



**Asia-Pacific  
Economic Cooperation**

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**2019/SOM1/EC/WKSP2/018**

## **Inclusive Growth and the Digital Economy**

Submitted by: Policy Support Unit, APEC Secretariat



**Workshop on the Digital Economy:  
Measurement, Regulation and Inclusion  
Santiago, Chile  
6 March 2019**

# Inclusive Growth and the Digital Economy

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Digital Economy: Measurement,  
Regulation and Inclusion

6 March 2019 • Santiago

**Advancing** Free Trade  
for Asia-Pacific **Prosperity**

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# Outline

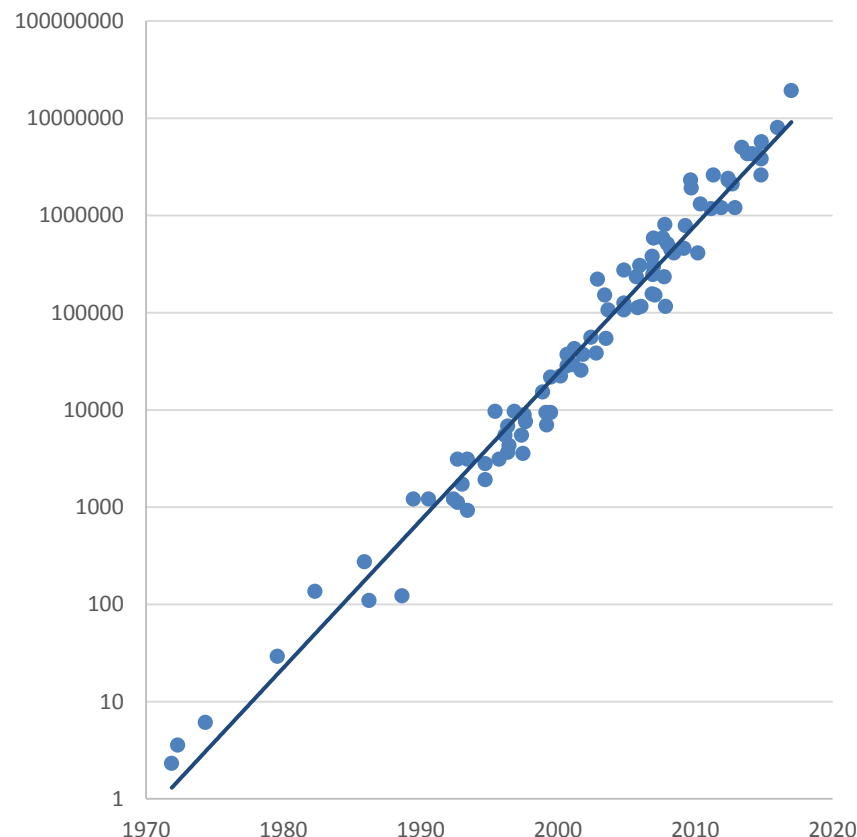
- Industry 4.0 and digital technology
- Impacts of digital technology
- Inclusion in the digital economy



