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

Submitted by: ITIF

Workshop on Enabling ICT Infrastructure Investment for Growth and Recovery
Cancun, Mexico
24 September 2009
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.
Today's Presentation

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

Andrew S. Mckay
Robert D. Alkison

David D. Calvo
Robert D. Alkison

ITIF
Understanding the Economic Benefits of the Information Technology Industry

Digital Prosperity

Digital Quality of Life
Stimulus measures that spur investment, as opposed to consumption, serve double duty:
- Spurs jobs and economic activity in the short run
- Boosts productivity and innovation in the moderate term

Key Component of National Stimulus Measures

How Does ICT Drive Growth: Growth in the ICT Sector

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

- ICT Infrastructures:
  - Spurring investment in ICT infrastructures.
- Larger gains in jobs:
  - ICT infrastructures:
  - Spurring investment in ICT infrastructures.

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

- ICT Infrastructures:
  - Spurring investment in ICT infrastructures.
- Larger gains in jobs:
  - ICT infrastructures:
  - Spurring investment in ICT infrastructures.

- Job growth: Between 1995–2006 ICT sector employment increased at an average annual rate of 0.9% in the OECD.
- Higher wages: Jobs in the U.S. ICT industry pay 70% higher wages than other industries.
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:
- ICT was responsible for 75% of labor productivity growth from 1995 to 2002, and 44% from 2000 to 2006 (Oliner, Sichel and Stiroh, 2007).
- 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% percent larger role on total factor productivity growth from 2000-2006 than it did from 1995-2000 (Brynjolfsson and Saunders, 2009).

Firms Be More Productive and Innovative

How Does ICT Drive Growth? Help Existing Firms Be More Productive and Innovative
ICT is driving productivity around the world.

ICT has outsized impacts:

1. ICT has 3 times more impact on productivity than non-ICT capital (Nathan Associates, 2007).
2. Businesses that use ICT have faster sales and employment growth and higher productivity compared to just 65.28% for the firms not using ICT (World Bank, 2005).
3. In developing nations, value added per worker in the ICT-using enterprises is $8.712. Compared to just $5.288 for the firms not using ICT (World Bank, 2006).
4. Of all telecom infrastructures, broadband has the largest impact on economic growth (source: Qiang, 2009).
Reduction in energy intensity

ICT could reduce expected growth in carbon emissions by 1/3 over 10 years (Lawrence Berkeley National Laboratory).

More widely adopted broadband networks could result in net reduction of 1 billion tons of greenhouse gas emissions over 10 years (Lawrence Berkeley National Laboratory).

Japan—ICT could cut carbon emissions by 40 percent by 2050.

ICT could reduce expected growth in carbon emissions by 1/3 over 10 years (Lawrence Berkeley National Laboratory).

More ICT Use Equals Less Energy Use
Policy Implications: Job creation will be key

Driving Investment Will be Key to Recovery

For most nations, consumer expenditures and net exports are down. Therefore, government stimulus can help, especially if it spur private investment.

\[
\text{GDP: Consumption} + \text{Investment} + \text{Government spending} + (\text{Exports} - \text{Imports})
\]

For most nations, consumer expenditures and net exports are down. Therefore, government stimulus can help, especially if it spurs private investment.
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.
Estimates of U.S. Jobs Created by Investments in Network Infrastructures

ICT Infrastructure
Project

<table>
<thead>
<tr>
<th></th>
<th>Small Business Jobs Created</th>
<th>Jobs Created by Investments in Network Infrastructures</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Grid</td>
<td>182.600</td>
<td>301.700</td>
<td>$1.3 Billion Grid</td>
</tr>
<tr>
<td>ICT Health</td>
<td>231.180</td>
<td>402.800</td>
<td>$1.9 Billion ICT Health</td>
</tr>
<tr>
<td>Broadband</td>
<td>1.89.000</td>
<td>358.000</td>
<td>$0.2 Billion Broadband</td>
</tr>
</tbody>
</table>

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

Examples:

- 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.
- Network effects arise from new consumer and business behaviors enabled by digital infrastructure.

The network effect is greater in networks that are not yet fully mature.

