



SHAPING IRELAND'S FUTURE

COMMUNICATIONS FOR
THE SMART ECONOMY

The Conrad Hotel
Tuesday 13 October, 2009

Dr. Robert Atkinson
Information
Technology and
Innovation
Foundation



October 13, 2009

Investment in ICT and Broadband for Economic Recovery and Long-Term Growth

Presentation at ComReg National Conference 2009

Dr. Robert Atkinson

President

Information Technology and Innovation Foundation

ITIF is a think tank committed to articulating and advancing a pro-productivity, pro-innovation and pro-technology public policy agenda internationally, in Washington and in the states. ITIF focuses on:

- Telecommunications, Internet, and broadband policy,
- Innovation processes, policy and metrics,
- Science policy related to economic growth,
- E-commerce, e-government, e-voting, e-health,
- ICT and economic productivity, and
- Innovation and trade policy.



Digital *Quality* of Life

*Understanding the Personal &
Social Benefits of the Information
Technology Revolution*

**Robert D. Atkinson
&
Daniel D. Castro**



Digital **PROSPERITY**

*Understanding the Economic
Benefits of the Information
Technology Revolution*

**Robert D. Atkinson
&
Andrew S. McKay**

■ Today's Presentation

1

The New Global Competitiveness Challenge

2

ICT, Innovation and Economic Competitiveness

3

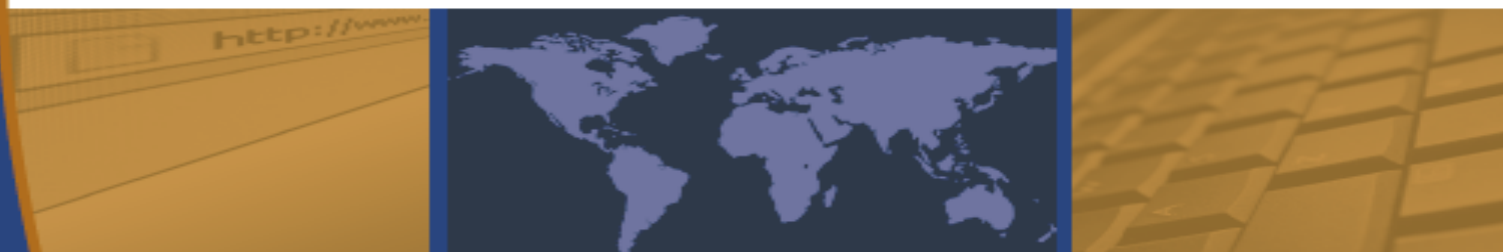
ICT and Recovery: Jobs

4

Implications for Policy

THE ATLANTIC CENTURY

Benchmarking EU & U.S.
Innovation and Competitiveness



Robert D. Atkinson and Scott Andes
The Information Technology and Innovation Foundation
Washington, D.C.

February 2009



European-American
Business Council



The Atlantic Century:

■ Benchmarking EU & U.S. Innovation and Competitiveness

■ The Study:

Comparing innovation-based competitiveness of 40 nations and regions.

■ Countries:

EU and NAFTA countries, Australia, Brazil, China, India, Japan, South Korea, Russia, and Singapore

■ Regions:

EU-10, EU-15, EU-25, and NAFTA

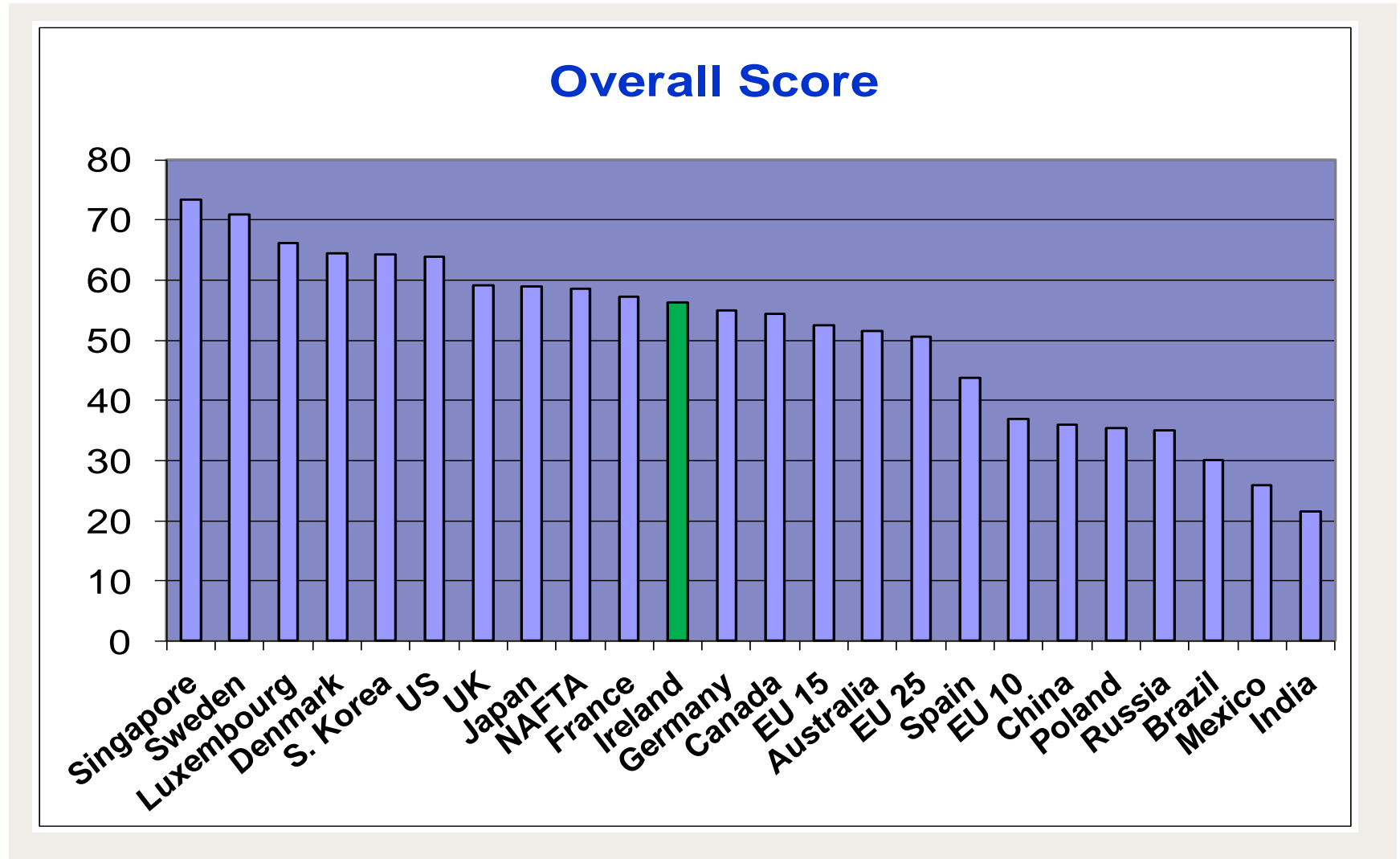
■ Report Data:

Uses the latest data available, but some is from 2005 and 2006, and much has changed since then.

