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

Presentation at the

International ICT Industry Summit on ICT Economic Stimulus Employment and Investment Policies

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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:

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

Today's Presentation

1. ICT, Innovation and Economic Competitiveness
2. ICT and Recovery: Jobs
3. International Experience with ICT Stimulus
4. Implications for Policy

A Test: Which Gives the Biggest Economic Return?

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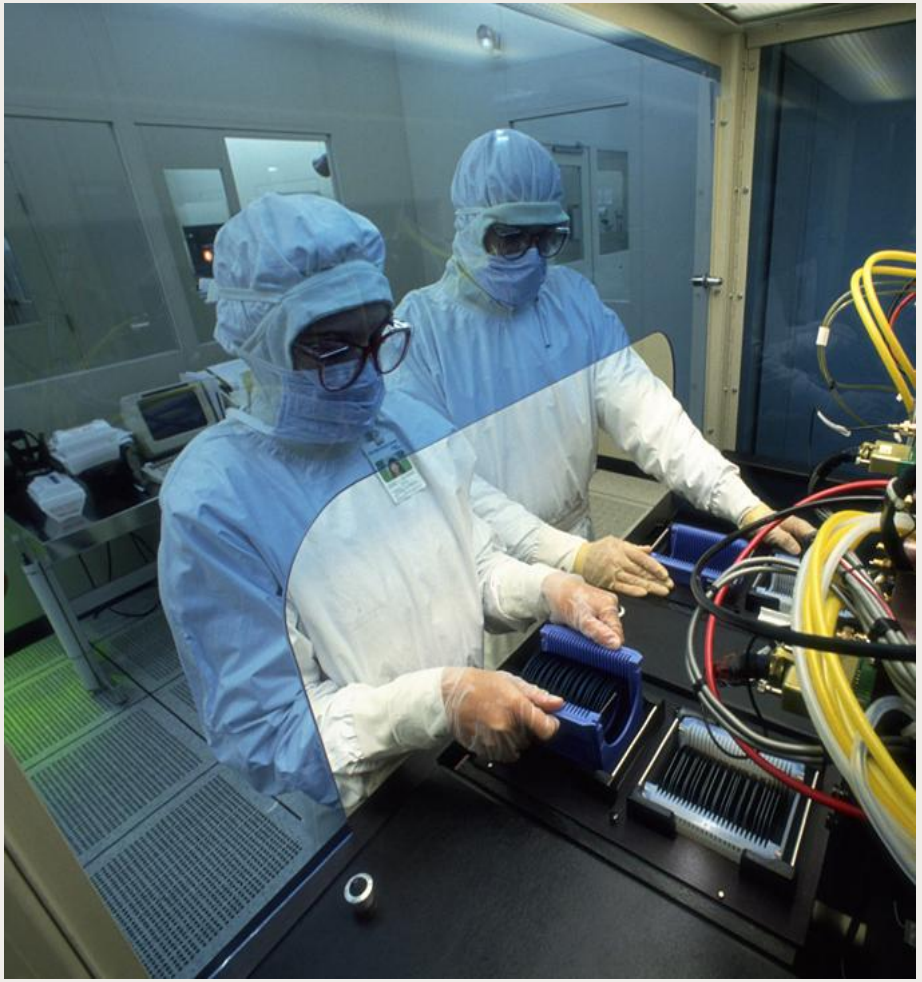
ICT Gives the Biggest Economic Return

Why is ICT So Important?

- ICT is what economists call a “general purpose technology” (GPT).
  - Most innovations come incrementally, with modest changes in products, processes and business models.
  - But approximately every half century a new technology *system* emerges that changes everything.
    - Steam power
    - Railroads
    - Steel and Electricity
    - ICT

How Does ICT Drive Growth?

- Growth in the ICT Sector:
  - **Jobs:** Between 1995-2006, ICT sector employment increased at an annual average rate of 0.9% in the OECD.
  - **Wages:** Jobs in ICT industry pay 70% higher wages than other industries.

