POLICIES TO ADDRESS THE POST-COVID CONNECTIVITY CHALLENGE

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Columbia Institute for Tele-Information

Connectivity, Competition & Collaboration
The 3Cs of Digital Trade
What policies for post-COVID success?
Geneva, June 22, 2021
### The Challenge We Are Facing in the Context of COVID-19: The Population That Does Not Use the Internet

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internet</td>
<td>4G</td>
</tr>
<tr>
<td>Africa</td>
<td>71 %</td>
<td>55.7 %</td>
</tr>
<tr>
<td>Arab States</td>
<td>45 %</td>
<td>38.1 %</td>
</tr>
<tr>
<td>Asia and Pacific</td>
<td>55 %</td>
<td>5.8 %</td>
</tr>
<tr>
<td>Commonwealth of Independent States</td>
<td>27 %</td>
<td>19.2 %</td>
</tr>
<tr>
<td>Europe</td>
<td>17 %</td>
<td>2.8 %</td>
</tr>
<tr>
<td>North America</td>
<td>9 %</td>
<td>2.1 %</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>31 %</td>
<td>14.0 %</td>
</tr>
<tr>
<td>WORLD</td>
<td>49 %</td>
<td>15.3 %</td>
</tr>
</tbody>
</table>

THE DIGITAL DIVIDE IS EVEN MORE ACUTE IN RURAL GEOGRAPHIES

DESPITE THE INCREASE IN AFFORDABILITY, BROADBAND REMAINS BEYOND THE REACH OF A LARGE PORTION OF THE POPULATION

<table>
<thead>
<tr>
<th>Area</th>
<th>Fixed Broadband</th>
<th>Mobile Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
<td>2020</td>
</tr>
<tr>
<td>WORLD</td>
<td>7.39%</td>
<td>7.14%</td>
</tr>
<tr>
<td>Africa</td>
<td>51.61%</td>
<td>46.08%</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>3.18%</td>
<td>3.62%</td>
</tr>
<tr>
<td>Asia and Pacific</td>
<td>2.83%</td>
<td>3.12%</td>
</tr>
<tr>
<td>Arab States</td>
<td>3.20%</td>
<td>3.55%</td>
</tr>
<tr>
<td>Commonwealth of Independent States</td>
<td>0.88%</td>
<td>0.77%</td>
</tr>
<tr>
<td>Europe</td>
<td>1.32%</td>
<td>1.27%</td>
</tr>
<tr>
<td>North America</td>
<td>0.86%</td>
<td>1.00%</td>
</tr>
</tbody>
</table>

COVID-19 HAS NEGATIVELY IMPACTED TELECOMMUNICATIONS INVESTMENT IN DEVELOPING COUNTRIES

### TELECOMMUNICATIONS INVESTMENT PER CAPITA (USD)

<table>
<thead>
<tr>
<th>Region</th>
<th>2019</th>
<th>2020</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>$ 50.86</td>
<td>$50.77</td>
<td>-0.2 %</td>
</tr>
<tr>
<td>Africa</td>
<td>$ 9.81</td>
<td>$ 9.12</td>
<td>-7.0 %</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>$ 45.16</td>
<td>$41.99</td>
<td>-7.0 %</td>
</tr>
<tr>
<td>Asia and Pacific</td>
<td>$ 30.08</td>
<td>$ 29.22</td>
<td>-2.9 %</td>
</tr>
<tr>
<td>Arab States</td>
<td>$ 42.54</td>
<td>$ 41.09</td>
<td>-3.4 %</td>
</tr>
<tr>
<td>Commonwealth of Independent States</td>
<td>$ 31.93</td>
<td>$ 33.04</td>
<td>3.5 %</td>
</tr>
<tr>
<td>Europe</td>
<td>$ 99.92</td>
<td>$ 101.77</td>
<td>1.9 %</td>
</tr>
<tr>
<td>North America</td>
<td>$ 291.50</td>
<td>$ 305.28</td>
<td>4.7 %</td>
</tr>
</tbody>
</table>

*Source: ITU (2021). The Economic Impact of Broadband and Digitization through the Covid-19 pandemic - Econometric Modelling*
OUR RESEARCH ON THE IMPACT OF COVID-19 INDICATES THAT THE MITIGATION OF ECONOMIC DISRUPTION CAUSED BY THE PANDEMIC CAN ONLY BE ACHIEVED AT HIGH LEVELS OF DIGITIZATION

PERCENTAGE VARIATION IN QUARTERLY GDP PER CAPITA AFTER AN INCREASE OF 1% IN COVID DEATHS PER 100 POPULATION

By level of fixed broadband penetration

- FBB<10%: -0.024%
- 10%<FBB<30%: -0.024%
- 30%<FBB<90%: -0.021%
- FBB>90%: -0.019%

By level of mobile broadband penetration

- MBB<10%: -0.023%
- 10%<MBB<30%: -0.023%
- 30%<MBB<50%: -0.019%
- 50%<MBB<75%: -0.018%
- MBB>75%: -0.018%

It is critical to explore new business models and financing methods to address the digital divide in the context of the pandemic.

