

DIGITAL PROSPERITY: A GLOBAL VIEW

Telecom Advisory Services, LLC

**2016 STRATEGIC INNOVATION SYMPOSIUM:
Digital Life in Latin American Cities
June 28, 2016**

AGENDA

- Development paths to digitization
- Social and economic impact of digitization
- National and sub-national dimensions of digitization
- Policy implications

DIGITIZATION IS THE CAPACITY TO USE DIGITAL TECHNOLOGIES TO GENERATE, PROCESS, SHARE AND TRANSACT INFORMATION

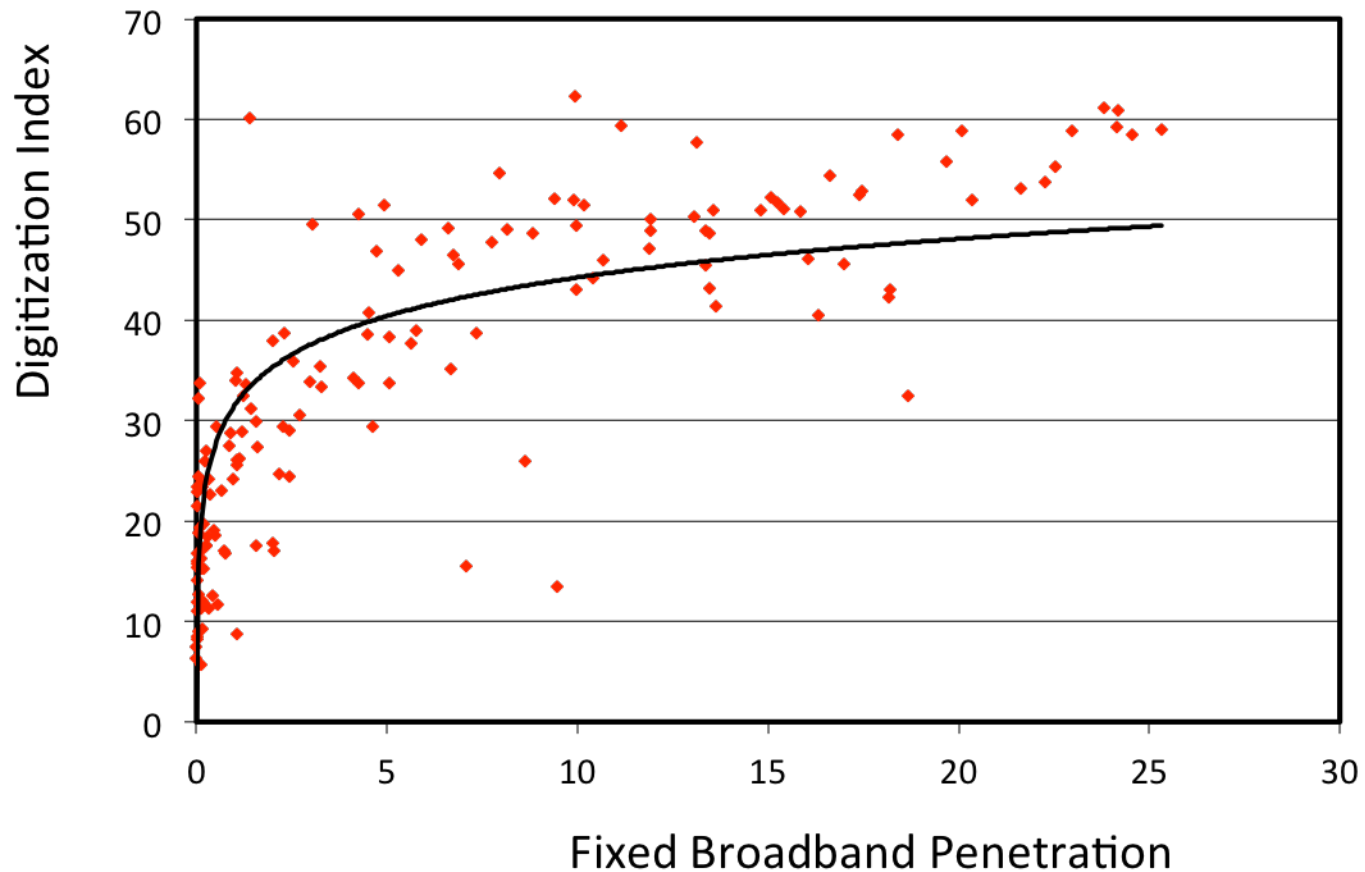
- To achieve a significant impact, digitization has to be widely adopted in the economic and social fabric of a given nation
 - Utilized by individuals, economic enterprises and societies
 - Embedded in processes of delivery of goods and services
 - Relied upon to deliver public services
- For this condition to occur, digitization has to fulfill several conditions
 - Affordable: it has to be sufficiently affordable to allow scalable impact
 - Ubiquitous: it is supported by telecommunications networks and reaching most population of a national territory
 - Accessible: networks need to be accessed by multiple fixed and mobile voice and data devices
 - Reliable: networks have to provide sufficient capacity to deliver vast amounts of information at speeds that do not hinder their effective use

A COMPOSITE INDEX CAPTURING 23 INDICATORS WAS DEVELOPED TO MEASURE THE LEVEL OF DIGITIZATION OF A GIVEN COUNTRY

SUB-INDEX	METRIC	INDICATORS
Affordability	Pricing of different telecommunications services that make digitization accessible to the population and enterprises	<ul style="list-style-type: none"> • Average of fixed, mobile and broadband access and usage costs, adjusted for GDP per capita • Fixed costs include line installation cost, and fixed line cost per minute; mobile costs include mobile connection fee and mobile prepaid tariffs; broadband costs correspond to the broadband tariffs
Reliability	Level of resilience of networks that transport digital information	<ul style="list-style-type: none"> • Measured by the overall mobile, broadband and fixed investments per habitant
Access	Adoption of devices and telecommunications networks that allow consumers and enterprises access to digital networks	<ul style="list-style-type: none"> • Averages the sum of fixed and mobile broadband, mobile phone and PC penetrations, and the coverage of mobile networks
Capacity	Network throughput indicating quality of service	<ul style="list-style-type: none"> • Measures the international internet bandwidth and the nominal downloading broadband speeds offered to subscribers
Usage	Adoption of ICT platforms and changes in business processes indicating assimilation of digital technologies	<ul style="list-style-type: none"> • Average of E-commerce penetration, E-Government services offered, data usage, online entrepreneurship, social media usage, percentage of individuals using the internet, and data as a percentage of wireless ARPU
Human Capital	The skill level of the workforce to use ICT	<ul style="list-style-type: none"> • Percent of engineers in the total employed population, and the percent of population with tertiary education

DIGITIZATION IS MEASURING SOMETHING MORE THAN BROADBAND ADOPTION

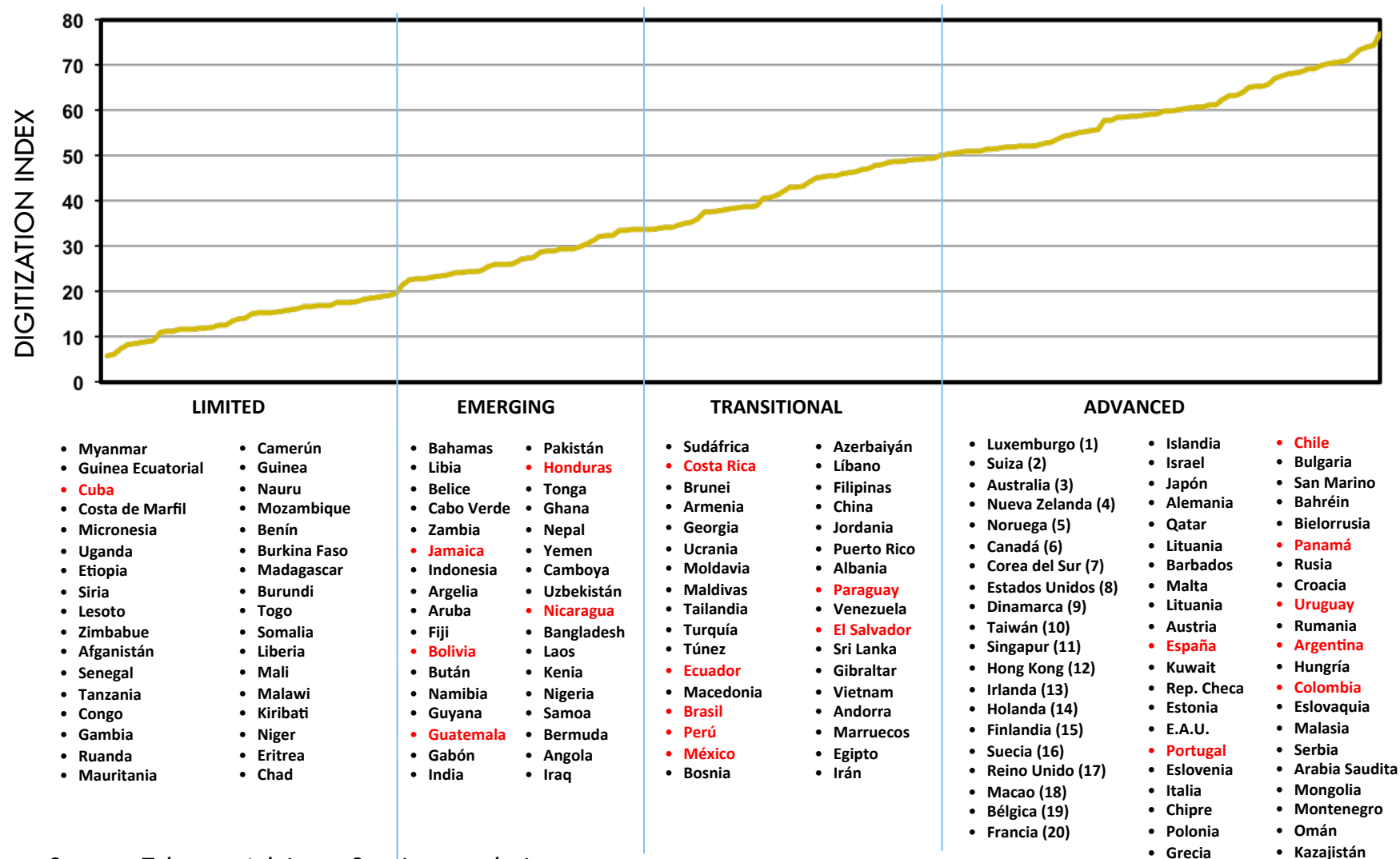
DIGITIZATION INDEX VERSUS BROADBAND PENETRATION (2014)



Source: ITU; Telecom Advisory Services analysis

THE 2014 DIGITIZATION INDEX WAS CALCULATED FOR 198 COUNTRIES, REVEALING FOUR DEVELOPMENT STAGES

STAGES OF DIGITIZATION DEVELOPMENT (2014)



Source: Telecom Advisory Services analysis

THE AVERAGE AND RANGE OF LEVEL OF DIGITIZATION ALSO VARIES BY REGION

DIGITIZATION INDEX BY REGIONS (2014)

