

# THE CONTRIBUTION OF DIGITAL TECHNOLOGIES TO ADDRESS THE PANDEMIC

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## THIS PRESENTATION WILL FOCUS ON FOUR QUESTIONS

- What is the economic impact of digitization?
- Can digitization mitigate the economic disruption caused by pandemics?
- Is there an inequality challenge in digitization that hampers its pandemic mitigation value?
- What are the implications of these questions for public and private intervention to address ongoing and future threats?

## THE ECONOMIC CONTRIBUTION OF DIGITIZATION IS THE RESULT OF THREE FACTORS

Production of digital goods and services

- Output of industries that are part of the domestic digital ecosystem (telecommunications, IT, media, digital platforms, e-commerce, and collaborative/sharing platforms)
- Typically represents between 4 percent to 8 percent of the Gross Domestic Product (GDP)

Spillovers of digital technology on the economy

- Multiplier effect on the overall economy (productivity gains across business units, gains across players in the value chain, and faster growth among digital players)
- Multiplier effect from digital investments, leading to the development of new business models (“gig” economy)

Consumer welfare from the adoption of digital technology

- Higher standard of living from enhanced empowerment and participation, equal availability of information and services
- Better inclusion of the socially excluded, and more equal availability of social opportunities

## DIGITAL TECHNOLOGIES HAVE PROVEN TO HAVE A CLEAR CONTRIBUTION TO ECONOMIC GROWTH

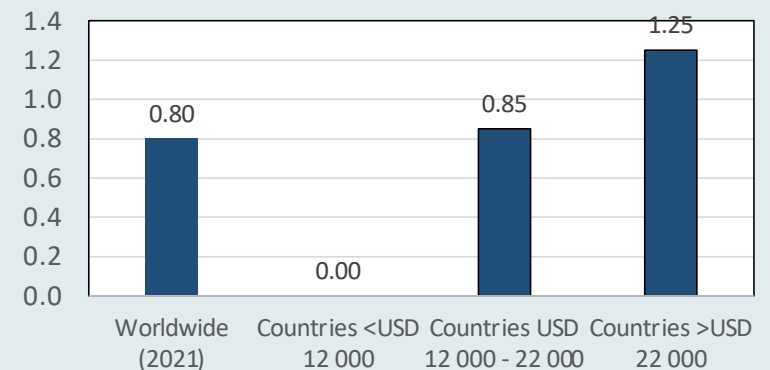
### STRUCTURAL MODEL

Aggregate production function	$\text{GDP per capita}_{it} = a_1(\text{Capital}_{it}) + a_2(\text{Education}_{it}) + a_3(\text{Broadband Penetration}_{it}) + e_{it} \quad (1)$
Demand function	$\text{Broadband Penetration}_{it} = b_1(\text{Rural population}_{it}) + b_2(\text{Broadband Price}_{it}) + b_3(\text{GDP per capita}_{it}) + b_4(\text{HHI}_{it}) + e_{it} \quad (2)$
Supply function	$\text{Broadband Revenue}_{it} = c_1(\text{Broadband Price}_{it}) + c_2(\text{GDP per capita}_{it}) + c_3(\text{HHI Fixed broadband}_{it}) + e_{it} \quad (3)$
Output function	$\Delta \text{Broadband Penetration}_{it} = d_1(\text{Fixed Broadband Revenue}_{it}) + \epsilon_{4it} \quad (4)$

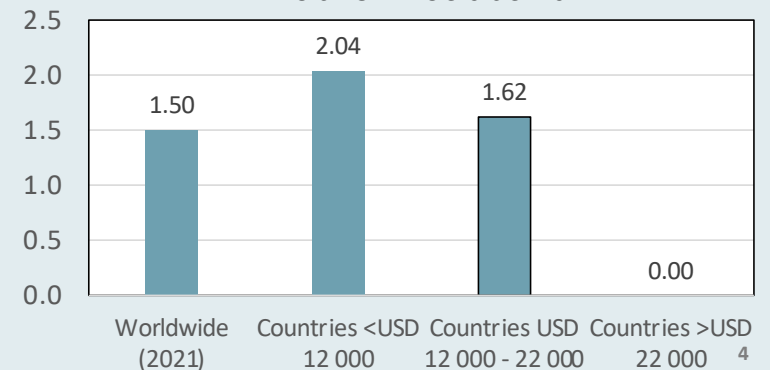
Source: Katz, R. and Callorda, F. (2020). *How broadband, digitization, and ICT Regulation impact the global economy – econometric modelling*. Katz, R. and Jung, J. (2021). *The Economic Impact of Broadband and Digitization through the Covid-19 pandemic - Econometric Modelling*

