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Econometric analysis of the contribution of broadband, digitization and ICT policy in Europe and CIS countries

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ITU Regional Economic Dialogue on Information and Communication Technologies (RED-2019) for Europe and CIS

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METHODOLOGY: THREE ECONOMETRIC MODELS

Economic impact of broadband

Aggregate Production function: (1)

$$GDPit=a1Kit+a2Lit+a3Mob\_Penit+ eit$$

Demand function: (2)

$$Mob\_Pen_{it}=b_1Rural_{it}+b_2Mob\_Price_{it}+b_3GDPC_{it}+b_4HHI_{it}+e_{it}$$

Supply function: (3)

$$Mob\_Rev_{it}=c_1MobPr_{it}+c_2GDPC_{it}+c_3HHI_{it}+$$

Output function: (4)

$$\Delta Mob\_Pen_{it} = d_1 Mob\_Rev_{it} + \varepsilon_{4it}$$

Economic impact of digitization

$$Y = A(t)K^{1-b}L^{b}$$

where

A(t) represents the level of technology progress (in our case the digitization index),

K corresponds to the fixed capital formation, and

L to the labour force.

By converting all terms to logarithms, the coefficients can be estimated through an econometric model.

$$log(GDP_{it}) = a_1 log(k_{it}) + a_2 log(L_{it}) + a_3 log(D_{it}) + \varepsilon_{it}$$

Impact of policy on digitization

$$\text{Dig. Index}_{it} = \beta_1 \text{Reg. Index}_{it} + \text{Year F. E.} + \text{Country F. E.} + e_{it}$$

Beyond measuring the correlation between both variables, a model with lagged variables was developed. In this case, the specified model is as follows:

$$\text{Dig. Index}_{it} = \beta_1 \text{Reg. Index}_{it} + \beta_2 \text{Reg. Index}_{it-1} + \text{Year F. E.} + \text{Country F. E.} + e_{it}$$

Finally, the variables were converted to logarithms to test causality of change in values of both indices:

$$\ln(\text{Dig. Index}_{it}) = \beta_1 \ln(\text{Dig. Index}_{it-1}) + \beta_2 \ln(\text{Reg. Index}_{it-1}) + \text{Year F. E.} + \text{Country F. E.} + e_{it}$$

GLOBAL STUDY RESULTS

Economic impact of fixed broadband

- Higher income countries: 10 per cent increase in broadband penetration yields 1.4 per cent increase in GDP growth.
- Middle income countries: 10 per cent increase in broadband penetration yields 0.5 per cent increase in GDP growth.
- Low income countries: while the coefficient of fixed broadband impact was similar to the middle impact countries, it was not statistically significant.

Economic impact of mobile broadband

- High income countries: no economic impact was detected.
- Middle income countries: An increase of 10 per cent in mobile broadband penetration yields an increase in 1.8 per cent in GDP.
- Low income countries: An increase of 10 per cent in mobile broadband penetration yields an increase in 2.0 per cent in GDP.

