THE ECOSYSTEM AND DIGITAL ECONOMY IN LATIN AMERICA

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THE PURPOSE OF THIS STUDY IS TO UNDERSTAND LATIN AMERICAN DIGITAL ECONOMY TRENDS AND MAKE POLICY RECOMMENDATIONS FOR ITS DEVELOPMENT

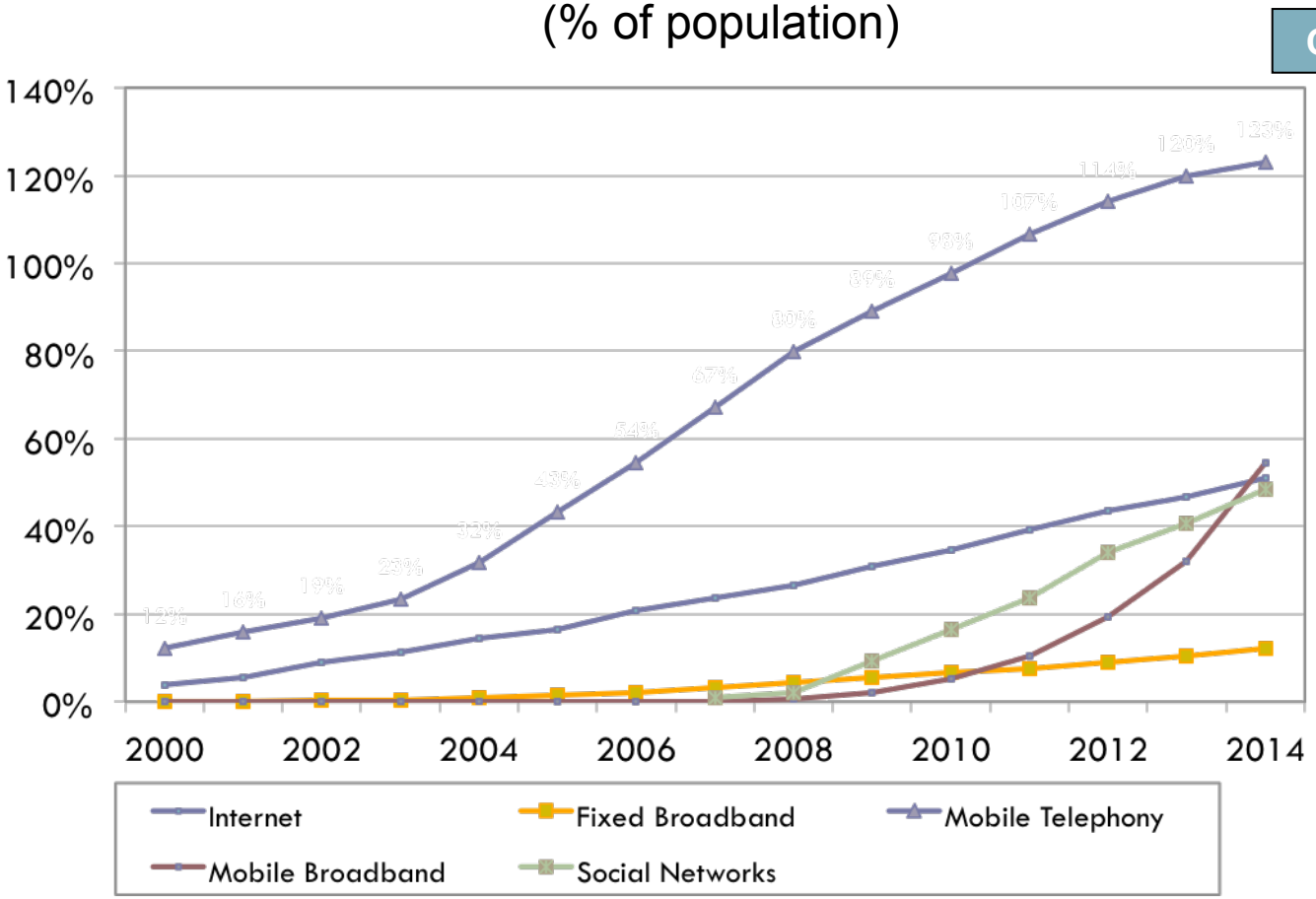
- Define the structure and measure Latin America's digital ecosystem
  - Quantify the development of digital industries in the region
  - Study the ongoing industry transformation, which is shifting from providing connectivity to the delivery of information
  - Analyze the emerging business models
- Define the social and economic context for the formulation of public policies that could foster the development of a digital ecosystem
  - The economic variables that drive the development of a digital economy
  - The creation and transfer of value within the digital value chain
  - The relevance of the demand side (content and applications) for closing the digital divide
- Identify public policies for the development of a digital economy in Latin America
  - How should we stimulate the development of applications and content in the region?
  - What is the role of government as promoter of development of the digital economy?
  - What are the publicy policies that could stimulate the development of a regional digital ecosystem?

CONTENTS

- Demand transformation: from connectivity to digitalization
- The digital eco-system: market structure and factors driving dominance
- Creation and transfer of value within the digital value chain
- The digital innovation challenge in Latin America

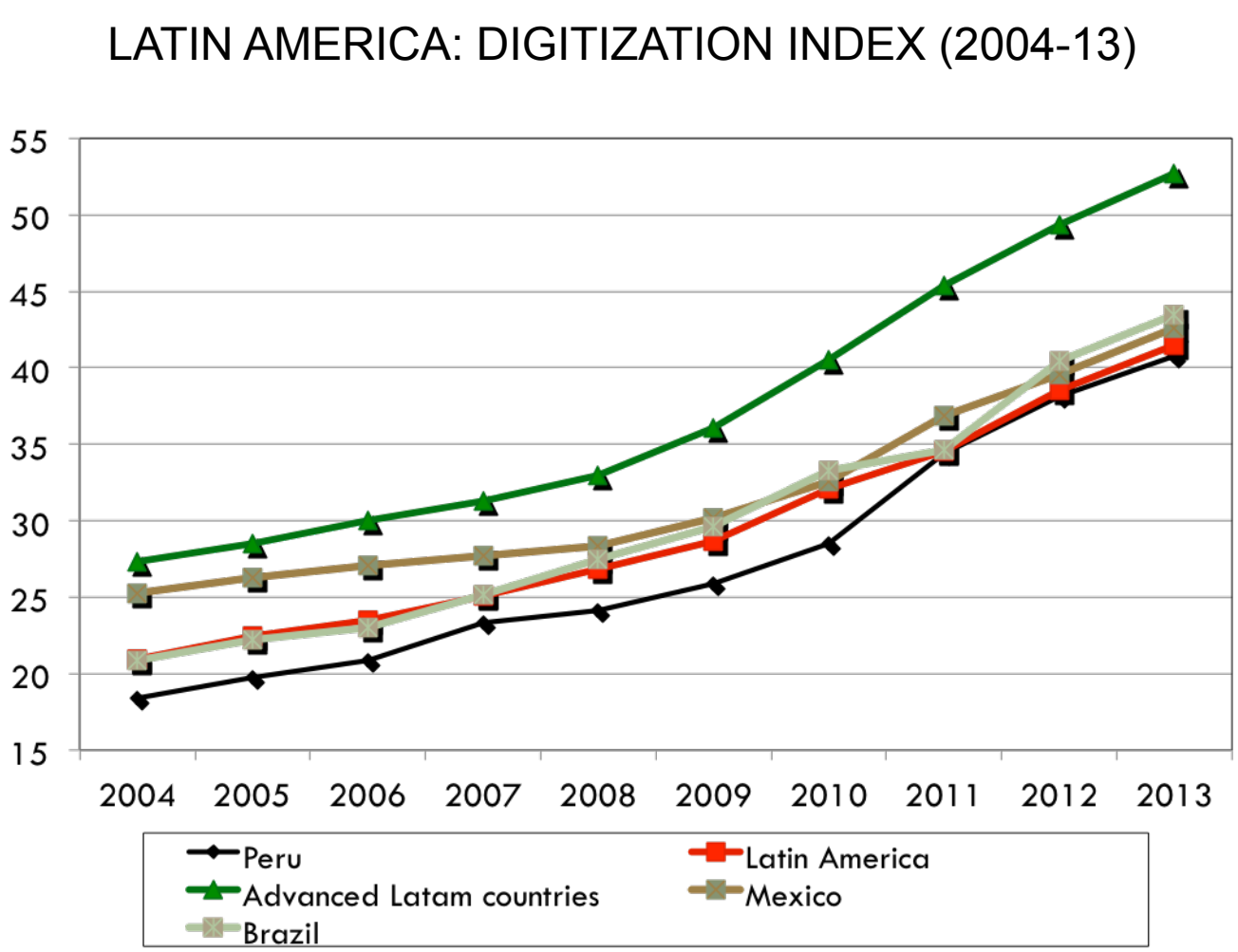
ADOPTION OF COMMUNICATION TECHNOLOGIES IN LATIN AMERICA CONTINUES TO GROW LEADING TO THE INCREASING IMPORTANCE OF MOBILE ACCESS TO DIGITAL PLATFORMS

INFORMATION AND COMMUNICATION TECHNOLOGIES PENETRATION (2000-14)
(% of population)



Sources: International Telecommunications Union; GSMA Intelligence; Owloo; Telecom Advisory Services analysis