6 Groups of 16 Indicators to Assess Global ■ Innovation-based Competitiveness:

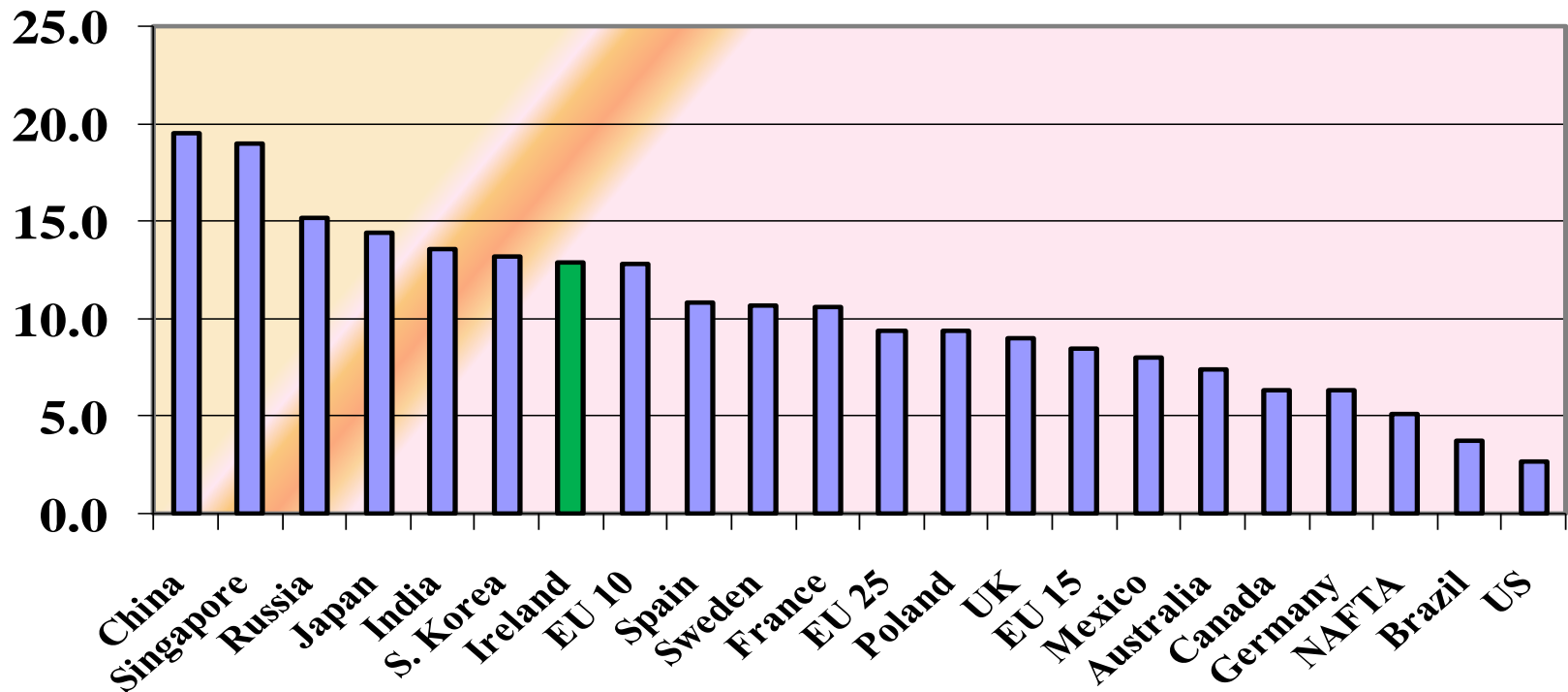
- Economic Structure
 - Human capital (college education; researchers)
 - Innovation capacity (corporate R&D; government R&D; scientific publications)
 - Entrepreneurship (new firms; venture capital)
 - ICT infrastructure (e-government; corporate ICT investment; broadband)
- Economic Policy (corp. tax; ease of doing business)
- Economic Performance (trade balance, FDI, GDP per worker, productivity)

