

POLICIES TO ADDRESS THE POST-COVID CONNECTIVITY CHALLENGE

Dr. Raul L. Katz



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

NON- INTERNET USERS (2019)

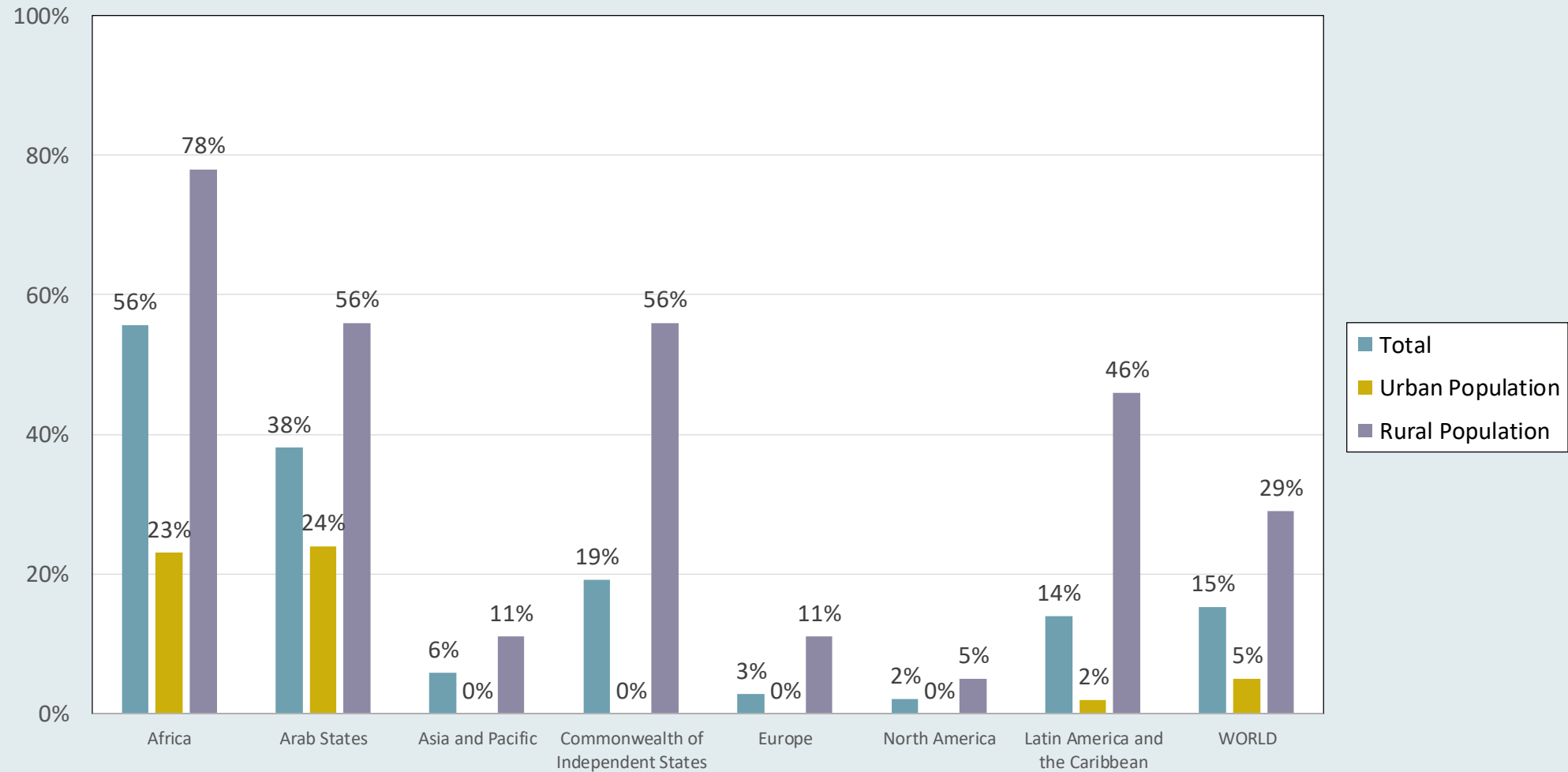
UNSERVED BROADBAND (2020)

	Internet		4G	Fixed Broadband
Africa	71 %		55.7 %	53.3 %
Arab States	45 %		38.1 %	23.9 %
Asia and Pacific	55 %		5.8 %	37.6 %
Commonwealth of Independent States	27 %		19.2 %	6.2 %
Europe	17 %		2.8 %	5.1 %
North America	9 %		2.1 %	4.1 %
Latin America and the Caribbean	31 %		14.0 %	11.0 %
WORLD	49 %		15.3 %	30.1 %

Source: ITU (2021). Telecommunications Industry in the Post-COVID-19 World Report of the VII ITU Economic Experts Roundtable

THE DIGITAL DIVIDE IS EVEN MORE ACUTE IN RURAL GEOGRAPHIES

PERCENT OF POPULATION UNSERVED BY 4G (2020)