THE EVOLUTION OF THE DIGITAL INDEX INDICATES A REGIONAL CONVERGENCE COMBINED WITH A FASTER GROWTH OF ADVANCED COUNTRIES

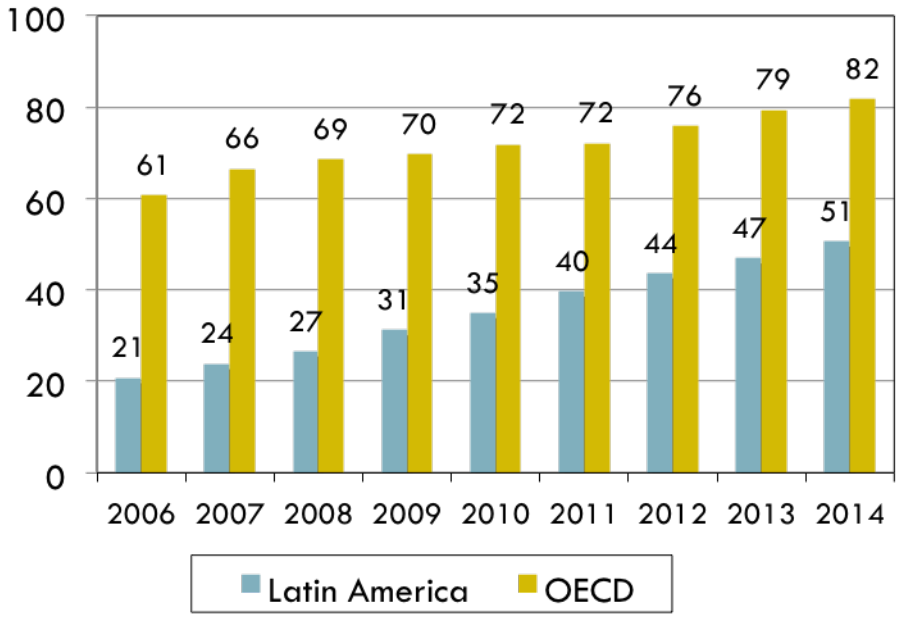


Source: Estimated with methodology described in Katz, Koutroumpis, Callorda (2013)

Country	Index (2013)
Argentina	49,30
Bolivia	27,97
Brazil	43,44
Chile	53,82
Colombia	43,56
Costa Rica	50,04
Cuba	18,83
Ecuador	44,63
El Salvador	38,66
Guatemala	27,16
Honduras	26,37
Mexico	42,55
Nicaragua	25,25
Panama	50,17
Paraguay	34,92
Peru	40,76
Dominican Rep.	36,29
Uruguay	53,61
Venezuela	38,94

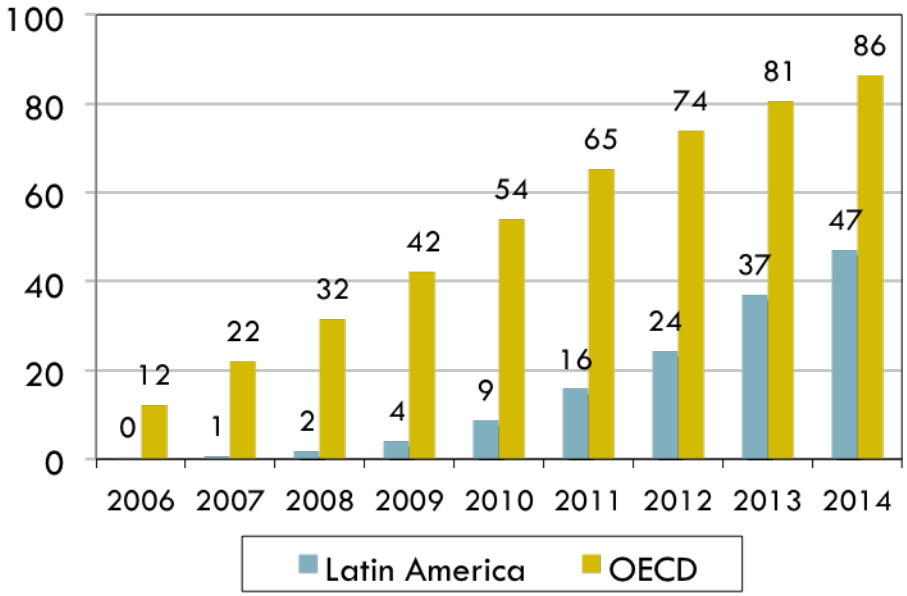
THE GAP WITH OECD COUNTRIES IN INTERNET AND MOBILE BROADBAND ADOPTION IS NARROWING DOWN

EVOLUTION OF INTERNET ADOPTION (2006-2014)



Note: OECD data excludes Chile and Mexico
Source: ECLAC, with data from ITU World Telecommunications Indicators Database, 2015

EVOLUTION OF MOBILE BROADBAND ADOPTION (2006-2014)



Note: OECD data excludes Chile and Mexico
Source: GSMA Intelligence

THE LATIN AMERICAN INTERNET USER IS CONNECTED TO THE INTERNET MORE TIME THAN USERS OF OTHER EMERGING REGIONS

INTENSITY OF INTERNET ACCESS (AVERAGE MONTHLY HOURS) (2013)

North America	35,9
Europe	25,1
World	22,8
Latin America	21,7
Asia - Pacific	17,6
Middle East and Africa	13,7

Uruguay	32,6
Brazil	29,4
Argentina	20,8
Peru	18,9
Chile	17,6
Venezuela	16,1
Colombia	15,2
Mexico	14,8

Sources: Comscore; Telecom Advisory Services analysis

AT THE SAME TIME, THE LATIN AMERICAN INERNET USER IS THE MOST INTENSE SOCIAL NETWORK SUBSCRIBER

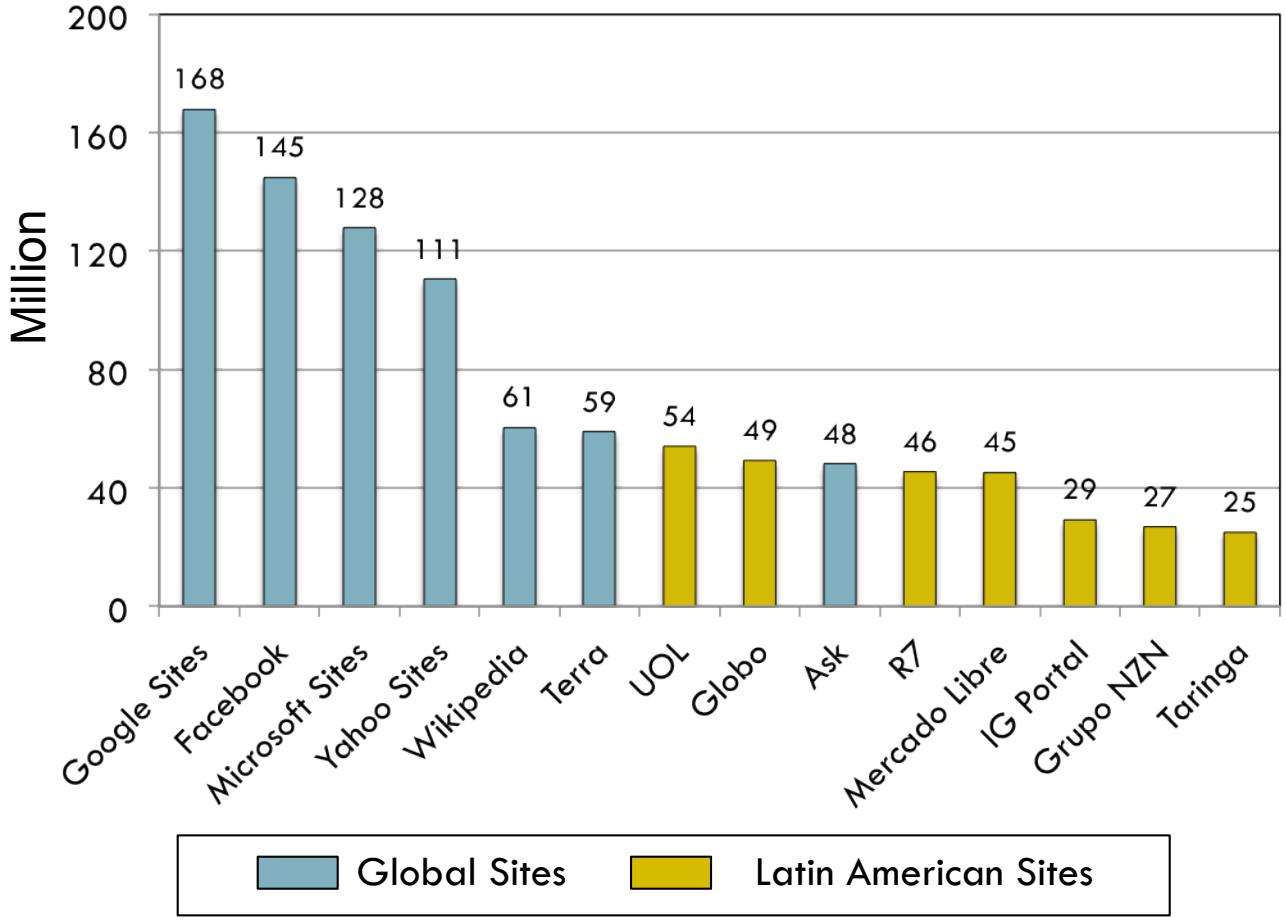
SOCIAL NETWORK MONTHLY SUBSCRIBERS AS A PERCENTAGE OF INTERNET USERS (2013)

