

The Transformative Economic Impact of Digital Technology

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Digitization is the capacity to use digital technologies to generate, process, share and transact information

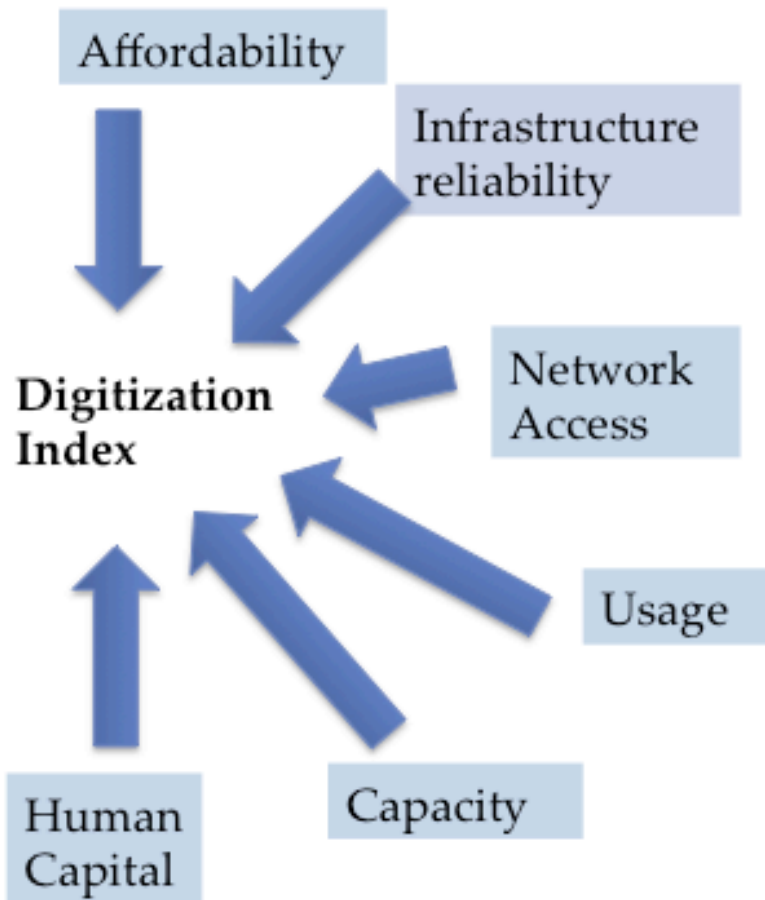
- At the most basic level, digitization is the process of converting analog information into a digital format
- In a broader context, digitization is defined as the social transformation triggered by the massive adoption of digital technologies to generate, process, share and transact information
- Digitization builds on the evolution of network access technologies, semiconductor technologies, and software engineering
- Leverages the spillover effects resulting from their use (common platforms for application development, e-government services, e-commerce, social networks, and availability of online information)

To achieve a significant impact, digitization has to be widely diffused within the economic and social fabric of a nation

- Adopted at three levels
 - 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 to allow scalable impact
 - Ubiquitous reaching most population of a national territory
 - Accessible by multiple fixed and mobile voice and data devices
 - Reliable, providing sufficient capacity to deliver vast amounts of information at speeds that do not hinder their effective use

