

ITU STUDY ON THE ECONOMIC CONTRIBUTION OF BROADBAND, DIGITAL TRANSFORMATION AND REGULATION OF ICT

Econometric modelling for Africa



ITU Regional Economic Dialogue on Telecommunications/ICT for Africa //
*Dialogue économique régional de l'UIT sur les Télécommunications/TIC
pour l'Afrique (RED-AFR19)*

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Lomé, September 10, 2019

KEY CONCLUSIONS OF THE GLOBAL STUDY

Fixed Broadband

The impact of fixed broadband on GDP is higher in more advanced economies than in emerging countries (“return to scale” effect)

Mobile Broadband

The impact of mobile broadband on GDP is higher in less developed countries than in more developed ones (“saturation” effect)

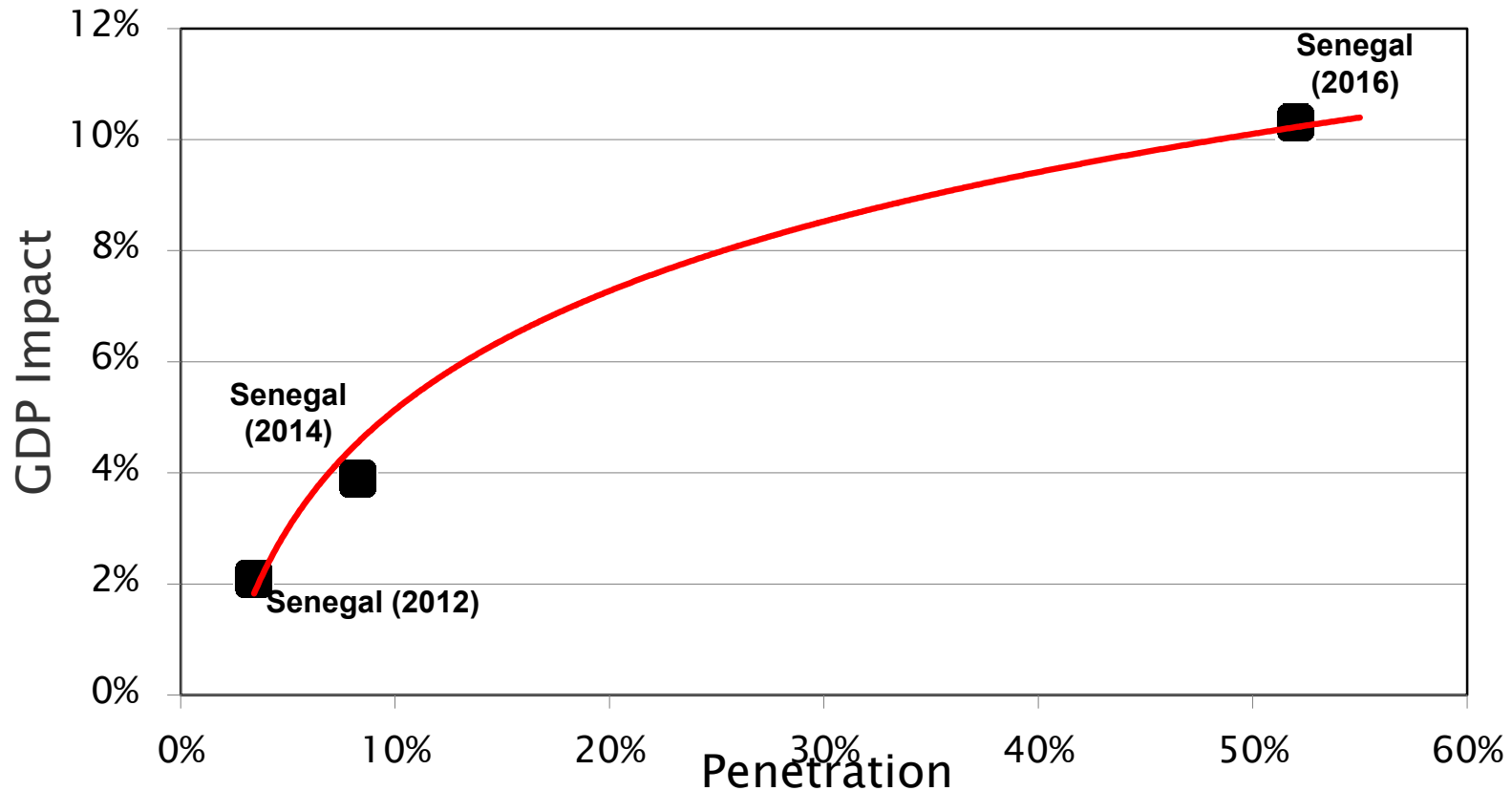
Digitization

The impact of the digital ecosystem on more advanced economies is higher than in developing countries (“return to scale”)

ICT regulation and policies

The ICT regulatory and policy framework has a consistent impact on the development of digitization, regardless of the country’s level of development

SENEGAL: MOBILE BROADBAND PENETRATION VS. MOBILE BROADBAND ECONOMIC IMPACT



Source: Katz, R. and Callorda, F. (2018c). *Telecommunications economic impact: diminishing returns or return to scale?* Columbia Institute for Tele-information Working Paper.