Region	Internet Users	Social Network Subscribers	Social Network subscribers as a percentage of Internet Users
Western Europe	327.712.663	178.490.451	54,47%
Eastern Europe	116.075.787	82.286.947	70,89%
North America	298.096.344	192.685.415	64,64%
Latin America	284.604.650	223.174.613	78,42%
Asia - Pacific	1.217.686.014	891.194.019	73,19%
CIS and Russia	142.783.276	46.020.576	32,23%
Sub-Saharan Africa	144.755.195	37.118.175	25,64%
Middle East and North Africa	168.185.445	64.898.306	38,59%
World	2.699.899.374	1.715.868.503	63,55%

Sources: ITU; Internet World Stats; Telecom Advisory Services analysis

ON THE OTHER HAND, LATIN AMERICAN INTERNET USAGE IS CONCENTRATED ON ACCESSING GLOBAL PLATFORMS

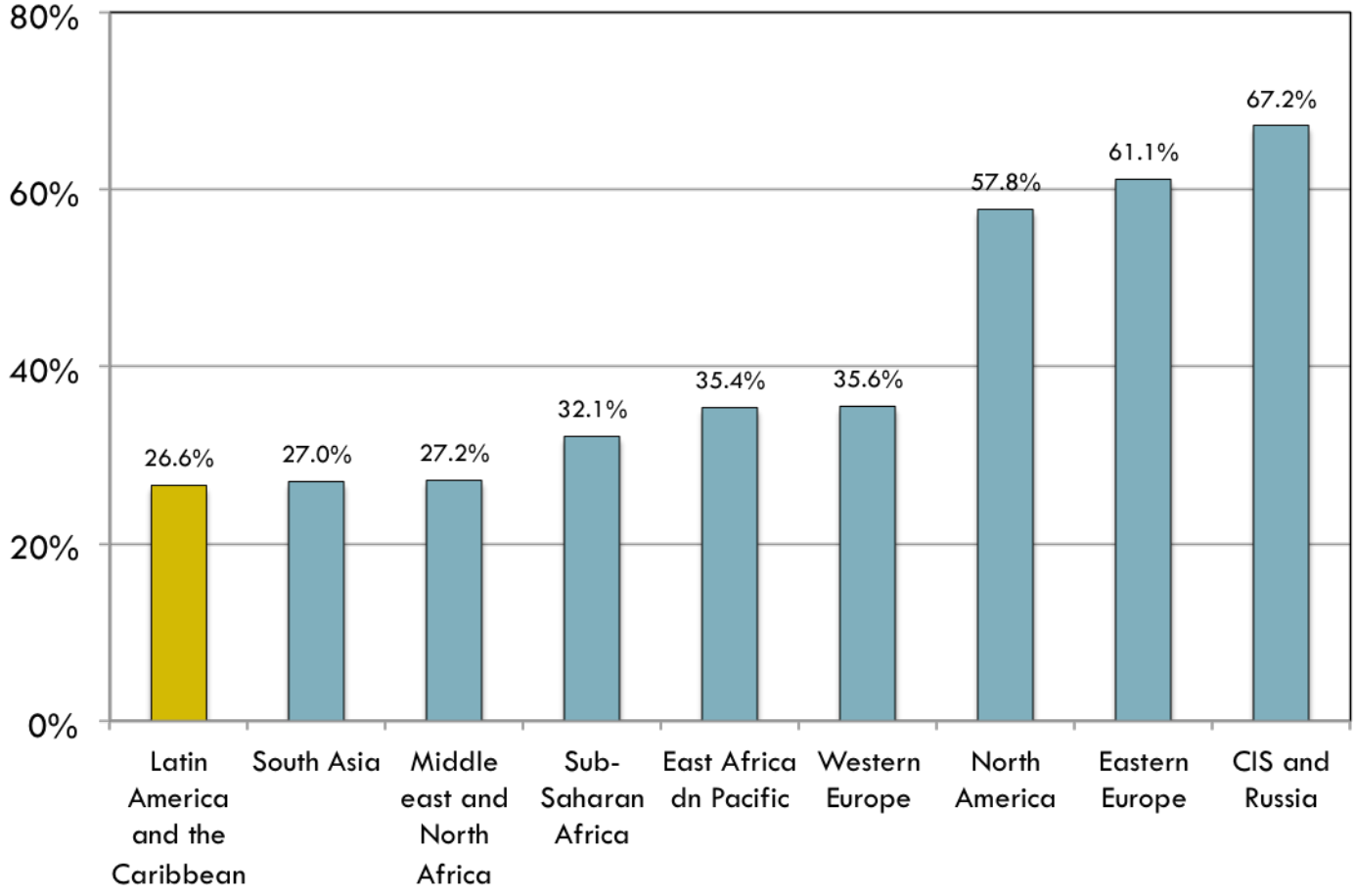
LATIN AMERICA: MOST POPULAR INTERNET SITES (measured by unique monthly visitors)



Source: Comscore; Telecom Advisory Services analysis

THIS IS A CONFIRMATION OF THE LIMITATIONS OF LATIN AMERICA WITH REGARDS TO THE PRODUCTION OF LOCAL INTERNET CONTENT AND APPLICATIONS

PERCENTAGE OF LOCAL SITES AMONG THE MOST ACCESSED INTERNET SITES BY REGION (2013)

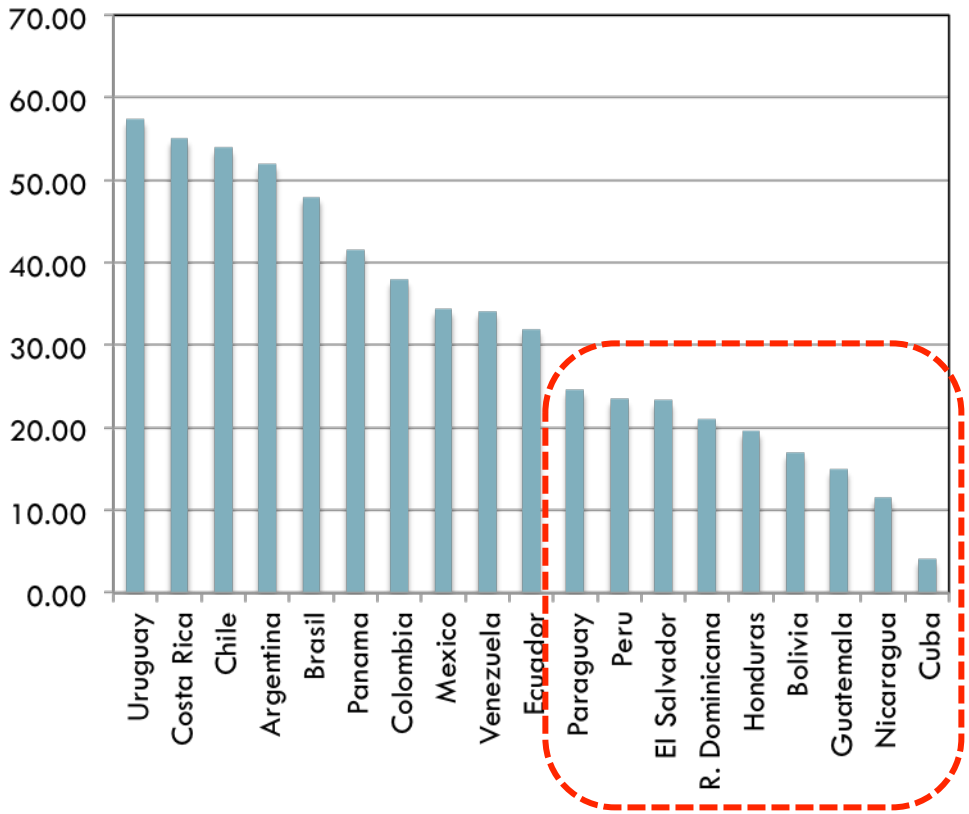


Note: a local site is considered to be one that has been developed within the region

Source: Katz y Callorda (2014)