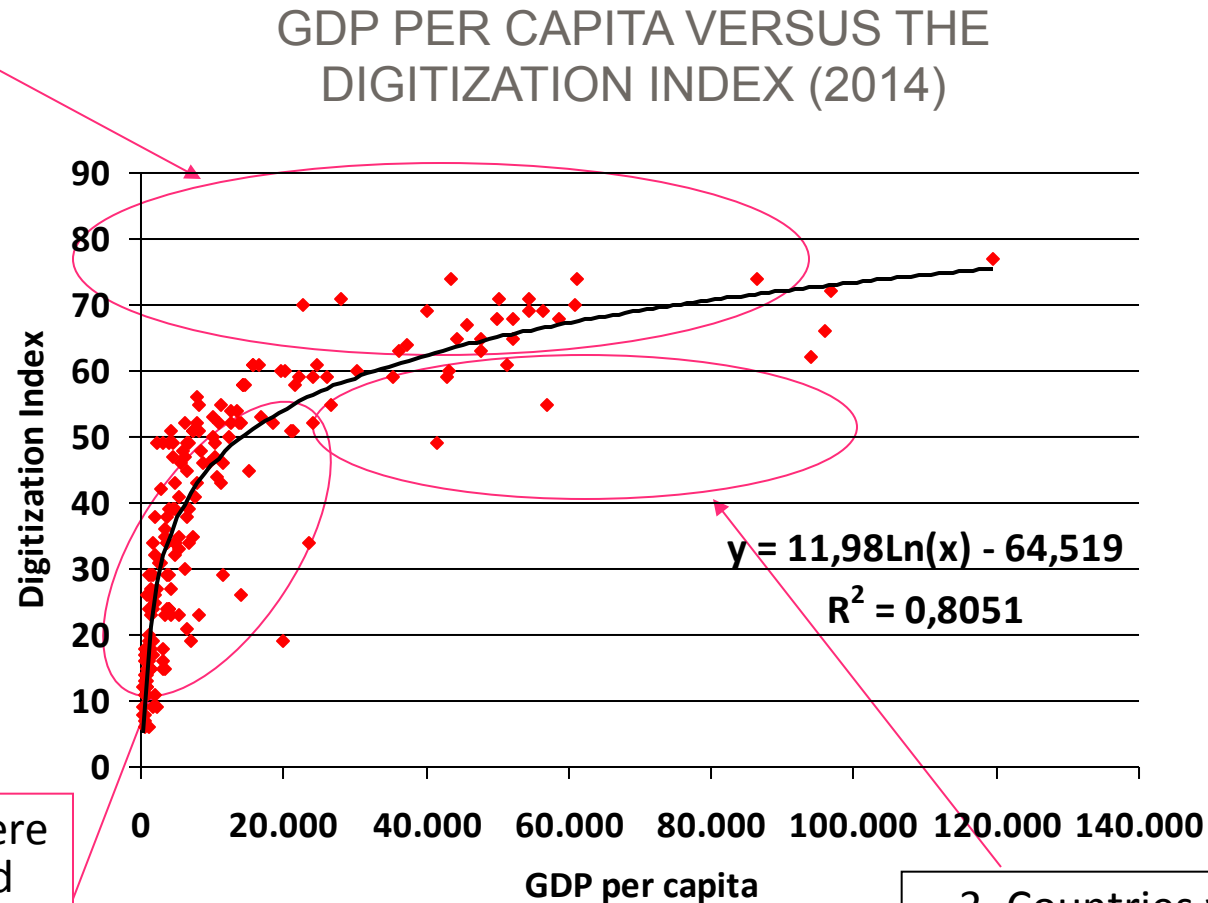
REGION	NUMBER OF COUNTRIES	AVERAGE INDEX	MINIMUM	MAXIMUM
NORTH AMERICA	3	70.65	38.99	70.90
WESTERN EUROPE	20	63.79	34.18	76.89
EASTERN EUROPE	20	51.94	37.58	61.18
ASIA PACIFIC	40	36.49	8.75	73.99
MENA	21	35.46	17.03	64.04
LATAM	34	44.55	18.76	61.15
SUB-SAHARAN AFRICA	45	19.24	5.69	50.36
CIS & RUSSIA	12	47.47	19.27	55.10

Source: Telecom Advisory Services analysis

THREE TYPES OF COUNTRIES CAN BE IDENTIFIED IN TERMS OF THE RELATIONSHIP BETWEEN ECONOMIC DEVELOPMENT AND DIGITIZATION

2. Countries where high digitization appears to have an impact on economic development; the threshold of digitization level is 40; after this point the level of economic development increases consistently

1. Countries where digitization and economic development are growing in tandem



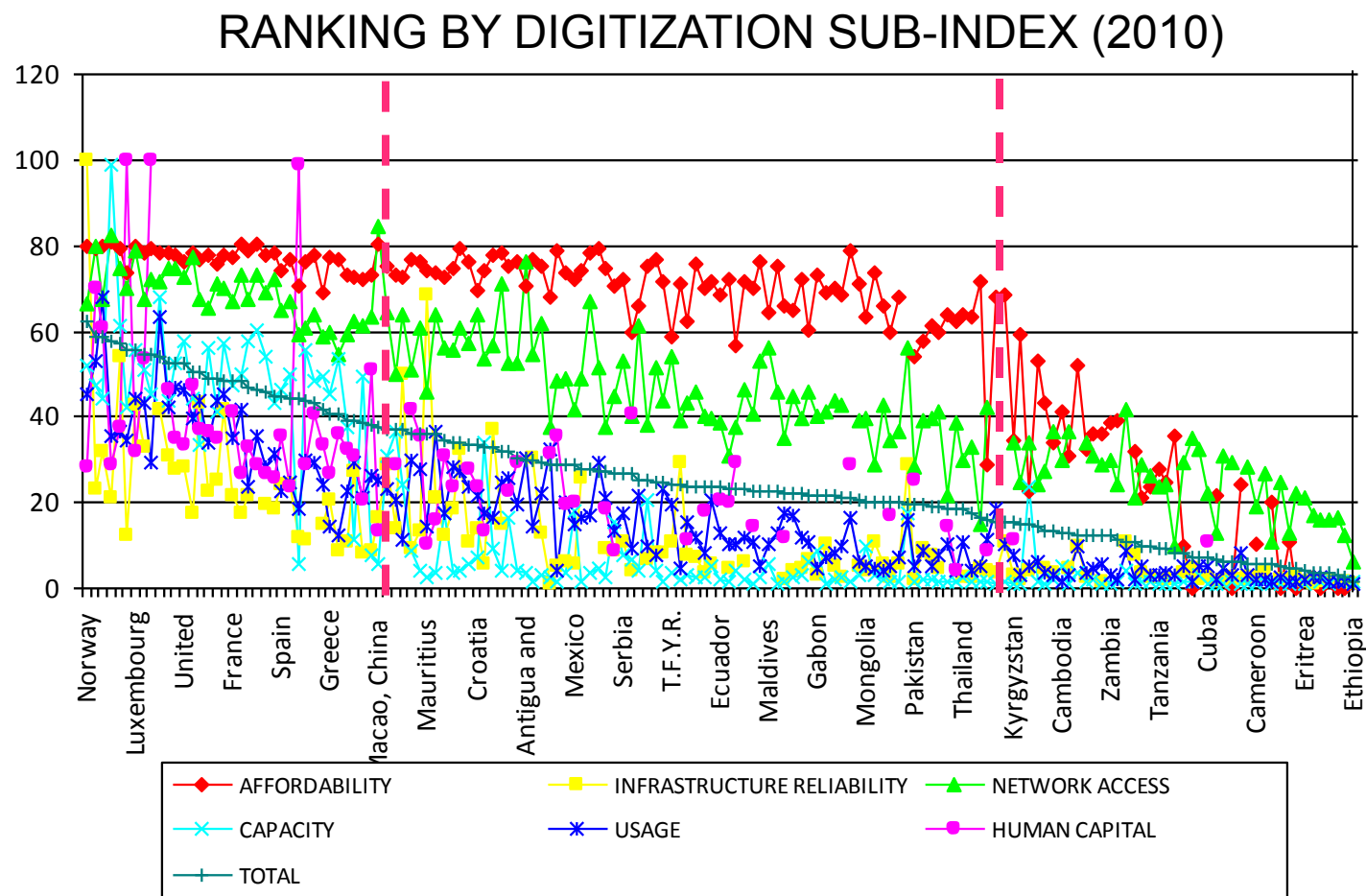
3. Countries where digitization does not increase despite economic growth

Source: Telecom Advisory Services analysis

CLUSTER 1 COUNTRIES ARE CONCENTRATED IN THE EMERGING/ADVANCED WORLD, ALTHOUGH THERE ARE SOME EMERGING COUNTRIES IN CLUSTER 2

