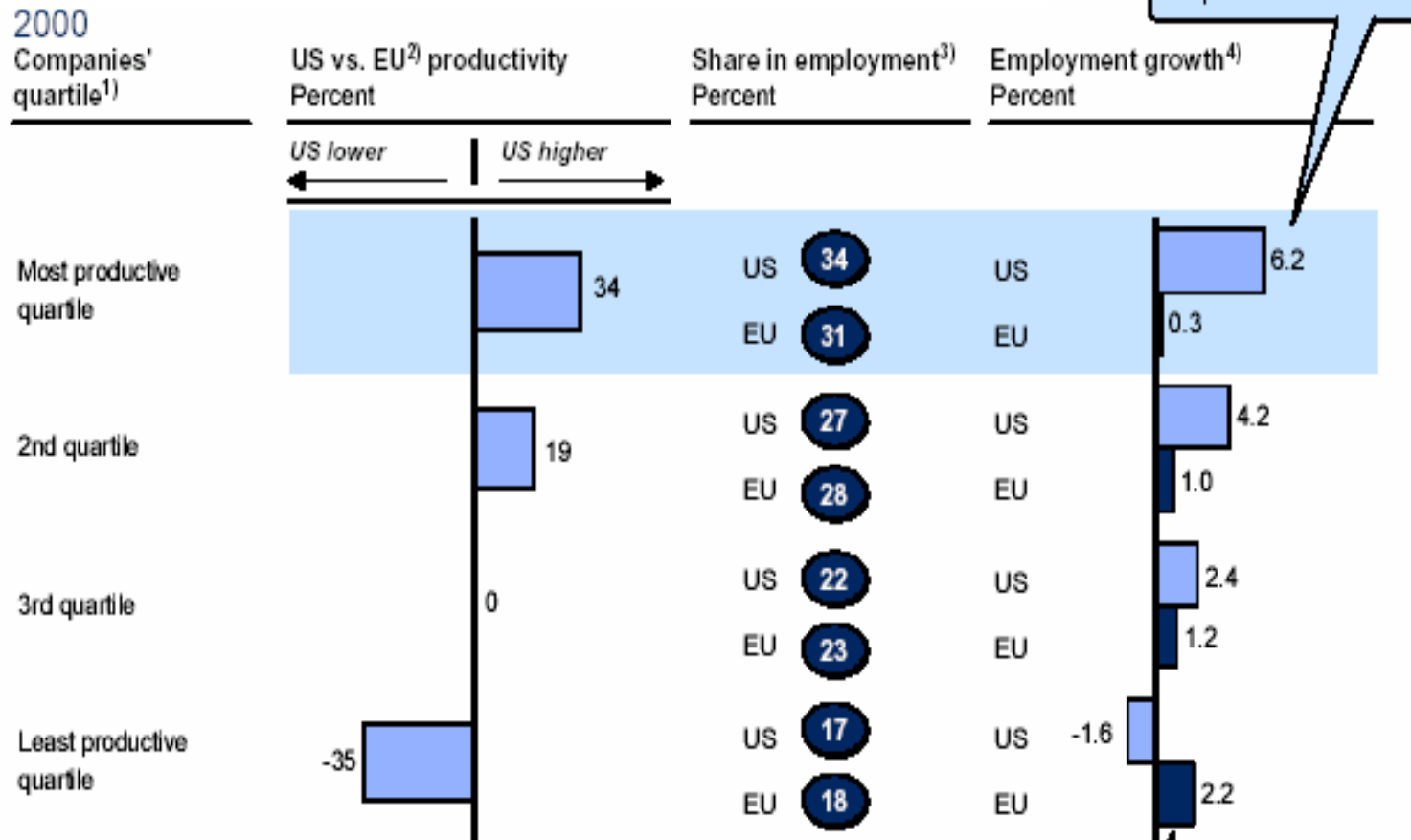
Innovation should be broader than high tech manufacturing and also target services

- ➔ High R&D-intensity in manufacturing target should not become the holy grail
- ➔ Non-technological (organizational) innovations are at least as important, in particular in services
- ➔ Limited room for targeted innovation policies to facilitate service innovation:
 - ⊙ invest to improve the quality of the workforce
 - ⊙ Invest in physical and technological infrastructure to foster innovation activities
- ➔ Much of the productivity-enhancing innovations in services originate from suppliers and clients in the value chain

Reforms are key to reallocate resources to high productivity activities

- ➔ Reforms should concentrate on:
 - ⊙ Help increase entry and exit in industries
 - ⊙ Make price-quality relationships transparent
 - ⊙ Put pressure on margins in existing markets;
 - ⊙ ... but also allow firms to exploit new markets;
 - ⊙ ... and to exploit not abuse scale advantages
- ➔ Reform management is complex:
 - ⊙ Many measures are industry-specific
 - ⊙ Reforms need to be comprehensive & complementary
 - ⊙ Time lags before productivity effects emerge
 - ⊙ Reforms need to tackle vested interests;
 - ⊙ ... raise awareness of opportunities;
 - ⊙ ... and facilitate transition not the status quo

Europe shows lack in dynamics of firms at the top



Top US companies grow faster than top EU companies

The US eliminates its least productive companies; the EU does not

1) Aggregated data for manufacturing sector, STAN 15137
 2) Weighted average of EU countries for which data were available; Finland, France, United Kingdom, the Netherlands and Sweden
 3) Average share 1995-2000
 4) Average annual growth in resources, 1995-2000

Source: ESI-VU



In sum ...

- ➔ Developing and emerging economies will continue to bring more people to labour market ...
- ➔ ... but their productivity is key to improving living standards
- ➔ Productivity improvements have been world wide, except for EU-15, Latin America and Middle East
- ➔ Productive use of technology is key to productivity in particular in services
- ➔ Manufacturing competition is not just a cost matter, but also relates to innovation capabilities
- ➔ Limited room for targeted innovation policies – in particular not in services – quality of workforce is the key
- ➔ Reforms need focus on reallocation of resources to most productive uses but need to be managed