The universal service funds cannot address, on their own, the digital divide.

There is no single model to be relied upon; the solution to the problem must be tackled through a combination of business models and investment incentives.

Regulatory frameworks may need to be adjusted to stimulate investment whilst maintaining a “sensible” level of competition, shifting from a “purist” to a “pragmatic” viewpoint on State aid regulation.

A large part of potential business models existed before the pandemic – the challenge remains how to scale them.

The implementation of such models requires the partnership of multiple stakeholders which, by definition, might not share common interests, which raises the potential for the so-called “coordination failures”.
FUTURE POLICIES NEED TO BE INFORMED BY ASSESSING THE IMPACT OF REGULATION AND INSTITUTIONS ON THE PERFORMANCE OF THE ICT SECTOR

- What is the impact of government policies and regulation on the performance of the ICT sector, measured by capital investment, network deployment, service pricing, consumer demand?
- Is competition enough of an incentive to drive an improvement of sector performance?
- How long does it take for changes in regulation and policies to affect sector performance?
OUR ANALYSIS OF EXISTING RESEARCH INDICATES THAT A RANGE OF CAUSAL LINKS TAKE PLACE BETWEEN THE POLICY AND REGULATORY CONTEXT AND MARKET OUTCOMES IN THE ICT SECTOR

**Macro policies**
- Competition policy
- Tax policy

**Contextual factors**
- Geography
- Legal institutions
- Political orientation
- Executive leadership
- International institutions

**ICT sector policies**
- Competition
- Sector specific taxation
- Spectrum management

**ICT regulatory institutional framework**
- Sector specific NRA
- Regulatory autonomy/independence
- Regulatory convergence

**ICT sector outcome**
- Investment/innovation
- Service adoption
- Sustainability

**Macro-economic outcome**
- Contribution to GDP
- Growth of the digital economy
- Average household income

Models were built with data from 145 countries between 2008 and 2019 and comprise 50 initiatives of policy reforms and institutional characteristics as well as 13 indicators of ICT sector performance.
MODEL EQUATIONS IN THE CONTEXT OF THE OVERALL CAUSALITY FLOWS

MODEL EQUATIONS TO DEPICT CAUSAL LINKS

Macro-policies
- Competition policy
- Tax policy

ICT sector policies
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- Sector specific taxation
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ICT sector outcome
- Service adoption
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Macro-economic outcome
- Contribution to GDP
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Investment equation
Coverage equation
Price equation

Demand equation
FIRST FINDING: THE REGULATORY INSTITUTIONAL FRAMEWORK IS LINKED TO A POSITIVE AND SIGNIFICANT INCREASE IN TELECOMMUNICATION INVESTMENT

Macro policies
- Competition policy
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Causal link  | Effect
-----------------|--------------------------------------------------
ITU Regulatory Tracker comprised of all four scores | An increase of 10% in the Tracker score is associated with an increase of fixed and mobile investment of over 7%.
Regulatory authority (independence, accountability, and enforcement power) score | An increase of 10% in the score is associated with an increase of close to 8% in fixed and mobile investment.
Regulatory mandate (responsible for QoS, licensing, interconnection rates, spectrum, universal service, broadcasting, Internet, IT and consumer issues) score | An increase of 10% in the score is associated with an increase of close to 11% in fixed and mobile investment.
Regulatory regime (good practices in terms of licensing, interconnection, QoS, infrastructure sharing, access regulation, and number portability, among others) score | An increase of 10% in the score is associated with an increase of approximately 4% in fixed and mobile investment

SECOND FINDING: A REDUCTION IN TAXATION AND ADMINISTRATIVE BURDENS IS LINKED TO A SIGNIFICANT INCREASE OF CAPITAL INVESTMENT

THIRD FINDING: BEING AFFILIATED TO INTERNATIONAL ORGANIZATIONS THAT PROMOTE SOUND REGULATIONS IS ASSOCIATED WITH A HIGHER TELECOMMUNICATION INVESTMENT