# 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



Libraries/  
Archives



Search  
Engines



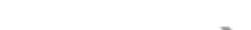
Snail  
mail



Email/  
Messaging apps



Manual  
transcription



Voice-to-  
text apps



Typewriters



Word processors



Manual book-  
keeping/inventory



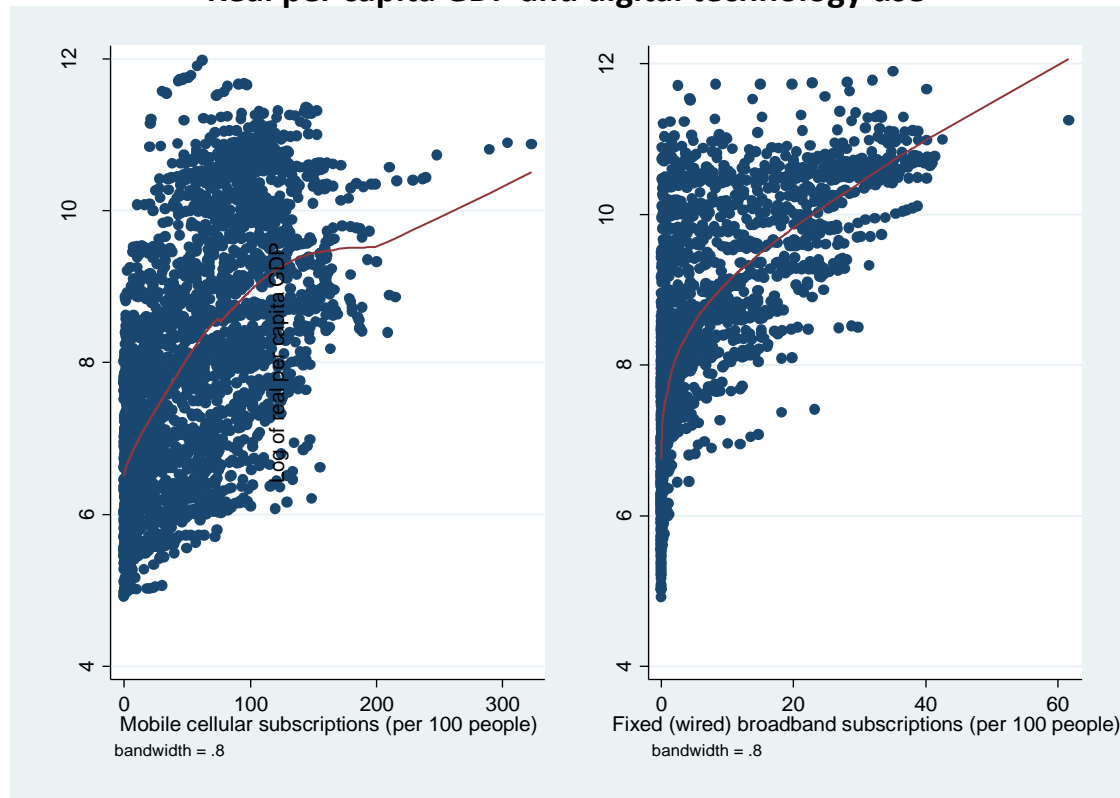
Point-of-sale  
systems