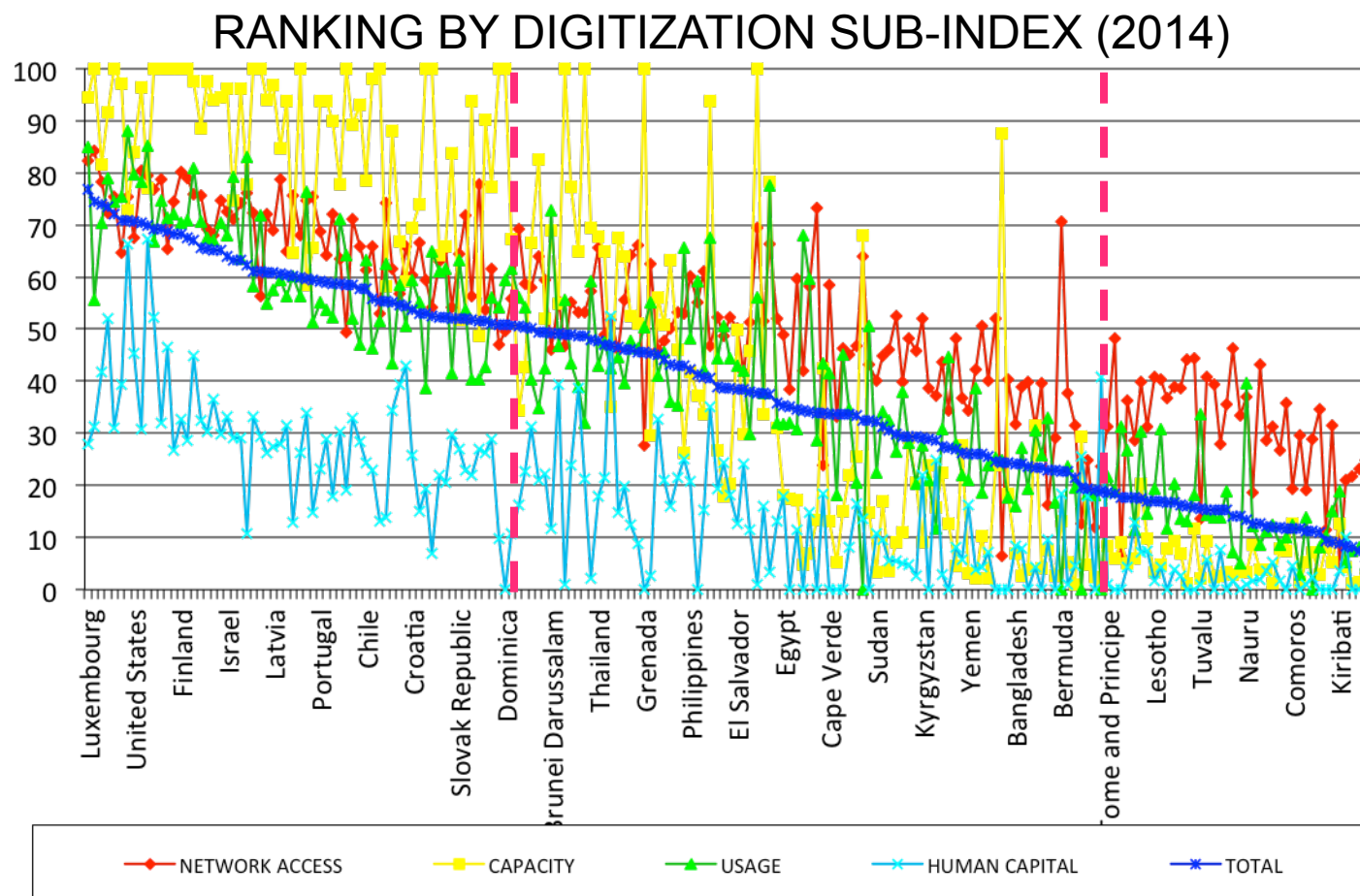
	CLUSTER 1		CLUSTER 2		CLUSTER 3	
	Digitization and the economy are growing in tandem		High digitization appears to have an impact on economic growth		Digitization does not increase despite economic growth	
Western Europe	<ul style="list-style-type: none"> • Luxembourg • Norway • Switzerland • Denmark • Sweden • Iceland • Netherlands • Portugal • Greece 	<ul style="list-style-type: none"> • Germany • Austria • Finland • Belgium • U. Kingdom • France • Italy • Spain 			<ul style="list-style-type: none"> • San Marino 	
Eastern Europe & CIS & Russia	<ul style="list-style-type: none"> • Croatia • Hungary • Turkey • Tajikistan 	<ul style="list-style-type: none"> • Cyprus • Slovenia • Estonia • Slovakia 	<ul style="list-style-type: none"> • Russia • Belarus • Armenia • Ukraine 	<ul style="list-style-type: none"> • Moldova • Kyrgyzstan • Czech Rep. • Poland 	<ul style="list-style-type: none"> • Turkmenistan 	
North America			<ul style="list-style-type: none"> • United States 	<ul style="list-style-type: none"> • Canada 		
Asia-Pacific	<ul style="list-style-type: none"> • Australia • Singapore • Hong Kong • Japan 	<ul style="list-style-type: none"> • China • Indonesia • Malaysia 	<ul style="list-style-type: none"> • New Zealand • South Korea • Taiwan • Thailand 	<ul style="list-style-type: none"> • Philippines • Vietnam • Mongolia • India 	<ul style="list-style-type: none"> • Macao • Brunei • Fiji • Samoa 	
EMEA	<ul style="list-style-type: none"> • Mauritius • Cape Verde • Kenya • Sierra Leone • U.A.E. 	<ul style="list-style-type: none"> • Niger • Saudi Arabia • Mozambique • Somalia • Israel 	<ul style="list-style-type: none"> • South Africa • Zambia • Ghana • Uganda • Egypt 	<ul style="list-style-type: none"> • Ethiopia • Guinea • Liberia • Tunisia 	<ul style="list-style-type: none"> • Eq. Guinea • Gabon • Namibia • Angola • Iraq 	<ul style="list-style-type: none"> • Nigeria • Cote d'Ivoire • Cameroon • Senegal • Qatar
Latin America	<ul style="list-style-type: none"> • T. & Tobago • Uruguay • Argentina • Brazil • Venezuela • Paraguay 	<ul style="list-style-type: none"> • Mexico • Costa Rica • Suriname • Grenada • Peru • Bolivia 	<ul style="list-style-type: none"> • Barbados • Chile • Panama 	<ul style="list-style-type: none"> • Colombia • Ecuador 	<ul style="list-style-type: none"> • Bahamas 	<ul style="list-style-type: none"> • Cuba

ACCESS AND AFFORDABILITY ARE LESS OF A WORLD PROBLEM; BIG SPREADS BETWEEN MATURE AND EMERGING COUNTRIES ARE USAGE, CAPACITY AND HUMAN CAPITAL



- For all countries, normalized usage sub-index never matches the levels of access sub-indices, which indicate a big challenge across the world
- For all OECD and middle income countries, the sub-indices affordability and network access tend to be consistently above the digitization index
- The affordability and capacity sub-indices tend to rapidly drop at low GDP levels,

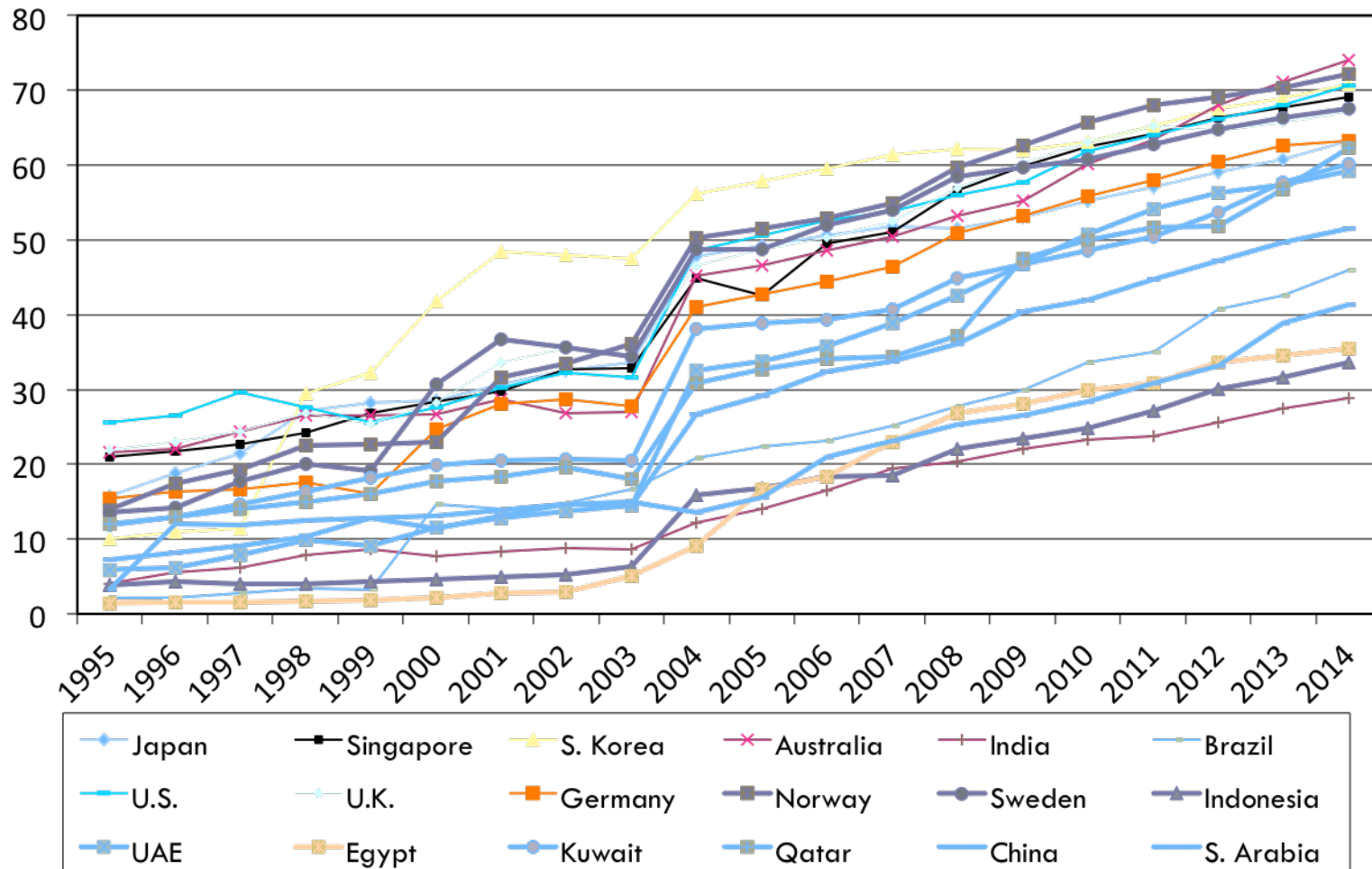
ACCESS AND AFFORDABILITY ARE LESS OF A WORLD PROBLEM; BIG SPREADS BETWEEN MATURE AND EMERGING COUNTRIES ARE USAGE, CAPACITY AND HUMAN CAPITAL



- Overall index has moved up for the whole world
- Usage has moved up matching the overall index
- Human Capital remains consistently under the overall index indicating the big challenge (education, workforce training)

MOST INDUSTRIALIZED COUNTRIES HAVE CONSISTENTLY INCREASED THEIR DIGITIZATION LEVEL OVER THE PAST TWENTY YEARS, ALBEIT AT DIFFERENT RATES

COMPARATIVE EVOLUTION OF DIGITIZATION (1995-2014)



Source: Telecom Advisory Services analysis

IN ADDITION, QUANTUM LEAP CHANGES IN DIGITIZATION ARE TRIGGERED BY SPECIFIC POLICY INITIATIVES

COUNTRY	1995-2000 POLICIES	2000 INDEX	2000-5 POLICIES	2005 INDEX	2005-10 POLICIES	2010 INDEX
China	<ul style="list-style-type: none"> • Creation of MII (1998) 	13.16		15.50	<ul style="list-style-type: none"> • Foreign ownership of telcos allowed up to 49% (2006) • 3G licenses awarded (2009) 	28.33
Saudi Arabia		11.44	<ul style="list-style-type: none"> • STC partial privatization (2003) • Creation of regulator SCC (2003) • Wireless liberalization (2002) 	29.12	<ul style="list-style-type: none"> • Universal Access and Service legislation (2006) • Pro- investment policy in fixed and mobile broadband • Introduction of 3rd mobile competitor • Opening of the fixed voice and data markets during that period 	42.03
India		7.70		14.11	<ul style="list-style-type: none"> • Telecommunications liberalization 	23.36
Indonesia	<ul style="list-style-type: none"> • Privatization of Telkom (1995) 	4.61	<ul style="list-style-type: none"> • Telecom liberalization (2002-3) • 3G licenses awarded (2003) 	16.77		24.90
Egypt		2.15		16.64	<ul style="list-style-type: none"> • ICT strategy 	29.96
Singapore	<ul style="list-style-type: none"> • Creation of IDA (1999) • Telecom liberalization (1995) 	28.33	<ul style="list-style-type: none"> • MNP enacted (2003) • 3G licenses awarded (2001) • Liberalization of telephony (2000) 	42.63	<ul style="list-style-type: none"> • NP enacted for fixed, broadband and mobile (2009) • 4G licenses awarded (2010) • NGN deployed (2010) 	62.43
Brazil	<ul style="list-style-type: none"> • Privatization of Telebras (1995) 	14.59		22.31	<ul style="list-style-type: none"> • National Broadband Plan (2010) 	33.61