Source: ITU (2021). *Telecommunications Industry in the Post-COVID-19 World Report of the VII ITU Economic Experts Roundtable*

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

INCREASE IN BROADBAND AFFORDABILITY (Service pricing as per cent of GNI per capita)

	Fixed Broadband			Mobile Broadband		
	2019	2020	Delta	2019	2020	Delta
WORLD	7.39 %	7.14 %	-3.3 %	1.60 %	1.51 %	-5.1 %
Africa	51.61 %	46.08 %	-10.7 %	7.03 %	5.68 %	-19.2 %
Latin America and the Caribbean	3.18 %	3.62 %	13.9 %	1.97 %	1.78 %	-10.0 %
Asia and Pacific	2.83 %	3.12 %	10.3 %	0.95 %	1.08 %	13.0 %
Arab States	3.20 %	3.55 %	10.9 %	1.27 %	1.05 %	-17.0 %
Commonwealth of Independent States	0.88 %	0.77 %	-12.5 %	0.99 %	0.86%	-12.6 %
Europe	1.32 %	1.27 %	-3.7 %	0.60 %	0.61 %	1.6 %
North America	0.86 %	1.00 %	16.3 %	0.44 %	0.43 %	-4.5 %

Source: Katz, R. and Jung, J. (2021). *The Economic Impact of Broadband and Digitization through the Covid-19 pandemic - Econometric Modelling*. ITU

COVID-19 HAS NEGATIVELY IMPACTED TELECOMMUNICATIONS INVESTMENT IN DEVELOPING COUNTRIES

TELECOMMUNICATIONS INVESTMENT PER CAPITA (USD)

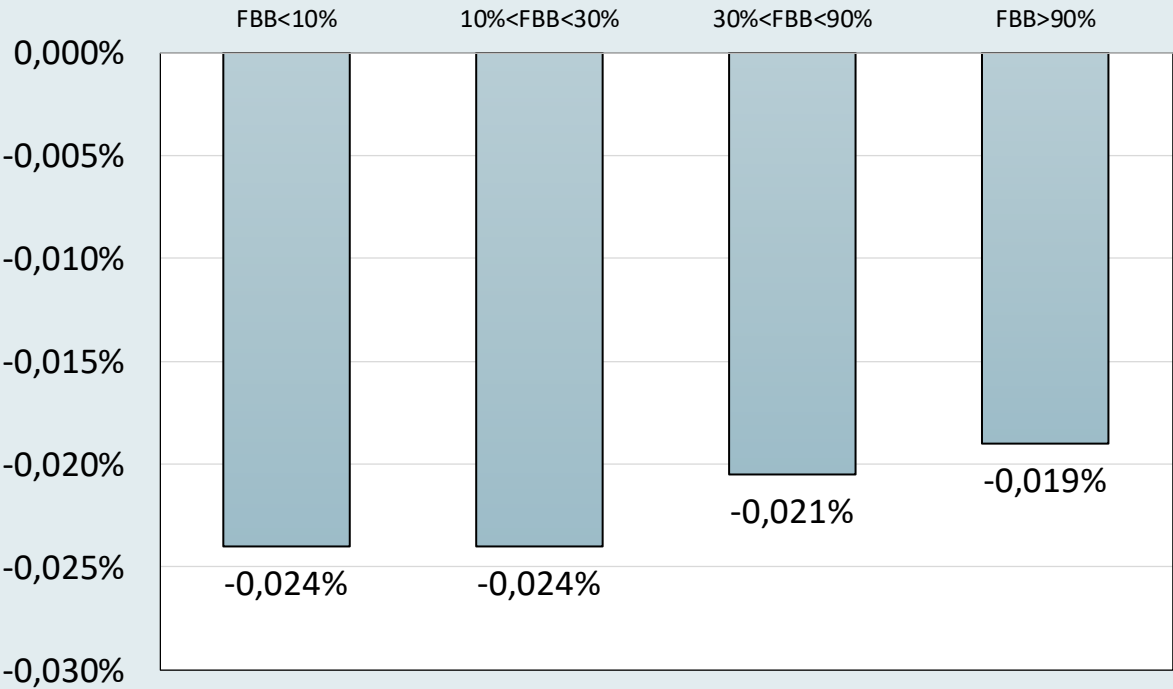
	2019	2020	Delta
WORLD	\$ 50.86	\$50.77	-0.2 %
Africa	\$ 9.81	\$ 9.12	-7.0 %
Latin America and the Caribbean	\$ 45.16	\$41.99	-7.0 %
Asia and Pacific	\$ 30.08	\$ 29.22	-2.9 %
Arab States	\$ 42.54	\$ 41.09	-3.4 %
Commonwealth of Independent States	\$ 31.93	\$ 33.04	3.5 %
Europe	\$ 99.92	\$ 101.77	1.9 %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

Source: ITU (2021). The Economic Impact of Broadband and Digitization through the Covid-19 pandemic - Econometric Modelling