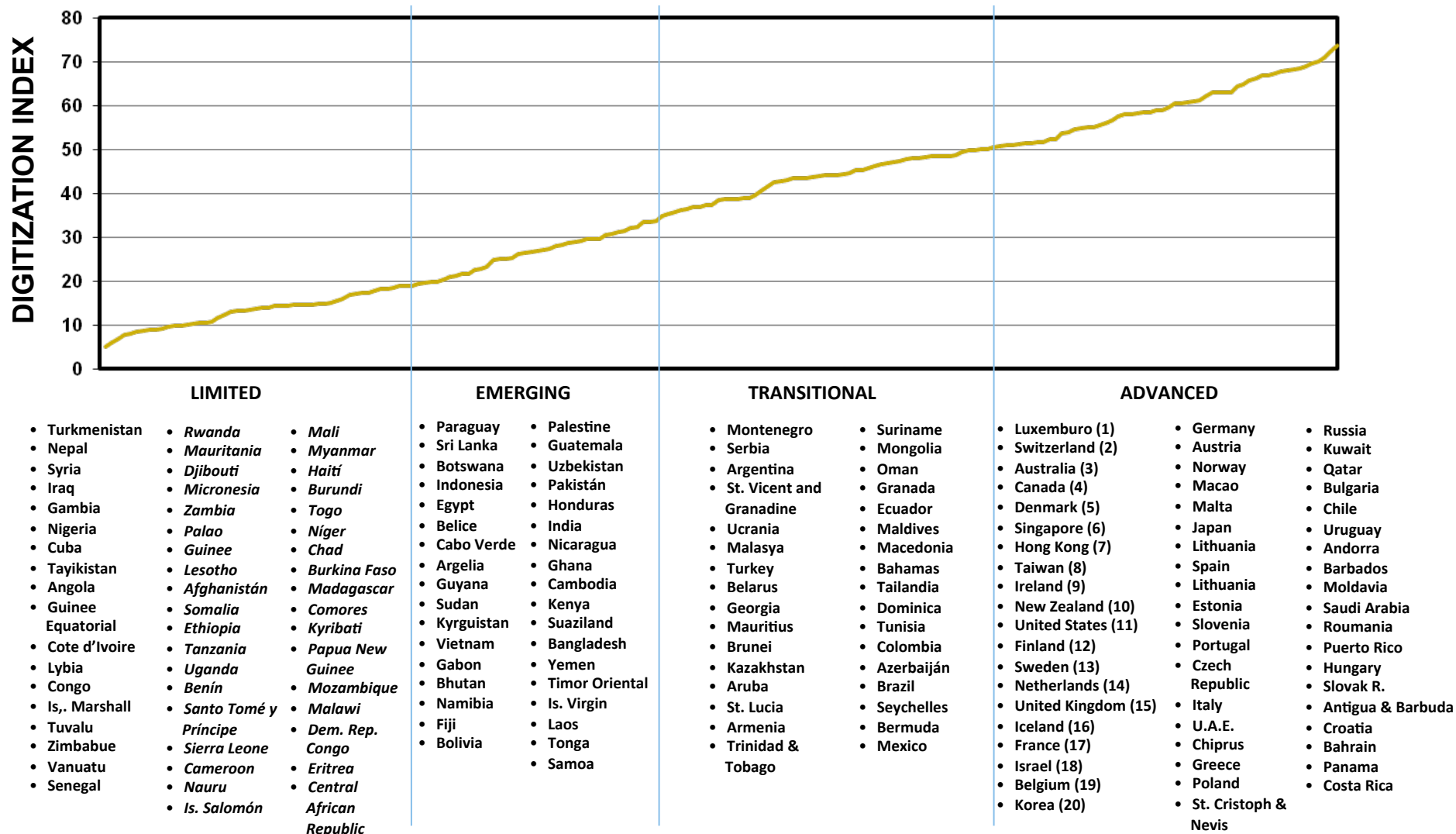
A composite index comprising 25 indicators was developed to measure the level of digitization of a given country

DIGITIZATION INDEX



Components	Indicators
Affordability	Residential fixed line tariff adjusted for GDP per capita
	Residential fixed line connection fee adjusted for GDP per capita
	Mobile cellular prepaid tariff adjusted for GDP/capita
	Mobile cellular prepaid connection fee adjusted for GDP per capita
	Fixed broadband Internet access cost adjusted for GDP per capita
	Samrtphone broadband Internet access cost adjusted for GDP per capita
	UBS/dongle broadband Internet access cost adjusted for GDP per capita
Infrastructure Reliability	Mobile investment per telecom subscriber
	Broadband investment per telecom subscriber
	Fixed line investment per telecom subscriber
Network Access	Fixed Broadband penetration
	Mobile Phone penetration
	Mobile Broadband penetration
	PC population penetration
	Mobile cellular network coverage
Capacity	International Internet bandwidth (kbps/user)
	% Broadband connections higher than 2 Mbps
Usage	Internet retail volume
	E-government usage
	% Individuals using the internet
	Data as % of wireless ARPU
	Dominant Social Network Unique Visitors per month Per Capita
	SMS Usage
Human Capital	% Engineers in labor force
	% Skilled Labor