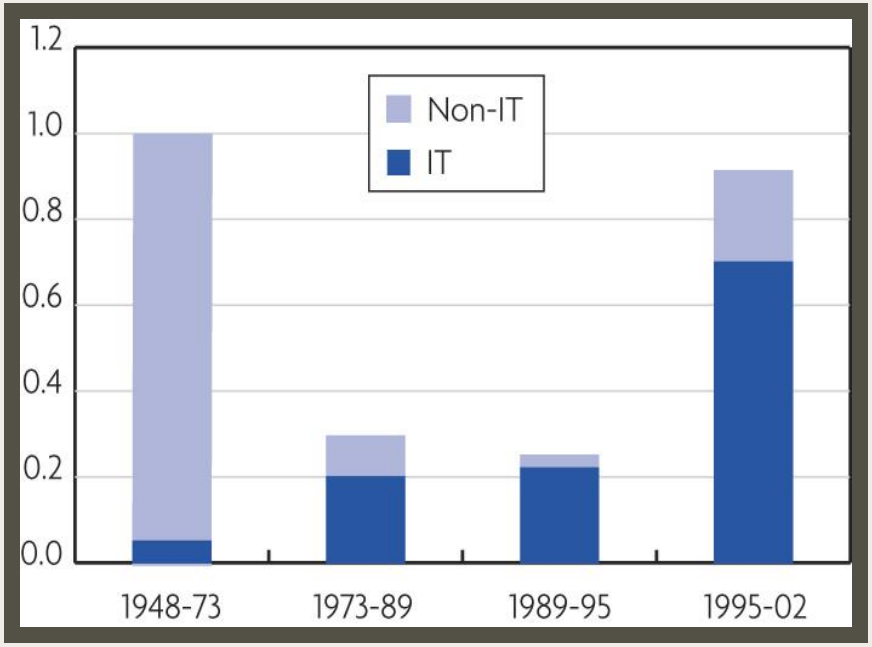


How Does ICT Drive Growth?

- ICT helps existing firms in all sectors become more productive is the most important path to growth. 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 Driving Productivity in the United States

- 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).
  - The use of ICT is playing a 30% larger impact on total factor productivity growth from 2000-2006 than it did in 1995-2000 (Brynjolfsson and Saunders, 2009).