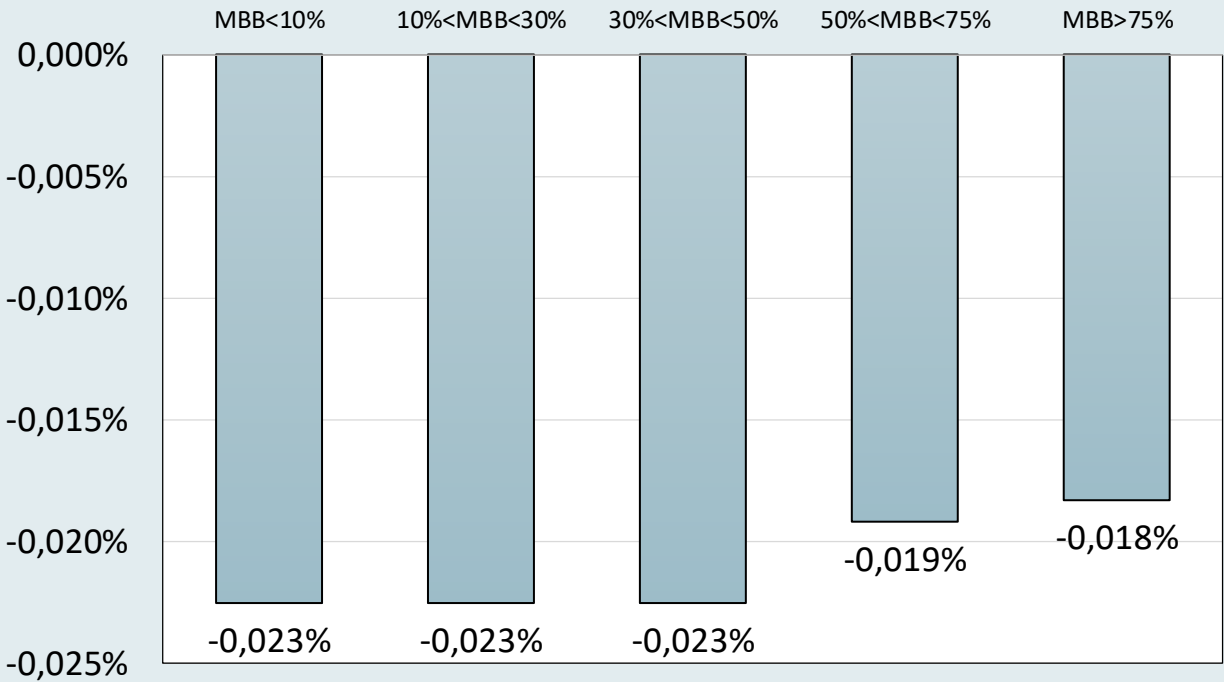
OUR RESEARCH ON THE IMPACT OF COVID-19 INDICATES THAT THE MITIGATION OF ECONOMIC
DISRUPTION CAUSED BY THE PANDEMIC CAN ONLY BE ACHIEVED AT HIGH LEVELS OF DIGITIZATION

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

By level of fixed broadband penetration



By level of mobile broadband penetration



Source: Katz, R. and Jung, J. (2021). *The Economic Impact of Broadband and Digitization through the Covid-19 pandemic - Econometric Modelling*