FOURTH FINDING: MOBILE ICT SECTOR POLICIES (TECHNOLOGY NEUTRALITY, SPECTRUM SHARING, AND NUMBER PORTABILITY) HAVE A POSITIVE AND SIGNIFICANT IMPACT ON INVESTMENT

<table>
<thead>
<tr>
<th>Causal link</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convergent technology neutral licenses</td>
<td>Moving from service and network specific to convergent licensing is associated with an increase of mobile investment of 10%, network coverage by over 9%, price reduction by over 5%, and mobile penetration by approximately 2% after two years.</td>
</tr>
<tr>
<td>Spectrum sharing agreements</td>
<td>The possibility of performing voluntary spectrum sharing agreements is associated with a 18% increase in mobile investment, network coverage by over 17%, price reduction by close to 10%, and mobile penetration by over 3% after two years.</td>
</tr>
<tr>
<td>Mobile number portability</td>
<td>The introduction of mobile portability has a positive effect of increasing mobile investment by close to 11%, network coverage by 11%, price reduction by approximately 6%, and mobile penetration by 2% after two years.</td>
</tr>
</tbody>
</table>

GIVEN THE DYNAMIC NATURE OF CAUSALITY, THE POSITIVE IMPACT FROM POLICY AND INSTITUTIONAL REFORMS WILL TRANSLATE INTO FURTHER GAINS BEYOND A SINGLE TIME PERIOD

DYNAMIC ECONOMIC GAINS AFTER A POLICY REFORM IN PERIOD T

Timeline | Period t | Period t+1 | Period t+2 | Period t+3 | Period t+4
--- | --- | --- | --- | --- | ---
POLICY REFORM ($\Delta X_t$) | $\Delta CAPEX_t$ | $\Delta CAPEX_{t+1}$ | $\Delta CAPEX_{t+2}$ | $\Delta CAPEX_{t+3}$ | $\Delta CAPEX_{t+4}$

$\Delta COV_{t+2}$ $\Delta PRICES_{t+2}$ $\Delta DEMAND_{t+2}$ $\Delta GDP_{t+2}$ $\Delta COV_{t+3}$ $\Delta PRICES_{t+3}$ $\Delta DEMAND_{t+3}$ $\Delta GDP_{t+3}$ $\Delta COV_{t+4}$ $\Delta PRICES_{t+4}$ $\Delta DEMAND_{t+4}$ $\Delta GDP_{t+4}$

Regulators and policy-makers alike should assess the quality of the institutional framework guiding industry operations and examine whether some of the policies found to be critical in promoting an improvement of performance are in place.

Even if they have been adopted, it is important to examine the policies in detail to determine how much they meet some of the international best practices.
ADDITIONALLY, INNOVATIVE BUSINESS MODELS WITH POTENTIAL TO STIMULATE BROADBAND DEPLOYMENT IN RURAL AREAS NEED TO BE IMPLEMENTED

- Enable the emergence of wholesale access providers through the elimination of taxes on equipment acquisition, the reduction in regulatory approvals, and the development of sharing incentives
- Promote infrastructure sharing (backhaul networks, towers, spectrum, last mile deployment, passive and active infrastructure) to reduce deployment costs
- Infrastructure sharing among operators requires the involvement of the public sector to generate the necessary incentives
- Stimulate the development of wholesale operators specialized in key stages of the production chain in order to leverage economies of scale and scope
- Promote the development of public and private enterprises focused on rural markets, combining the investment of telecommunications operators, internet platforms and development banks
- Stimulate the demand of ICT services through the introduction of Internet platforms (e-commerce, financial inclusion, etc.) in the rural market
When it comes to funding models to promote ICT investment in rural geographies, governments should consider the experience of other infrastructures:

- Combine classical project finance with other approaches such as joint ventures of telecommunications operators and Internet platforms, or demand aggregation.
- Develop blended finance approaches to attract investors with different risk profiles (private equity, pension funds, development banks, commercial banks, etc.).
- Implement pooled finance funds, in which a public, or quasi-public funds provide financing with better interest rates to develop multiple small ventures (last mile networks per city).
- Governments should provide in-kind funding support such as tax exemptions, free deployment and installation permits, or synchronization of infrastructure deployment.
- Include the “connectivity” concept within corporate social responsibility contributions in terms similar to education, health and poverty reduction.
- Continue implementing classical models such as public-private partnerships and the participation of development banks.
For further information please contact:

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