Economic impact of digitization

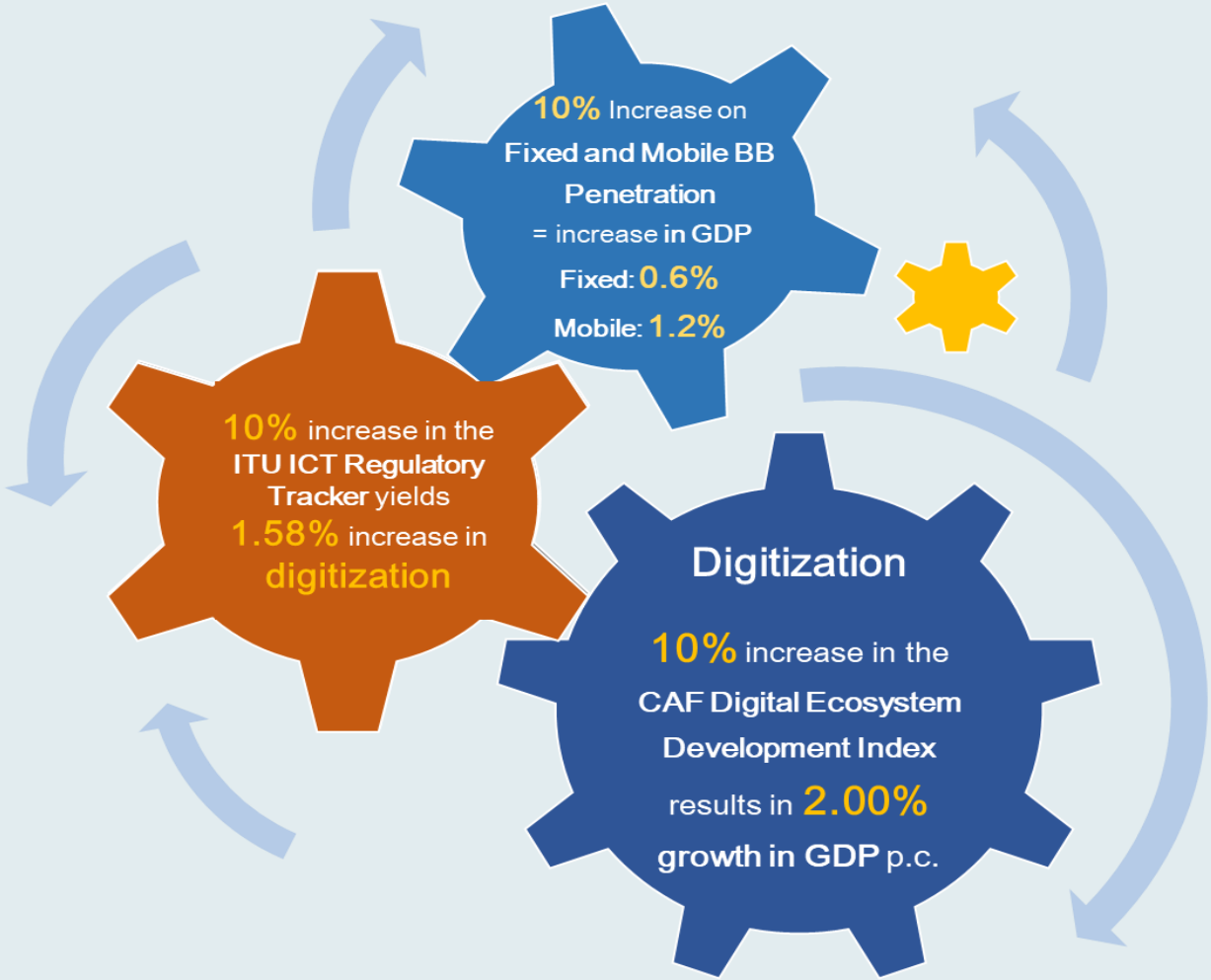
- OECD countries: An increase of 10 per cent in the CAF Digital Ecosystem Development Index resulted in a 1.4 per cent growth in GDP per capita.
- Non-OECD countries: An increase of 10 per cent in the CAF Digital Ecosystem Development Index yielded a 1.0 per cent growth in GDP per capita.