Source: Telecom Advisory Services analysis

ALSO IN LATIN AMERICA, INSTITUTIONAL CHANGES GENERATE AN INCREASE IN THE GROWTH RATE OF THE DIGITIZATION INDEX

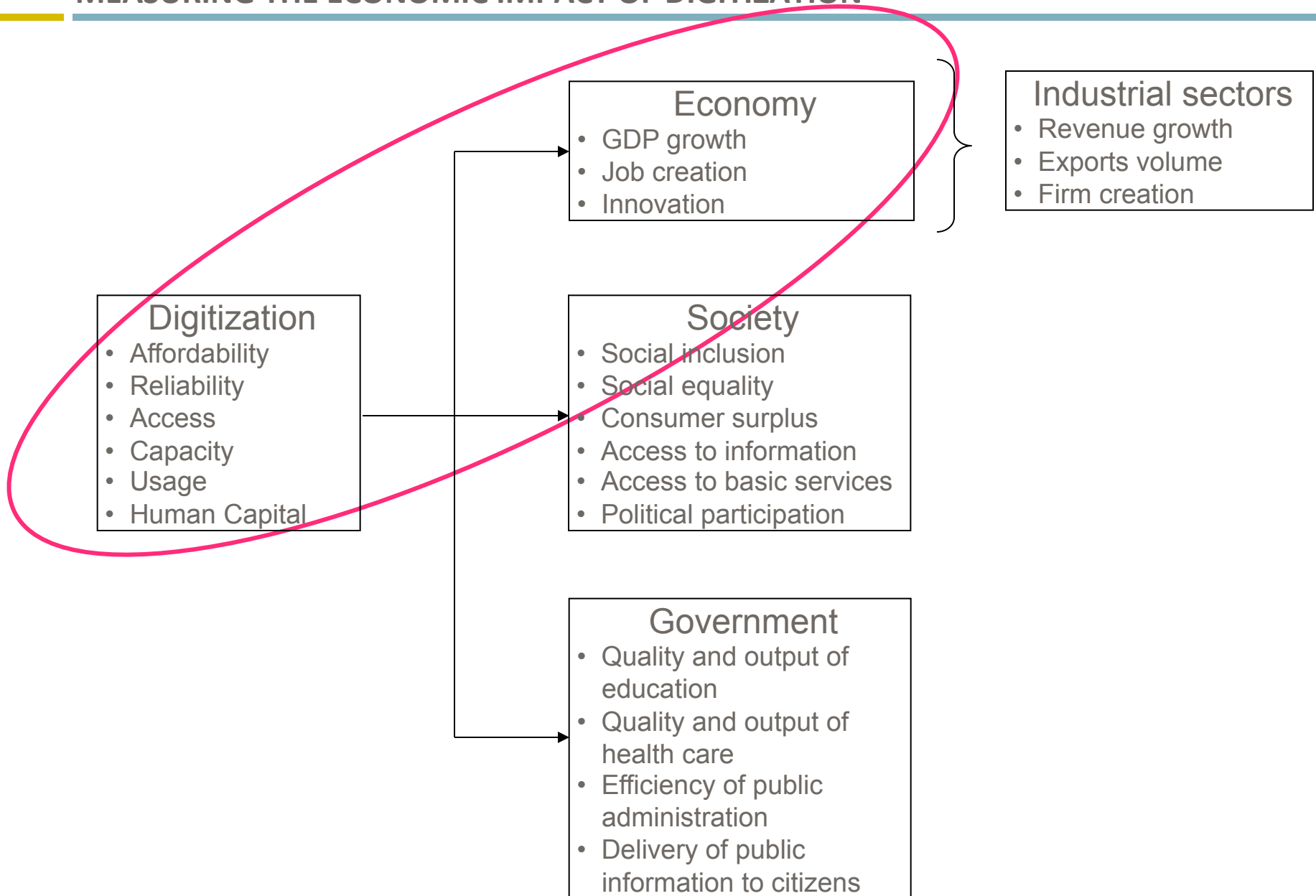
COUNTRY	YEAR	CAGR		POLITICAL-INSTITUCIONAL CHANGE
		BEFORE	AFTER	
Chile	2008	4.74%	8.80%	<ul style="list-style-type: none"> Launch of first version of Agenda Digital
Uruguay	2009	6.16%	9.09%	<ul style="list-style-type: none"> Launch of Plan Ceibal
Panamá	2008	5.90%	14.09%	<ul style="list-style-type: none"> Launch of Plan "Internet para Todos" Autoridad Nacional para la Innovación Gubernamental (2009)
Costa Rica	2010	6.60%	10.67%	<ul style="list-style-type: none"> Launch of Estrategia Nacional de Banda Ancha Transfer of Viceministerio de Telecomunicaciones to Ministerio de Ciencia y Tecnología
Argentina	2009	6.64%	7.11%	<ul style="list-style-type: none"> Launch of Plan Argentina Conectada Coordinación General del Plan Argentina Conectada dentro del Ministerio de Planificación
Ecuador	2011	7.32%	8.54%	<ul style="list-style-type: none"> Launch of Plan Ecuador Digital Creation of MINTEL (8/2009)
Colombia	2011	8.35%	11.23%	<ul style="list-style-type: none"> Creation of MinTIC Launch of Plan Vive Digital
Brasil	2011	7.68%	9.57%	<ul style="list-style-type: none"> Launch of National Broadband Plan

Source: Telecom Advisory Services analysis

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MEASURING THE ECONOMIC IMPACT OF DIGITIZATION



FOR DEVELOPED AND DEVELOPING COUNTRIES 1% INCREASE ON DIGITIZATION INCREASES GDP PER CAPITA BY 0.0749%

Simple Cobb-Douglas form:

$$Y_{(t)} = A_{(t)} K_{(t)}^{1-b} L_{(t)}^b$$

where:

$A_{(t)}$ represents the level of technology progress (in our case the Digitization Index)

$K_{(t)}$ corresponds to the fixed capital formation

$L_{(t)}$ to the labor force

GDP_(t)	Not Weight	Weighted Model
Previous GDP (GDP _(t-1))	0,7508 (0,0228) ***	0,7402 (0,0361) ***
Fixed Capital Stock (K _(t))	0,0953 (0,0252) ***	0,1191 (0,0361) **
Labour Force (L _(t))	-0,0154 (0,0139)	-0,0481 (0,0331)
Digitization Index (A _(t))	0,0633 (0,0204) **	0,0749 (0,0253) **
Constant	1,7817 (0,2779) ***	1,8261 (0,2855) ***
Year Fixed Effect	Yes	Yes
Country Fixed Effect	Yes	Yes
Observations	1.350	1.350
R - Squared	0,9953	0,9934

$$\begin{aligned} \log(\mathbf{GDP}_{i,t}) &= \beta_0 + \beta_1 * \log(\mathbf{GDP}_{i,t-1}) + \beta_2 * \log(A_{i,t}) \\ &\quad + \beta_3 * \log(K_{i,t}) + \beta_4 * \log(L_{i,t}) + \varepsilon_{i,t} \end{aligned}$$

A 10% INCREASE ON DIGITIZATION INCREASES LEADS TO A -0.0715% CHANGE IN UNEMPLOYMENT RATE

- Simple model links unemployment rates with existing infrastructure and human capital levels
- Model controls for country and year fixed effects

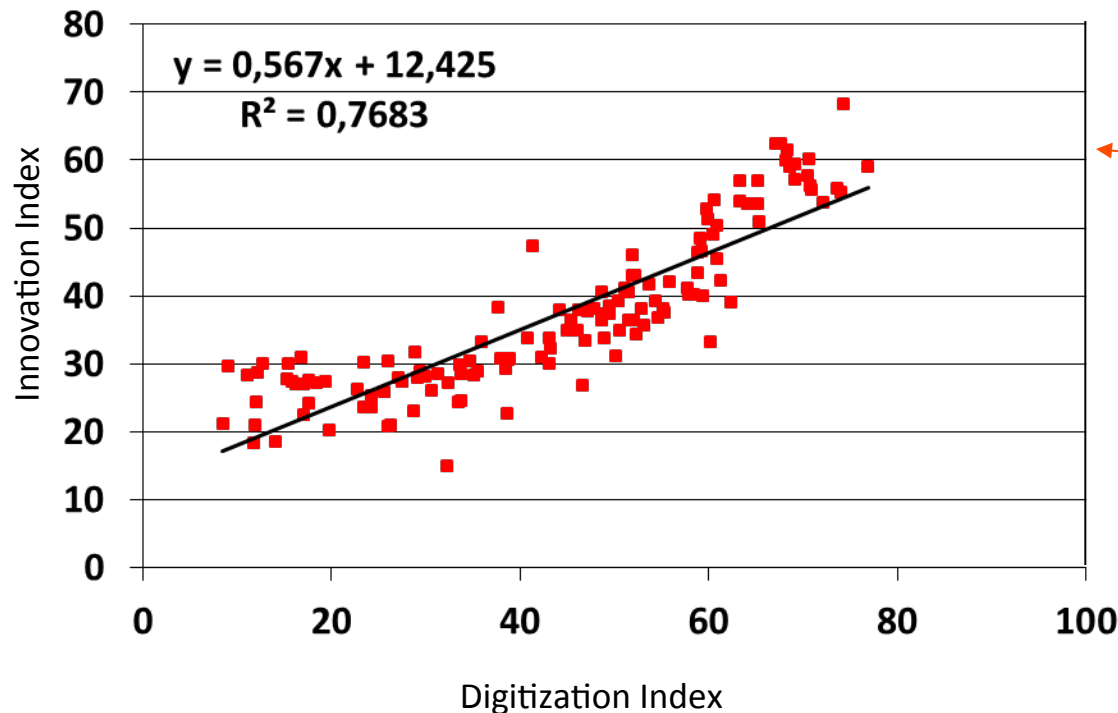
Unemployment _(t)	Not Weight	Weighted Model
Unemployment _(t-1)	0,7067 (0,0348)***	0,7276 (0,0434)***
Fixed Capital Stock (K_{it})	-0,1811 (0,0864)*	-0,2508 (0,1044)**
Human Capital (h_{it})	0,0307 (0,0181)	-0,0050 (0,0502)
Digitization Index (A_{it})	-0,0670 (0,0178)***	-0,0715 (0,0281)**
Constant	1,2023 (0,3052)***	1,0398 (0,3720)***
Year Fixed Effect	Sí	Sí
Country Fixed Effect	Sí	Sí
Observations	1.296	1.296
R - Squared	0,9487	0,9304

$$\begin{aligned}
 &\log(\text{Unemployment}_{i,t}) \\
 &= \beta_1 * \log(\text{Unemployment}_{i,t-1}) + \beta_2 * \log(A_{i,t}) \\
 &+ \beta_3 * \log(K_{i,t}) + \beta_4 * \log(\text{Human Capital}_{i,t}) + \varepsilon_{i,t}
 \end{aligned}$$

Source: Telecom Advisory Services analysis

THE IMPACT OF DIGITIZATION ON INNOVATION IS DUE TO THE CAPACITY TO ENABLE THE CREATION OF NEW FORMS OF ECONOMIC VALUE CREATION

DIGITIZATION AND INNOVATION (2014)



10 POINTS
INCREASE IN
DIGITIZATION
INDEX YIELDS
5.67 POINTS
INCREASE IN
INNOVATION
INDEX

- Acceleration of innovation resulting from the introduction of new ICT-enabled applications and services
- New applications and services (telemedicine, Internet search, e-commerce, online education, VOD and social networking)
- New forms of commerce and financial intermediation

