ICT as a Driver of Productivity in CEE Countries. The Role of Structural Policies

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Summary

- ICT use and production seem to have accelerated productivity growth in CEE countries both on the macro and industry-level.
- There is divergence in productivity growth patterns between manufacturing and services.
- Productivity growth in ICT producing and ICT using manufacturing in CEE countries seems to be mostly dependent on basic fundamental reforms...
- ... Whereas faster productivity growth in services seems to require deeper structural reforms.
The contribution of ICT to productivity growth in CEE was substantial on the macro...

Source: Piatkowski and Bart van Ark (2006)
Table 1. Labour productivity growth in ICT producing, using and non-ICT using industries, 1995-2003 average

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</thead>
<tbody>
<tr>
<td><strong>Total Economy</strong></td>
<td>1.2</td>
<td>2.4</td>
<td>2.2</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>ICT-Producing Industries</strong></td>
<td>7.9</td>
<td>10.8</td>
<td>4.9</td>
<td>11.0</td>
<td>8.8</td>
</tr>
<tr>
<td><strong>ICT-Producing Manufacturing</strong></td>
<td>17.6</td>
<td>24.4</td>
<td>10.5</td>
<td>16.1</td>
<td>13.5</td>
</tr>
<tr>
<td><strong>ICT-Using Services</strong></td>
<td>4.6</td>
<td>4.3</td>
<td>4.5</td>
<td>9.1</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>ICT-Using Manufacturing</strong></td>
<td>1.4</td>
<td>4.2</td>
<td>5.9</td>
<td>3.6</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>ICT-Using Industries</strong></td>
<td>1.6</td>
<td>1.9</td>
<td>5.4</td>
<td>11.1</td>
<td>12.2</td>
</tr>
<tr>
<td><strong>ICT-Producing Manufacturing</strong></td>
<td>1.3</td>
<td>4.8</td>
<td>6.1</td>
<td>1.4</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>ICT-Using Manufacturing</strong></td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>1.1</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>ICT-Using Services</strong></td>
<td>1.6</td>
<td>2.2</td>
<td>3.5</td>
<td>-1.9</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Non-ICT-Using Manufacturing</strong></td>
<td>1.7</td>
<td>2.0</td>
<td>-0.1</td>
<td>4.9</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Non-ICT-Using Services</strong></td>
<td>1.7</td>
<td>0.4</td>
<td>0.7</td>
<td>4.9</td>
<td>4.9</td>
</tr>
</tbody>
</table>

Source: Van Ark and Pratkowski (2005)
The ICT producing sector had particularly high productivity growth rates...

Figure 2. ICT-producing sector labour productivity growth, 1995-2003 average

Source: Van Ark and Piatkowski (2006)
.. But it is too small to drive convergence.

Figure 3. ICT-producing sector contribution to labour productivity growth, 1995-2003 average

Source: Van Ark and Piatkowski (2006)
... Particularly as there is no conclusive evidence for ICT-production spillover effects.

- Trajtenberg (2005) - since 1990, the ICT sector in Israel grew at a double-digit rate per year, while at the same time the rest of the economy stagnated. Productivity in some non-ICT producing sectors even declined.
ICT use seems to stimulate productivity growth in manufacturing...

Figure 4. Labour productivity growth in ICT-using and non-ICT using manufacturing industries, 1995-2003 average

Source: Van Ark and Piatkowski (2006)
... but not so much in services: productivity growth is much lower than in US services and in CEE manufacturing...

Source: Van Ark and Piatkowski (2006)
This may suggest that ICT-led growth and convergence is a “two-phase” process...

- In the first “restructuring” phase, convergence is driven by productivity growth in ICT-using manufacturing and a rise in ICT production (mainly through FDI) and seems to be dependant on basic macroeconomic and structural reforms;

- Later, however, productivity growth slows as the restructuring process in ICT-using manufacturing nears completion and simple post-transition growth reserves become exhausted (largely completed institution-building and privatization, macroeconomic stability, elimination of loss-making SOEs etc.).
Hence, in the second “expansionary” phase...

- Faster productivity growth must be dependent on productivity growth in services and non-ICT using industries...

- … which, however, requires that ICT investment, especially in services, is complemented with more sophisticated structural reforms: flexible product and labor markets, higher quality of human capital, business re-organization around ICT and better managerial skills. These are much harder to achieve (socially sensitive).
High-quality management practices seem to be essential to ensure productive use of ICT...

Table 2. Changes in firm-level productivity based on a survey by LSE and McKinsey on 100 manufacturing companies in France, Germany, UK and USA

<table>
<thead>
<tr>
<th>MANAGEMENT PRACTICE</th>
<th>IT USE</th>
</tr>
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<tbody>
<tr>
<td>HIGH (top 25%)</td>
<td>+8%</td>
</tr>
<tr>
<td>LOW (bottom 25%)</td>
<td>0</td>
</tr>
<tr>
<td>HIGH (top 25%)</td>
<td>+20%</td>
</tr>
<tr>
<td>LOW (bottom 25%)</td>
<td>+2%</td>
</tr>
</tbody>
</table>

Source: Dorgan and Dowdy (2004)

IT investment has to go hand-in-hand with management skills.
The “two-phase” convergence can be shown as the following...

Source: Piatkowski and Van Ark (2005)
So, what needs to be done?

- **Implement second-stage structural reforms**
  - Develop financial markets (VC), implement flexible labor markets, low administrative barriers, transparent and effective regulations, high level of competition, attract FDI.

- **Improve corporate governance to enhance the quality of management**

- **Develop public e-services and e-procurement (spillover and network effects);**
  - Promote ICT investment in non-ICT using sectors through public rankings of industrial productivity, peer pressure, educational programs, public grants and co-financing,
  - Establish mandatory deadlines for electronic communication between public administration and the private sector (the case of Poland’s ZUS)
  - Implement centralized public e-procurement (spillover effects).