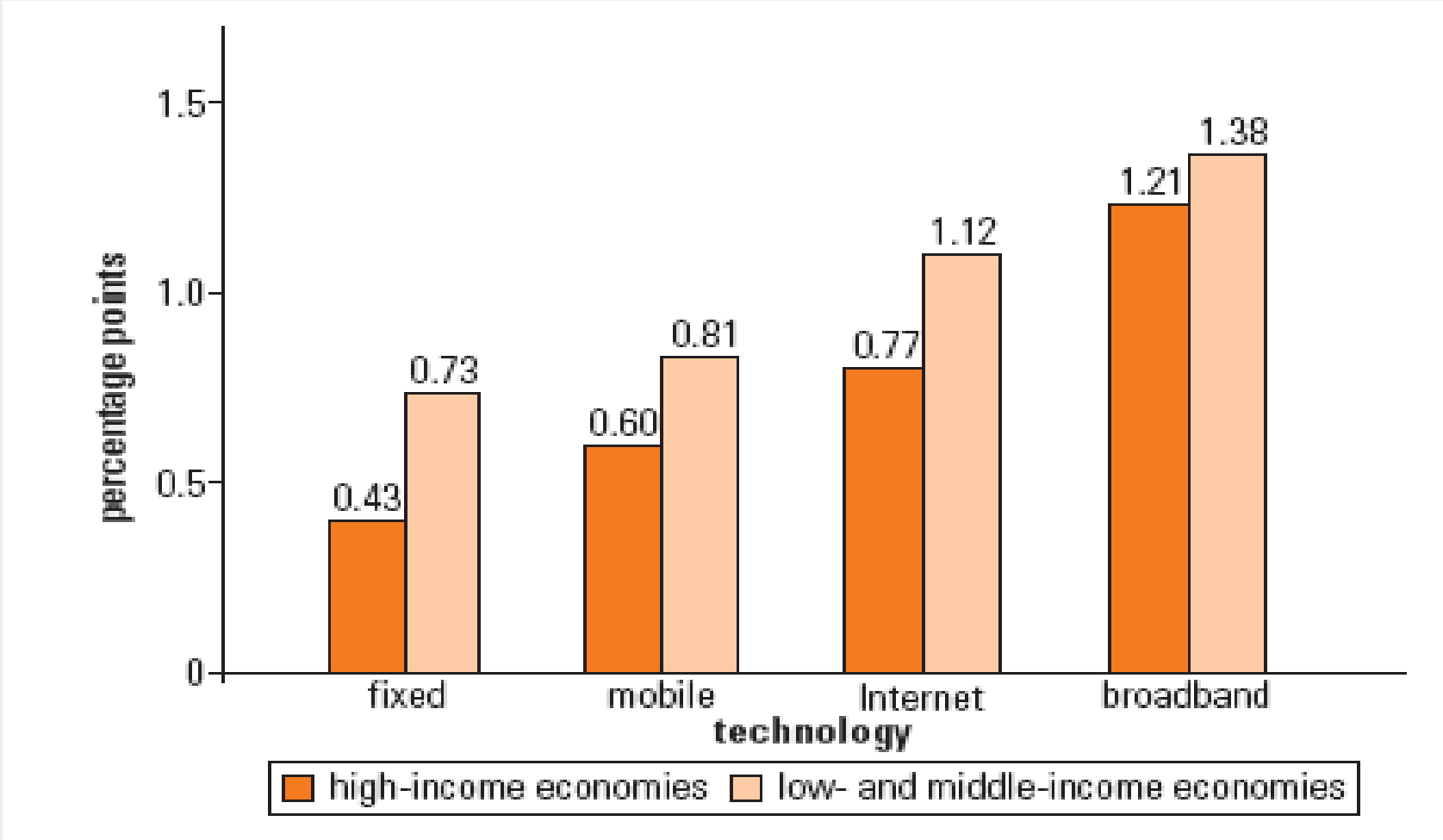


ICT is Driving Growth Around the World

- ICT capital has 7 times the impact on productivity than non-ICT capital in nations with lower levels of IT usage, and around 3 times more in other nations. (Nathan Associates, 2007)

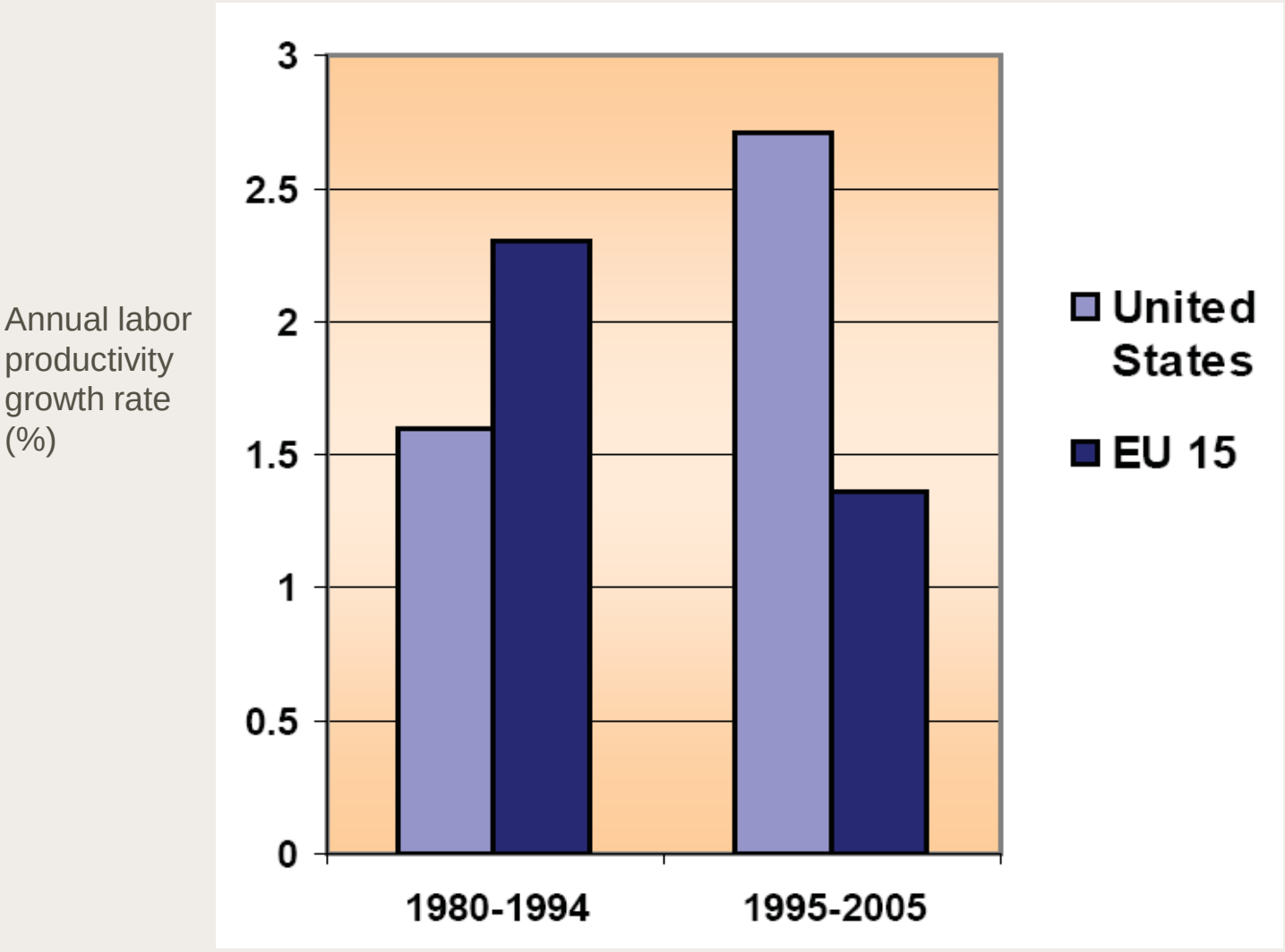
- ICT leads to job growth. Firms in low- and middle-income countries that use more ICT have faster sales and job growth, as well as higher productivity growth. (World Bank, 2005)