FIXED BROADBAND MIGHT HAVE AN IMPACT ON GDP IN AFRICA, ALTHOUGH THE IMPACT IS NOT STATISTICALLY SIGNIFICANT

Model specified for 34 African countries:
 Angola, Benin,
 Botswana, Burkina
 Faso, Cameroon,
 Central African
 Republic, Chad, Côte
 d'Ivoire, Democratic
 Republic of the Congo,
 Eritrea, Ethiopia,
 Gabon, Gambia,
 Ghana, Guinea,
 Guinea-Bissau, Kenya,
 Lesotho, Liberia, Mali,
 Mauritius,
 Mozambique,
 Namibia, Niger,
 Nigeria, Republic of
 the Congo, Rwanda,
 Senegal, South Africa,
 Tanzania, Togo,
 Uganda, Zambia, and
 Zimbabwe.



GDP per Capita (PPP)	
Fixed Broadband Subscribers Penetration	0.03031
Capital	0.11728 ***
Education	0.26642 ***
Fixed Broadband Subscribers Penetration	
Fixed Telephone Subscribers	0.37878 ***
Rural Population	-0.55948 ***
GDP per capita	0.50957 ***
Fixed Broadband price	-0.22882 ***
HHI Fixed Broadband	-0.39252 ***
Revenue Fixed Broadband	
GDP per capita	0.54882 ***
Fixed Broadband price	0.34617 ***
HHI Fixed Broadband	-0.87728 ***
Fixed Broadband Adoption Growth	
Revenue Fixed Broadband	-0.55864 ***
Observations	956
Number of countries	34
Country Fixed Effects	Yes
Year and quarter Fixed Effects	Yes
Years	2010-2017
R-Squared first model	0.9826

***, **, * significant at 1%, 5% and 10% critical value respectively

ON THE OTHER HAND, AN INCREASE OF 10 PER CENT IN MOBILE BROADBAND PENETRATION YIELDS AN INCREASE IN 2.5 PER CENT IN GDP PER CAPITA

Model specified for 34 African countries: Angola, Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of the Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.



GDP per Capita (PPP)	
Mobile Broadband Unique Subscribers Penetration	0.24613 ***
Capital	-0.00708
Education	0.22785 ***
Mobile Broadband Unique Subscribers Penetration	
Mobile Unique Subscribers Penetration	1.58580 ***
Rural Population	0.18895 ***
GDP per capita	0.20936 ***
Mobile Broadband price	-0.31082 ***
HHI Mobile Broadband	-0.16634 ***
Revenue Mobile Broadband	
GDP per capita	0.71111 ***
Mobile Broadband price	-0.46106 ***
HHI Mobile Broadband	-1.10363 ***
Mobile Broadband Adoption Growth	
Revenue Mobile Broadband	-1.25511 ***
Observations	899
Number of countries	34
Country Fixed Effects	Yes
Year and quarter Fixed Effects	Yes
Years	2010-2017
R-Squared first model	0.9784

***, **, * significant at 1%, 5% and 10% critical value respectively

FURTHERMORE, AN INCREASE OF 10 PER CENT IN DIGITIZATION YIELDS A 1.9 PER CENT GROWTH IN AFRICAN GDP PER CAPITA, BUT RESULTS ARE NOT STATISTICALLY SIGNIFICANT

Model specified for six African countries: Botswana, Equatorial Guinea, Gabon, Mauritius, Seychelles, and South Africa



DIGITIZATION INDEX

- Digital infrastructure
- Digital connectivity
- Household digitization
- Digitization of production
- Digital industries
- Digital factors of production
- Digital competition
- Regulation of digital sector



Previous GDP	0.4707 ** (0.1783)
Digitization index	0.1871 (0.3189)
Capital	0.3272 ** (0.1213)
Labour	0.2415 (1.0771)
Constant	3.3805 (2.4301)
Observations	43
Year fixed effects	Yes

***, **, * significant at 1%, 5% and 10% critical value respectively

FINALLY, AN INCREASE OF 10 PER CENT IN THE ITU ICT REGULATORY TRACKER INDEX YIELDS A 0.682 PER CENT INCREASE IN DIGITIZATION

Model specified for six African countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Democratic Republic of the Congo, Cote d'Ivoire, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe

ICT REGULATORY TRACKER

- Regulatory authority
- Regulatory mandate
- Regulatory regime
- Competition framework

Log CAF Digital Ecosystem Development Index (without the regulatory and competition pillars)	Coefficient (Standard deviation) Africa
Log Digital Ecosystem Development Index (without regulation and competition pillars) (t-1)	1.8825 (0.0656)***
Log ITU ICT Regulatory Tracker (t-1)	0.0682 (0.0185)***
Constant	0.4605 (0.0716) ***
R-Squared	0.7410
Fixed effects for year and country	Yes
Groups	43
Observations	430
Years	2008-2017

***, **, * significant at 1%, 5% and 10% critical value respectively

IN CONCLUSION, THE RESULTS FOR AFRICA CONFIRMED THE CONCLUSIONS GENERATED IN THE GLOBAL STUDY

	GLOBAL STUDY	AFRICA
Fixed Broadband	The impact of fixed broadband on GDP is higher in more advanced economies than in emerging countries (“return to scale” effect)	Impact of fixed broadband in the Africa region is as low as the impact estimated for low income countries in the global sample, with no statistical significance
Mobile Broadband	The impact of mobile broadband on GDP is higher in less developed countries economies than in more developed ones (“saturation” effect)	Impact of mobile broadband in the Africa region is as high as the impact estimated for low income countries in the global sample
Digitization	The impact of the digital ecosystem on more advanced economies is higher than in developing countries	Impact of digitization in the Africa region is similar to low income countries, in the global sample
ICT regulation and policies	The ICT regulatory and policy framework has a consistent impact on the development of digitization, regardless of the country’s level of development	In the case of the Africa, the results also validated the positive impact of the policy and regulatory variable in the region

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