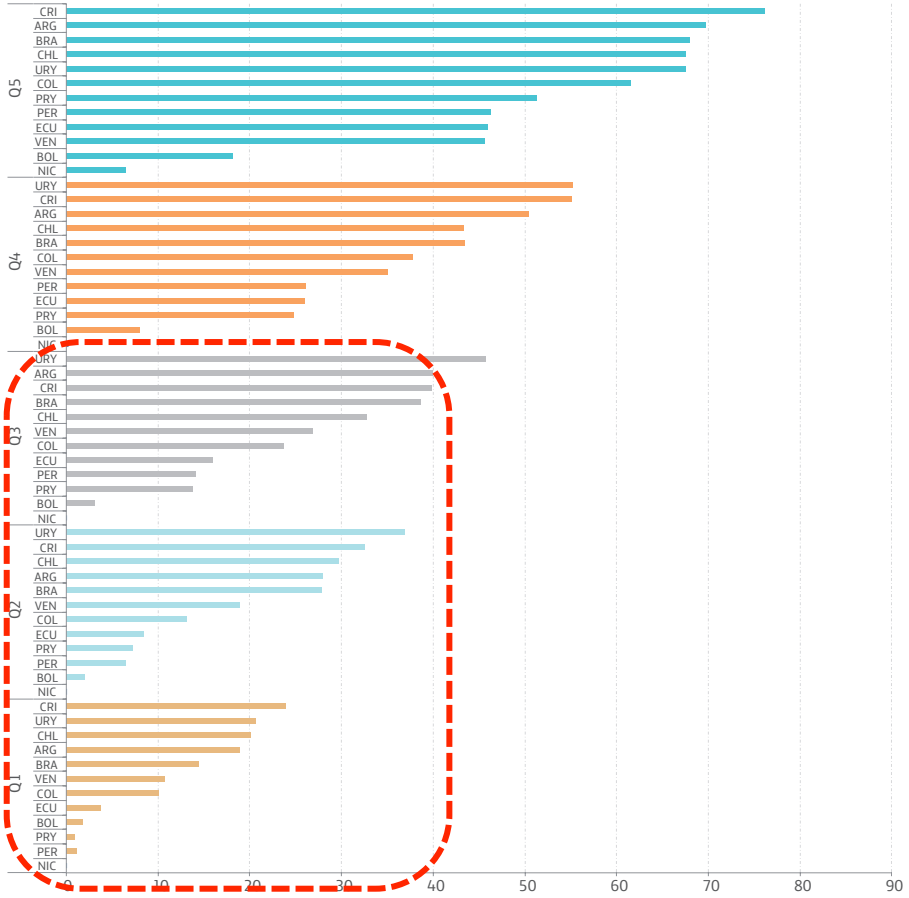
FURTHERMORE, LATIN AMERICA STILL FACES A PERSISTENT DIGITAL DIVIDE, BOTH IN SOCIAL AND GEOGRAPHIC TERMS

PERCENT HOUSEHOLDS WITH INTERNET ACCESS (%)



Source: ITU. Telecommunications World Indicators Database

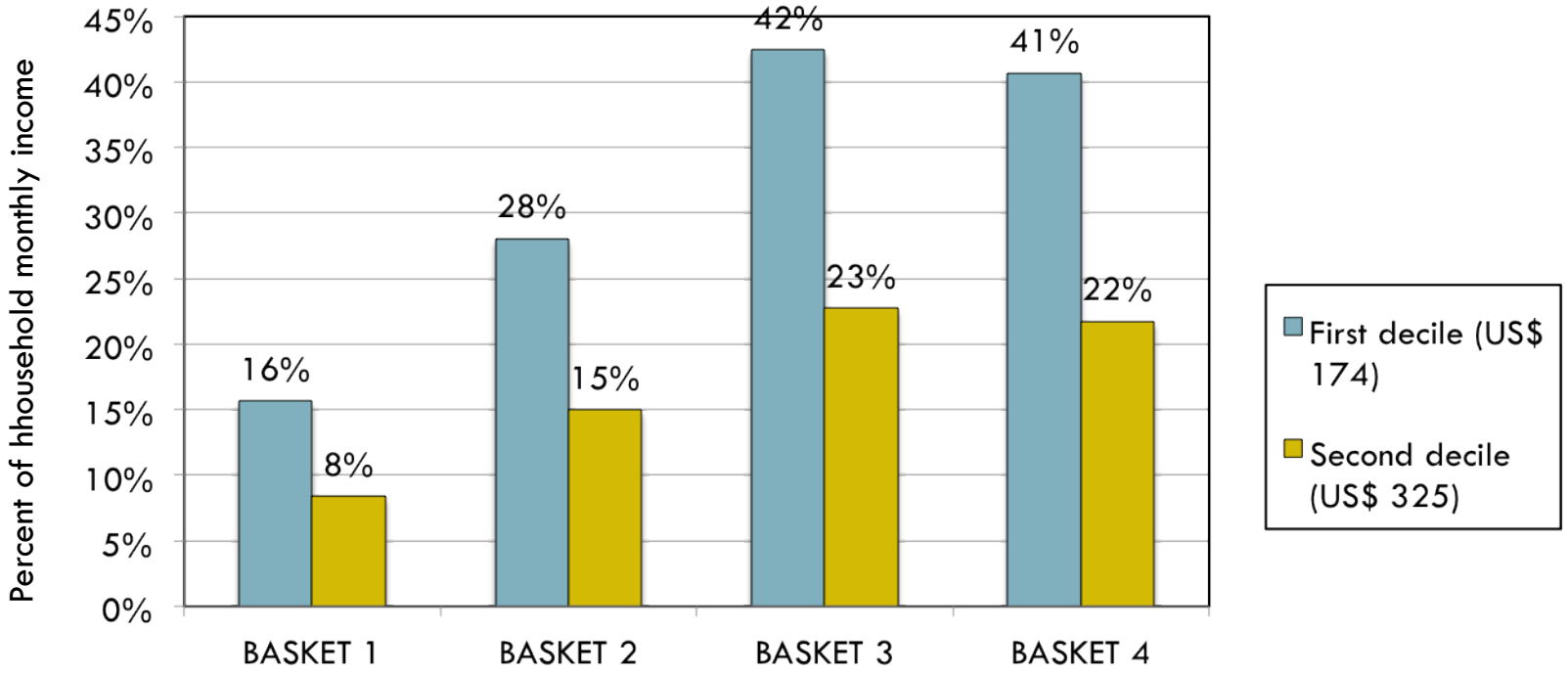
HOUSEHOLDS WITH INTERNET ACCESS BY INCOME QUINTILE (%)



Source: ECLAC Observatory for the Information Society in Latin America and the Caribbean, based on National Household Surveys

THE DIGITAL DIVIDE IN LATIN AMERICA IS PRIMARILY DRIVEN BY AN INCOME DISTRIBUTION VARIABLE

BRAZIL: ICT AFFORDABILITY IN FIRST AND SECOND DECILE (2014)



BASKET 1	BASKET 2	BASKET 3	BASKET 4
• 2 smartphones (w/voice and data plan) • Over the air TV	• 2 smartphones (w/voice and data plan) • Subscription TV	• 2 smartphones (w/voice and data plan) • Subscription TV • 1 PC • 1 USB modem	• 2 smartphones (w/voice and data plan) • Subscription TV • 1 PC • Fixed broadband

Sources: IBGE; Oi; VIVO; NET; Telecom Advisory Services analysis

IN SUM, WHILE THE BEHAVIOR OF THE LATIN AMERICA INTERNET USER RESSEMBLES THAT OF THE INDUSTRIALIZED WORLD, SEVERAL CHALLENGES FOR DIGITIZATION DEVELOPMENT REMAIN

PROGRESS

- Significant progress in the adoption of ICT (126 % mobile telephony; 52% Internet; 24% mobile broadband; 43% social networks; 41% fixed broadband households; 57% pay-tv households)
- Digital consumption behavior is similar to that of industrialized countries (hours connected; 78% social network adoption among Internet users)

REMAINING CHALLENGES

- Advanced digitization countries (Argentina, Chile, Colombia, Costa Rica, Panama and Uruguay) are progressing at a faster pace than the rest of Latin America, emphasizing regional duality
- Internet adoption in urban (42%) vs. rural (9%) settings
- Affordability barriers at the base of the pyramid
- Most popular Internet sites developed outside the region
- 26% of most popular sites developed locally (the lowest percentage among regions)

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THE LATIN AMERICAN DIGITAL ECO-SYSTEM COMBINES DOMINANT GLOBAL SOCIAL NETWORKS AND SEARCH PLATFORMS WITH LOCAL ELECTRONIC COMMERCE AND ONLINE VIDEO PRESENCE

GLOBAL SUPPLY

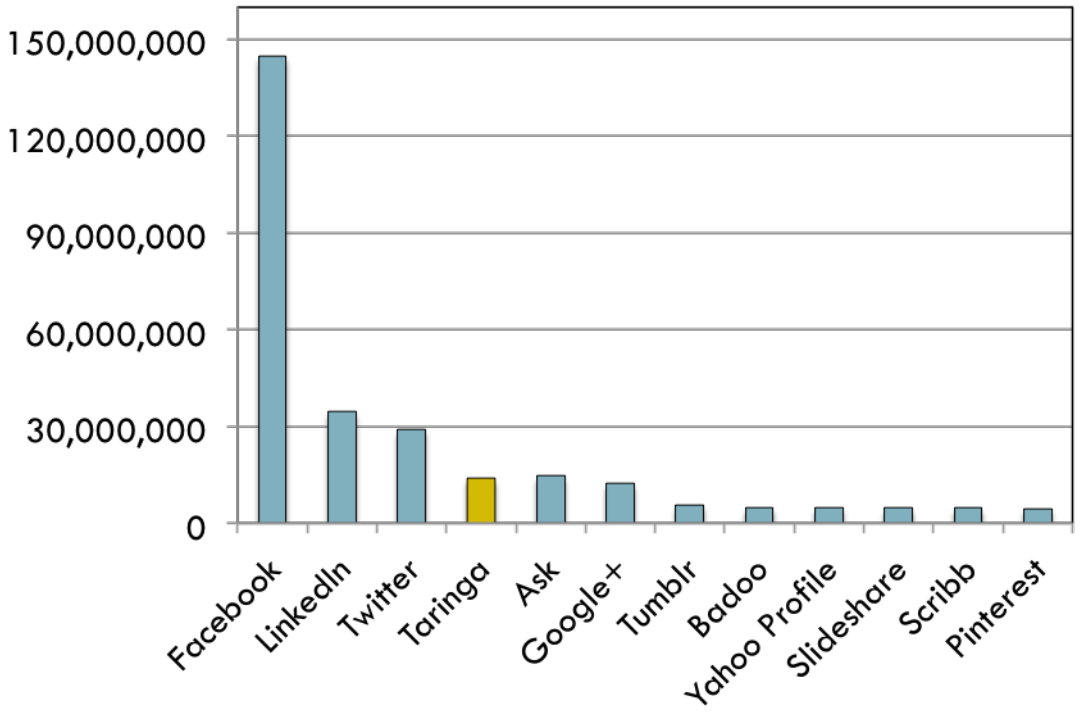
- Nine of the ten most important social networks accessed in Latin America are global
- Global search engines (Google, Bing, Yahoo) control 98% of the Latin American market

