Drivers of broadband connectivity in Asia-Pacific developing countries

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Outline:

- Challenge – Widening digital divide in Asia and the Pacific;
- Education/electricity and broadband connectivity;
- Policy implication
Widening digital divide

Mobile-broadband subscriptions per 100 inhabitants, by income groups, 2007-2016

Widening digital divide

Fixed-broadband subscriptions per 100 inhabitants, by income groups 2007-2016

Widening digital divide

Mobile-broadband connectivity, by ESCAP subregions (2017)

ACCESS

COVERAGE

(% of population covered by at least 3G network (weighted average))

AFFORDABILITY (Fixed-broadband monthly sub-basket as % of GNI/capita) (weighted average):

• >2% (unaffordable)  • <2% (affordable)

CAPACITY (size of bubbles) (Internet International bandwidth/user (bits/sec)(weighted average))

Note: Reference lines for x and y axis indicate weighted average of the sample

18 Asia-Pacific economies have less than \( \frac{1}{3} \) of their total population have mobile-broadband subscriptions;

18 Asia-Pacific economies have less than 2 per cent of total population have fixed-broadband subscriptions (ITU, 2017);

Lack of broadband technology divide – emerging technologies (AI, IoT, big data, block chain), need ICT connectivity to work);

Most are LDCs, LLDCs, or SIDS.
What are drivers of broadband connectivity?

- Mobile adoption and telecom policies in Pacific island countries (competition, independent regulators, privatization) (‘Ofa 2009, 2010);
- Income levels and mobile adoption in emerging markets (Kalba 2008);
- Availability and affordability (tariff and transportation costs) of mobile devices in Eastern Africa and South Asia (GSMA, 2017);
- Teachers’ computer literacy & confidence on technology in Saudi Arabia (Alshmrany & Wilkinson 2017);
- Teachers background & interest in ICT in Kenya (Tonui et al, 2016; Smeets, 2005);
- Electricity availability and mobile phone adoption in emerging markets (GSMA, 2017; Tonui et al, 2016, ESCAP, 2018)
- ICT infrastructure resilience to natural disasters in Asia-Pacific economies (ESCAP 2017)
Methodology & Data

- **Objective:** to examine any relationship between ICT and education (primary school) & electricity access;
- 30 Asia-Pacific economies who are LDCs, LLDCs, and SIDS;
- Panel dataset of 211 countries for period (2000-2016);
- Estimate using fixed-effects;
- Other control variables in the estimation – population density, governance, tariff, geography, life exp, GDP per capita
### Education/electricity and broadband connectivity in Asia-Pacific developing economies?

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable description</th>
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<tbody>
<tr>
<td><strong>Dependent variable</strong> – Broadband connectivity</td>
<td>(1). Fixed-broadband subscriptions per 100 inhabitants with ages between 15 and 64.</td>
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<tr>
<td></td>
<td>(2). Mobile-broadband subscriptions per 100 inhabitants with ages between 15 and 64.</td>
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<td><strong>Independent variable</strong> – controlling for Asia-Pacific developing countries</td>
<td>Dummy variable of Asia-Pacific developing countries <em>Primary school (number of years)</em></td>
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<tr>
<td></td>
<td>Dummy variable of Asia-Pacific developing countries <em>Electricity consumption (kWh per capita)</em></td>
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Results:

- (1). Controlling for Asia-Pacific developing economies, the duration (years) of primary education has a statistically significant positive effect on fixed-broadband subscriptions;
- (2). Electricity consumption was found to have a statistically significant positive effect on mobile-broadband subscriptions, when controlling for Asia-Pacific developing economies;
Policy implication for governments in Asia-Pacific developing economies:

- (1). Education - early childhood learning on ICT for strengthening digital literacy: strengthened ICT curriculum at early years (primary school).
- (2). Electricity – mobile-broadband connectivity requires a reliable and affordable energy source: affordable/renewable source and resilient electricity infrastructure;
Limitations

- Subscriptions vs subscribers;
- No gender information;
- No geospatial information;
- No age/income information;
- Reporting errors;

BUT...

- Reported by most countries in the world; for many years; not costly & these statistics are currently being used for monitoring the SDGs.
Thank you