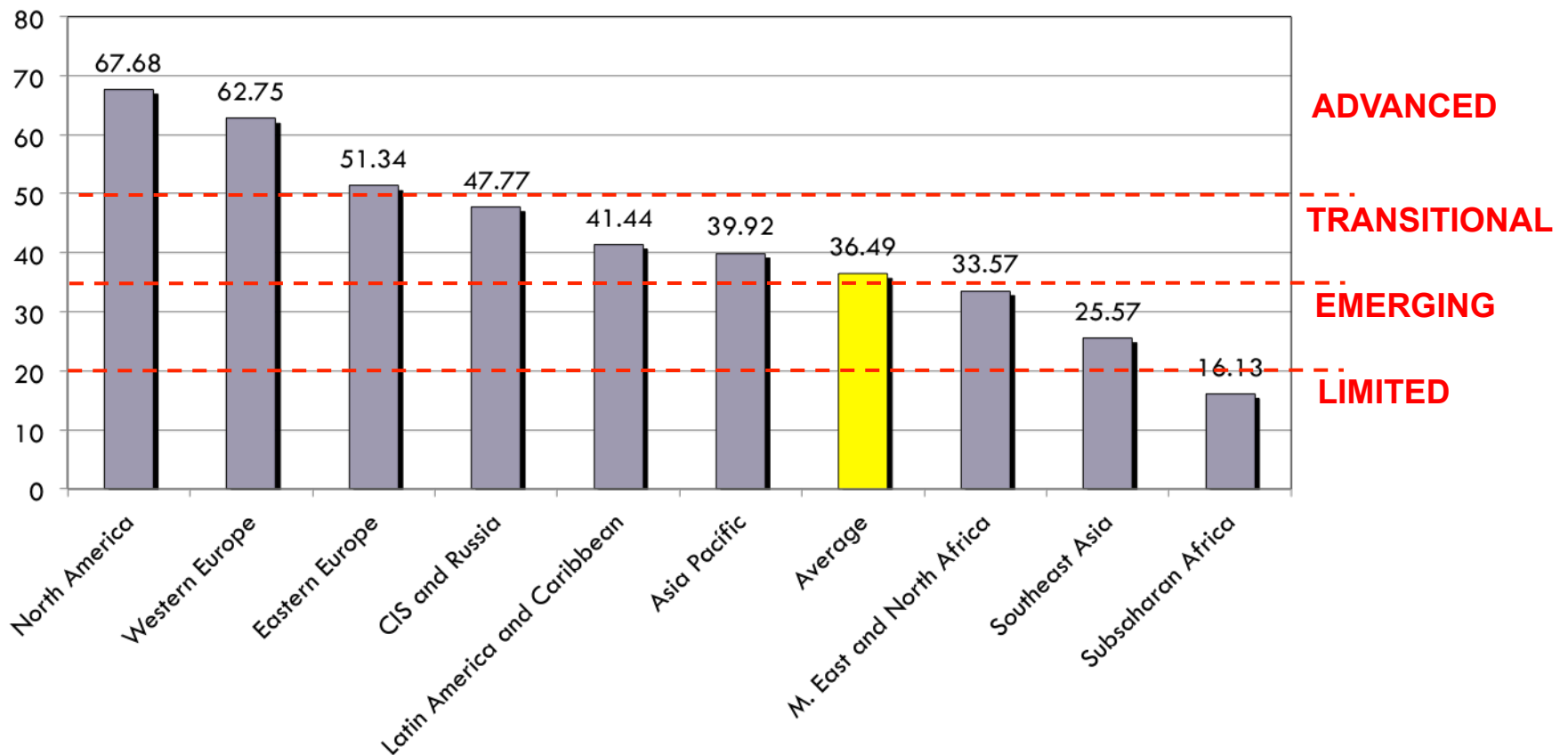
The 2013 Digitization Index was calculated for 150 countries, indicating four developmental stages



Source: Calculated in 2015 on Katz, Koutroumpis and Callorda (2013). The Latin American path towards digitization

The emerging world is primarily at the transitional, emerging and limited stages of development