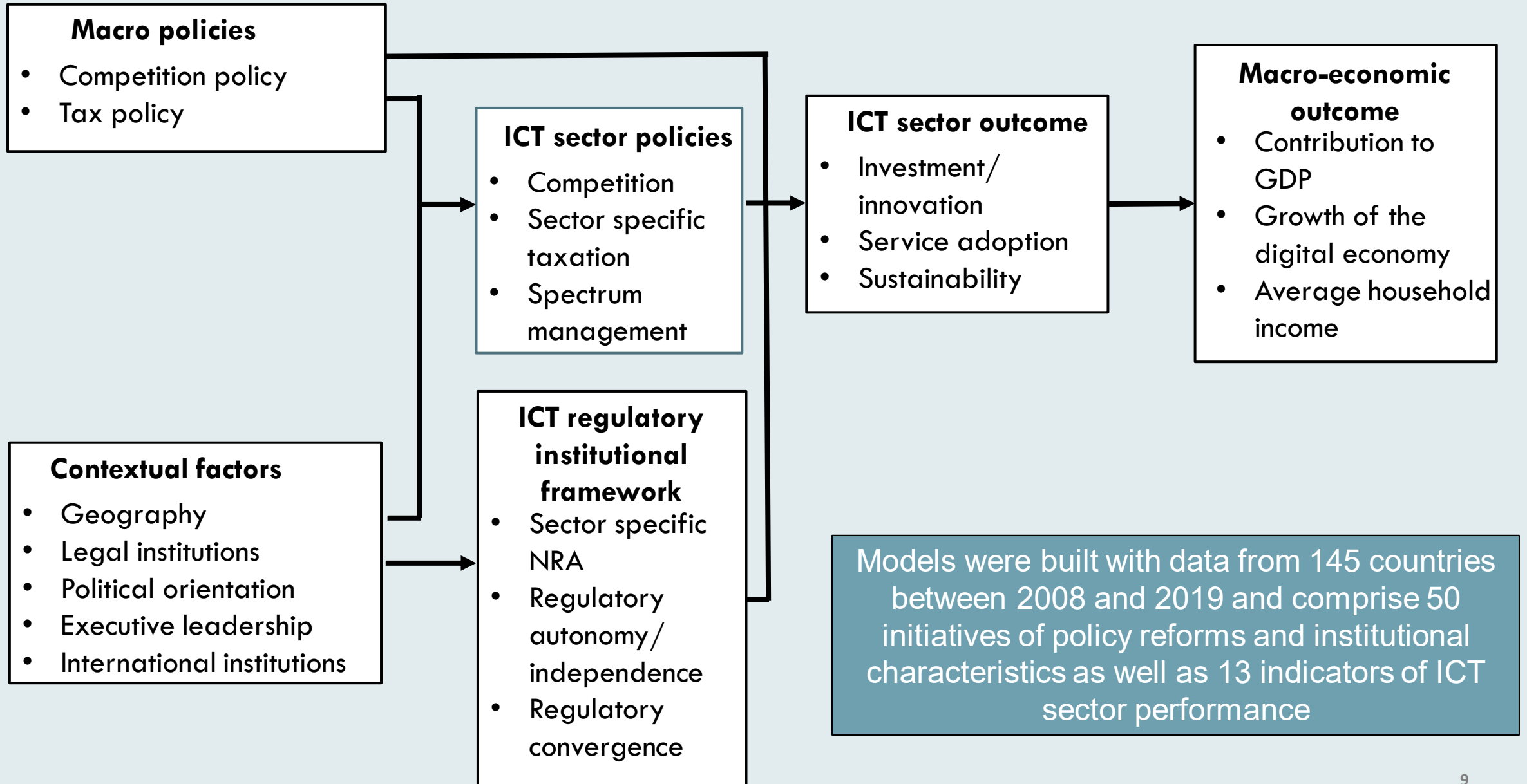
IF THERE IS ONE IMPORTANT REALIZATION FROM COVID-19 IT MUST BE WE CANNOT GO BACK TO THE WAYS THINGS WERE DONE BEFORE

- 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

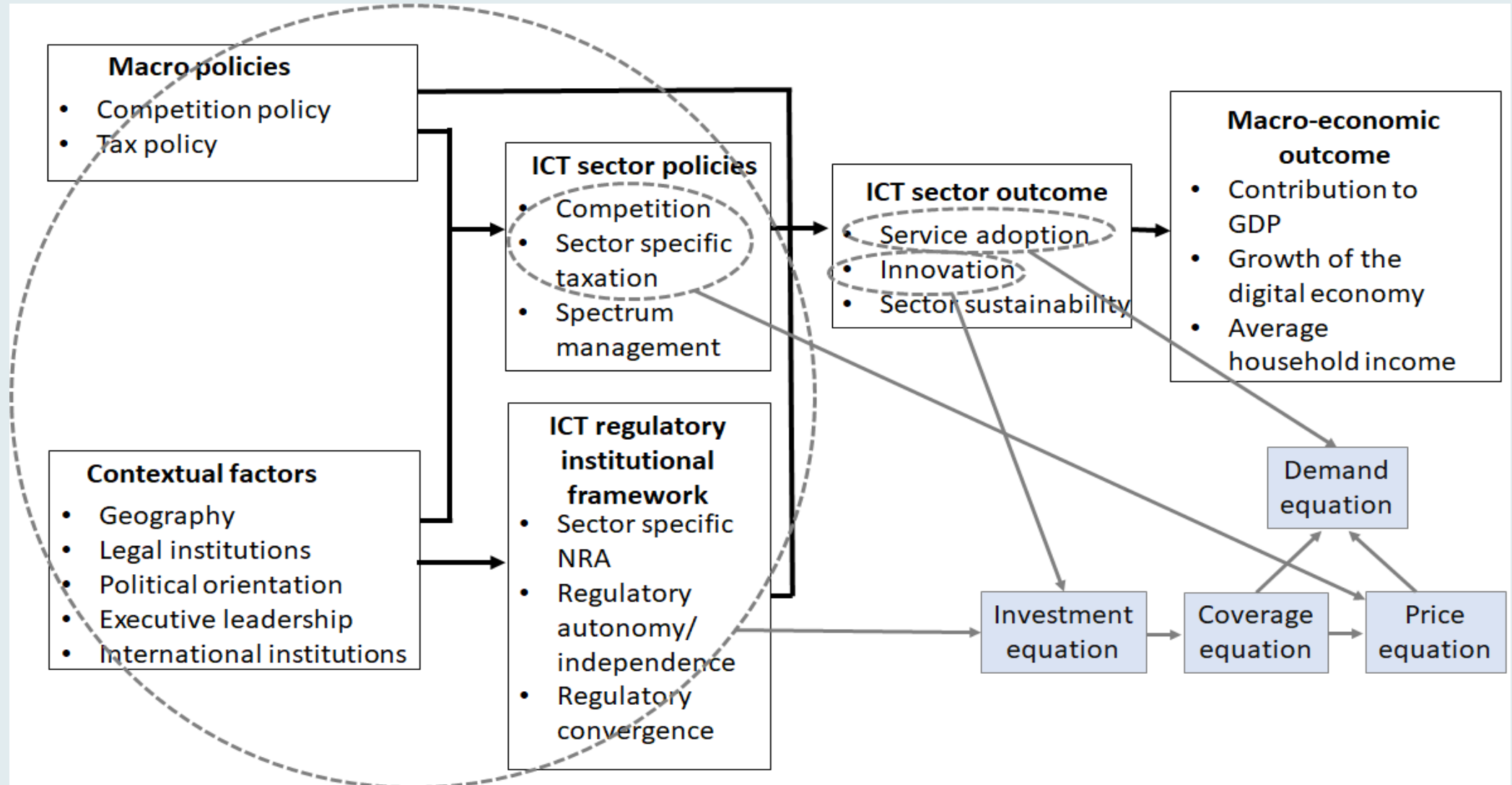
- What is the impact of government policies and regulation on the performance of the ICT sector, measured by capital investment, network deployment, service pricing, consumer demand?
- Is competition enough of an incentive to drive an improvement of sector performance?
- How long does it take for changes 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