### GDP GROWTH IMPACT OF AN INCREASE IN 10% OF BROADBAND PENETRATION

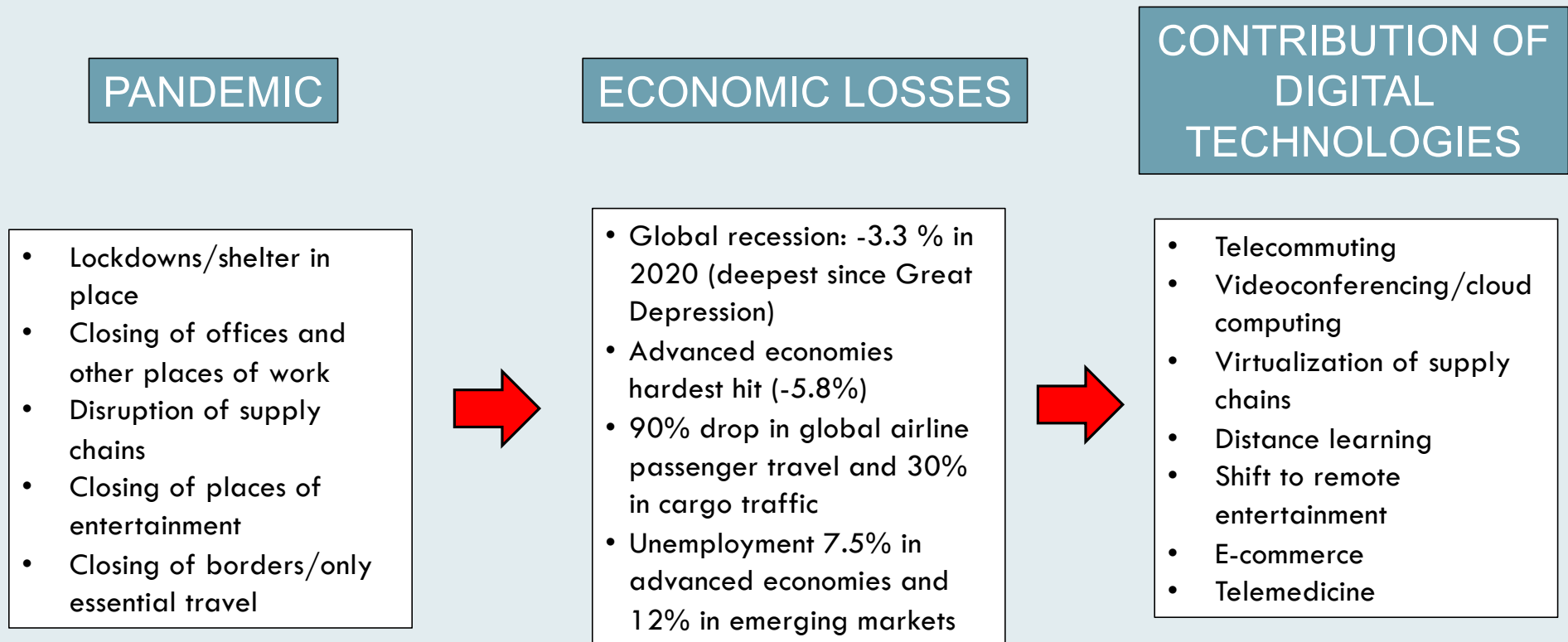
#### Fixed Broadband



#### Mobile Broadband



## ANECDOTAL EVIDENCE INDICATES THAT DIGITIZATION HAS ALSO BEEN ABLE TO MITIGATE PART OF THE DISRUPTION GENERATED BY THE PANDEMIC



## WE TESTED WHETHER ALL COUNTRIES ARE EQUALLY ABLE TO MITIGATE THE ECONOMIC DISRUPTION TRIGGERED BY THE PANDEMIC

### MODIFIED FIRST STEP OF STRUCTURAL MODEL

$$\text{Log}(\text{GDPpc})_i = \mu_i + \theta \text{Log}(\text{GFKF})_{it} + \sigma \text{Log}(\text{HK})_{it} + \beta \text{Log}(\text{BB PEN})_{it} + \delta \text{COVID}_{it} + \gamma (\text{BB} * \text{COVID}^2)_{it} + \rho_{i,2020} + \zeta_t + \varepsilon_{it}$$