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



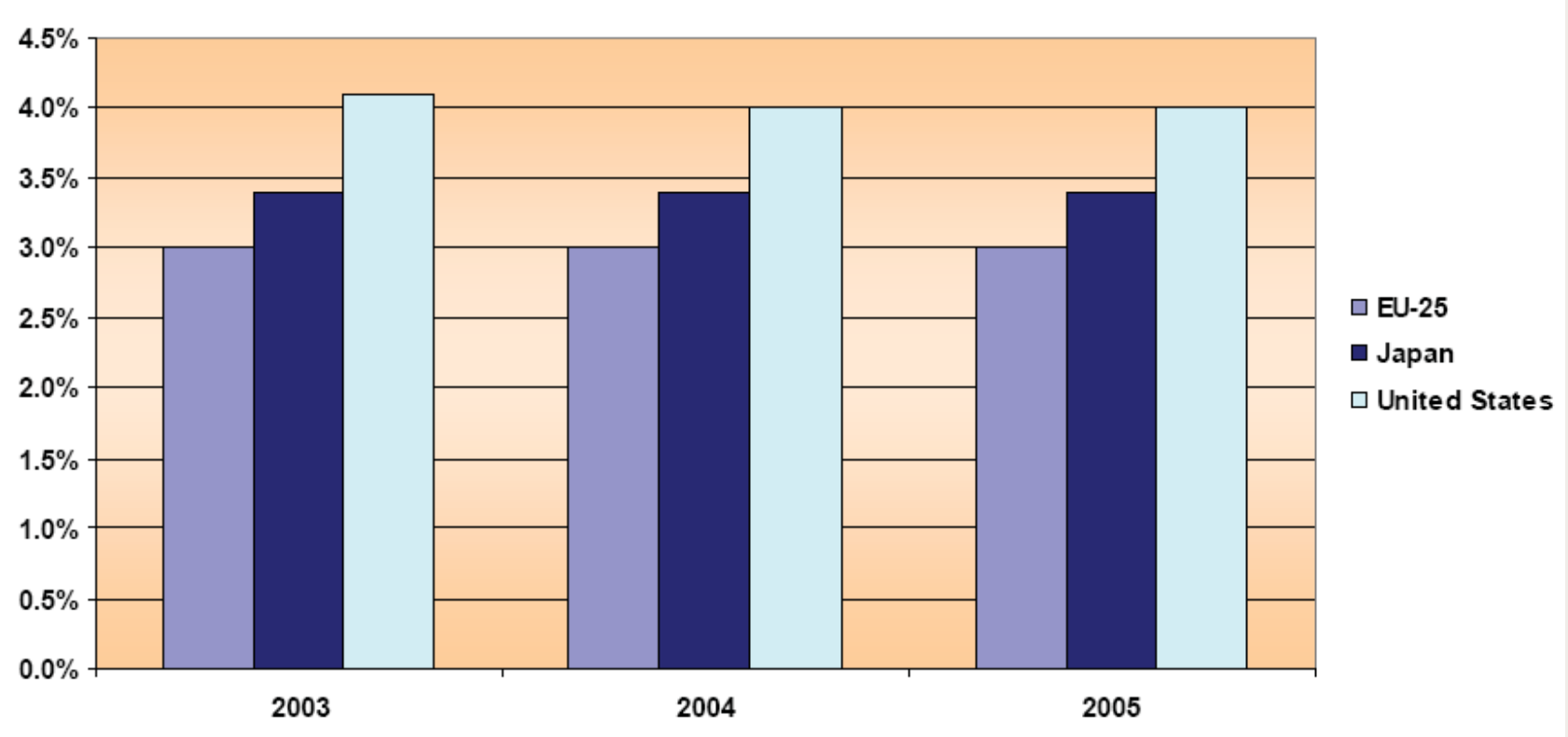
Effect of a 10 percent increase in technology penetration on per-capita GDP growth (source Qiang, 2009).

But Europe Lags Behind in Productivity Growth



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)

Where is Turkey?