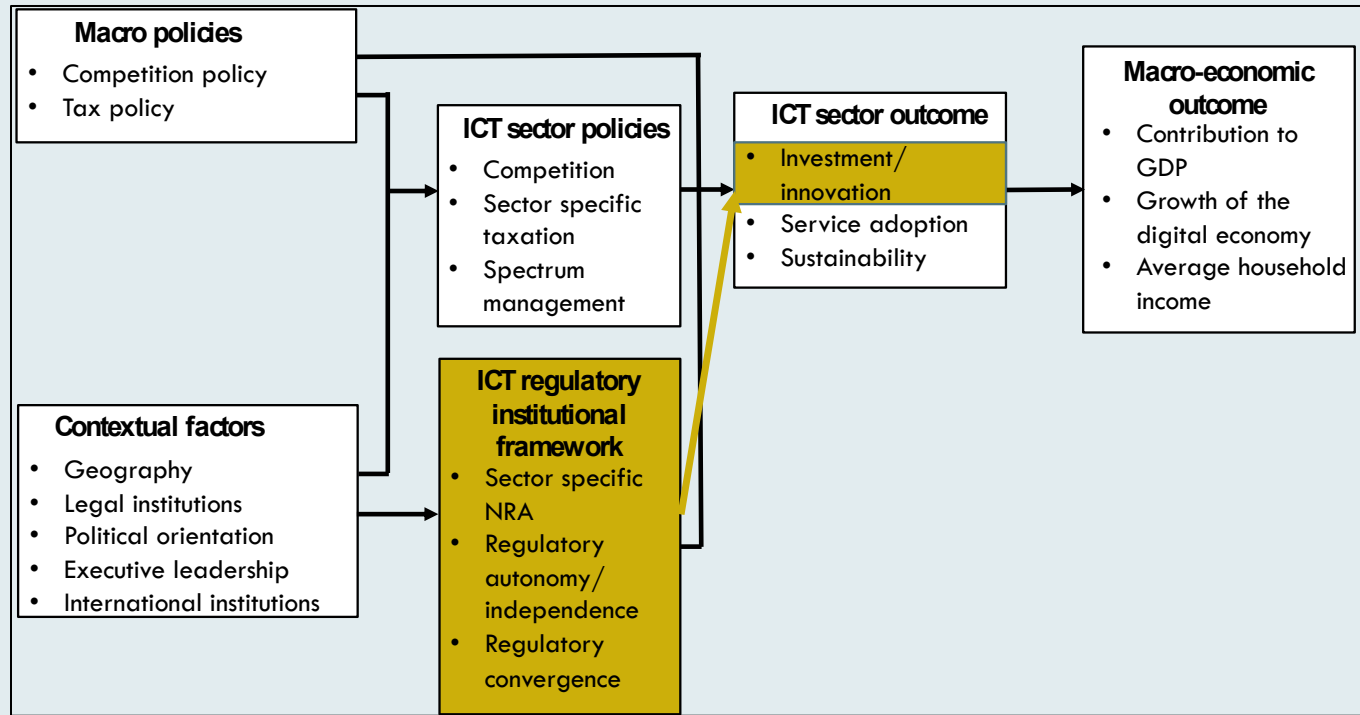


MODEL EQUATIONS IN THE CONTEXT OF THE OVERALL CAUSALITY FLOWS

MODEL EQUATIONS TO DEPICT CAUSAL LINKS



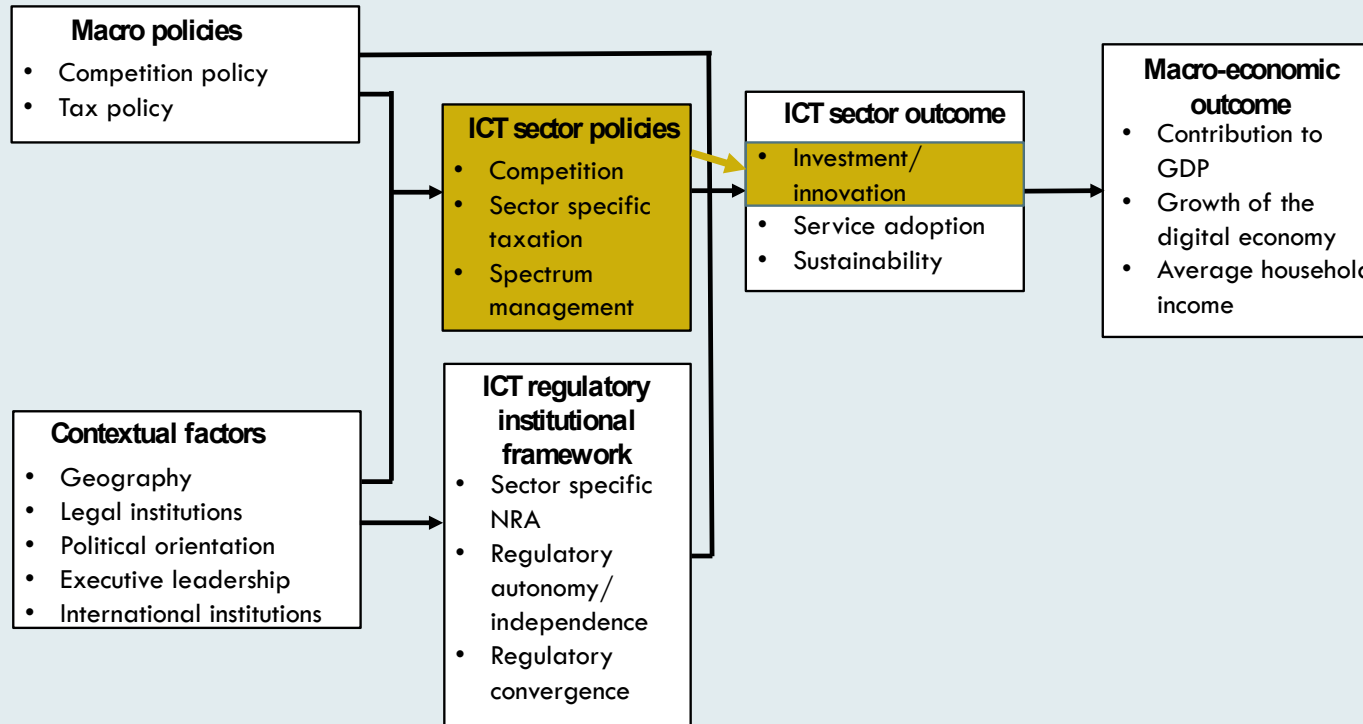
FIRST FINDING: THE REGULATORY INSTITUTIONAL FRAMEWORK IS LINKED TO A POSITIVE AND SIGNIFICANT INCREASE IN TELECOMMUNICATION INVESTMENT



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