ICT Infrastructure Spurs the Network Effect
Broadband in the U.S. Stimulus Package

Implications for Policy

International Experience with ICT Stimulus

ICT and Recovery: Jobs

Competitiveness

ICT and Recovery: Productivity, Innovation and

Today's Presentation
International Examples of Broadband Stimulus

- Canada: > $200 million over three years to extend broadband coverage to unserved rural communities.

- France: > $1 billion, initial public investment into a 10-year, $13 billion plan to provide universal coverage by 2010 and "ultrafast" broadband.

- Japan: > $370 million over two years to extend broadband to unserved communities.

- South Korea: > $1 billion, initial public investment of $24.6 billion over four years to upgrade broadband to reach 30 million households by 2012.

International Examples of Smart Grid Stimulus

- European Union: > $5 billion to upgrade the European electric grid system.

- United States: > $11 billion, advanced electrical systems.

- China: > $70 billion, undetermined timeframe.

- China: > $37 billion, initial public investment of $3.2 billion within four years.

- South Korea: > $3.2 billion, within four years.

- U.S.: > $11 billion, advanced electrical systems.

- European Union: > $5 billion.

- Smart grid and metering projects.

- United States: > $11 billion, advanced electrical systems.

- China: > $70 billion, undetermined timeframe.

- United States: > $11 billion, advanced electrical systems.

- European Union: > $5 billion.

- Smart grid and metering projects.
International Examples of Other IT Stimulus

- United States: > $22 billion, 2010-2012
  - Promote digital health records and grants to digital best practices
- Canada: > $2 billion, 2010-2012
  - Allowed companies to expense in the first year all ICT purchases
  - Canada
  - VAT reduction on computers from 8% to 5 percent
  - Permanently reduce telecom/broadband tax from 15% to 5 percent
- Turkey
  - Permanently reduce telecom/broadband tax from 15% to 5 percent
  - E-government, e-government services, intelligent transportation systems, fiber network for health care
- Japan: > $31 billion, "Japan 2015 Strategy"
  - Intelligent transportation systems, fiber network for health care
  - United States: > $22 billion, 2010-2012
  - Canada: > $3.75 billion
  - France: > $7.3 billion
Tax policy (supply)
e.g. tax incentives for ICT investments like broadband, R&D tax credits

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

ICT and Recovery: Jobs
ICT and Recovery: Competitiveness
ICT and Recovery: Productivity, Innovation and Growth

Policy tools

Today’s Presentation

International Experience with ICT Stimulus
ICT and Recovery: Jobs
ICT and Recovery: Competitiveness
ICT and Recovery: Productivity, Innovation and Growth

Implications for Policy
- Make investments large enough to have an impact.
- Tax incentives.
- Front-load public support for ICT infrastructure, including broadband, as part of economic stimulus, through both grants and tax incentives.

Policy Implications: Focus on Digital Transformation
Front-load public support for ICT infrastructures, including broadband adoption, through both grants and tax incentives for PCs in schools, tax incentives for PCs and broadband adoption for individuals and SMEs through demand-side initiatives (e.g., PCs in schools, tax incentives for PCs and broadband adoption for individuals and SMEs through demand-side initiatives). Make investments large enough to have an impact.

Create a national broadband plan / digital transformation strategy, including tax incentives as part of economic stimulus, through both grants and demand-side initiatives. Make investments large enough to have an impact.

Policy Implications: Focus on Digital Transformation

- Create a national broadband plan / digital transformation strategy, including tax incentives as part of economic stimulus, through both grants and demand-side initiatives. Make investments large enough to have an impact.

Policy Implications: Focus on Digital Transformation
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.
- Make investments large enough to have an impact.
- Create a national broadband plan / digital transformation strategy.
- Spur ICT adoption for individuals and SMEs through demand-side initiatives (e.g. PCs in schools, tax incentives for PC and broadband adoption).
- Ensure that regulations and tax policy do not hinder ICT investment.
- Increase allocation of spectrum.

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.
- Make investments large enough to have an impact.
- Create a national broadband plan / digital transformation strategy.
- Spur ICT adoption for individuals and SMEs through demand-side initiatives (e.g. PCs in schools, tax incentives for PC and broadband adoption).
- Ensure that regulations and tax policy do not hinder ICT investment.