- **Share of firms with websites (46 percent). Rank: 34 of 46 nations**
- **Share of firms using the Internet: 80%; EU25 = 93%.**
- **Dot.com registrations per firm. 1.4 in Turkey, 12 in the U.S.**
- **Broadband subscribers; 8.7% of population: 29th of 30 OECD nations**
- **Average advertised broadband download speed: 3.3mbs; 29th of 30 OECD nations.**
- **% of citizens purchasing over the Internet in last year. 0.8%; 31 out of 31 OECD nations.**

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 percent 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.**

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)

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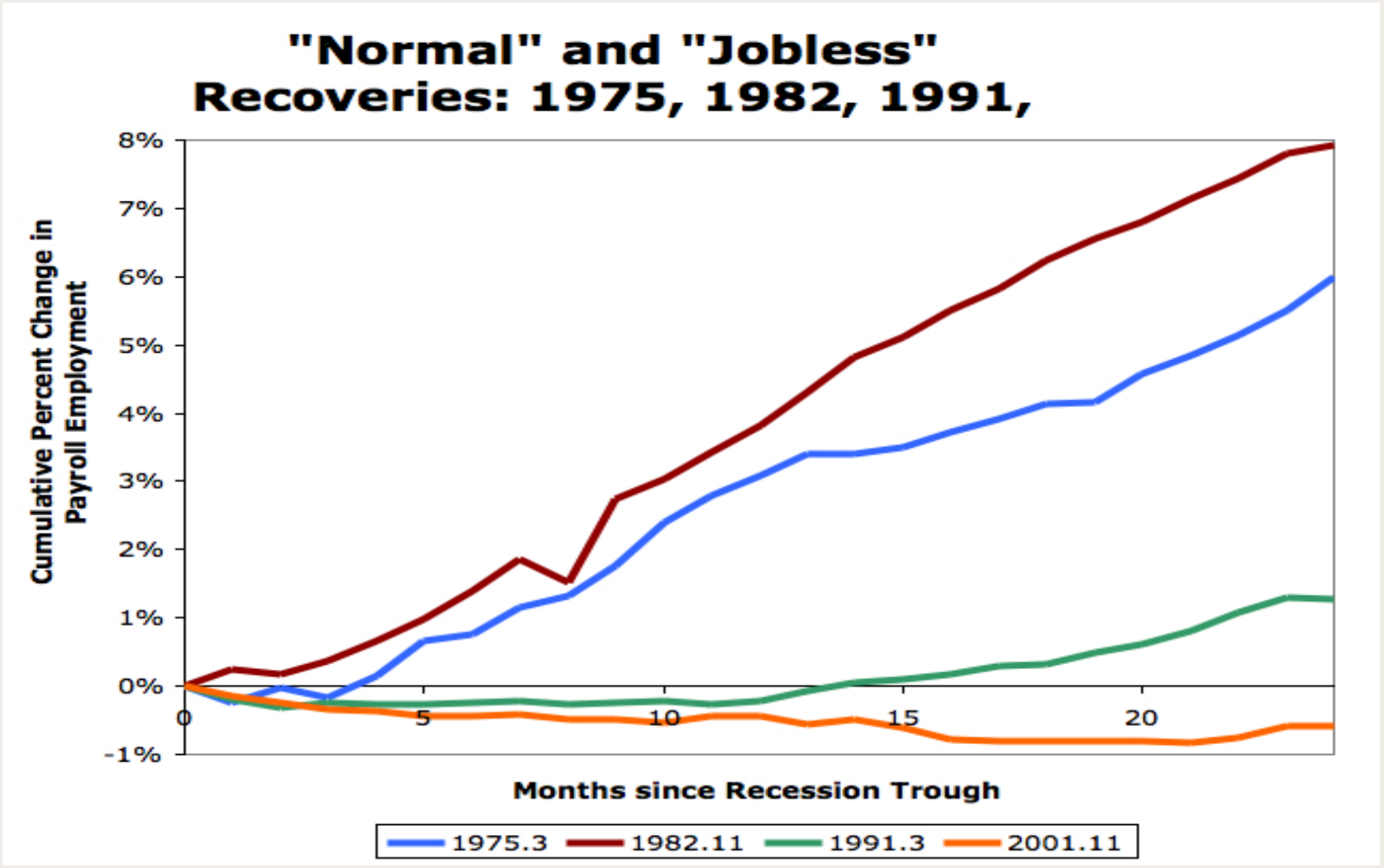
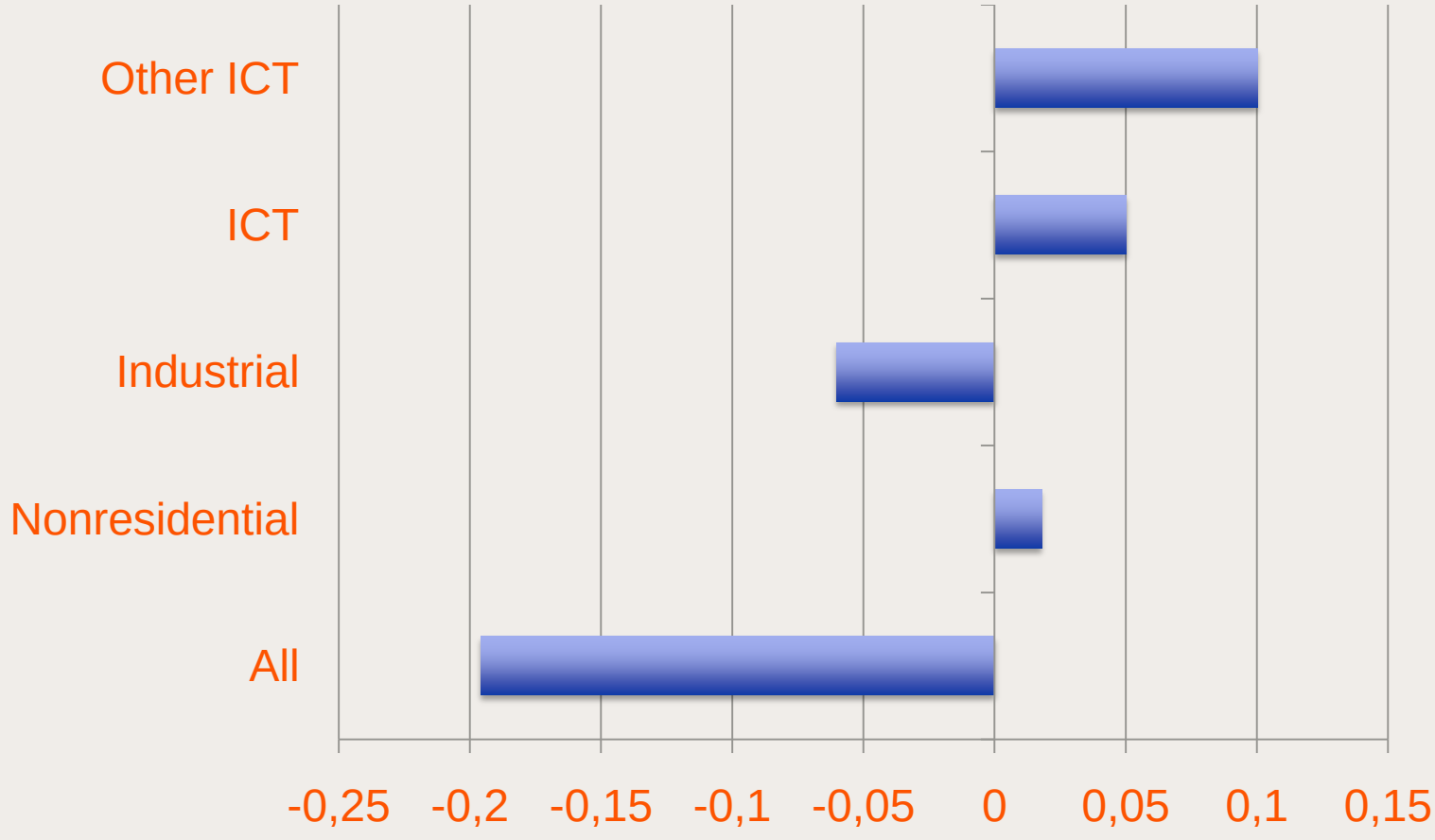
Job Creation Will be Key For the Recovery