LOCAL AND REGIONAL SUPPLY

- While global online video sites (e.g. YouTube) have a dominant presence in the region, local market presence remains important
- The video streaming market is divided between global (e.g. Netflix) and local players
- Latin American electronic commerce platforms have a dominant share of visits and transaction volumes

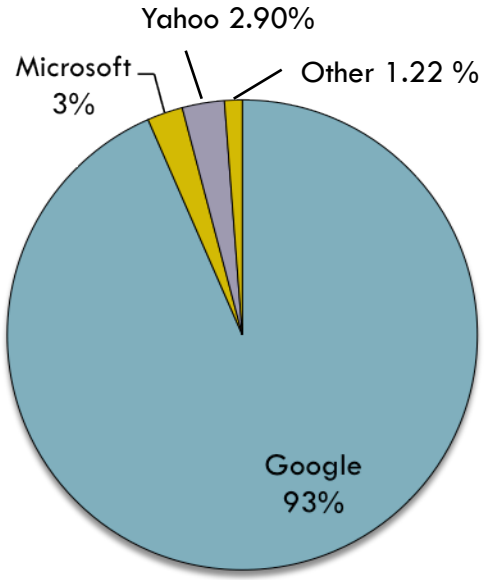
GLOBAL SOCIAL NETWORKS AND SEARCH PLATFORMS DOMINATE THE LATIN AMERICAN MARKET

LATIN AMERICA: MOST IMPORTANT SOCIAL NETWORKS (unique monthly visitors) (2014)



Sources: Comscore; Telecom Advisory Services analysis

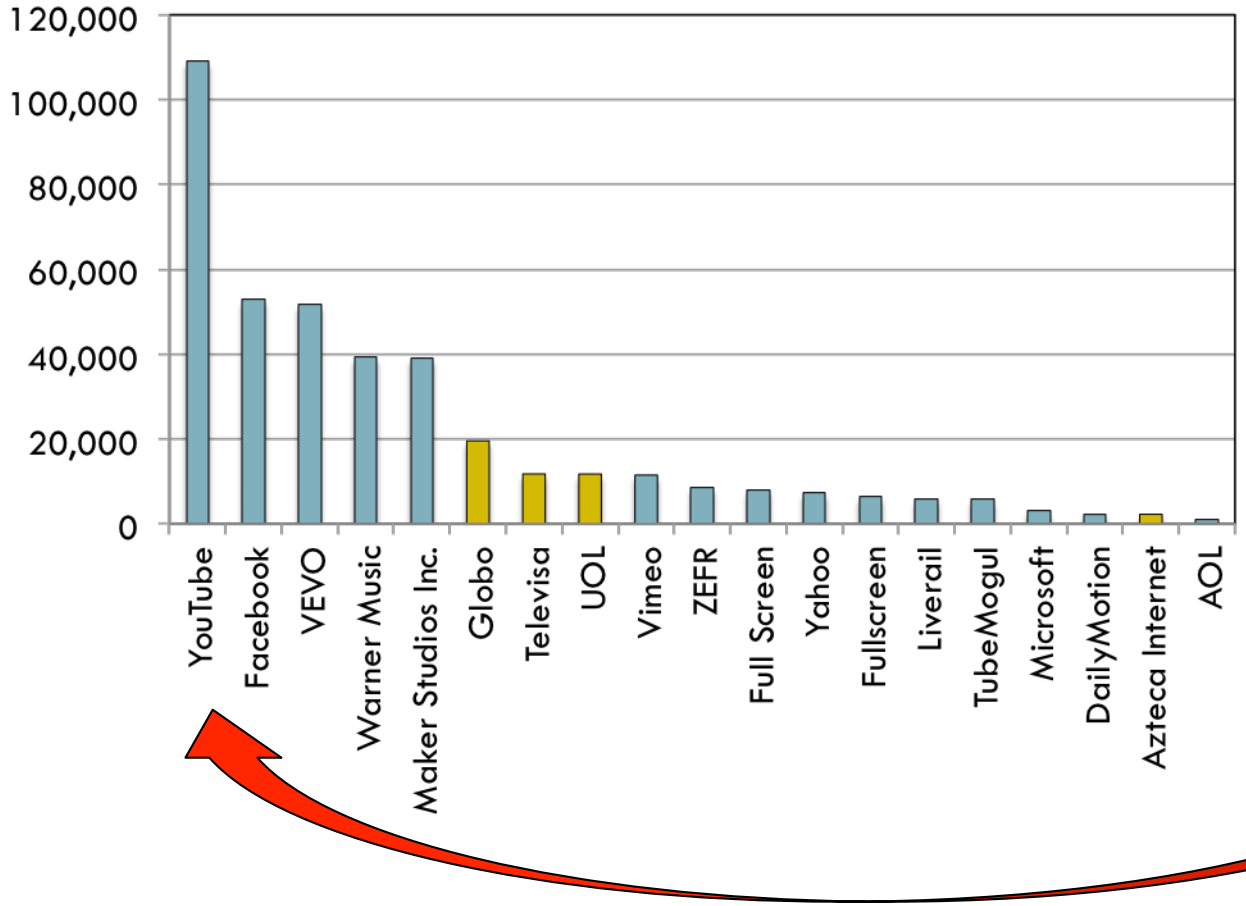
LATIN AMERICA: SEARCH ENGINE MARKET SHARE (2014) (2014)



Sources: Webcertain; Comscore

WHILE THE ONLINE VIDEO MARKET IS DOMINATED BY YOUTUBE, LOCAL MARKET PRESENCE RELYING ON THE PLATFORM IS QUITE INTENSE

LATIN AMERICA: MOST IMPORTANT ONLINE VIDEO SITES (measured by unique viewers) (2014)



YOUTUBE LOCAL ASSOCIATED CHANNELS

- Telemundo
- Farolatino
- SBT
- infobae

Source: Comscore; Google

SIMILARLY, THE VIDEO STREAMING MARKET DEPICTS INTENSE ACTIVITY OF LOCAL OTT PLATFORMS

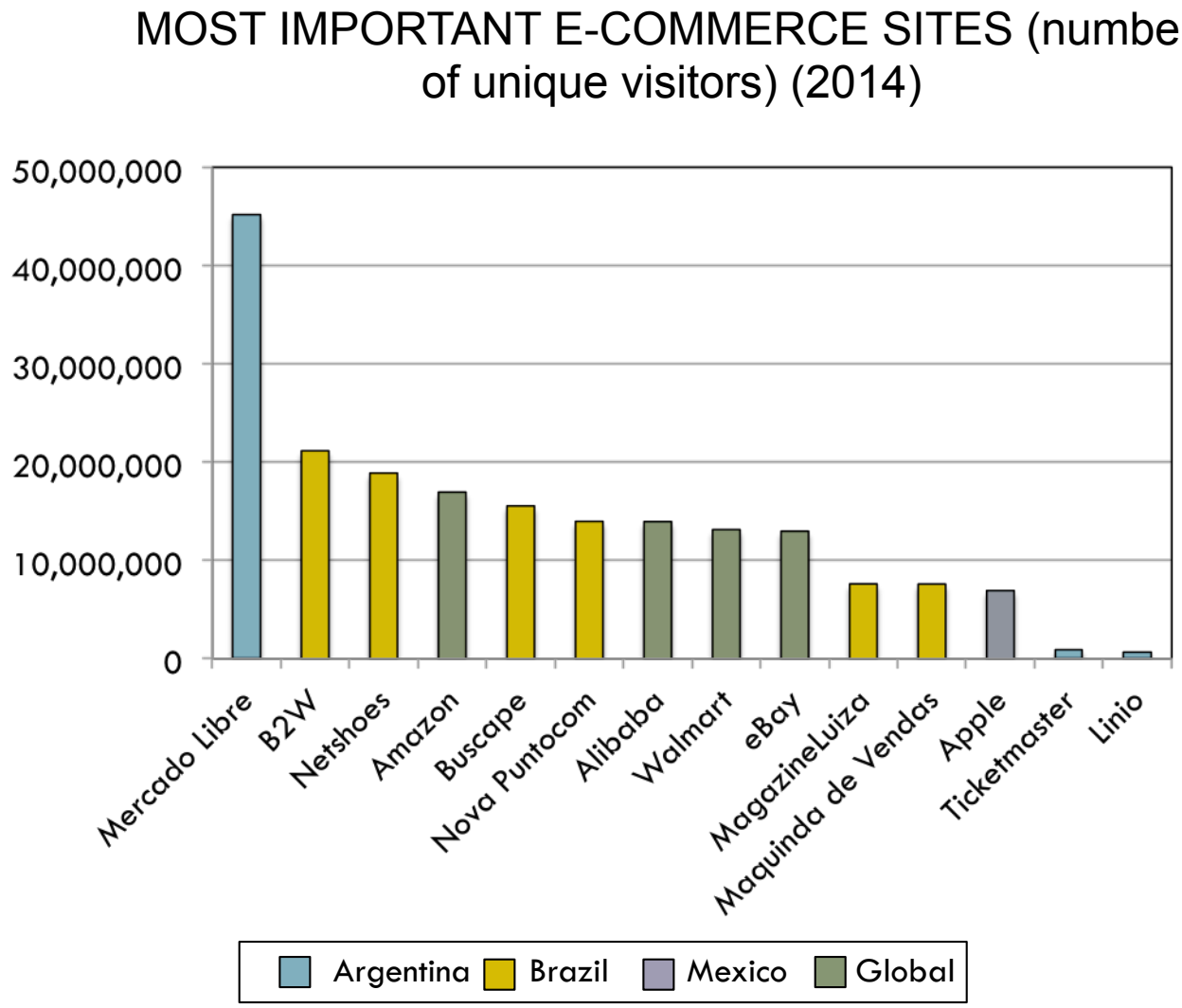
VIDEO STREAMING: GLOBAL VS. LATIN AMERICAN SITES (2014)