■ Ireland Ranks 13th Overall



- And 18th in Change from 2000 to 2007

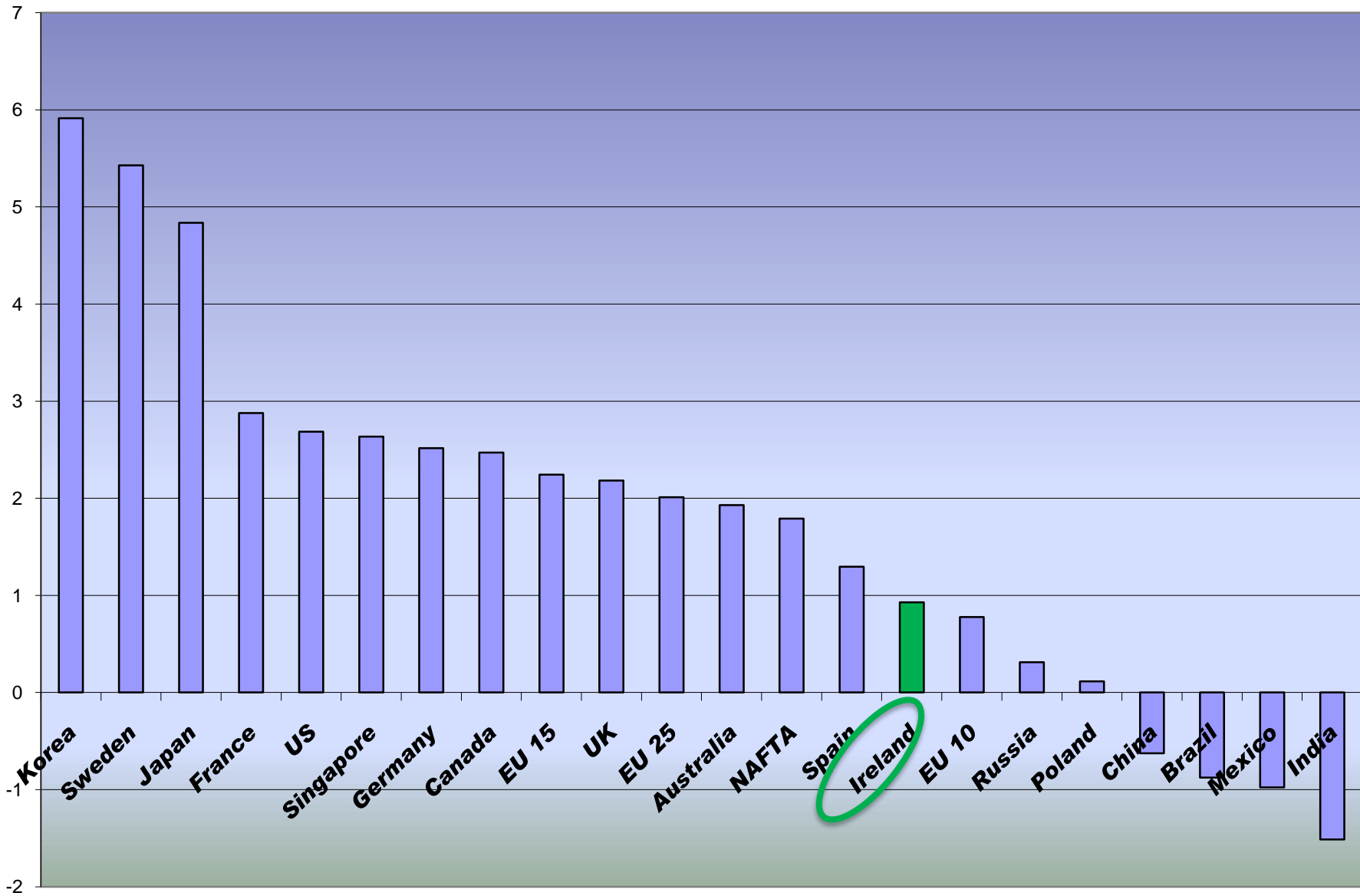
Overall Change



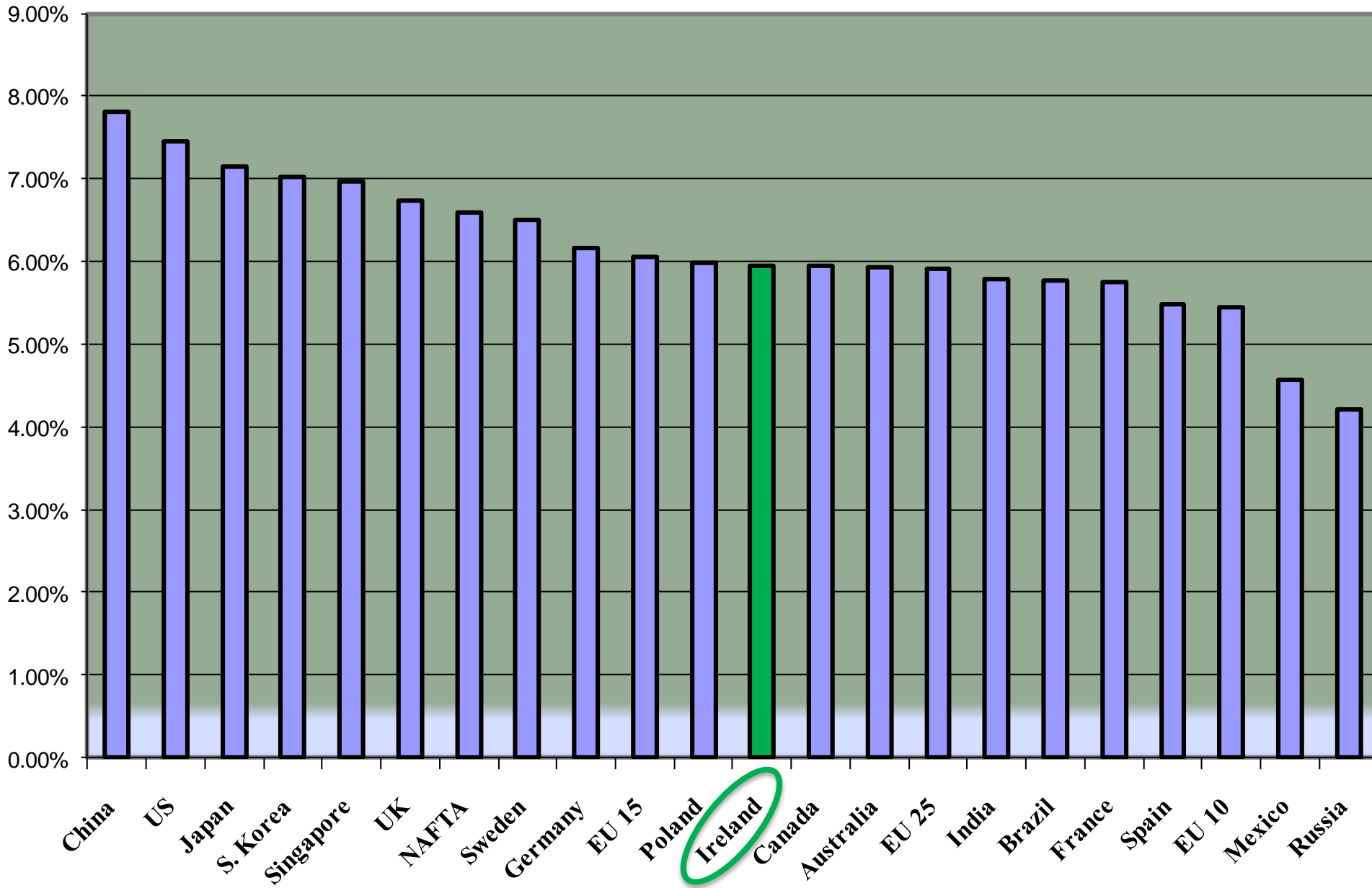
■ Ireland's Strengths

- **Higher Education – 6th**
- **Corporate Tax – 5th**
- **Business Climate – 4th**
- **Trade Balance – 4th**
- **FDI – 2nd**
- **GDP per Adult – 4th**