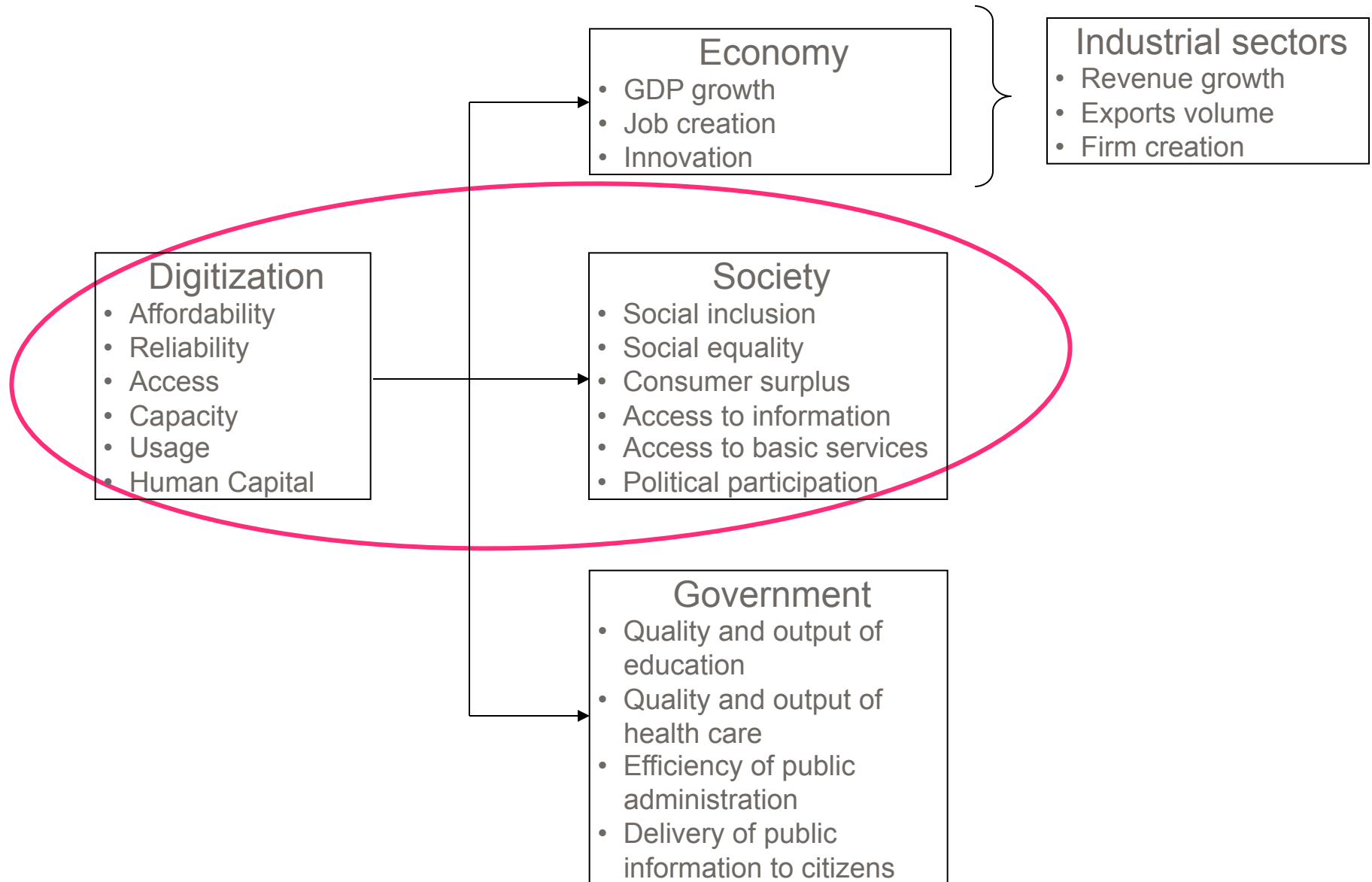
Source: Telecom Advisory Services analysis

IN SUM, DIGITIZATION HAS BEEN FOUND TO HAVE A CONTRIBUTION TO THE THREE ECONOMIC VARIABLES

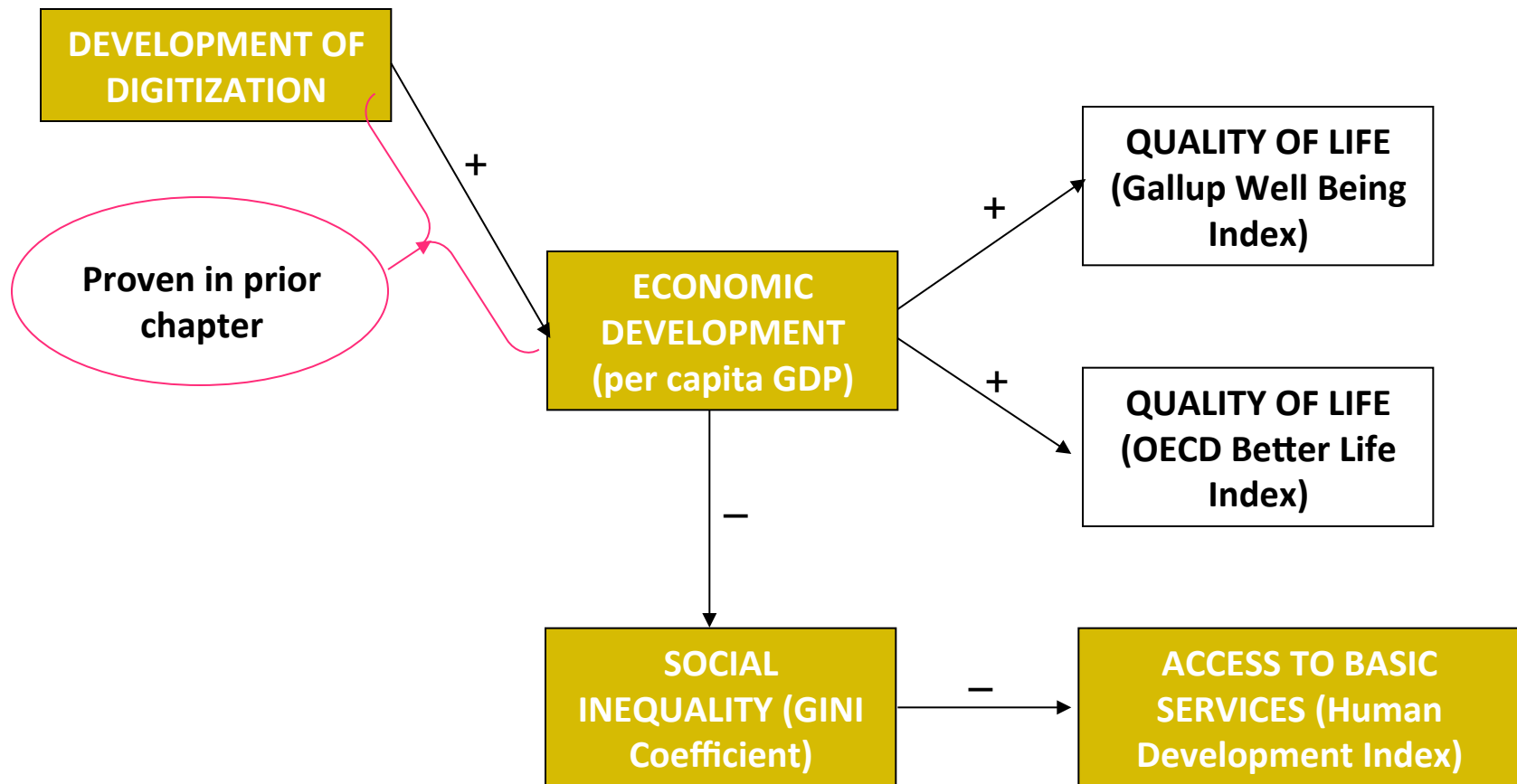
ECONOMIC VARIABLE	CONTRIBUTION OF DIGITIZATION	OBSERVATIONS
<ul style="list-style-type: none"> Growth of GDP per capita 	<ul style="list-style-type: none"> 1% increase on digitization index increases GDP per capita by 0.0749% 	<ul style="list-style-type: none"> A production function for a sample of more than 100 countries between 2000 and 2014 All signs of coefficients are in the expected direction of causality Coefficient of digitization is significant at the 10% level 1,350 Observations
<ul style="list-style-type: none"> Decrease in growth of unemployment rate 	<ul style="list-style-type: none"> 10% increase on digitization index decreases the rate of unemployment by 0.715% 	<ul style="list-style-type: none"> Fixed effects panel data regression run for more than 80 countries Coefficients of all control variables have the expected sign All canonical variables are statistically significant Coefficient of digitization is significant at the 10% level 1,296 observations
<ul style="list-style-type: none"> Increase in innovation 	<ul style="list-style-type: none"> 10 Points increase in digitization index yields 5.67 points increase in innovation index 	<ul style="list-style-type: none"> Data limitations allow for correlation analysis only 136 observations Digitization index coefficient was found to be statistically significant Data for 2014

Source: Telecom Advisory Services analysis

WE HAVE ALSO EVALUATED THE SOCIAL IMPACT OF DIGITIZATION



WE WILL NOW EXAMINE IN MORE DEPTH THE PATH LINKING DIGITIZATION TO INEQUALITY AND ACCESS TO SOCIAL SERVICES



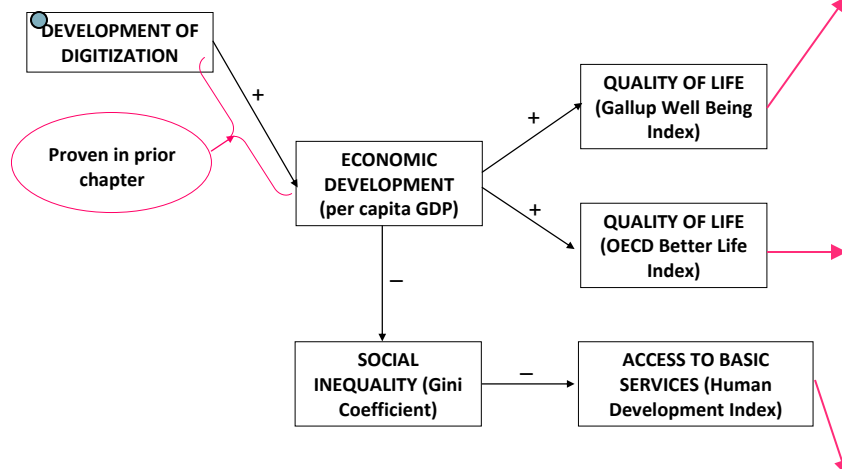
THE HYPOTHESES CAN BE SPECIFIED ACCORDING TO THE FOLLOWING EFFECTS

EFFECTS	DETAIL	EVIDENCE SO FAR
Digitization and Quality of Life	<ul style="list-style-type: none"> By having an impact on economic development, digitization has a transitive impact on quality of life 	<ul style="list-style-type: none"> Digitization contributes to economic development (1% increase on digitization index increases GDP per capita by 0.0749%) Economic development and quality of life should be causally linked
Digitization and Inequality	<ul style="list-style-type: none"> By having an impact on economic development, digitization contributes to decreasing poverty levels and therefore, reducing inequality 	<ul style="list-style-type: none"> Digitization and economic growth have already been proven in the prior section (1% increase on digitization index increases GDP per capita by 0.0749%) Economic growth contributes to the decrease of inequality (according to the inverted “U” polynomial function of Kusnetz Law, an increase in economic development beyond US \$7000 reduces inequality)
Digitization and access to basic services	<ul style="list-style-type: none"> By decreasing income inequality, digitization contributes to access of basic services by general population 	<ul style="list-style-type: none"> Income inequality and access to basic services are indirectly linked (see UNDP Report)