Source: Katz, R. and Jung, J. (2021). *The impact of policies, regulation, and institutions on ICT sector performance*. International Telecommunication Union

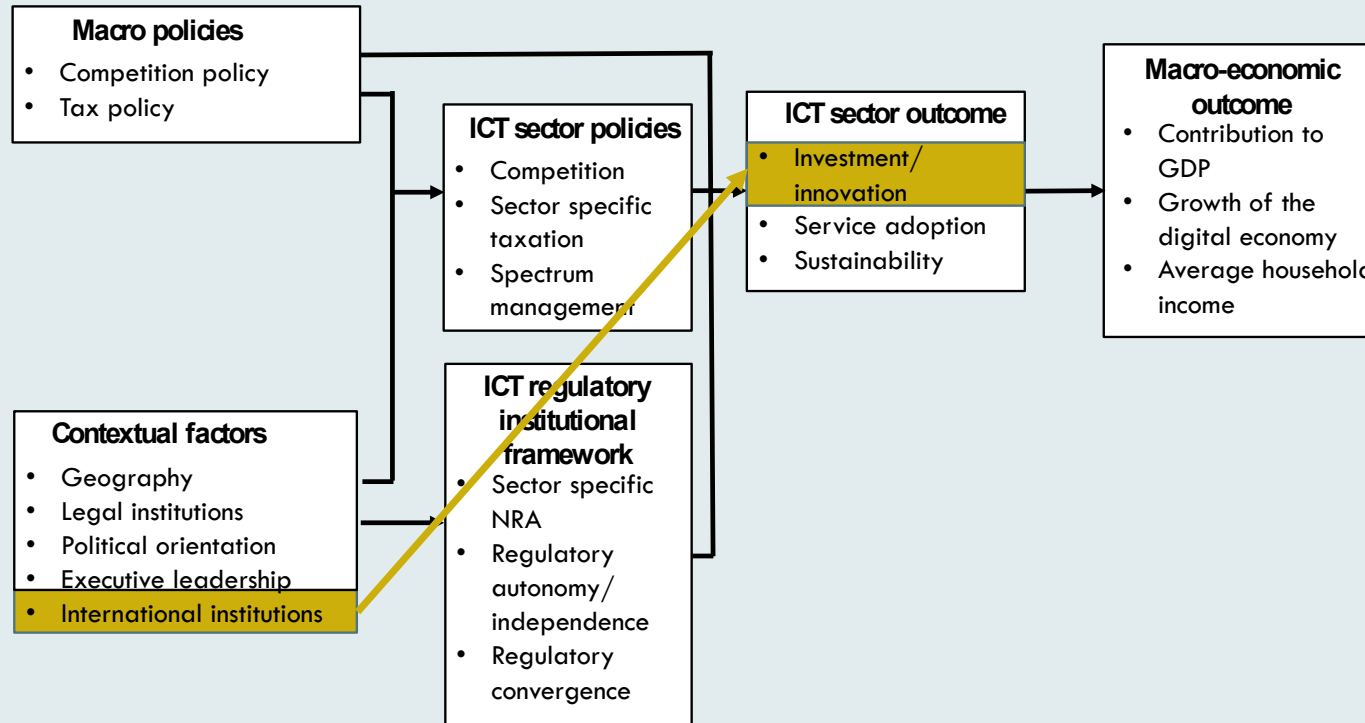
SECOND FINDING: A REDUCTION IN TAXATION AND ADMINISTRATIVE BURDENS IS LINKED TO A SIGNIFICANT INCREASE OF CAPITAL INVESTMENT