Policy impact on digitization

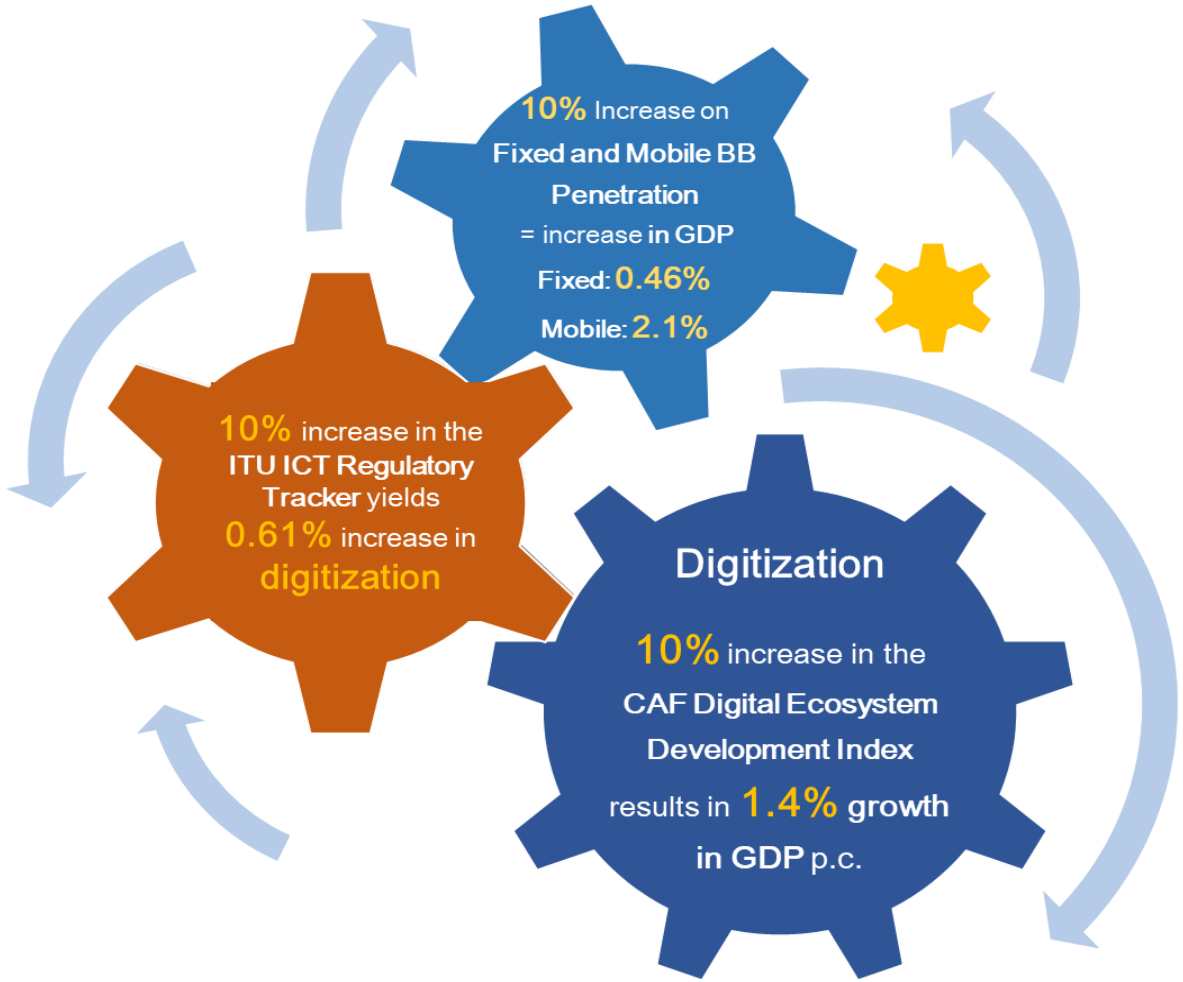
the importance of the regulatory and institutional variable in driving digital ecosystem growth. An increase of 10 per cent in the ITU ICT Regulatory Tracker yielded a positive increase in the CAF Digital Ecosystem Development Index of 0.348 per cent in the subsequent time period.