Driving Investment Will be Key to Job Growth

- **GDP: Consumption + Investment + Government + (Exports minus Imports)**
  - For most nations, consumer expenditures and net exports are down.
  - Therefore, government expenditures and private sector investment will drive recovery. Ideally, government expenditures (direct or tax) will spur private sector investment in ICT and broadband.

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

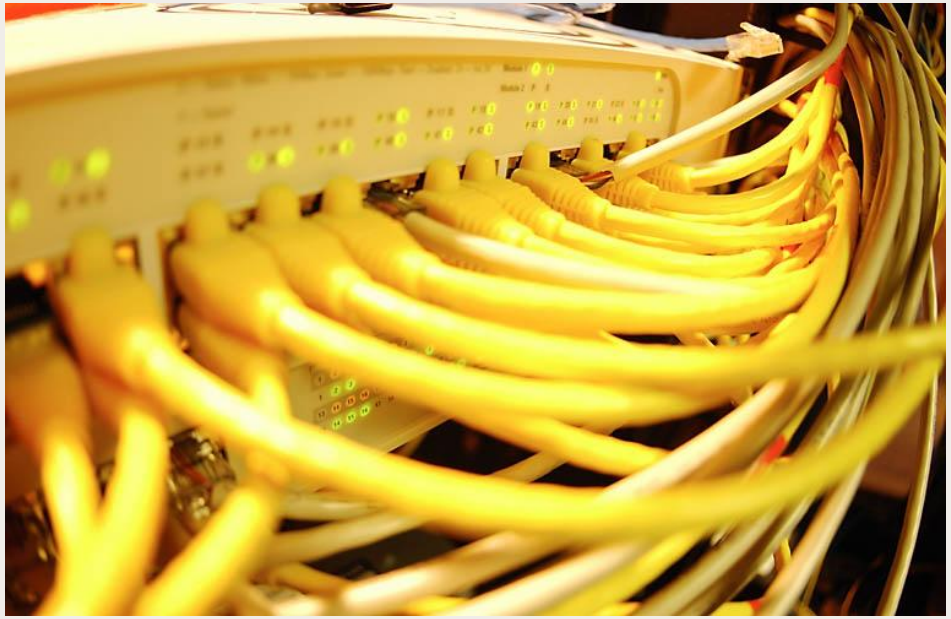


Percentage Change in U.S. Private Fixed Investment, 2005-2009 (2nd Q).