Source: Telecom Advisory Services analysis

THE REGRESSION RESULTS SHOW THE DIGITIZATION INDEX TO BE CONSISTENTLY CORRELATED WITH OTHER SOCIAL IMPACT INDICES

REGRESSION OF THE DIGITIZATION INDEX AGAINST THREE SOCIAL INDICES

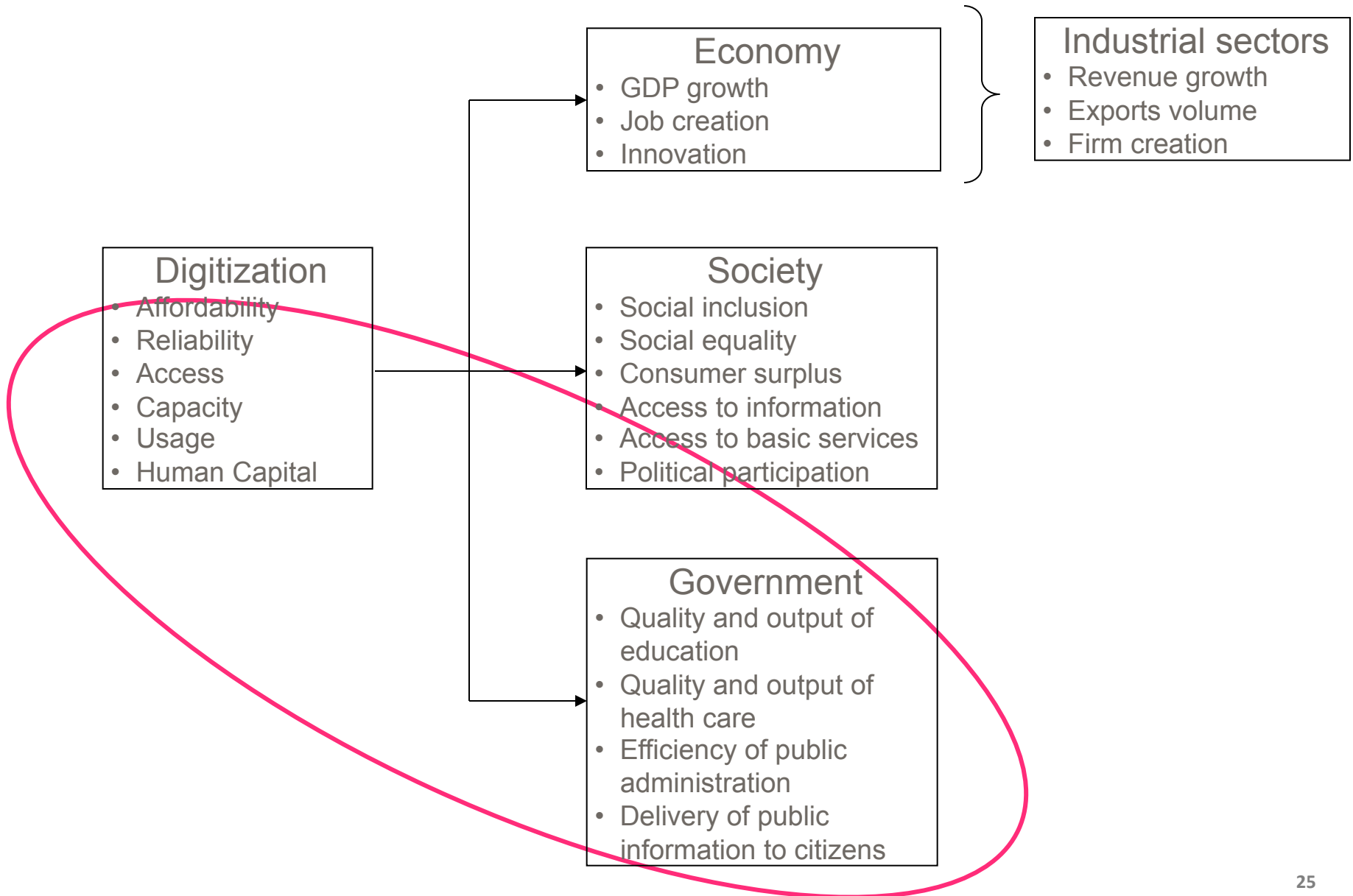


		Digitization Index	Digitization Index	Digitization Index
Better Life Index	Coefficient	0.1391***		
	T-statistic	(7.32)		
	R-squared	0.5827		
Well-Being Survey	Coefficient		0.0084 ***	
	T-statistic		(6.21)	
	R-squared		0.4053	
Human Development Index	Coefficient			0.2187 ***
	T-statistic			(-4.30)
	R-squared			0.8681
Constant		0.1474 ***	0.039 ***	.0074 ***
		(1.03)	(5.61)	(8.50)
Number of observations		34	94	109

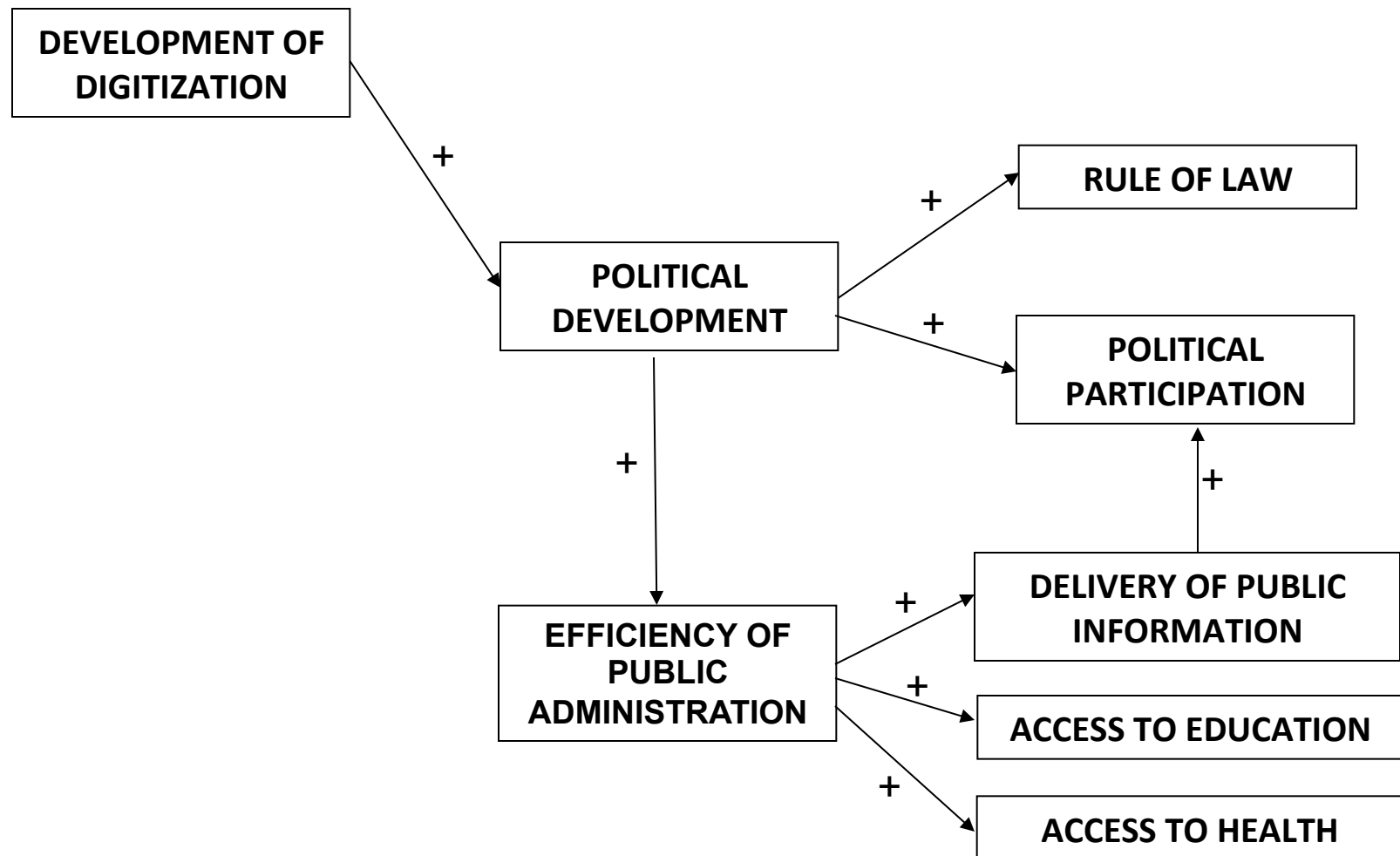
Note: * p < 0:05, ** p < 0:01, *** p < 0:001