Impact of  
COVID:  
deaths per  
100  
population

Interaction  
between  
broadband  
and COVID

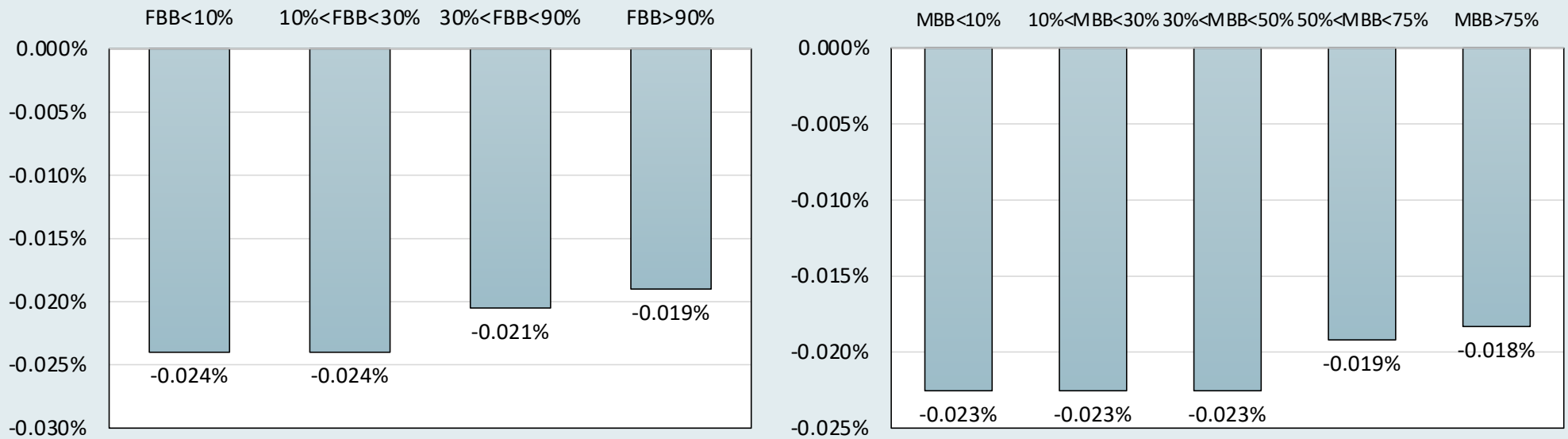
Broadband HH penetration	Examples
<10%	Afghanistan, Cameroon, Zimbabwe
10%-30%	Indonesia, Paraguay, Namibia
30%-90%	Brazil, Croatia, Lebanon
>90%	United Kingdom, United States, Germany

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

**THE RESULTS INDICATE 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*

## THE CHALLENGE WE ARE FACING IN THE CONTEXT OF COVID-19: DIGITIZATION INEQUALITY

### 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*



## EVEN AMONG DIGITAL USERS, HOUSEHOLD RESILIENCE TO FACE THE PANDEMIC IS LIMITED

### Digital Household Resilience Index

- Composite index
- Min-max normalization
- 30% weight for each indicator and 10% fintech

