Inclusive Growth and the Digital Economy

Submitted by: Policy Support Unit, APEC Secretariat
Inclusive Growth and the Digital Economy

Andre Wirjo
APEC Policy Support Unit

Digital Economy: Measurement, Regulation and Inclusion

6 March 2019 • Santiago
Outline

• Industry 4.0 and digital technology
• Impacts of digital technology
• Inclusion in the digital economy
Industry 4.0 and Digital Technology

- **Industry 1.0**: Mechanisation, steam power
- **Industry 2.0**: Mass production, electrification
- **Industry 3.0**: Computerisation, automation
- **Industry 4.0**: Big data, AI, decentralisation, interconnection

- Enabled by advancements in digital technology
- Changes the way we work, live, and interact
- Historically led to productivity growth and real wage growth → better living standards

**Transistor count per integrated circuit (in thousands), 1972–2017**
Industry 4.0 and Digital Technology

Maps --> GPS

Snail mail --> Email/Messaging apps

Typewriters --> Word processors

Libraries/Archives --> Search Engines

Manual transcription --> Voice-to-text apps

Manual book-keeping/inventory --> Point-of-sale systems
Impacts of Digital Technology: GDP

Real per capita GDP and digital technology use

- A higher rate of digital technology use is correlated with per capita GDP.
- Digital technology increases GDP through its impact on consumption and production, while a higher income also increases firms’ and households’ access to digital technology.

Note: Fitted curves are generated using nonparametric locally weighted scatterplot smoothing (LOWESS).
Source: World Bank, World Development Indicators and Directorate-General for Budget, Accounting and Statistics (Chinese Taipei).
Impacts of Digital Technology: Jobs

- Linkages between digital technology and employment are unclear.
- Correlations between digital use and GDP are positive and significant, while correlations for number of employed workers are insignificant.
- While these findings are preliminary, they could indicate opposing effects.

### Correlations between GDP/employment and digital technology use in APEC

<table>
<thead>
<tr>
<th></th>
<th>Real GDP (1)</th>
<th>Real GDP (2)</th>
<th>Employed workers (3)</th>
<th>Employed workers (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile cellular subs.</td>
<td>0.006**</td>
<td></td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>Fixed broadband subs.</td>
<td></td>
<td>0.005***</td>
<td></td>
<td>0.004</td>
</tr>
<tr>
<td>Lagged real GDP</td>
<td>0.936***</td>
<td>0.951***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real GDP (in 2005 USD)</td>
<td></td>
<td></td>
<td>0.261*</td>
<td>0.300**</td>
</tr>
<tr>
<td>Constant</td>
<td>1.622***</td>
<td>1.284***</td>
<td>9.458***</td>
<td>8.649**</td>
</tr>
<tr>
<td>Observations</td>
<td>526</td>
<td>268</td>
<td>454</td>
<td>273</td>
</tr>
<tr>
<td>R-squared</td>
<td></td>
<td></td>
<td>0.744</td>
<td>0.695</td>
</tr>
</tbody>
</table>

Source: World Bank, World Development Indicators; Directorate-General for Budget, Accounting and Statistics (Chinese Taipei); and APEC PSU staff calculations.
Impacts of Digital Technology: Productivity

- All these technological advancements should be leading to higher labour productivity growth, but...
Impacts of Digital Technology: The Great Decoupling

- Labour productivity growth is not translating to commensurate real wage growth

Macro-level decoupling in covered APEC economies, 1995-2013
Impacts of Digital Technology: Distribution

- Contributing to a declining trend in labour share of GDP (and rising share of capital share of GDP)

Adjusted labour share in APEC, 1995-2014 (% of GDP)
Impacts of Digital Technology: Disruption

• Outdated economic structures and indicators

• Constraints to entrepreneurship and innovation

• Structural unemployment

• Policy uncertainty
Inclusion in the Digital Economy: Reforms

• Structural reforms
  • AEPR 2019 topic

• Revise ways of doing things

• Upgrade skills and social protection
  • Access to the digital economy
Inclusion in the Digital Economy: ALMPs

Skills development:
- Education
- Technical and Vocational Training
- Apprenticeships
- Lifelong learning

Employment:
- Demand for skills and labour
- Coordination with employers and industry groups

Active labour market policies:

Labour market information systems:
- Labour force surveys
- Firm/employer surveys
- Feedback from social protection programmes

Social protection:
- Unemployment insurance
- Skills matching
- Job information portals
- Employment assistance

APEC Asia-Pacific Economic Cooperation
Inclusion in the Digital Economy: Access

Internet Users (million and percent of population), 2006 – 2016

- Industrialised APEC economies (number of users)
- Developing APEC economies (number of users)
- APEC (share of population)
- Developing APEC economies (share of population)
Inclusion in the Digital Economy: Measurement

• But first let’s operationally define inclusion
  • APEC Philippines 2015: everyone contributes, everyone benefits
  • APEC Viet Nam 2017: income growth of the bottom 40 per cent of the population at a rate higher than the average level

• Totals and averages won’t do; need to know who gets what and how much
Inclusion in the Digital Economy: Measurement

- **Macro-level: economy-level**
  - Labour share of GDP
  - Urban/rural; regional GDP reports
  - Imprecise (and potentially misleading) measures of inclusion
  - Easy to obtain, comparable, regularly reported (SNA)

- **Micro-level: HHs, firms, people**
  - Lorenz curve/Gini index: measure of income inequality
  - Concentration curve/index: measure of access and opportunity
  - Disaggregated data: gender, location, income, firm size, etc.
  - Sources: HH surveys, firms surveys, labour force surveys, big data*
  - Irregular, difficult to obtain and use, seldom comparable
Find out more
APEC Online and Social Media

apec.org

@APECnews

@APEC

@apec

APEC – Asia-Pacific Economic Cooperation