Broadband Quality and Subscription Rates (2009)



ICT Investments as % of GDP



■ Today's Presentation

1

The New Global Competitiveness Challenge

2

ICT, Innovation and Economic Competitiveness

3

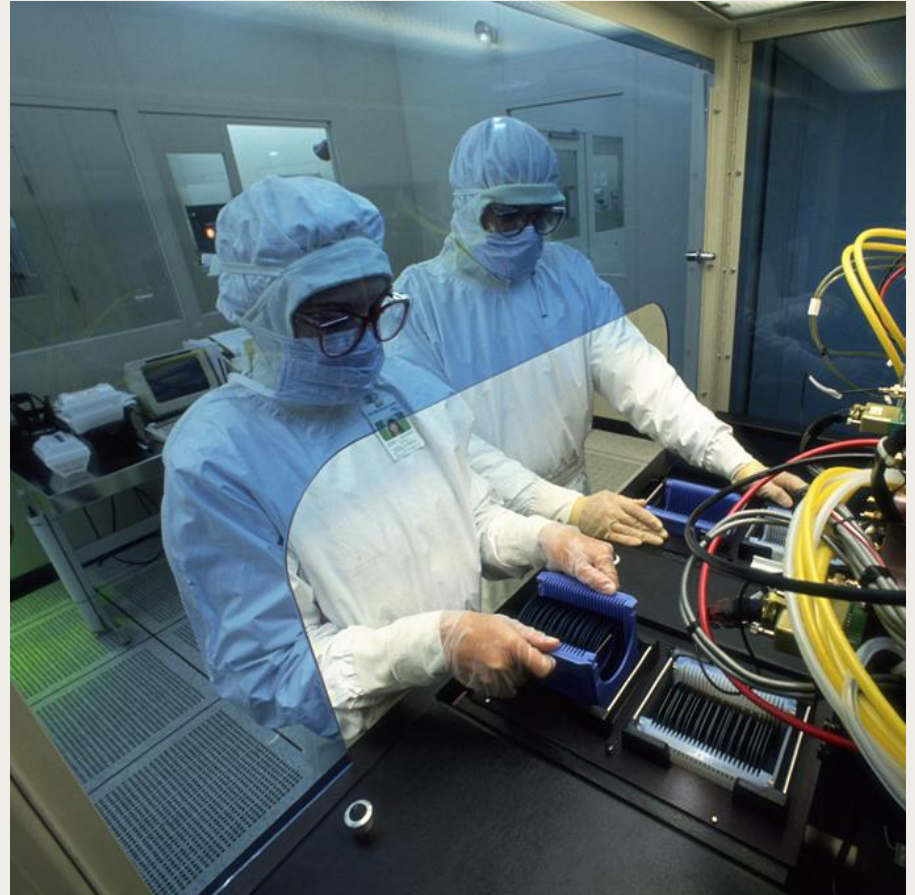
ICT and Recovery: Jobs

4

Implications for Policy

■ How Does ICT Drive Growth: the ICT Sector

- Growth in the ICT Sector:
 - Job growth: Between 1995 and 2006 ICT sector employment increased at an annual average rate of 0.9% in the OECD.
 - Higher wages: Jobs in the U.S. ICT industry pay 70% higher wages than other industries.



How Does ICT Drive Growth? Help Existing Firms Be More Productive and Innovative



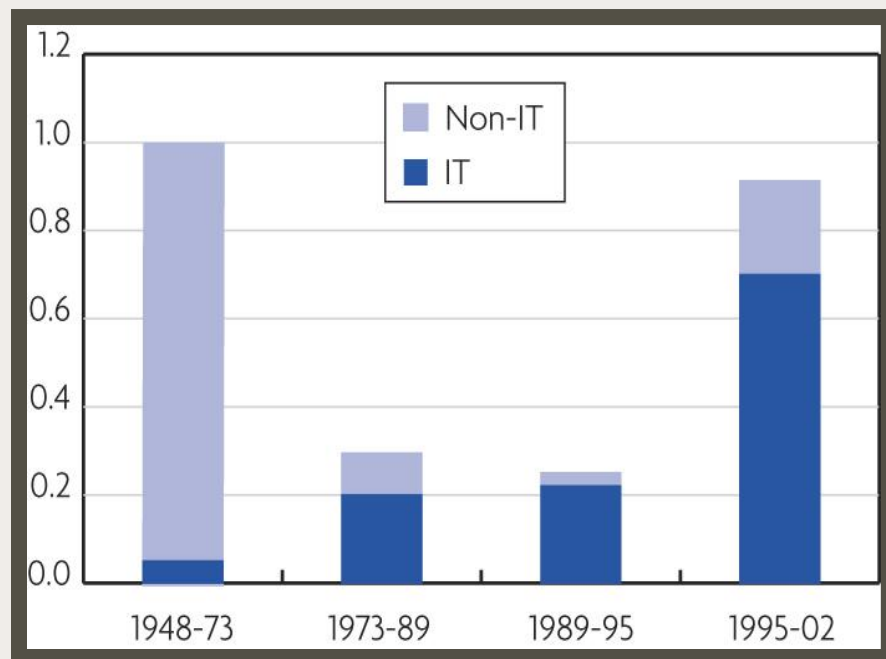
- In the U.S. the use of ICT was responsible for 80% of the productivity pick-up, with the ICT industry responsible for 20%.



ICT is the Key Driver of U.S. Productivity Performance

■ ICT has outsized impacts:

- In large U.S. firms, every dollar of ICT capital is associated with \$25 of market value (Gao and Hitt, 2004).
- ICT workers contribute significantly more to productivity than non-ICT workers and the difference has grown over time (Tambe and Hitt, 2008).
- ICT was responsible for 75% of labor productivity growth from 1995 to 2002, and 44% from 2000 to 2006 (Oliner, Sichel and Stiroh, 2007).
- The use of ICT is playing a 30% percent larger role on total factor productivity growth from 2000-2006 than it did from 1995-2000 (Brynjolfsson and Saunders, 2009).