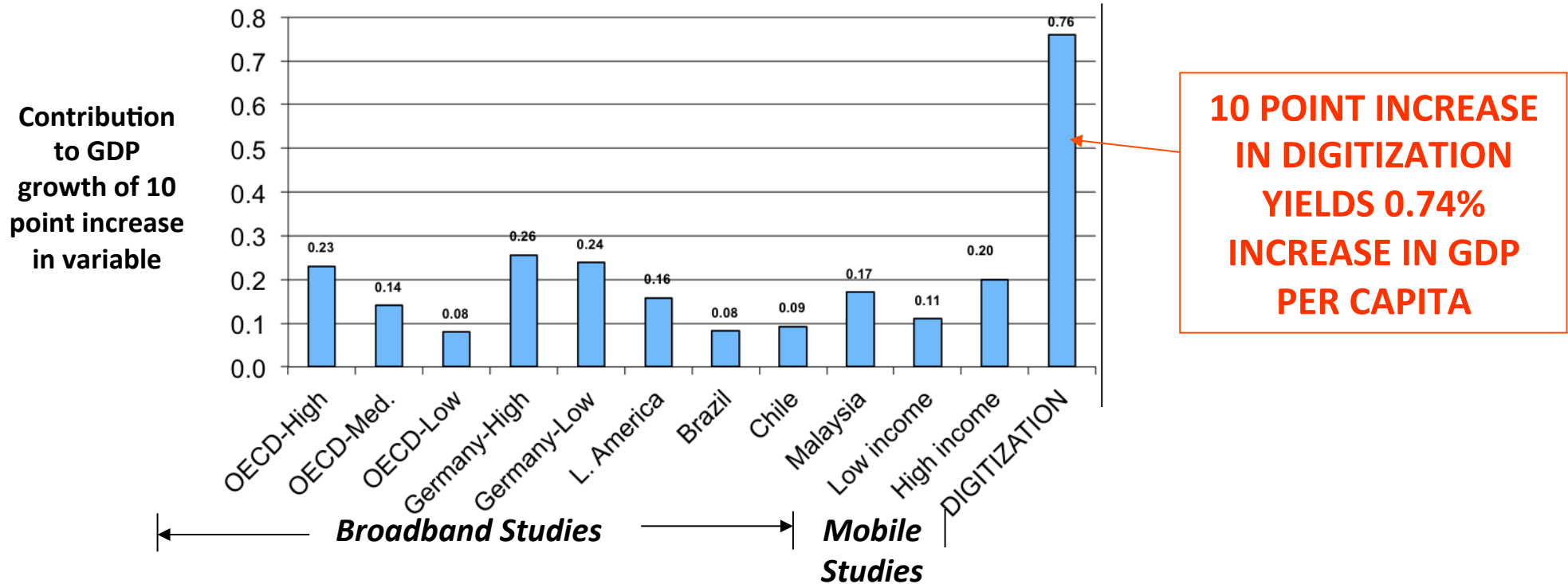
DIGITIZATION BY REGION(2013)



Source: Calculated in 2015 on Katz, Koutroumpis and Callorda (2013). The Latin American path towards digitization

