ICT and Economic Growth in Sub-Saharan Africa Countries

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Introduction

- Mobile phones and the Internet (ICT) has the potential to lead “leapfrogging” development in SSA.
- Penetration- 83% mobile phone, internet 17% in SSA (ITU, 2017).
Justification

- It is imperative to ask whether the technology has a favorable impact on growth in SSA.
- Understanding its impact would help governments and other stakeholders design and implement appropriate interventions which could maximize the benefits from ICT.
Methodology

- Literature Review
- Personal experience/observations
- Source for panel data:
  - World Bank’s World Development Indicators and International Telecommunication Union statistics for 40 SSA countries over the 2006-2015 period.
Econometric model

Applied Datta and Agarwal’s (2004) approach. The model is two step System Generalised Method of Moment (GMM) specified as follows:

\[ \text{lngdppc}_{it} = a + \beta_1 \text{lngdppc}_{i,t-1} + \beta_2 \text{lngovcon}_{it} + \beta_3 \text{lnmercha}_{it} + \beta_4 \text{lngcf}_{it} + \beta_5 \text{internet}_{it} + \beta_6 \text{mob}_{it} + \beta_7 \text{inf}_{it} + \beta_8 \text{popg}_{it} + \text{yr}_{i} + v_{i} + \varepsilon_{it} \]

Software: Stata 12
## Results

**Dep. Var. GDP per capita income**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coeff.</th>
<th>St. error</th>
<th>Z</th>
<th>p&gt;Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>lngdppc L.1*</td>
<td>0.9060462</td>
<td>0.05846</td>
<td>15.5</td>
<td>0.000</td>
</tr>
<tr>
<td>internet</td>
<td>0.0033255</td>
<td>0.00298</td>
<td>1.12</td>
<td>0.264</td>
</tr>
<tr>
<td>mob***</td>
<td>0.0012131</td>
<td>0.00070</td>
<td>1.74</td>
<td>0.082</td>
</tr>
<tr>
<td>Ingovcon*</td>
<td>-0.0745640</td>
<td>0.02771</td>
<td>2.69</td>
<td>0.007</td>
</tr>
<tr>
<td>Inmercha</td>
<td>0.0346075</td>
<td>0.06165</td>
<td>0.56</td>
<td>0.575</td>
</tr>
<tr>
<td>Ingc**</td>
<td>0.0491633</td>
<td>0.02328</td>
<td>2.11</td>
<td>0.035</td>
</tr>
<tr>
<td>inf*</td>
<td>-0.0000136</td>
<td>4.1E-06</td>
<td>3.31</td>
<td>0.001</td>
</tr>
<tr>
<td>popg</td>
<td>-0.0306409</td>
<td>0.01908</td>
<td>1.61</td>
<td>0.108</td>
</tr>
</tbody>
</table>
Diagnostic tests

- Autocorrelation
  - $AB(1)=z = -1.1 \ Pr > z = 0.268$;
  - $AB(2)=z = 0.95 \ Pr > z = 0.340$;

- Instrument exogeneity and exclusion
  - Difference-in-Hansen tests:
    - $Hansen(GMM)=\chi^2(18) = 19.58 \ Pr > \chi^2 = 0.357$,
    - $Difference(GMM)=\chi^2(3) = 2.68 \ Pr > \chi^2 = 0.444$,
    - $Hansen(IV)=\chi^2(7) = 10.90 \ Pr > \chi^2 = 0.143$,
    - $Difference(IV)=\chi^2(14) = 11.36 \ Pr > \chi^2 = 0.657$;

- Joint (in)significance
  - Wald $\chi^2(18) = 3.73e+07 \ Pr > \chi^2 = 0.000$;
  - Sargan=$\chi^2(21) = 8.39 \ Pr > \chi^2 = 0.993$;
  - Hansen=$\chi^2(21) = 22.26 \ Pr > \chi^2 = 0.385$;
Findings

- A 10% increase in mobile phone subscribers raises GDP per capita income by 1.2%.
- Internet penetration is statistically insignificant.
- This could be due to the low Internet penetration rate, insufficient local content, ICT skills limitations, and relatively expensive access price.
Recommendations

To achieve critical mass of users,
- Improve affordability and reliability
- Build telecom infrastructure
- Increase local content
- Design services to meet local demand

Further research is needed
- At sub national level and different groups
- Delivery of public services
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Thank you!