Causal link	Effect
Competition framework (competitive intensity in fixed, mobile, and broadband services, among others) score	An increase of 10% in the score is associated with an increase of close to 7% in fixed and mobile investment
Profit tax (non-sector specific)	A 50% reduction in profit tax affecting the business sector is associated with an increase of fixed and mobile investment of nearly 14%
Bureaucratic burden	A 50% reduction in administrative time required for doing business is linked to an increase in fixed and mobile investment of 17%

Source: Katz, R. and Jung, J. (2021). *The impact of policies, regulation, and institutions on ICT sector performance*. International Telecommunication Union

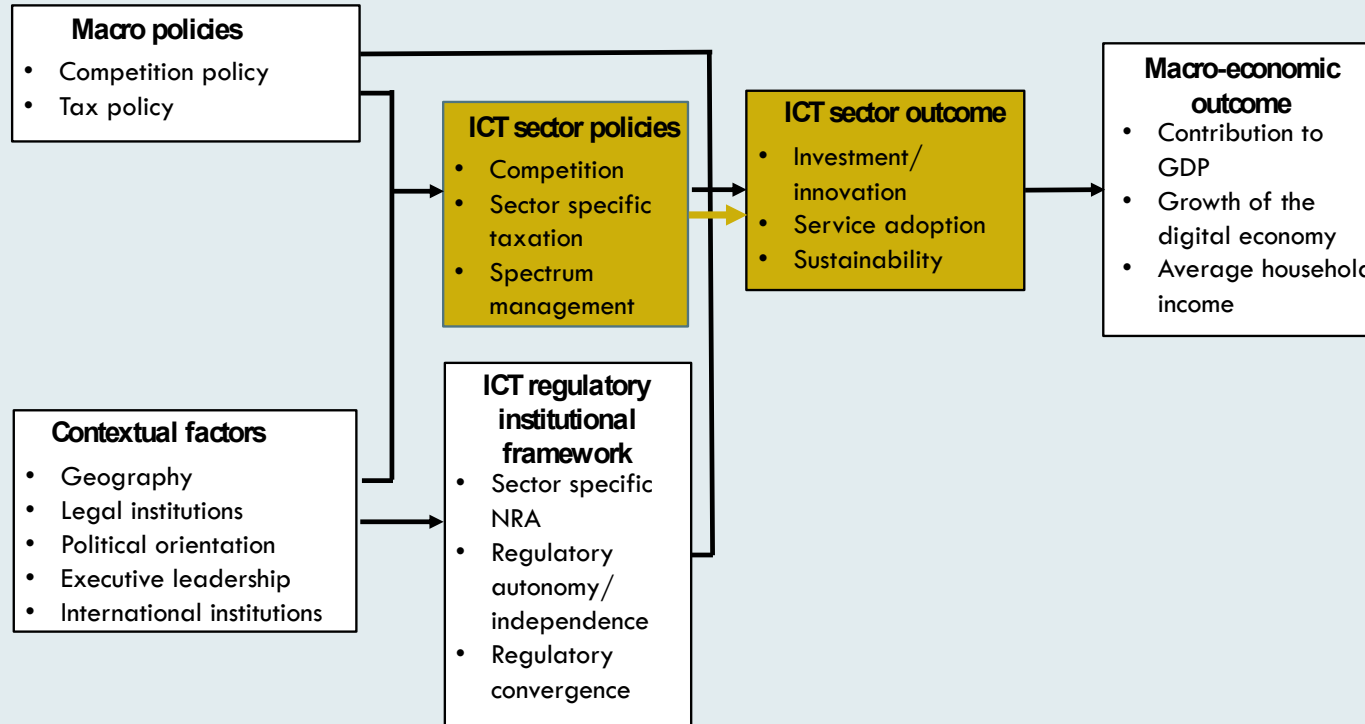
THIRD FINDING: BEING AFFILIATED TO INTERNATIONAL ORGANIZATIONS THAT PROMOTE SOUND REGULATIONS IS ASSOCIATED WITH A HIGHER TELECOMMUNICATION INVESTMENT