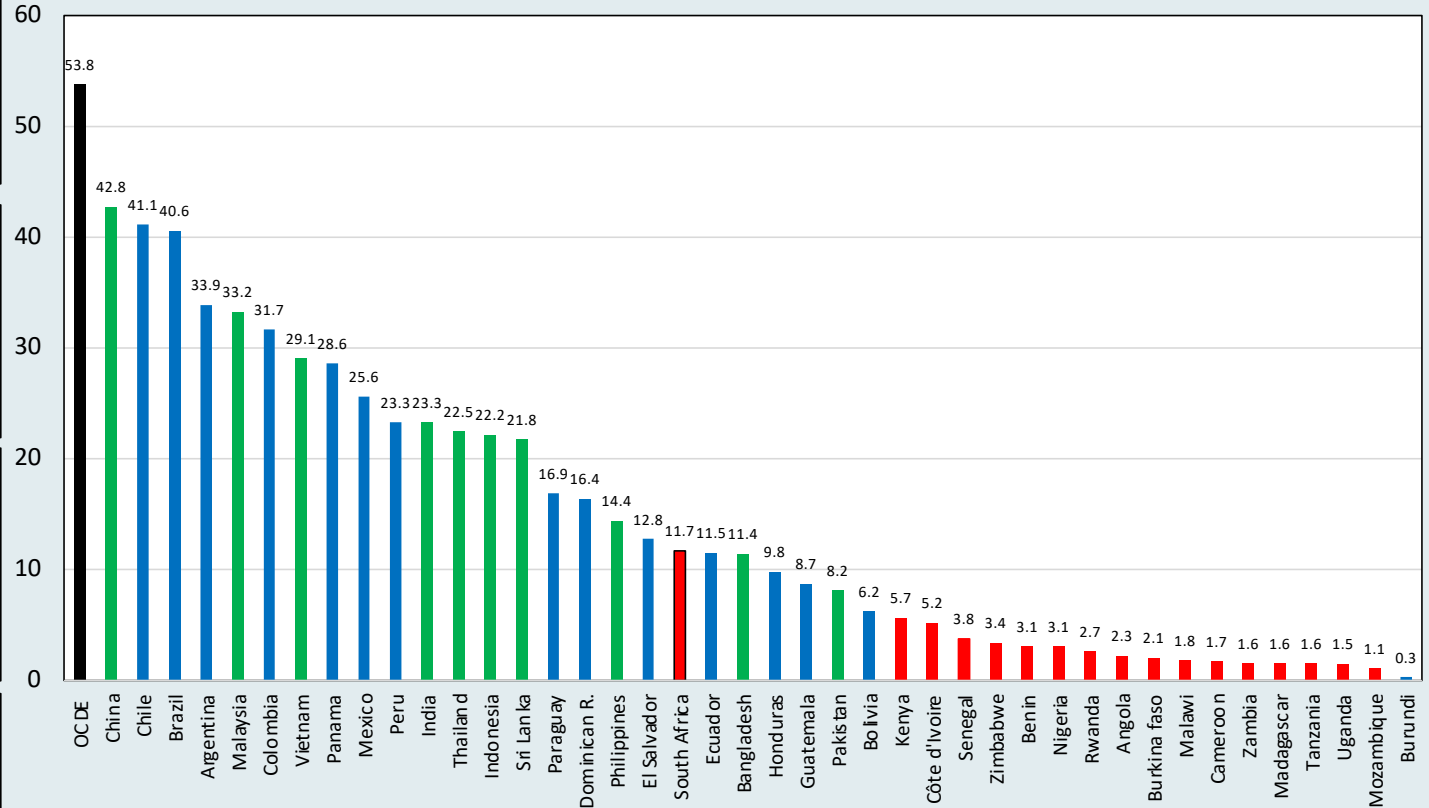
Number of Healthcare apps downloaded per population (Source: App Annie)

Number of Educational apps downloaded per population (Source: App Annie)

Number of Fintech platforms per 1,000,000 population (Source: Crunchbase)

E-commerce as percentage of total retail trade (Source: Euromonitor)