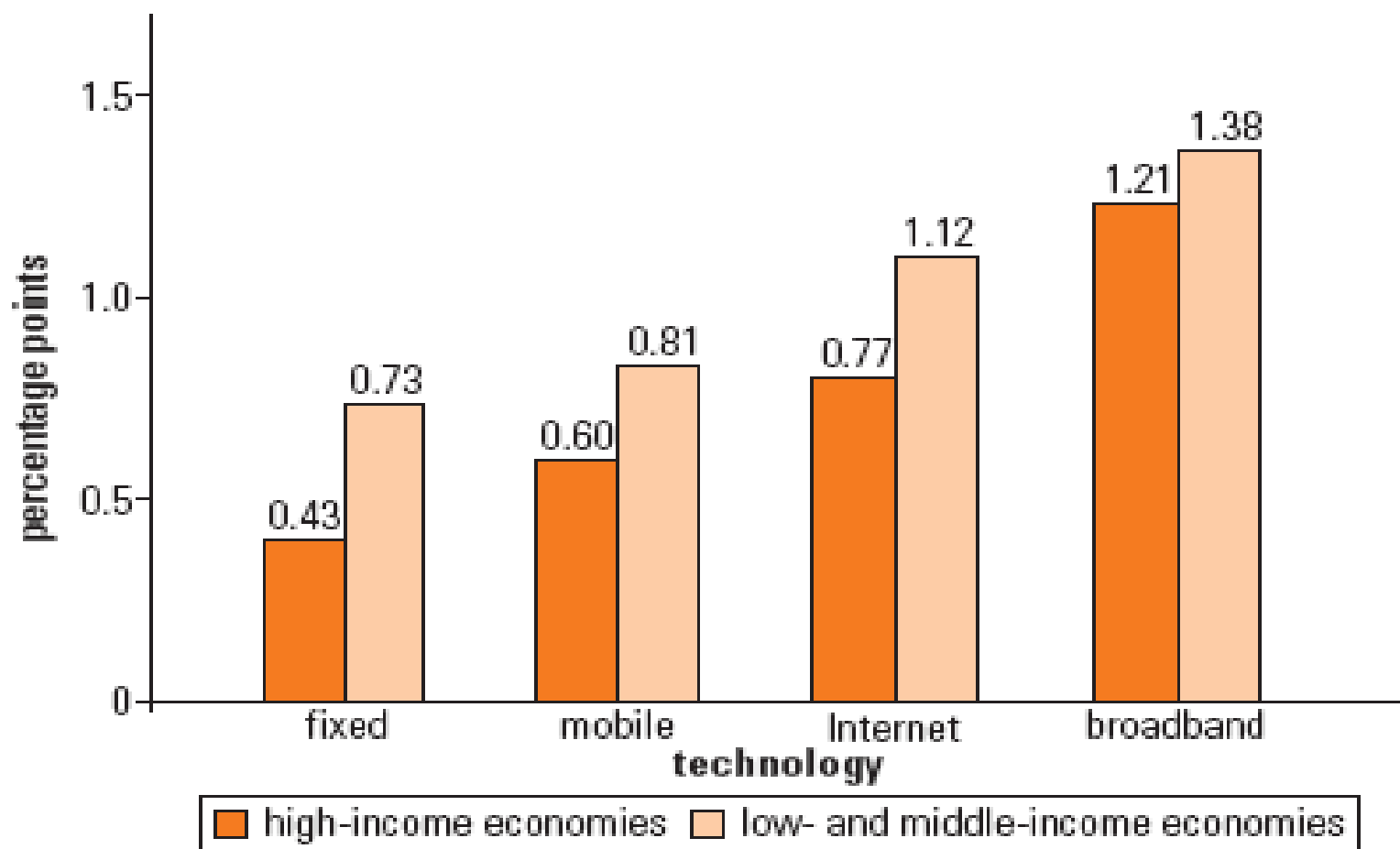


■ ICT is Driving Productivity Around the World

- An additional 10 percent of UK workers using Internet-enabled computers resulted in a 2.9 percent gain in productivity in older firms and 4.4 percent in new firms (Farooqui, 2005).
- Dutch firms that invested more in ICT not only enjoyed faster productivity growth but also produced more innovations (Van Leeuwen and van der Wiel, 2004).
- While France, Germany, the Netherlands, and the UK saw lower acceleration of productivity growth in intensive ICT-using sectors than the U.S., the sectors still experienced increased growth.
- Low levels of ICT use among German firms led to low productivity growth (e.g., Eicher and Roehn, 2007).

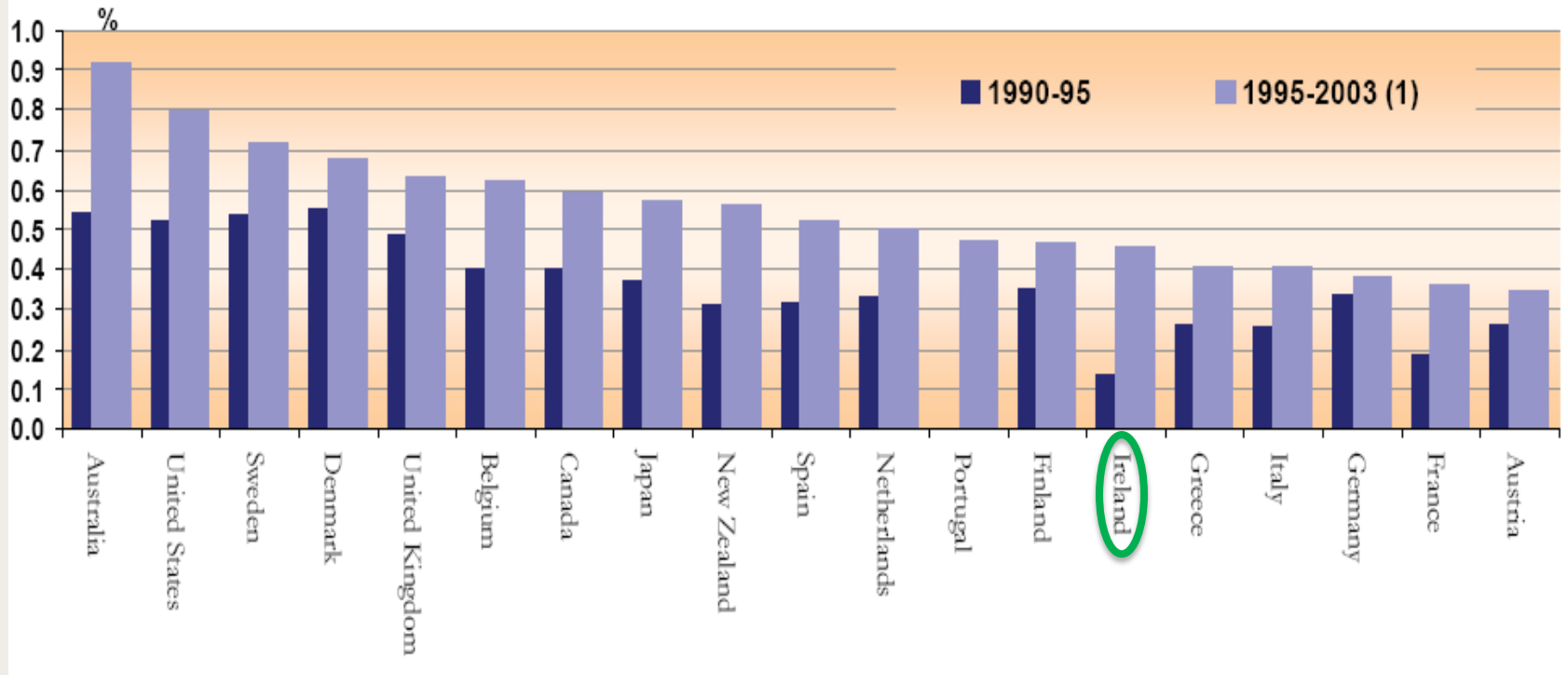
Of Telecom Infrastructures, Broadband Has the Largest Impact on Economic Growth