The Case for Making ICT and Broadband Investment a Key Component of Recovery Measures

- Recovery measures that spur investment, as opposed to consumption, serves double duty:
  - spurs jobs and economic activity in the short run.
  - boosts productivity and innovation in the moderate term.

- Spurring investment in ICT infrastructures:
  - generate even larger gains in jobs and productivity.



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***

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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: > $200 million over three years**
  - Extend broadband coverage to unserved rural communities
- **France: > $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: > $370 million over two years**
  - Extend broadband to unserved communities
- **South Korea: > $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: > $70 billion, undetermined timeframe**
  - Upgrade the country's grid system
- **United States: > $4 billion, advanced electrical systems**
  - Smart grid and metering projects.
- **European Union: > $5 billion**
  - Upgrades to the European electric grid system
- **South Korea: > $3.2 billion, within four years**
  - 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: $31 billion, "i-Japan 2015 strategy"**
  - Intelligent transportation systems, fiber network for health care, e-government, energy efficient ICT
- **France: $73 million**
  - E-government investments, including "Serious Gaming", Web 2.0 applications and other miscellaneous e-government public purchases
- **Canada**
  - Allowed companies to expense in the first year all ICT investments for 2 years. (worth $700 million Canadian)

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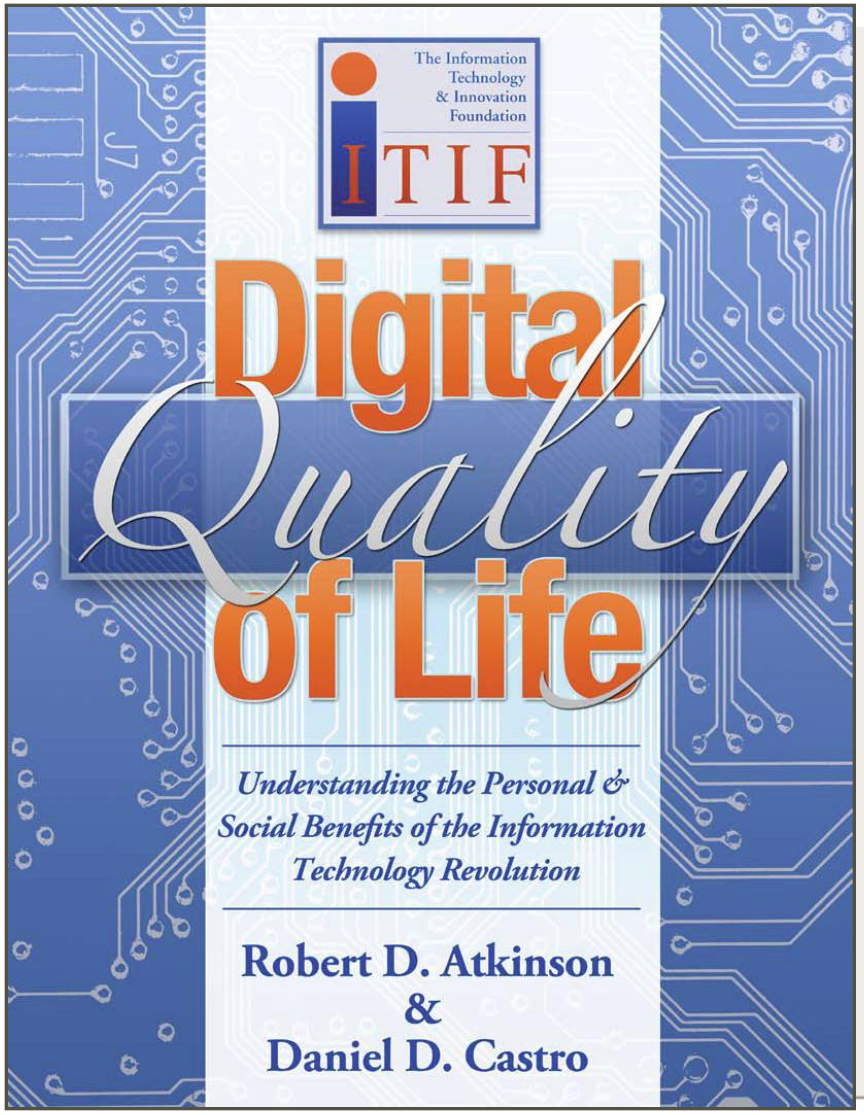
Policy Tools