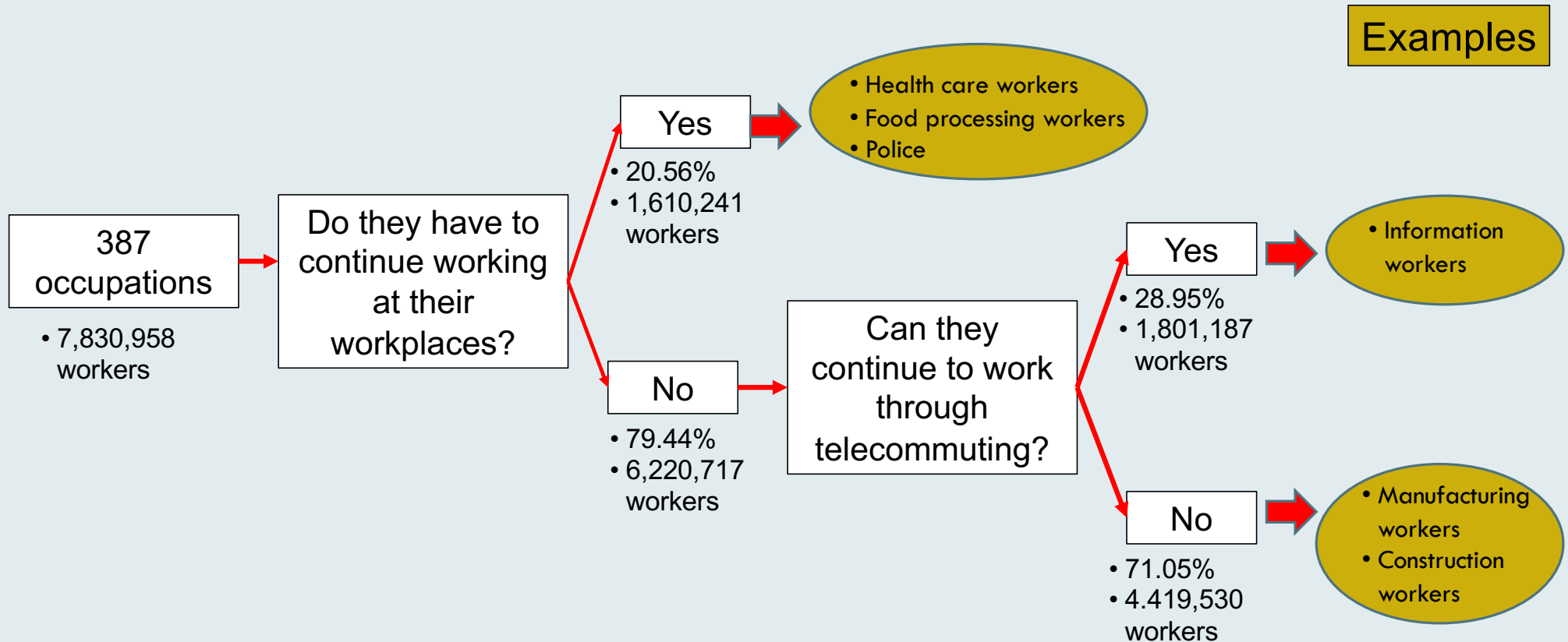
### Developing Countries: Digital Household Resilience Index (2019)



Source: Katz, R., Jung, J. and Callorda, F. (2020). *The State of Digitization in Latin America facing the COVID-19 Pandemic*. CAF Latin America Development Bank

## ADDITIONALLY, A LARGE PROPORTION OF THE LABOR FORCE CANNOT CONTINUE TO WORK UNDER LOCKDOWN CONDITIONS

### CHILE: TELECOMMUTING IMPACT ANALYSIS METHODOLOGY



Source: Encuesta CASEN; Katz, R., Jung, J., Callorda, F. (2021). *The impact of automation on employment and its social implications: Evidence from Chile*; Source: Katz, R., Jung, J. and Callorda, F. (2020). *The State of Digitization in Latin America facing the COVID-19 Pandemic*. CAF Latin America Development Bank

## THE ANALYSIS OF TELEWORKING LEVELS BY EDUCATIONAL AND INCOME LEVELS INDICATES THE DISPROPORTIONATE IMPACT OF THE PANDEMIC ON THE MOST VULNERABLE SOCIAL GROUPS

	Total	By educational level				By income level				
		No education	Primary education	Secondary education	Tertiary education	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Workers that continue to work at their workplaces	1,610,241	169,614	384,599	676,925	369,701	192,495	342,862	392,459	407,535	274,586
Workers that do not work at their workplace but can telecommute	1,801,187	29,828	98,872	429,245	1,234,063	61,732	149,758	267,170	436,918	885,610
Workers that do not work at their workplace and cannot telecommute	4,419,530	516,194	1,098,905	1,819,559	957,042	604,999	985,042	1,080,271	1,056,496	673,520

Source: Encuesta CASEN; Telecom Advisory Services analysis

**COVID-19 HAS NEGATIVELY IMPACTED TELECOMMUNICATIONS INVESTMENT IN DEVELOPING COUNTRIES, THEREBY AFFECTING THE CAPACITY OF DIGITIZATION TO MITIGATE THE PANDEMIC DISRUPTION**

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

## HOWEVER, THE EVIDENCE GENERATED SO FAR PROVIDES ADDITIONAL GUIDANCE FOR SOME FORWARD-LOOKING ACTIONS

- Governments and regulators in the developing world, need to evaluate initiatives that should reverse the declining capital spending trend and lead to stimulation of telecommunications investment to ensure continuous roll-out of networks
- The importance of ICT in mitigating part of the economic damage of pandemics raises the need for governments to reduce demand side barriers (affordability, digital literacy, local content development) and stimulate adoption of mobile broadband
- The high value of fixed broadband as a mitigant of pandemic-induced economic disruption raises the urgency of countries with underdeveloped fixed connectivity to explore approaches to foster the roll-out of networks, with an initial emphasis in high density urban concentrations

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