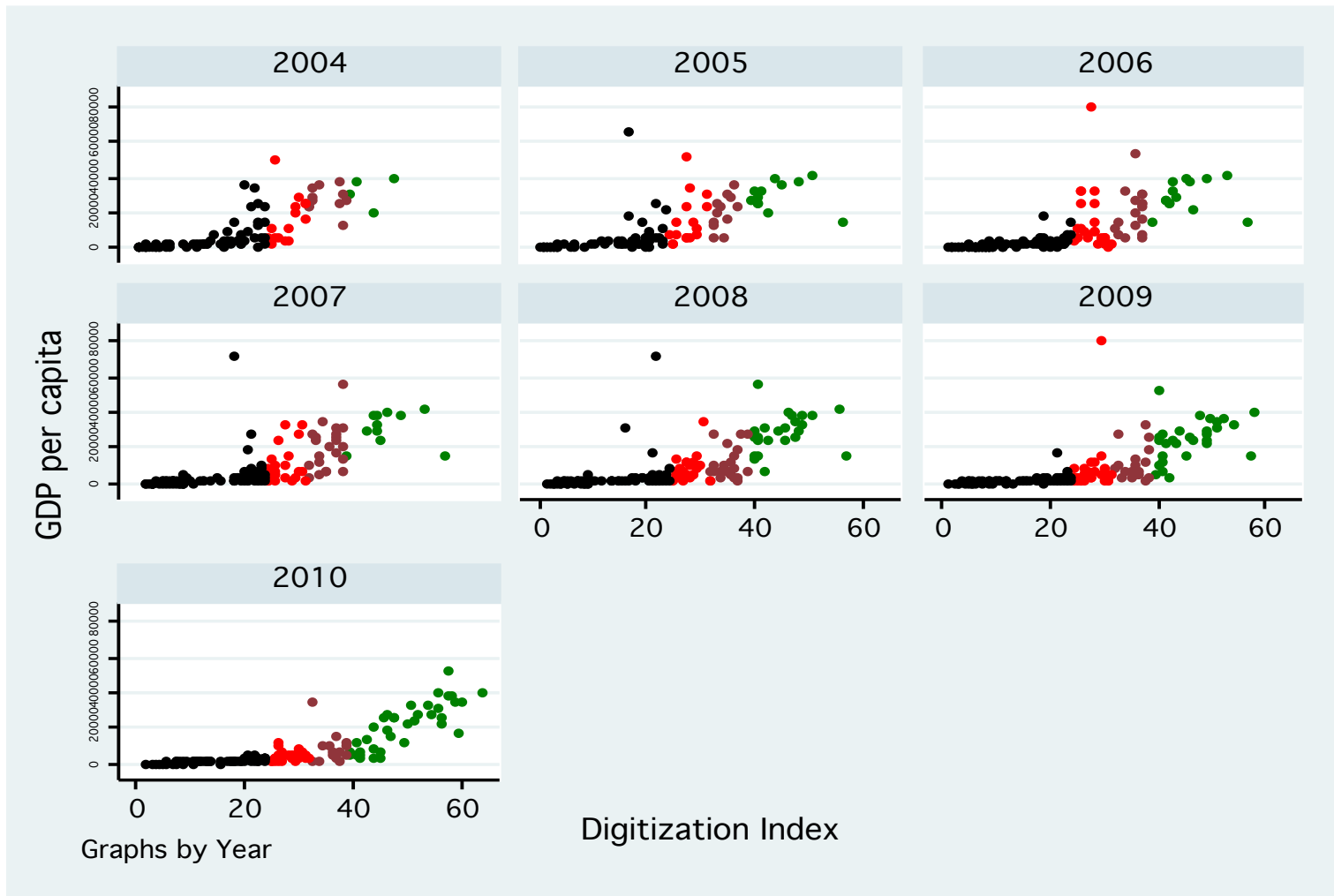
Digitization has a larger contribution to GDP than stand-alone technologies