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# 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

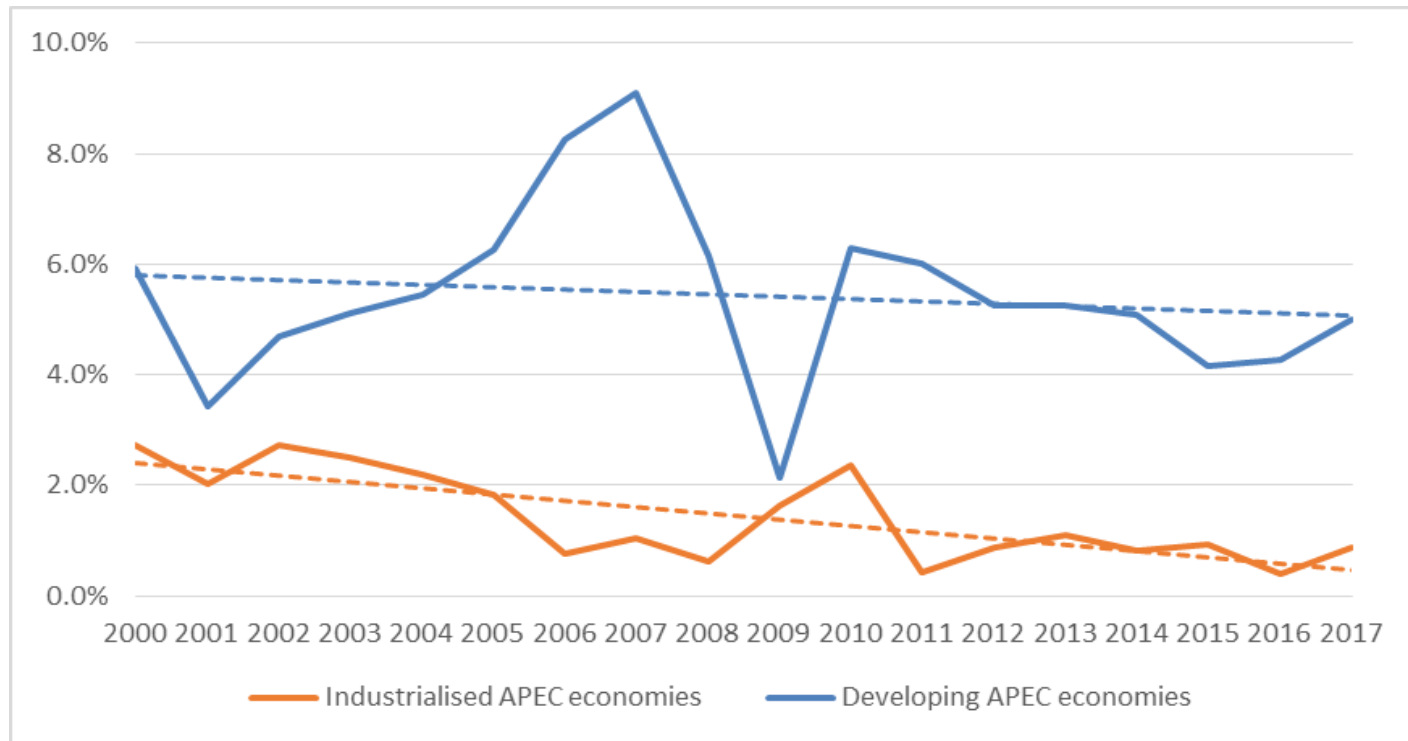
	Real GDP		Employed workers	
	(1)	(2)	(3)	(4)
Mobile cellular subscriptions	0.006**		0.018	
Fixed broadband subscriptions		0.005***		0.004
Lagged real GDP	0.936***	0.951***		
Real GDP (in 2005 USD)			0.261*	0.300**
Constant	1.622***	1.284***	9.458***	8.649**
Observations	526	268	454	273
R-squared			0.744	0.695