GLOBAL VIDEO STREAMING	
OPERATOR	**Subscribers (LATAM)**
Netflix	7.300.000
Apple TV	1.800.000
Amazon Video	N.D.
Google Play	3.100.000
HBO Go internet	N.D.

LATIN AMERICAN VIDEO STREAMING	
COUNTRY	**OPERATORS**
Argentina	Arnet Play, Speedy on Video, Cablevision VOD, Vesvi, Qubit.tv, Cinema Argentino, Conectate.gob, Personal (350.000)
Brazil	Claro Video, Telecine, Vivo VOD, GVT On Demand, Muu Globo
Chile	Claro Video, Movistar Play, Bazuca, VTR VOD
Mexico	Claro Video, Cablevision VOD, Cinepolis Klic, VEO (Televisa) (3.400.000), Total Play

Sources: Netflix Annual Report, Business Bureau, Egeda

ADDITIONALLY, THE ELECTRONIC COMMERCE MARKET IS DOMINATED BY LATIN AMERICAN - ESPECIALLY BRAZILIAN – FIRMS



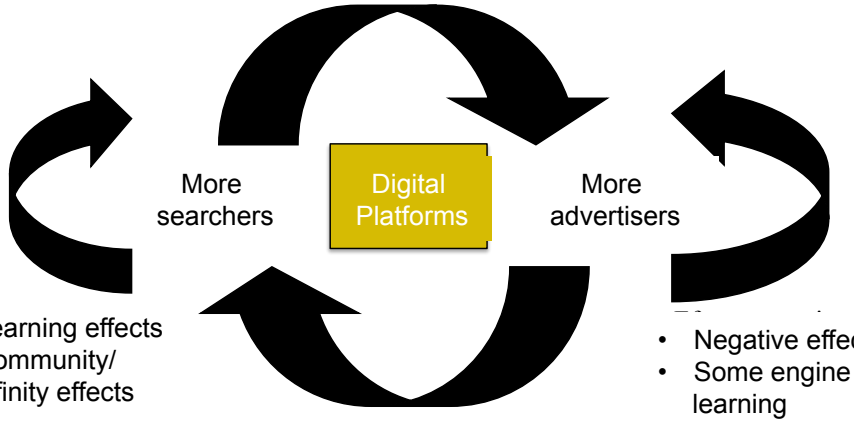
Sources: Comscore; Telecom Advisory Services analysis

THIS SITUATION RAISES A NUMBER OF QUESTIONS REGARDING FUTURE DEVELOPMENT OF THE LATIN AMERICAN DIGITAL ECONOMY

- What explains the structural global dominance of search and social network platforms?
- What is the probability that local online video and video streaming players will capture a significant market share?
- What is the strategic conclusion for the Latin American digital sector of the regional success of *Mercado Libre* and the Brazilian e-commerce sites?
- Recognizing that we are dealing with a global industry, how should Latin American governments react to stimulate the development of a local digital eco-system?

THE DOMINANCE OF GLOBAL PLATFORMS IN SEARCH AND SOCIAL NETWORKS IS DRIVEN BY ENORMOUS NETWORK EFFECTS AND SUPPLY-SIDE ECONOMIES OF SCALE

NETWORK EFFECTS IN TWO-SIDED MARKETS

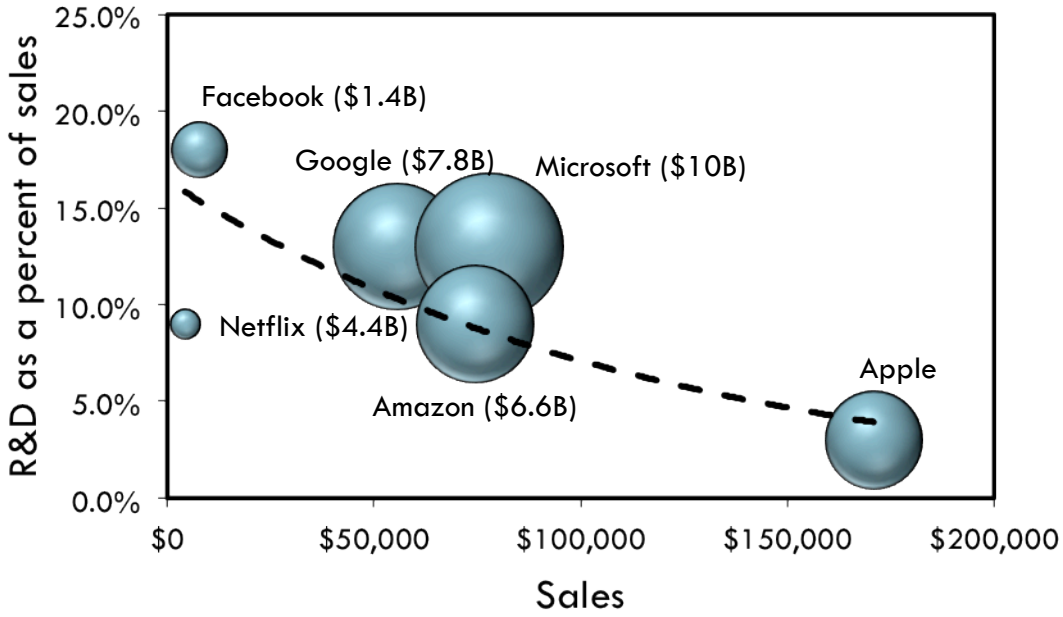


- Learning effects
- Community/ affinity effects

- Negative effects
- Some engine learning

- Better signaling
- Market reach

R&D ECONOMIES OF SCALE

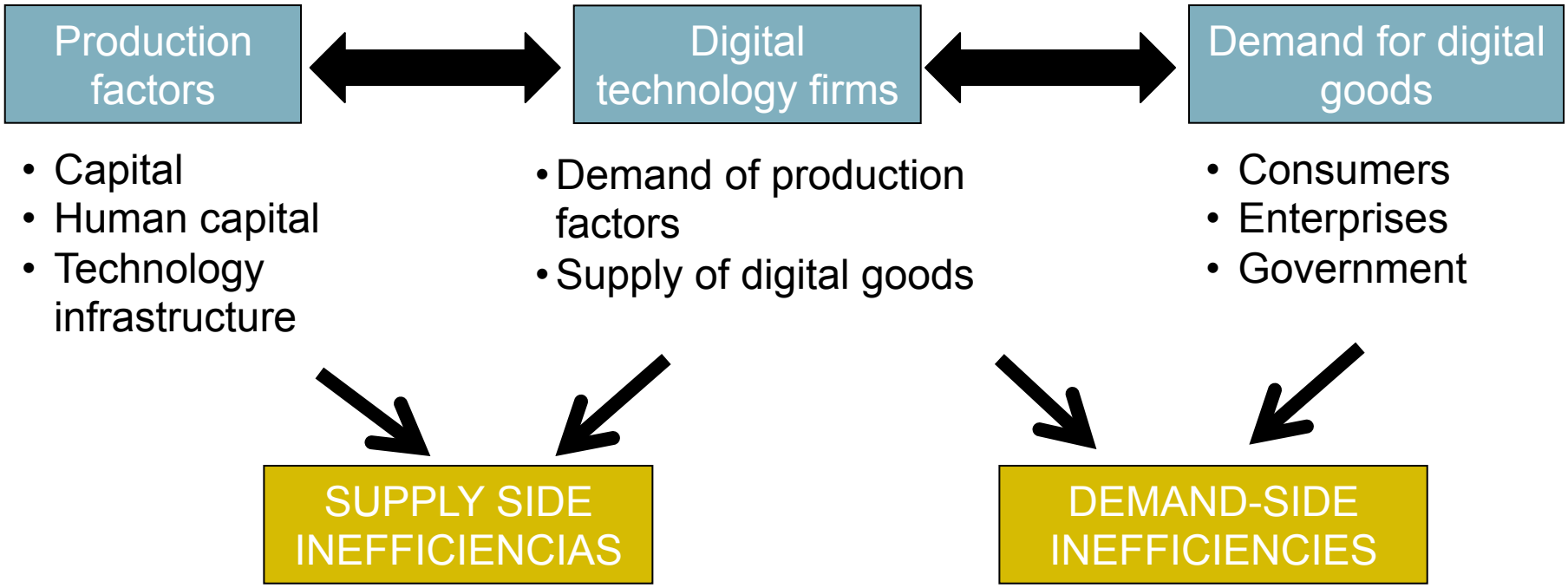


Source: Annual reports; Telecom Advisory Services analysis

NOTE: the size of bubble indicates total R&D budget

BEYOND THE STRUCTURAL FACTORS, THE DOMINANCE OF GLOBAL PLATFORMS IS THE RESULT OF COORDINATION FAILURES IN THE LATIN AMERICAN DIGITAL ECO-SYSTEM