- Largest Impact on Economic Growth



Effect of a 10 percent increase in technology penetration on per-capita GDP growth (source Qiang, 2009).

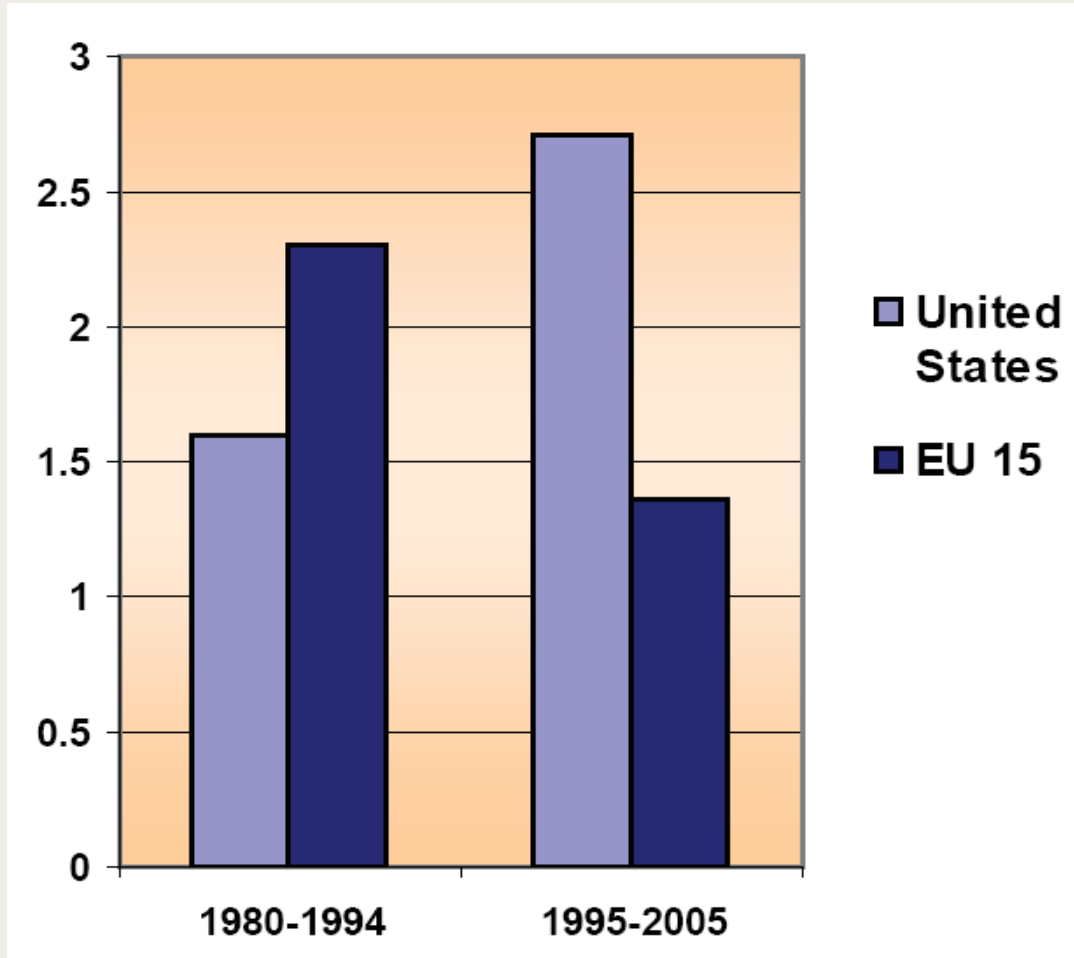
Contributions of ICT Investment to GDP Growth, 1990-95 and 1995-2003



1995-2002 for Australia, France, Japan, New Zealand and Spain. OECD Productivity Database, September 2005.