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...

**APEC labour productivity growth, 2000-2017**

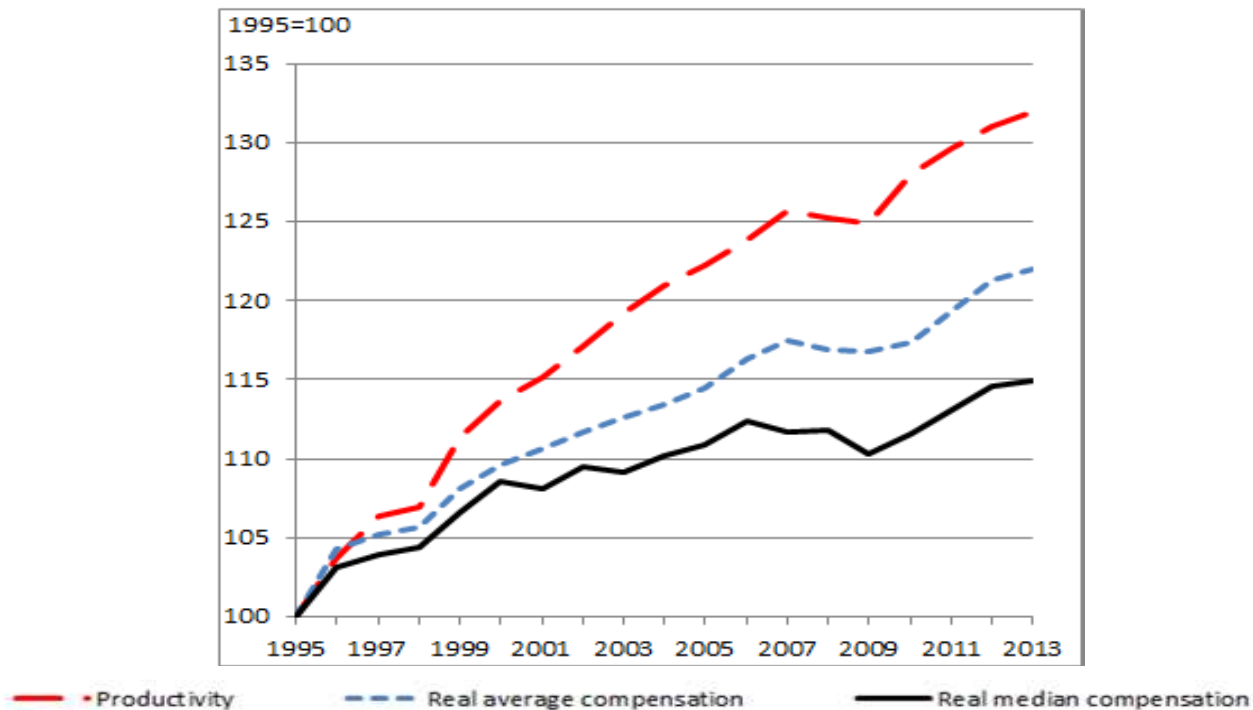




# Impacts of Digital Technology: The Great Decoupling

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

**Macro-level decoupling in covered APEC economies, 1995-2013**

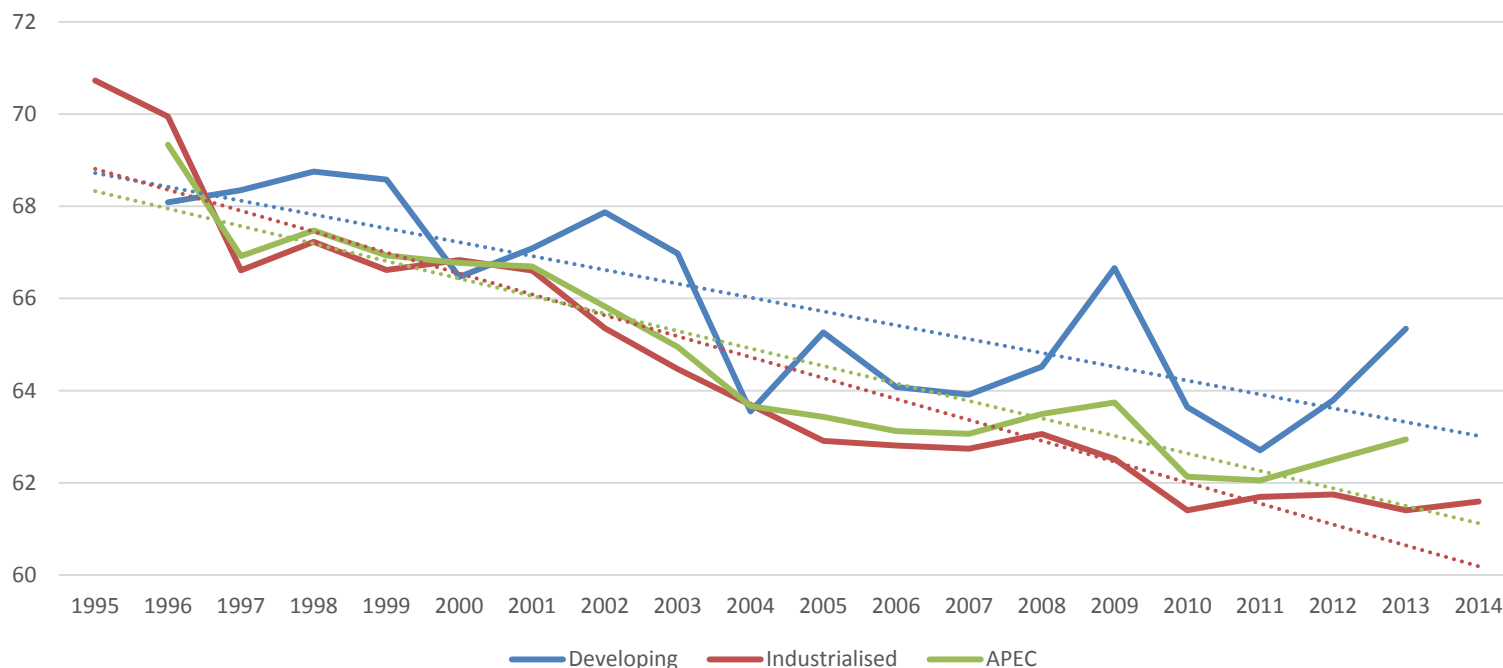


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# Impacts of Digital Technology: Distribution