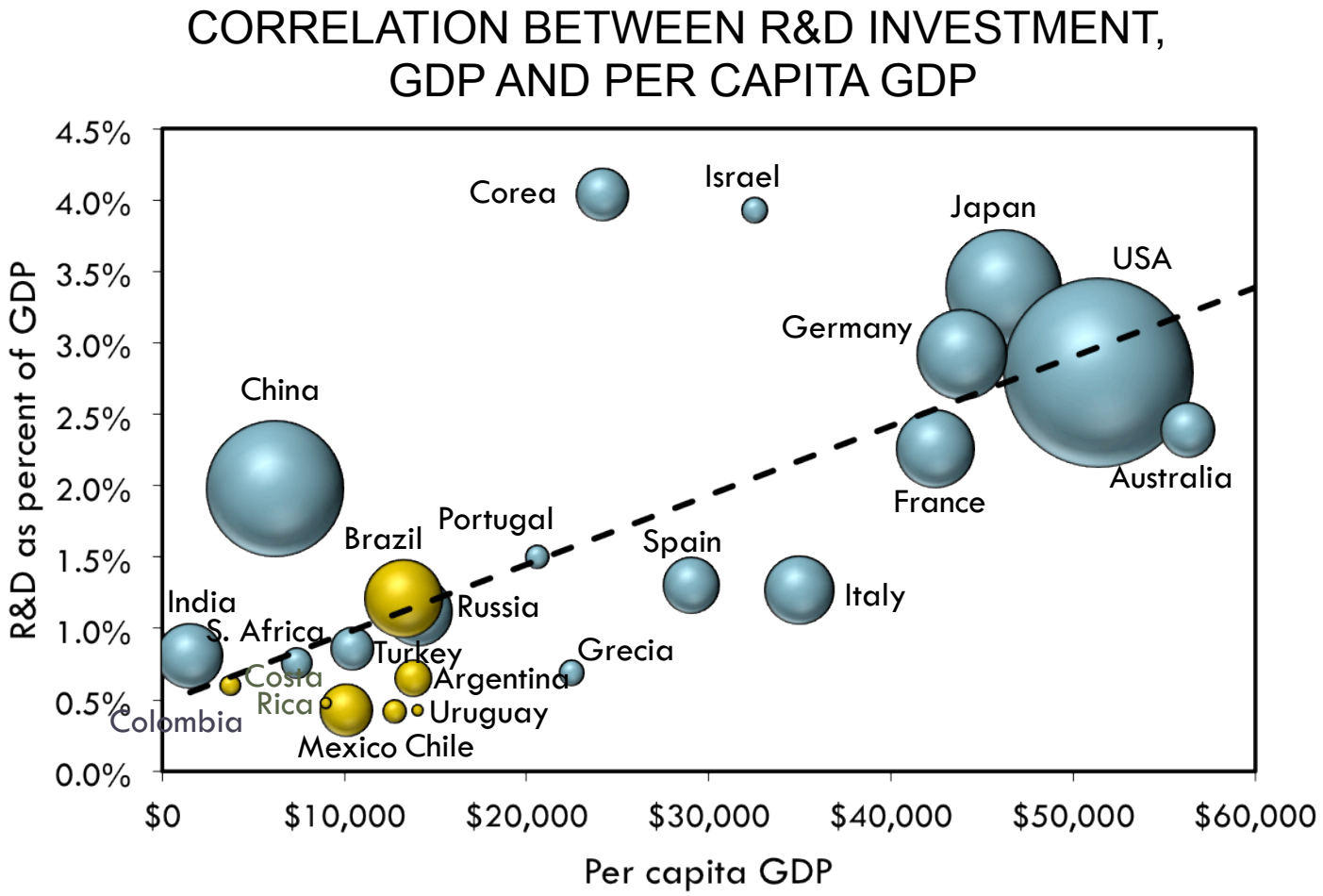
DIGITAL ECO-SYSTEM INEFFICIENCIES



- Limited access to capital
- Lack of interest of local and foreign investors
- High transaction costs (e.g. Regulation, collusion)
- Limited human talent production

- Demand gap (broadband, PCs) in residential and SME sectors
- Limited export potential

FIRST, THE TOTAL R&D INVESTMENT IN THE REGION IS NOT COMMENSURATE TO ITS LEVEL OF ECONOMIC DEVELOPMENT



Nota: the size of bubble depicts the size of GDP; the year of per capita GDP statistics is that of R&D investment

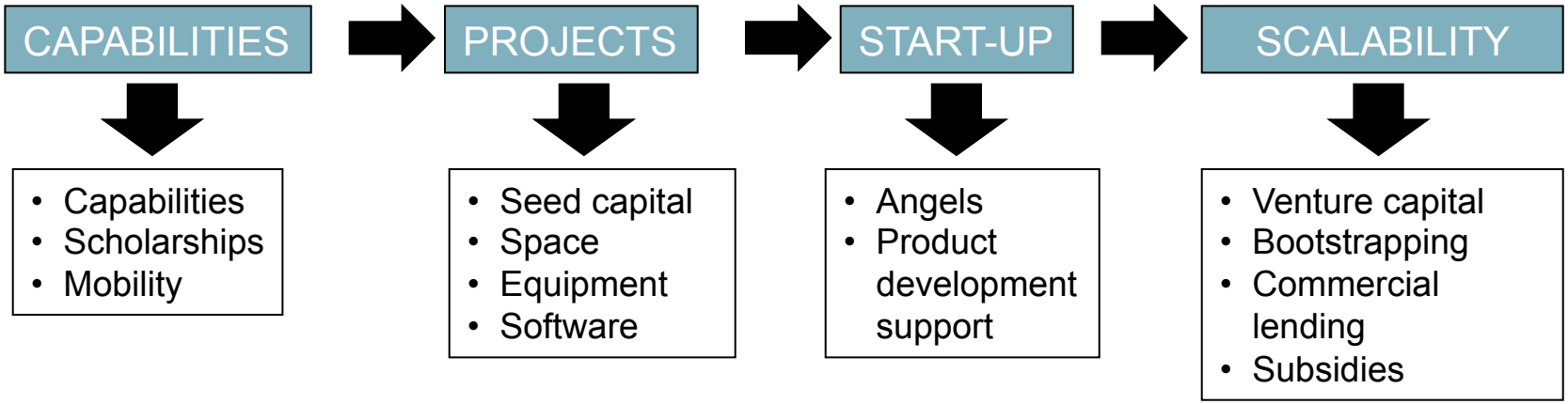
Sources: World Bank; Telecom Advisory Services analysis

THIS IMBALANCE IS DUE TO THE LACK OF COORDINATION AMONG MULTIPLE FINANCING SOURCES AND LIMITED ALIGNMENT WITH ECONOMIC DEVELOPMENT PLANS

- Multiplicity of financing mechanisms, programs and agencies deployed at the national, provincial and municipal level
- Redundancies of financing sources, resulting in sometimes even competition among programs
- Lack of eligibility criteria to assign funds based on development objectives
- Lack of standardization in application procedures, which raises entrepreneur transaction costs
- Limited entrepreneur visibility of financing sources

OF THE TOTAL AMOUNT OF PUBLIC R&D&I FINANCING IN THE DIGITAL SECTOR, ONLY 13% IS FOCUSED IN PROJECT DEVELOPMENT AND INCUBATION

LATIN AMERICA: PUBLIC R&D FUNDS IN THE DIGITAL ECO-SYSTEM (in million US$)