Source: Telecom Advisory Services analysis

WE HAVE ALSO COMPLETED EVALUATING THE IMPACT OF DIGITIZATION ON POLITICAL DEVELOPMENT AND GOVERNMENT EFFICIENCY

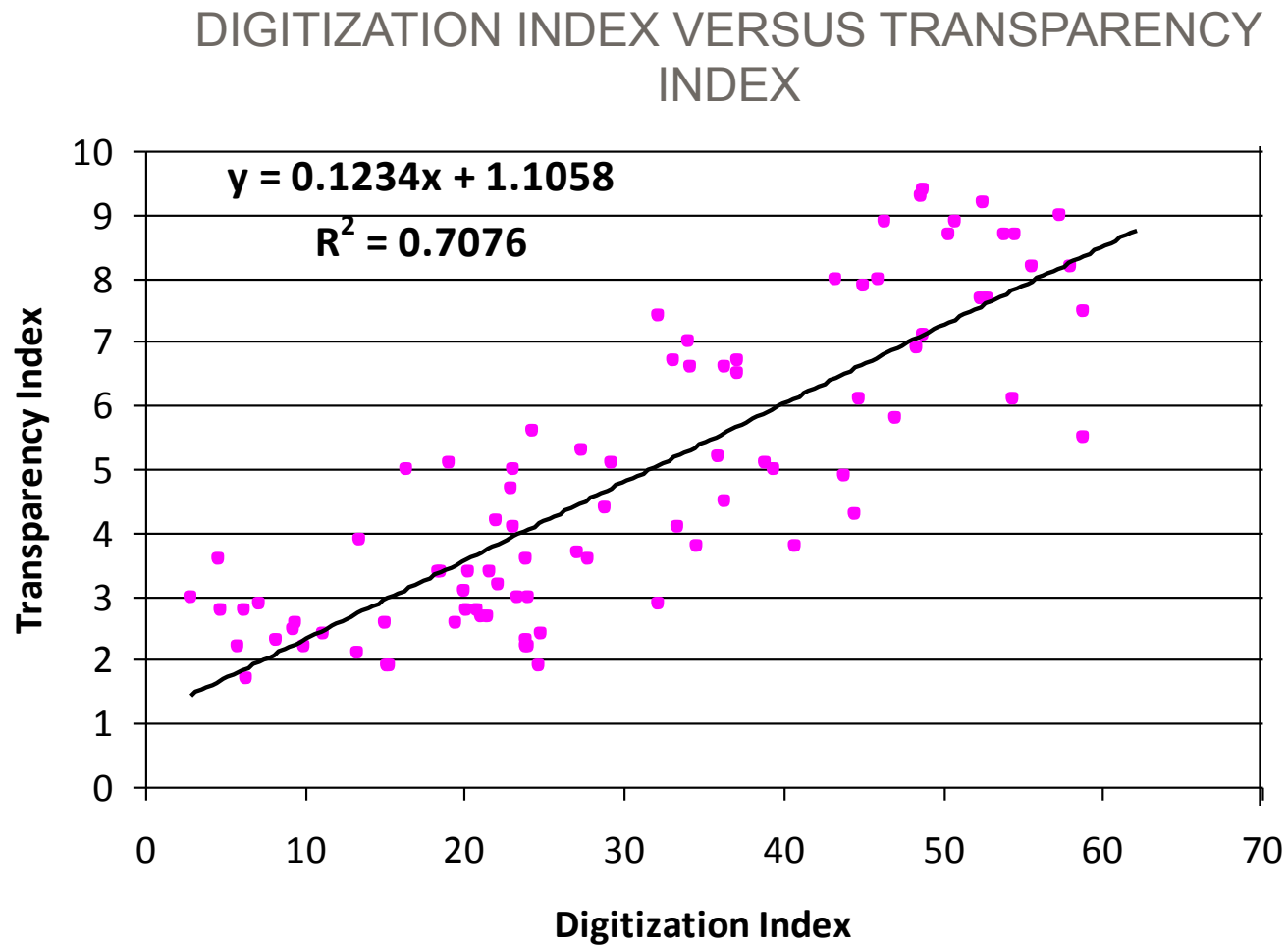


THE SET OF HYPOTHESES REGARDING POLITICAL IMPACT TO BE TESTED IS CAPTURED IN THE FOLLOWING CRITICAL PATH



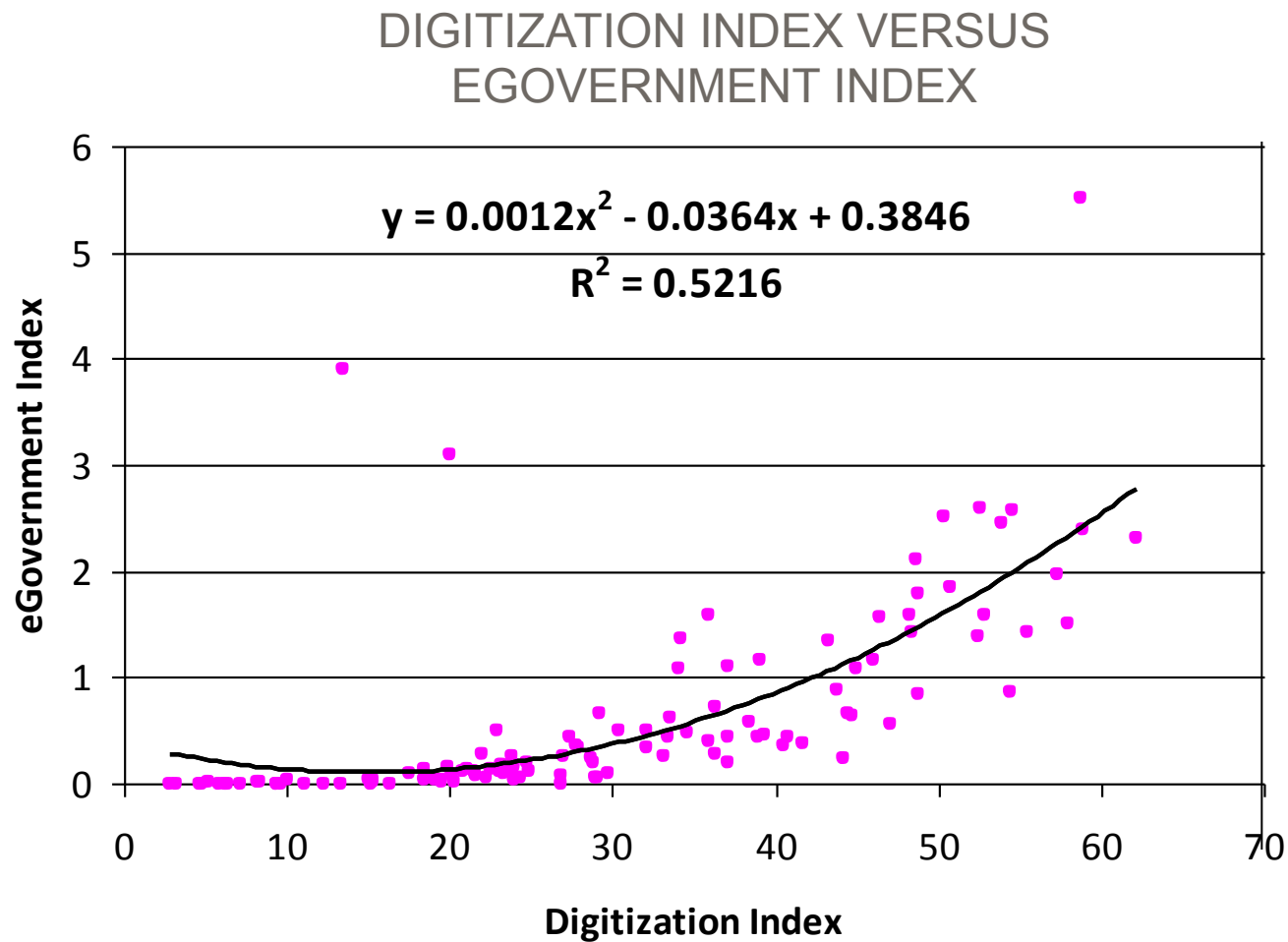
Source: Telecom Advisory Services analysis