- 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

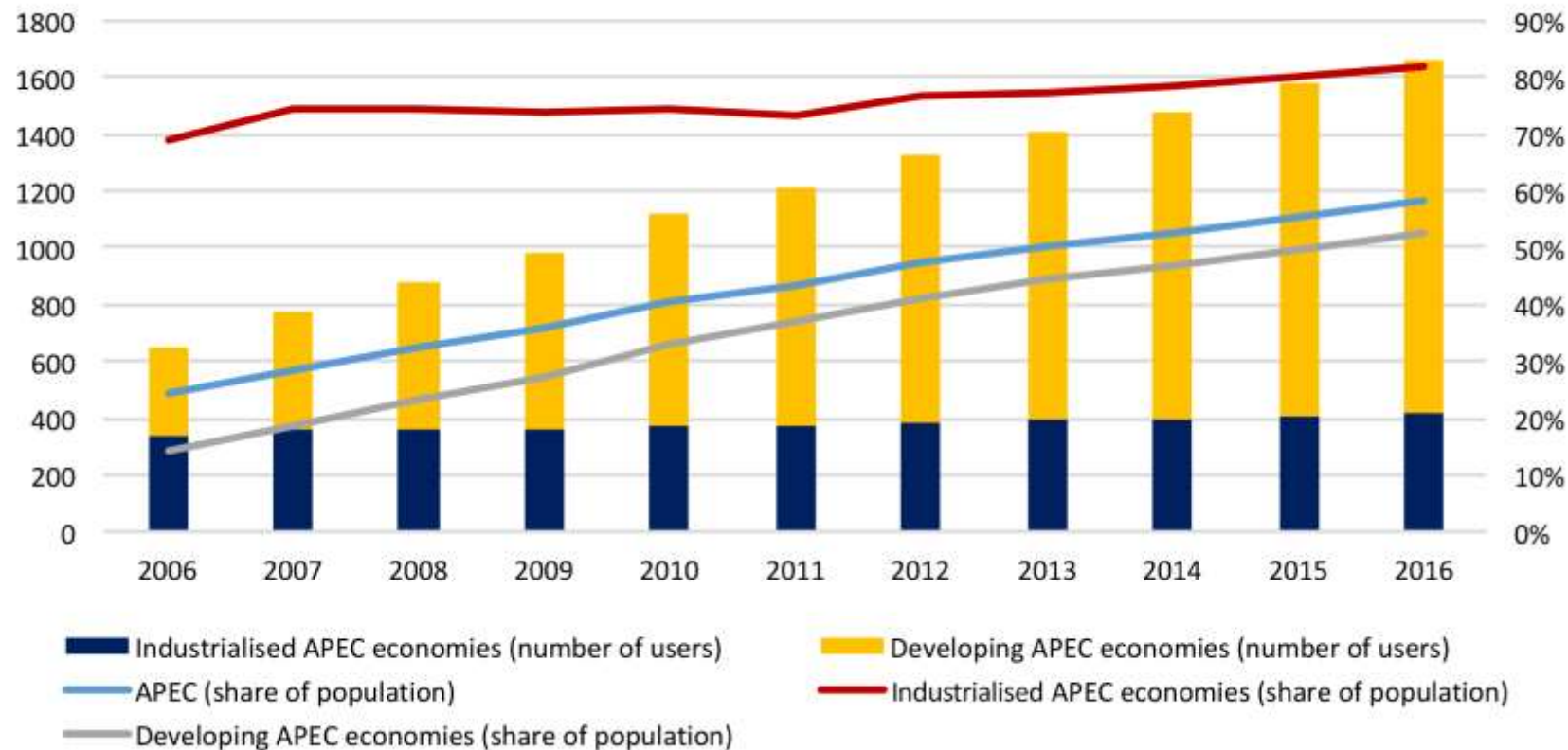
- Structural reforms
  - AEPR 2019 topic
- Revise ways of doing things
- Upgrade skills and social protection
  - Access to the digital economy

# Inclusion in the Digital Economy: ALMPs



# Inclusion in the Digital Economy: Access

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



# 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





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