DIGITIZATION AND ECONOMIC DEVELOPMENT



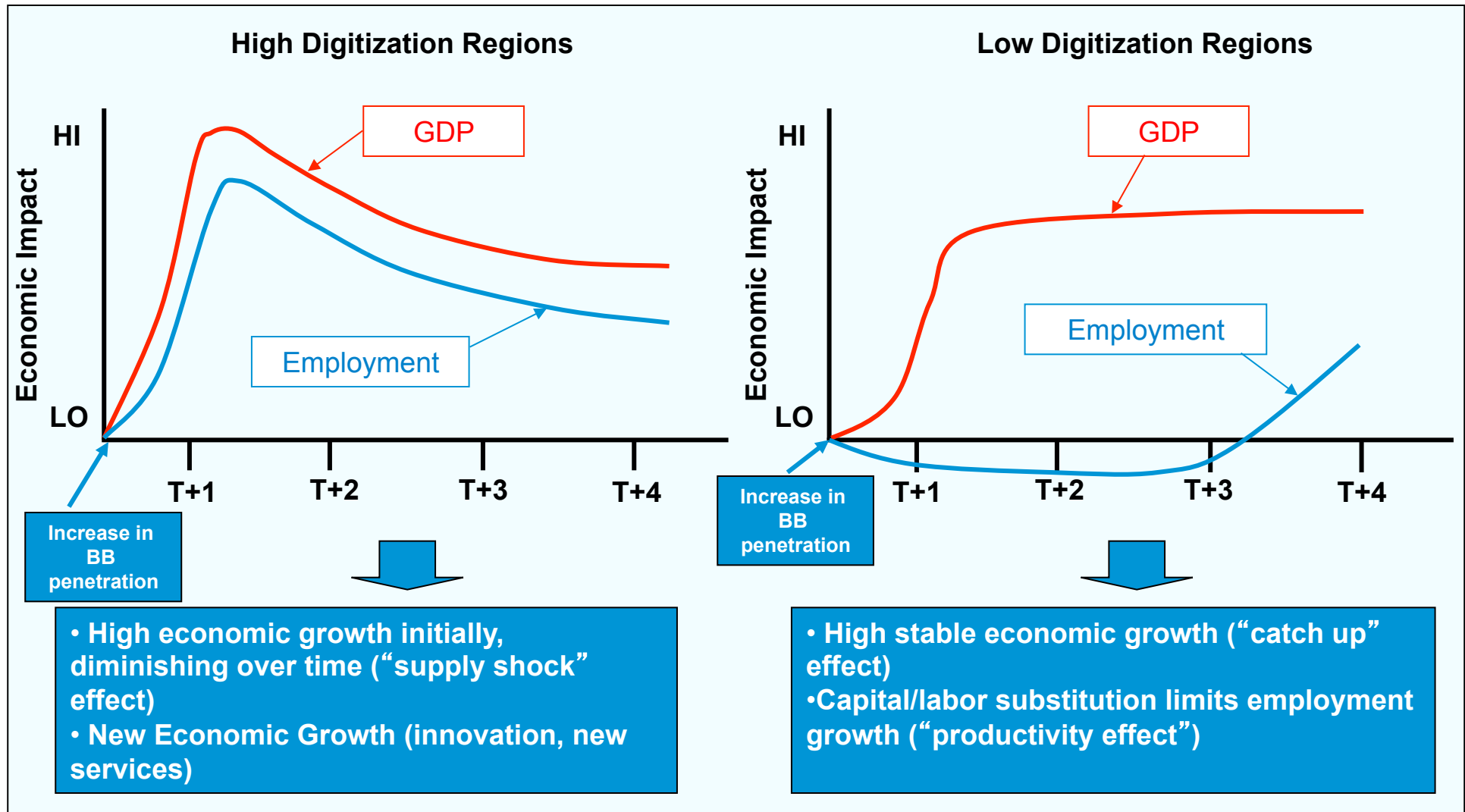
- This stipulates that full economic impact ICT is achieved through the cumulative adoption of all technologies, in addition to the assimilation and usage in the production and social fabric
- Achieving broadband penetration is only one aspect of required policies; maximization of economic impact can only be achieved through a holistic set of policies ranging from telecoms to computing to adoption of internet and eCommerce

Additionally, digitization exhibits increasing returns to scale, where economic impact increases after an index score of 30



Countries with lower scores are often the ones that lack basic access, skills and usage that would prevent them from experiencing important effects on their economies

On the other hand, the pattern of economic impact of digitization varies by region and sector



Source: Katz, Vaterlaus, Zenhausem, and Suter (2012). *The impact of broadband of jobs and the German economy*

The economic impact of digital technology ranges from new business generation to productivity spillovers

LATIN AMERICA: NEW BUSINESS EFFECTS OF DIGITIZATION

SECTOR	EMPLOYMENT	REVENUES (million US\$)
Digital Advertising	- - -	\$ 3,291
E-Commerce	- - -	\$ 5,630
Platform Applications	20,000	\$ 788
Videogames	7,000	\$ 237
Total	27,000	\$ 9,946

LATIN AMERICA: PRODUCTIVITY EFFECTS OF DIGITIZATION

COUNTRIES	SECTORS
Brazil	Agriculture, Electric utilities, gas and and Water
Chile	Mining, Manufacturing, Commerce, Communications, Financial Services
Mexico	Agriculture, Construction, Communications, Financial Services

Source: Katz (2015). *The digital eco-system in Latin America (under publication)*

To sum up, the transformative economic impact of digital technology implies multiple effects

- The emerging world is primarily in the transitional, emerging and limited stages of digitization development
- Economic impact of digitization is much higher than stand-alone technologies (cumulative effects, accumulation of intangible capital)
- Economic impact of digitization indicates a return to scale (economic impact increases with level of digitization development)
- Economic growth and job creation varies by level of technology development of a country
 - Developed countries/regions (economic growth and job creation driven by new services, job creation restricted to selected industries)
 - Emerging countries/regions (“catch up” in economic growth, capital/labor substitution restricts employment growth)