CIS STUDY RESULTS

Commonwealth of Independent States: Economic Impact of Fixed and Mobile Broadband and Digitization, 2019



Europe: Economic Impact of Fixed and Mobile Broadband and Digitization, 2019



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Thank You

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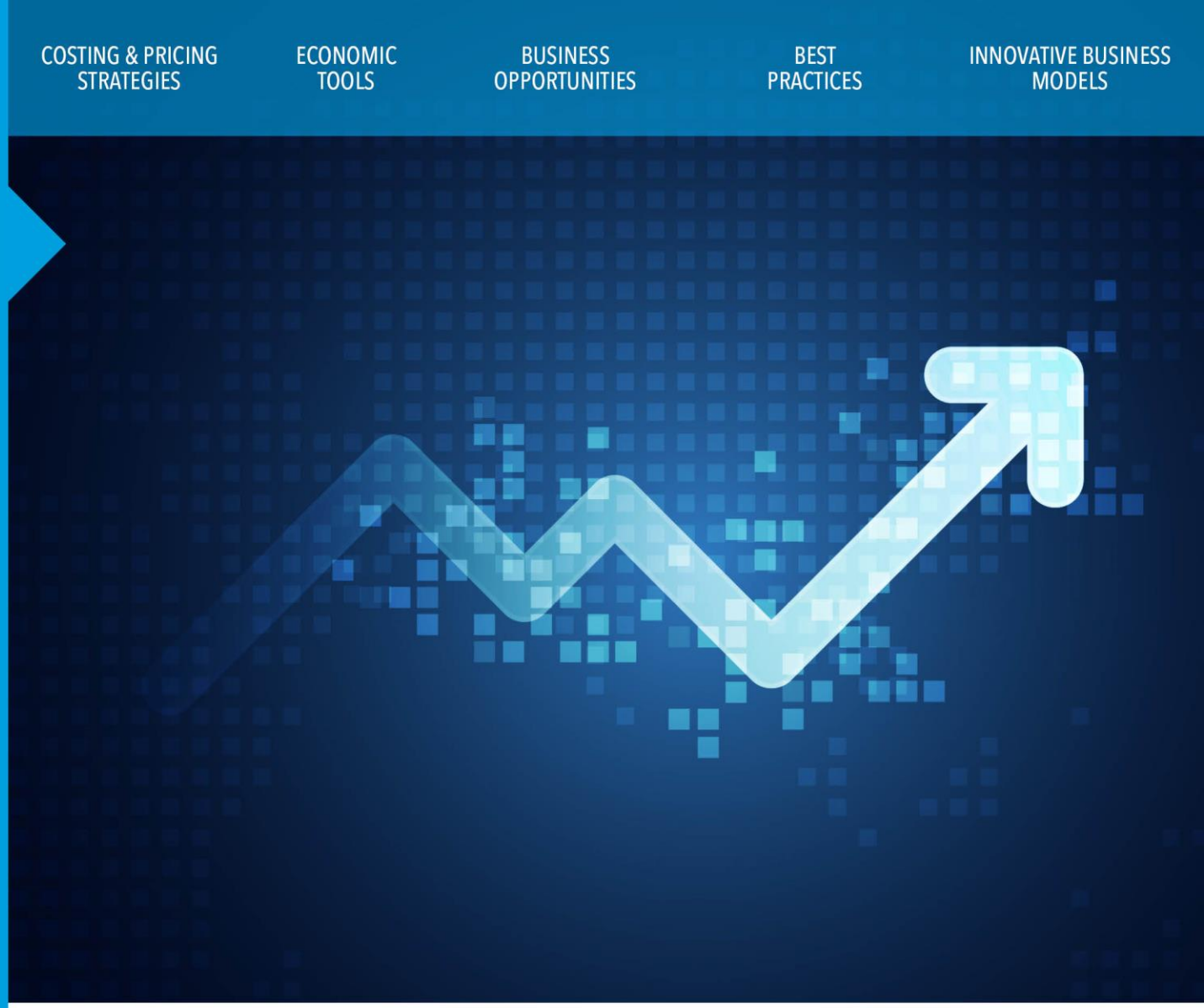

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