Causal link	Effect
OECD membership	OECD membership is associated with an increase in 36% in fixed and mobile investment
Five-year WTO membership	Countries with a five-year membership of WTO are associated with a 17.5% more fixed and mobile investment with respect to non-members

Source: Katz, R. and Jung, J. (2021). *The impact of policies, regulation, and institutions on ICT sector performance. International Telecommunication Union*

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

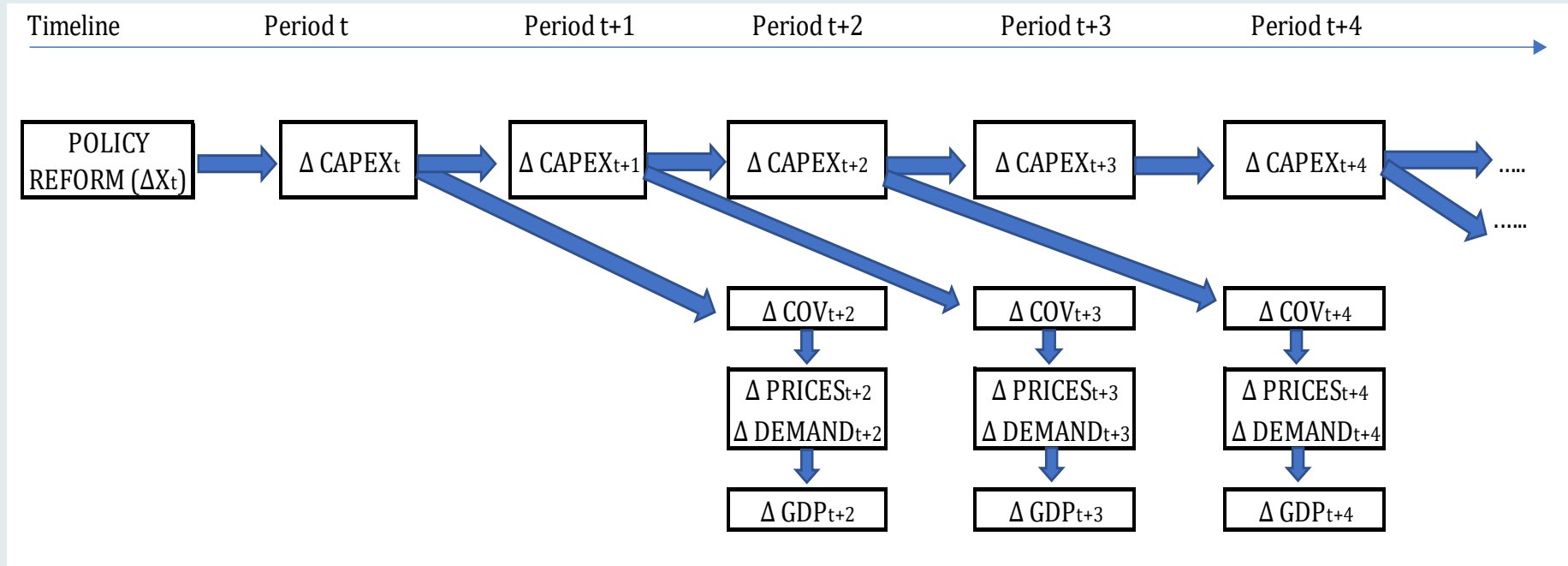


Causal link	Effect
Convergent technology neutral licenses	Moving from service and network specific to convergent licensing is associated with an increase of mobile investment of 10%, network coverage by over 9%, price reduction by over 5%, and mobile penetration by approximately 2% after two years.
Spectrum sharing agreements	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.
Mobile number portability	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

Source: Katz, R. and Jung, J. (2021). *The impact of policies, regulation, and institutions on ICT sector performance*. International Telecommunication Union

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



Source: Katz, R. and Jung, J. (2021). *The impact of policies, regulation, and institutions on ICT sector performance*. International Telecommunication Union.

THE RESULTS ARE POWERFUL IN TERMS OF INFORMING POLICY DECISIONS

- 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



COLUMBIA INSTITUTE FOR TELE-INFORMATION

For further information please contact:

Raul Katz, raul.katz@teleadvs.com, +1 (845) 868-1653

Telecom Advisory Services LLC
139 West 82nd Street, Suite 6D
New York, New York 12581 USA