DIGITIZATION APPEARS TO POSITIVELY CONTRIBUTE TO THE TRANSPARENCY OF THE POLITICAL STRUCTURE



Source: Telecom Advisory Services analysis

IN ADDITION, DIGITIZATION AND eGOVERNMENT APPEAR TO BE RELATED

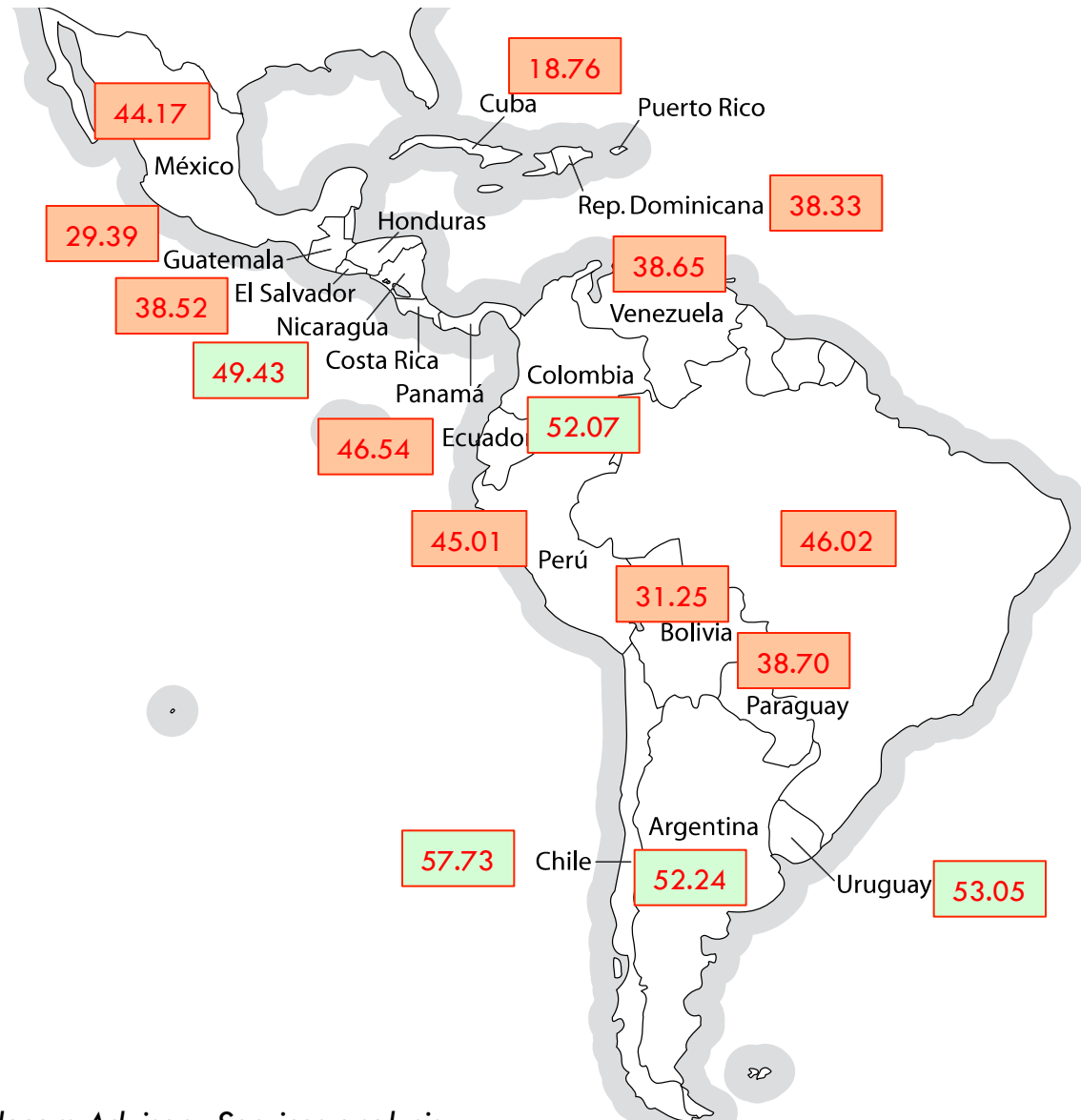


Source: Telecom Advisory Services analysis

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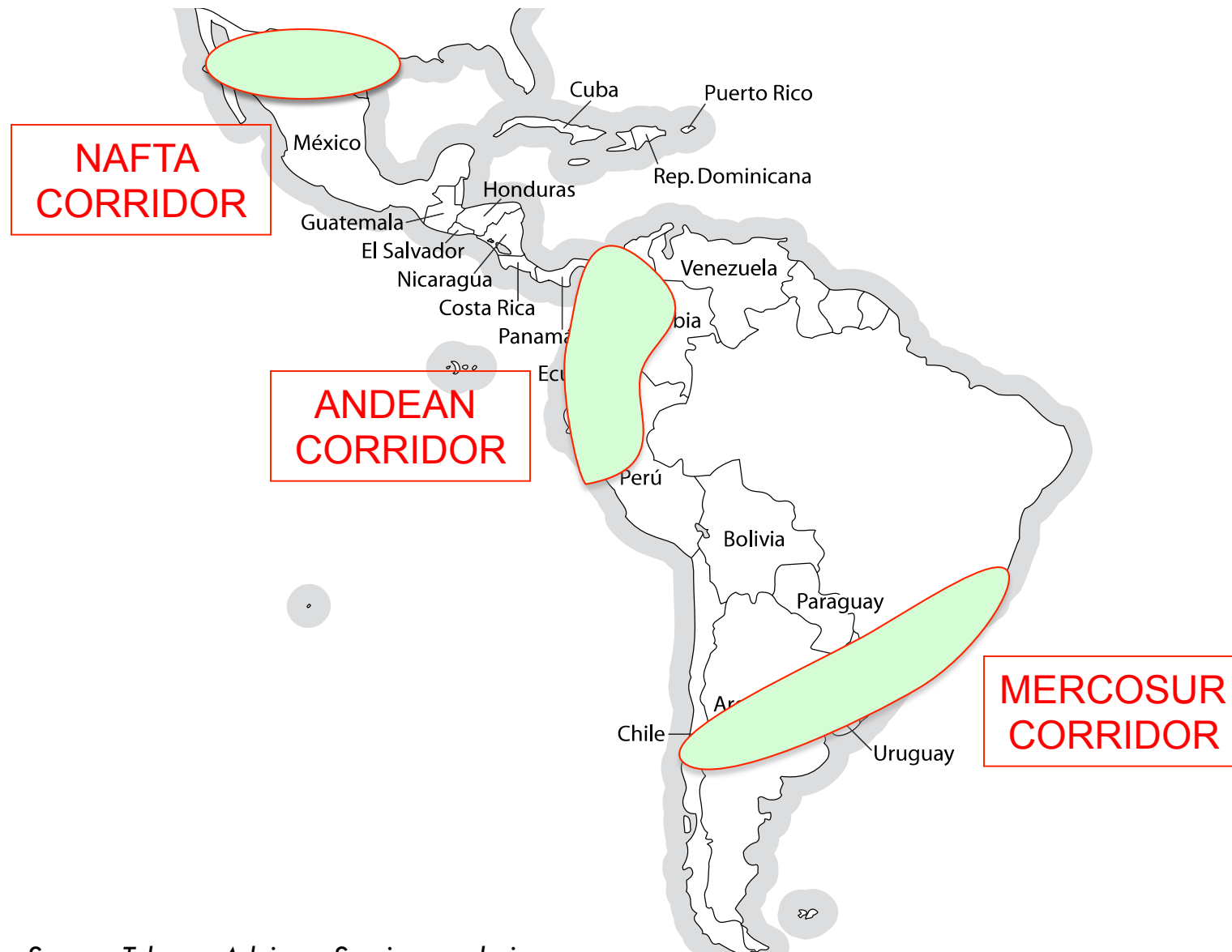
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LATIN AMERICAN DIGTIZATION: A TALE OF TWO CONTINENTS



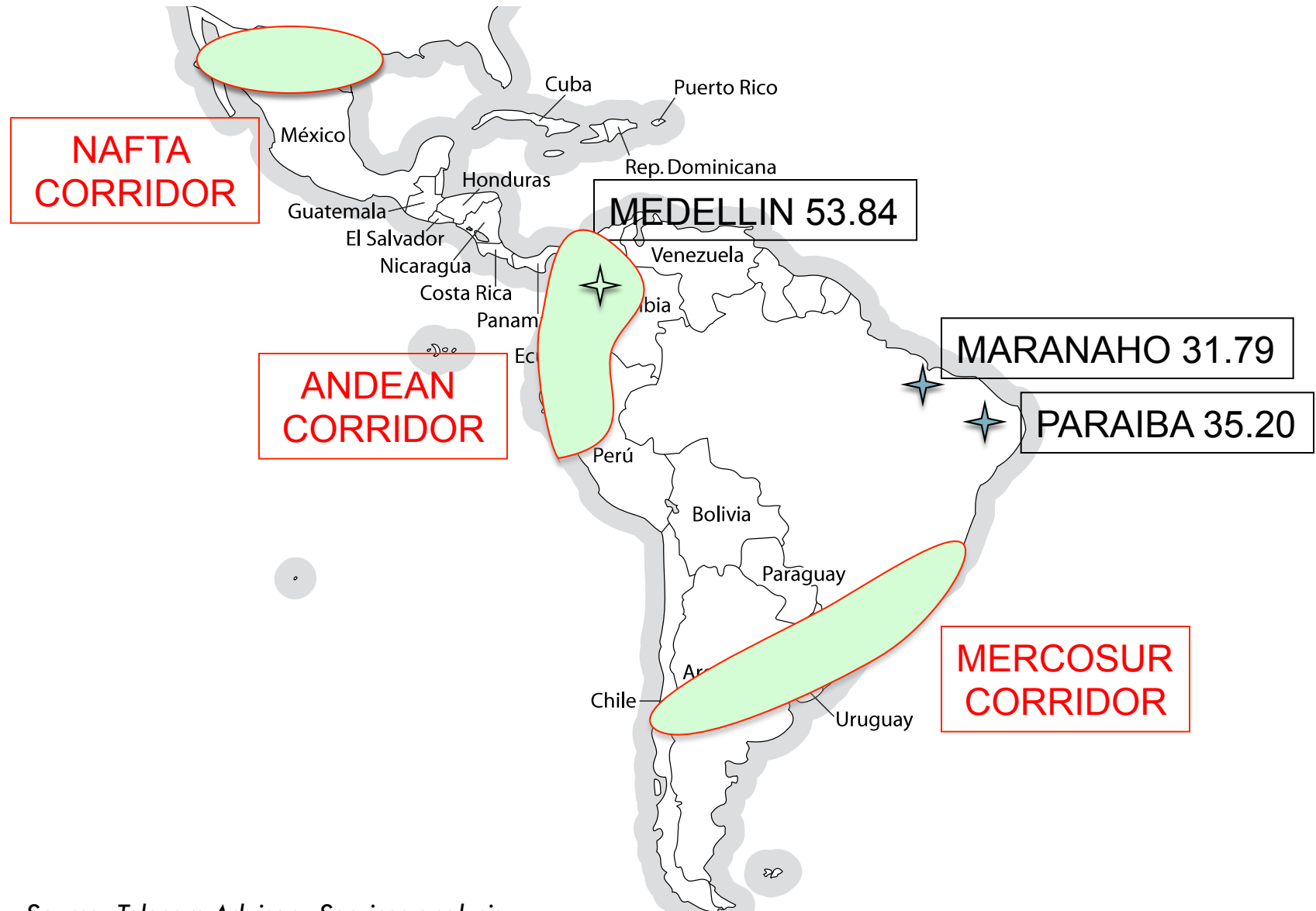
Source: Telecom Advisory Services analysis

LATN AMERICAN DIGITIZATION: A TALE OF THREE REGIONS



Source: Telecom Advisory Services analysis

LATIN AMERICAN DIGITIZATION: WORLD CITIES AND BACKWARD PROVINCES



Source: Telecom Advisory Services analysis

AGENDA

- Development paths to digitization
- Social and economic impact of digitization
- National and sub-national dimensions of digitization
- Policy implications

RANKING OF COUNTRIES USING THE INDEX YIELDS AN UNDERSTANDING OF STAGES OF DIGITIZATION DEVELOPMENT

- There are three clusters of countries in terms of the relationship between digitization and development
 - Countries where digitization and the economy are growing in tandem
 - Countries where high digitization appears to have an impact on economic development (the threshold of digitization level is 50; after this point the level of economic development increases consistently)
 - Countries where digitization does not increase despite high levels of economic development
- Not only are countries at different stages of digitization development; they tend to follow different paths to reach full digitization
 - Mature countries follow a gradual progression towards digitization
 - Some emerging countries undergo quantum leap changes (25 points in five years) in digitization triggered by specific policy initiatives
- The analysis of countries that are rapidly increasing their digitization could be linked to two distinct economic development drivers

DIGITIZATION HAS A LARGE ECONOMIC CONTRIBUTION TO GDP GROWTH AND JOB CREATION

- 1% increase on digitization index increases GDP per capita by 0.0749%, while 10% increase on digitization index decreases the rate of unemployment by 0.715%; this amount of impact is higher than that of broadband alone
- Implication: achieving broadband penetration is only one aspect of required policies; maximization of economic impact can only be achieved through a holistic set of policies ranging from telecoms to computing to adoption of internet and Ecommerce
- The higher level of digitization, the more intense innovation is: 10 Points increase in digitization index yields 5.67 points increase in innovation index
- The more important sub-indices of digitization in driving innovation are network capacity and usage The implications of this finding are critical:
 - Providing access or infrastructure reliability is not enough to promote innovation capacity
 - This needs to be followed with high capacity networks and high Internet adoption within the economy and the social fabric

DIGITIZATION IS ALSO SIGNIFICANTLY CORRELATED WITH QUALITY OF LIFE, ALTHOUGH THE RELATIONSHIP IS STRONGER AT HIGHER LEVELS OF DEVELOPMENT

- At lower levels of development, digitization is less related to quality of life because other factors remain critical in terms of needs
 - When considering all countries in our sample (94), 1% increase in digitization yields 0.001 increase in Gallup's Well Being Index
 - On the other hand, 1% increase in digitization for OECD countries results in 0.09% increase in the OECD Better Life Index
- The difference in strength of effect is due to the fact that at lower levels of economic development (captured in the full sample of Gallup's Well being Index), there are other variables, beyond digitization that affect quality of life

REGRESSION OF SUB-INDICES OF DIGITIZATION TO SOCIAL INDICES YIELDED OTHER IMPORTANT FINDINGS

- More specifically, countries that exhibit larger deployment of technology (networks and devices), higher network capacity, and lower pricing significantly increase the impact on social well-being
- Beyond the dimensions of access, capacity and affordability, usage is the more important lever
 - In other words, lower pricing, network deployment and device access and network capacity are not enough
 - The social return on digitization can only be achieved if usage is increased
 - This requires targeting demand side factors, which comprise E-commerce penetration, E-government applications adoption, internet usage intensity, local development internet content, social network adoption, and wireless broadband usage

FINALLY, DIGITIZATION HAS ALSO AN IMPACT ON COUNTRIES' POLITICAL DEVELOPMENT AND GOVERNMENT EFFICIENCY

- A relationship appears to exist between digitization and the level of transparency of a political system
 - The adoption of digital platforms favors free flow of information among the citizens of a country, which in turn results in a forcing function that promotes transparency of financial institutions
 - As such, 1% increase in digitization yields an increase of 0.10% in the transparency index
- Likewise, a correlation could exist between eGovernment adoption and digitization, although this reflects a somewhat circular argument; unfortunately the World Bank Index of Public Sector efficiency lacks sufficient coverage to enable a comprehensive assessment of its link to digitization
- Finally, a relationship appears to exist between digitization and the quality of education services delivered by the government, when measured by a country education index, when controlled by inequality
- One could hypothesize, as well, that, based on research conducted in mature countries, digitization has an impact on civic life and public participation, but no indicators are available as of now to test this on a global scale

IMPLICATIONS OF THESE FINDINGS IN TERMS OF PUBLIC POLICY

- The enhanced impact of digitization vis-à-vis broadband requires to tackle the formulation of ICT policies in a comprehensive/holistic manner, covering all areas of the eco-system
- Complementing the deployment of networks, government policies need to emphasize usage, targeting to reach 15% of eCommerce transactions/retail, an eGovernment web measurement index higher than 30, and internet adoption higher than 30%
- Countries that aim at achieving a quantum leap in digitization (25 points rise of the index in five years) need to combine four levers: telecom market liberalization with spill-over impact on eco-system, usage promotion policies, a combination of active government involvement and private sector participation, and centralized convergent state planning
- Digitization promotion policies need to be combined with industrial sector related policies aimed at generating the spill-over ICT impact on economic growth and job creation

TELECOM ADVISORY SERVICES, LLC

For further information please contact:

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

Telecom Advisory Services LLC

182 Stissing Road

Stanfordville, New York 12581 USA