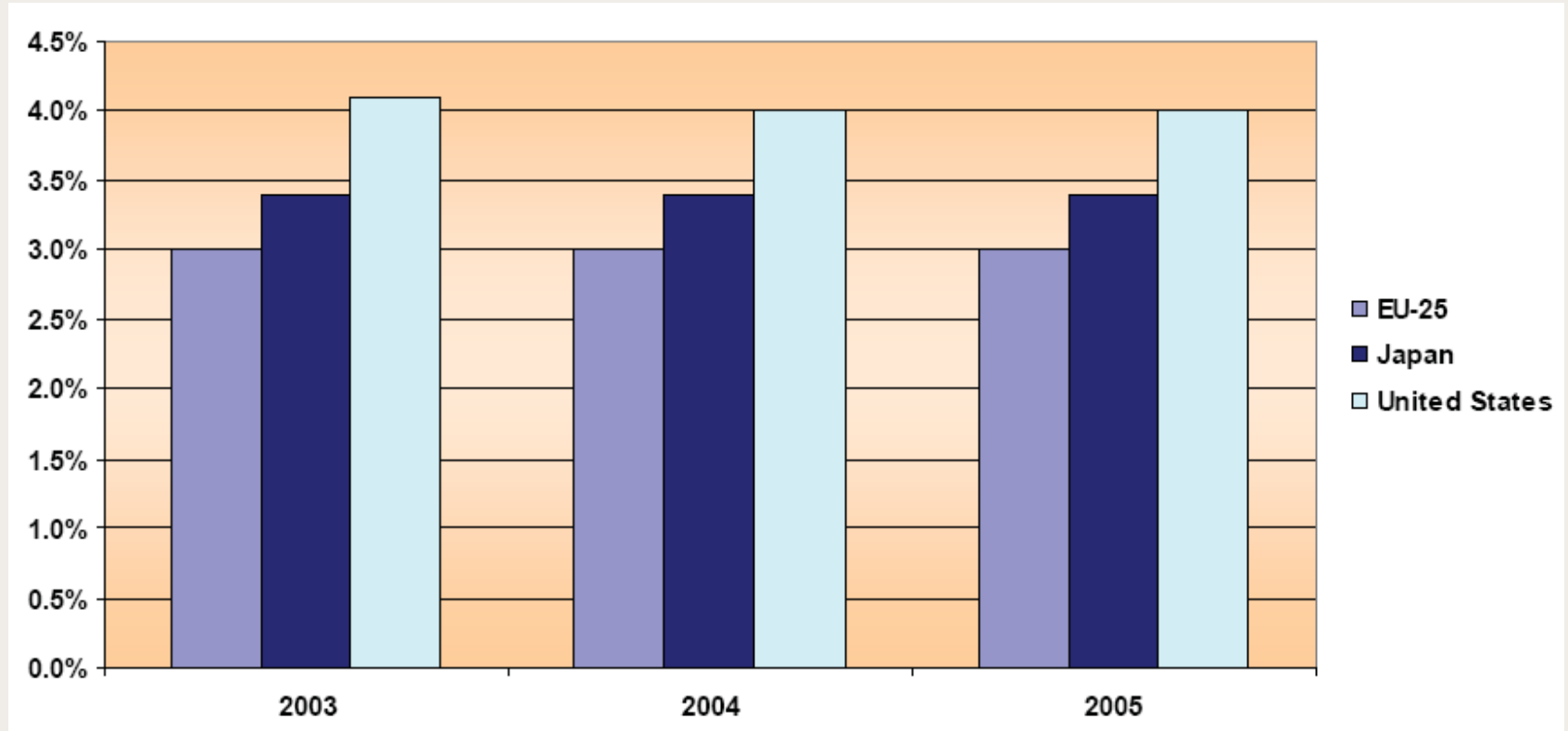
■ But Europe Lags Behind in Productivity Growth

Annual labor productivity growth rate (%)



■ Why Has Europe Benefited Less from the IT Revolution?

• EU firms invest less in IT



ICT Investments as a Percentage of GDP: Eurostat, "Information Society Statistics," (Statistical Office of the European Communities, 2007)

■ Why Has Europe Benefited Less from the IT Revolution?

- **EU firms have been slower to make the process and organizational changes that would allow them to achieve the full benefits of ICT.**
 - 97% of surveyed U.S. business executives believed IT alone would not raise productivity in their firm to the highest level achievable unless it was accompanied by organizational changes.
 - “Firms do not simply plug in computers or telecommunications equipment and achieve service quality or efficiency gains. Instead they go through a process of organizational redesign and make substantial changes to their service or output mix.” (Brynjolfsson, 2004)

■ Why Has Europe Benefited Less from the IT Revolution?

■ **Management matters:**

- U.S. multinationals in the United Kingdom use about 40% more ICT capital per worker than average and purely U.K. firms use much less ICT capital per worker than the average.
- More than 80% of the advantage in productivity for U.S. owned subsidiaries was explained by these U.S. firms' better use of ICT, not the overall amount of ICT they had.