- Tax policy (supply)
  - e.g. tax incentives for ICT investments like broadband, reduce taxes and tariffs on ICT investments
- Tax policy (demand)
  - e.g. reduce telecom taxes, VAT and import taxes on PCs
- Direct investment
  - e.g. invest in broadband, health ICT, smart grid, ITS, e-government, digital literacy
- Regulatory
  - e.g. allocate unused spectrum, trade spectrum for broadband investment

Policy Implications: Focus on Digital Transformation

- Create a national broadband plan / digital transformation strategy.
- Front-load public support for ICT infrastructures, including broadband, as part of economic stimulus, through both grants and tax incentives.
- Spur ICT adoption for individuals and SMEs through demand-side initiatives (e.g. PC's in schools, tax incentives for PC and broadband adoption).
- Ensure that regulations and tax policy do not hinder ICT investment.
  - Avoid regulatory restrictions (e.g. behavioral web targeting, net neutrality, etc.).
  - Protect intellectual property.
  - Reduce protections for incumbents against digital innovators.
  - Reduce tariffs and taxes on ICT products and services.
- Increase allocation of spectrum.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Digital Quality of Life
Understanding the Personal & Social Benefits of the Information Technology Revolution
Robert D. Atkinson
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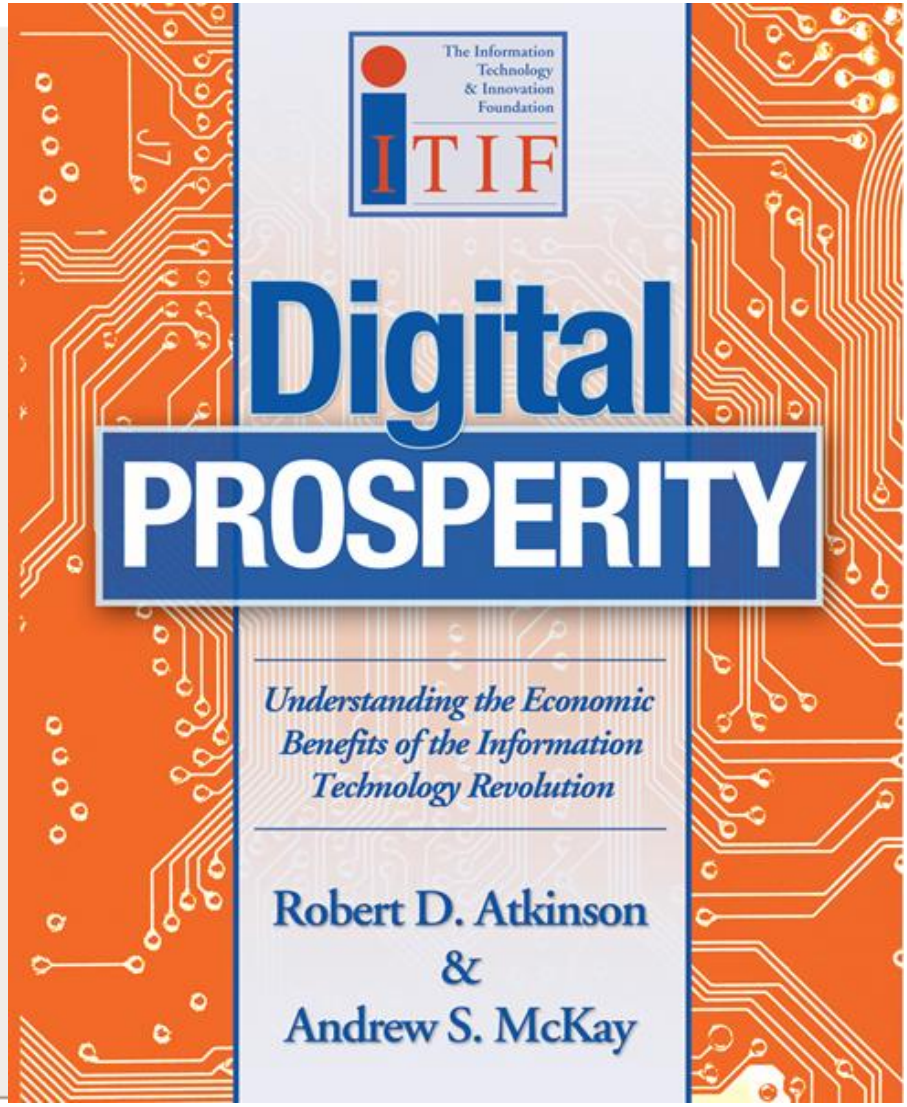
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