■ Today's Presentation

1

The New Global Competitiveness Challenge

2

ICT, Innovation and Economic Competitiveness

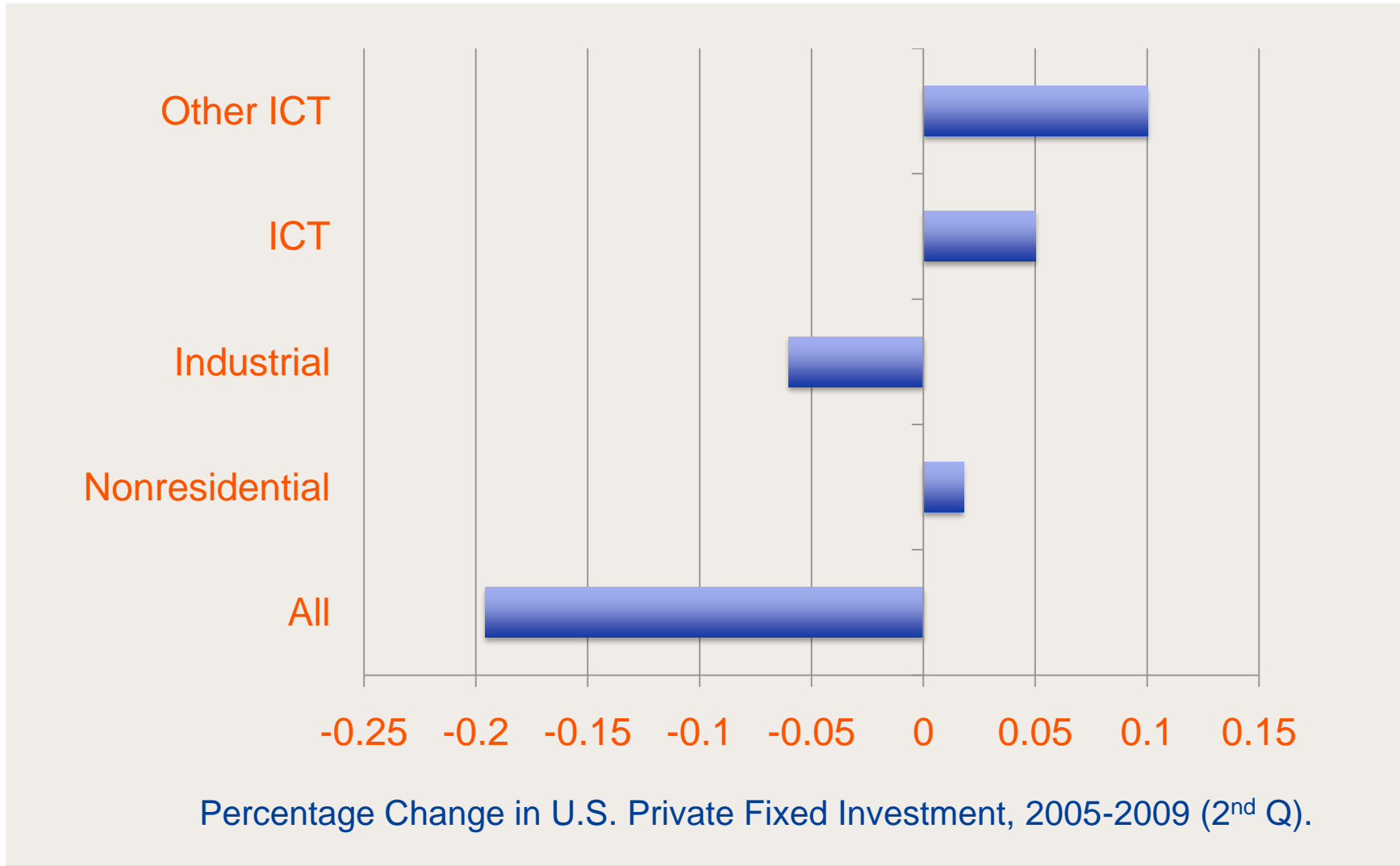
3

ICT and Recovery: Jobs

4

Implications for Policy

In the U.S. ICT is the Only Major Investment Category Growing.



Percentage Change in U.S. Private Fixed Investment, 2005-2009 (2nd Q).

ICT Infrastructure Spurs the Network Effect Multiplier

- Network effects arise from new consumer and business behaviors and downstream industries enabled by digital infrastructure.
- Digital infrastructures act as a platform that supports creation of innovative technologies and services.
- The network effect is greater in networks that are not yet fully mature.

Examples:

Broadband: Newer computers, peripherals, social networking, more e-commerce and e-government

Health ICT: WebMD, Microsoft Health Vault, web cams, telehealth

Smart Grid: Smart appliances, plug-in hybrid electric vehicles, energy storage, and residential solar power

■ U.S. Jobs Creation Estimates

- A stimulus package that spurs or supports investment of \$39.2B in America's ICT network infrastructure will create about 1 million U.S. jobs.

Estimates of U.S. Jobs Created by Investments in Network Infrastructures

ICT Infrastructure Project	Investment	Jobs Created	Small Business Jobs Created
Broadband networks	\$7.2 billion	358,000	189,000
Health ICT	\$19 billion	402,800	231,180
Smart power grid	\$13 billion	301,700	182,650
Total	\$39.2 billion	1,062,500	602,830

■ Broadband in the U.S. Stimulus Package

■ **Broadband Technology Opportunities Program (BTOP)**

■ \$4.7 billion

- \$250M for “competitive grants for innovative programs to encourage sustainable adoption of broadband service”
- \$200M for “competitive grants for expanding public computer center capacity, including at community colleges and public libraries”
- \$250M for “developing and maintaining a broadband inventory map”
- \$10M for oversight and auditing

■ **Rural Utility Service (RUS)**

- \$2.5 billion in grants, loans, or loan guarantees
- 75% of investment must serve rural area

■ International Examples of Broadband Stimulus

- **Canada: Approximately \$200 million over three years**
 - Extend broadband coverage to unserved rural communities
- **France: Approximately \$1 billion, initial public investment into 10yr, \$13 billion plan.**
 - Provide universal coverage by 2010 and “ultrafast” broadband to 4 million households by 2012
- **Japan: Approximately \$370 million over two years**
 - Extend broadband to unserved communities
- **South Korea: Approximately \$1 billion, initial public investment of \$24.6 billion plan**
 - Upgrade broadband to reach 30 million households by 2012

■ International Examples of Smart Grid Stimulus

- **China: Up to \$70 billion, undetermined timeframe**
 - Upgrade the country's grid system
- **United States: Approximately \$11 billion, advanced electrical systems**
 - Smart grid and metering projects.
- **European Union: Approximately \$5 billion**
 - Upgrades to the European electric grid system
- **South Korea: Approximately \$2.27 billion over 4 years on green ICT**
 - Overall green IT infrastructure, including smart grid

■ International Examples of Health ICT

- **United States: Approximately \$22 billion, 2010-2012**
 - For Health ICT, including electronic health records
- **Canada: Approximately \$3.75 billion**
 - \$452 million ICT for health care so that half its citizens can have an electronic health record by 2010

■ International Examples of Other ICT Stimulus

- **Japan: Approximately \$31 billion, “i-Japan 2015 strategy”**
 - Intelligent transportation systems, fiber network for health care, e-government, energy efficient ICT
- **France: Approximately \$73 million**
 - E-government investments, including “Serious Gaming”, Web 2.0 applications and other miscellaneous e-government public purchases
- **Turkey**
 - Permanently reduce telecom/broadband tax from 15 to 5 percent
 - VAT reduction on computers from 18 to 8 percent
- **Canada**
 - Allowed companies to expense in the first year all ICT investments for 2 years. (worth \$700 million Canadian)

■ Today's Presentation

1

The New Global Competitiveness Challenge

2

ICT, Innovation and Economic Competitiveness

3

ICT and Recovery: Jobs

4

Implications for Policy

■ Policy Implications: Focus on Digital Transformation

- Create a national broadband plan / digital transformation strategy.

■ Policy Implications: Focus on Digital Transformation

- Front-load public support for ICT infrastructures, including broadband, as part of economic stimulus, through both grants and tax incentives.

■ Policy Implications: Focus on Digital Transformation

- Avoid migrating legacy regulatory regimes into IP networks and applications.
 - Voip
 - Content
 - Network management
 - Data retention
 - Etc.

■ Policy Implications: Focus on Digital Transformation

- Beyond the Digital Dividend
 - White spaces
 - UHF digital conversion
 - VHF low def, single-casting

■ Policy Implications: Focus on Digital Transformation

- Digital Leadership Beyond Broadband: Spur digital transformation in:
 - Sectors (e.g., transportation, housing-real estate, government, education, and health);
 - Functions (e.g., mobile commerce; digital signatures, smart cards, 4G wireless); and
 - Individuals (e.g., broadband adoption)

Through smart government procurement, smart regulations, IT-enabled government, and support for technology.

Thank you!

ratkinson@itif.org

www.itif.org