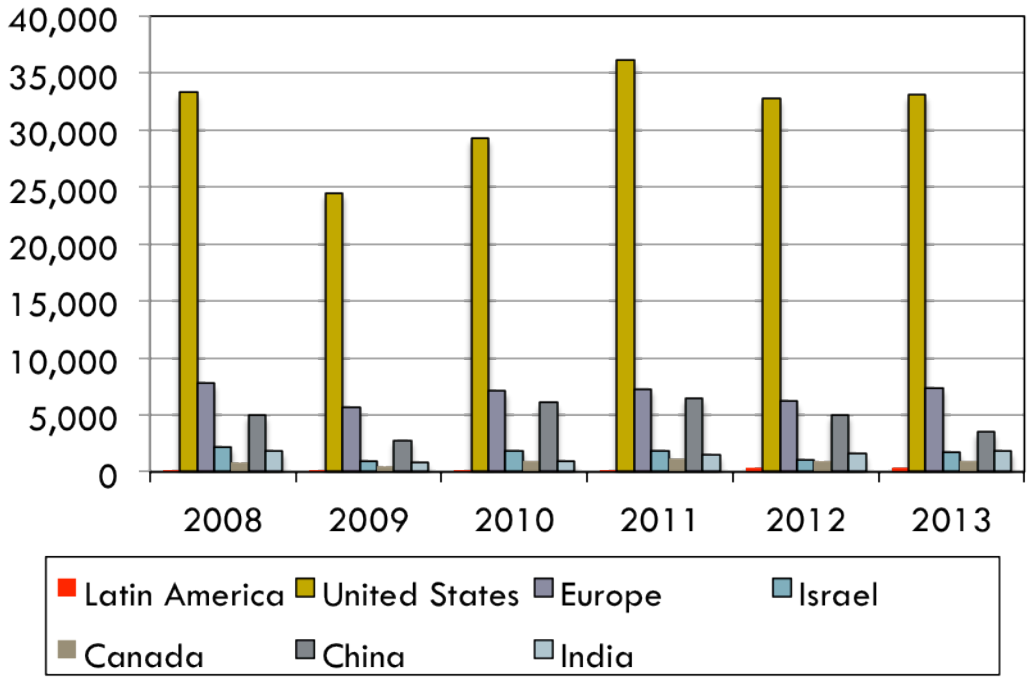
Country	Capabilities	Projects	Start-up	Scalability
Argentina	50,91	94,86	8,61	8,77
Brazil	3.885,06	1.831,8	2,13	9.798,00
Chile	584,78	16,98	73,87	2,26
Colombia	838,92	24,06	44,6	259,99
Costa Rica	0,00	35,00	0,91	0,54
Mexico	1526,92	417,63	32,03	621,29
Peru	1,37	8,04	21,72	0,00
Total	6.887,96	2.428,38	183,85	10.690,86

12,9%

Source: Katz, R. (2015). Input paper Funding mechanism Working Group. Latin America-Europe Advanced Dialogues to Enhance ICT Research and Innovation Partnership.

ON THE OTHER HAND, VENTURE CAPITAL AVAILABILITY IS VERY LIMITED WHEN COMPARED WITH OTHER REGIONS

COMPARATIVE VENTURE CAPITAL INVESTMENT (US$ '000'000)



VENTURE CAPITAL PER POPULATION (US$)

Country / Region	Amount
Latin America	$ 1.67
United States	$ 415.17
Europe	$ 37.71
Israel	$ 818.96
China	$ 15.55
India	US$ 4.63

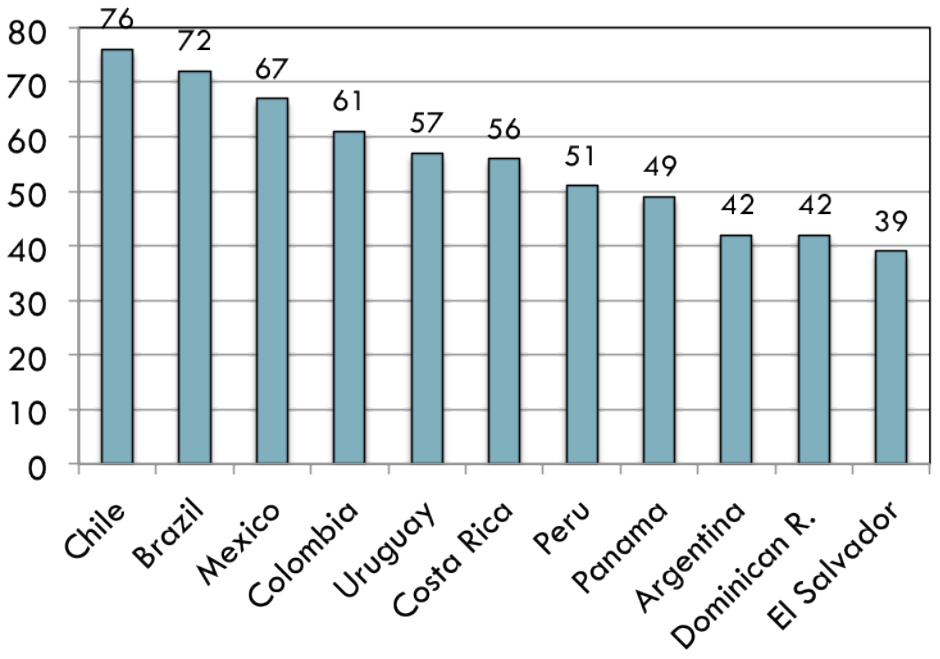
Sources: Latin American Venture Capital Association; Dow Jones Venture Source; Telecom Advisory Services analysis

THE LAG IN PRIVATE SECTOR INVESTMENT IS THE RESULT OF NUMEROUS REGULATORY AND CONTEXTUAL FACTORS

CONDITIONS FOR DEVELOPMENT OF VENTURE CAPITAL SCORECARD (2014)

DIMENSION	
Quality of local accounting/use of intl. standards	3.3
Registration/reserve requirements on investments	2.8
Corporate governance requirements	2.5
Entrepreneurship	2.4
Tax treatment of PE/VC funds and investments	2.2
Bankruptcy procedures/creditors rights	2.2
Laws on PE/VC fund formation and operation	2.1
Protection of minority shareholder rights	2.1
Protection of intellectual property rights	2.1
Capital markets development	2.1
Restrictions of local institutional investment	2.0
Strength of judicial system	2.0
Perceived corruption	1.5

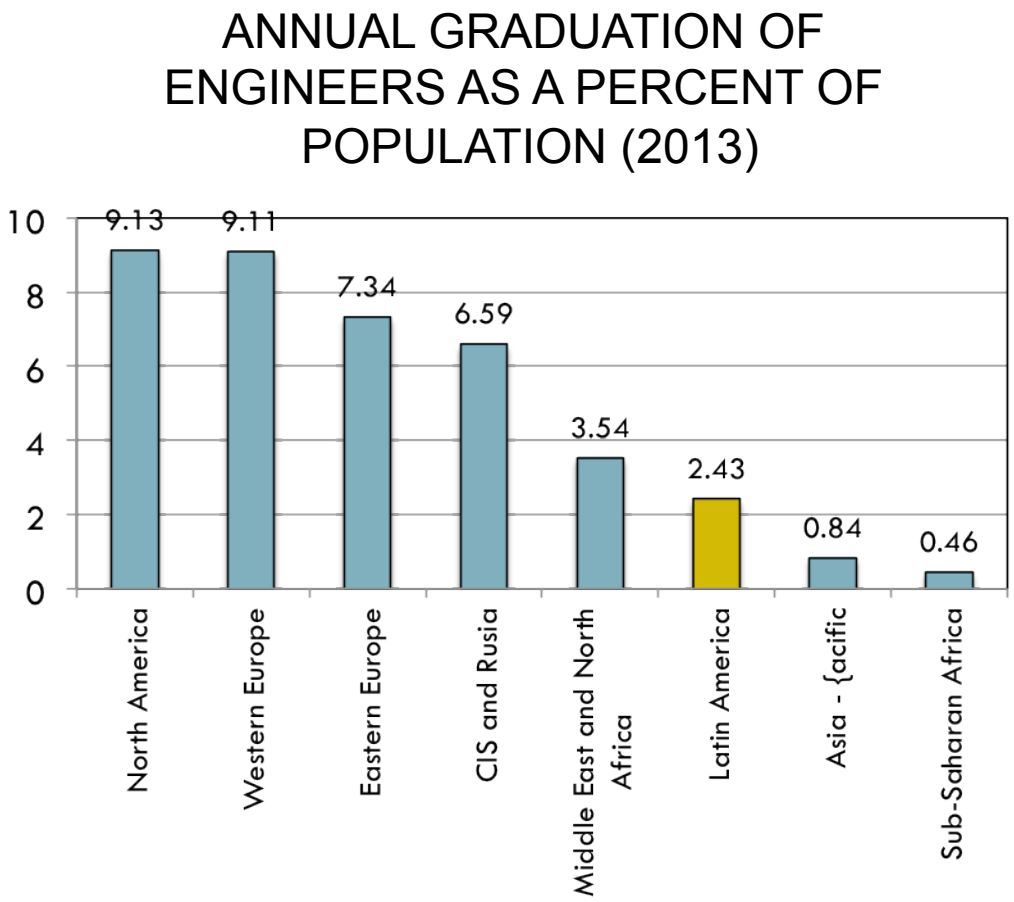
DEVELOPMENT OF VENTURE CAPITAL SCORECARD BY COUNTRY (2014)



Note: Survey conducted among fund managers where each factor is assigned a value between 1 (worst) and 4 (best)

Source: Latin American Venture Capital Association

FINALLY, THE LOCAL CAPACITY FOR GENERATING HUMAN CAPITAL IS FACING QUANTITATIVE AND QUALITATIVE CHALLENGES



- Based on a simple correlation between economic development and engineer production, Latin America should increase the annual number of graduates from 143,000 to 210,000
- 27% of businesses in Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and Venezuela report a difficult environment to hire telecommunications professionals
- On the other hand, the digital sector does not primarily need engineers but graduates in short courses more focused on platform design
- Diplomas focused on digital platform design do not exist In many countries of the region

Note: Engineering graduates in the last recorded statistical year as percentage of the population

Sources: UNESCO; Telecom Advisory Services analysis

THE LIMITED DEVELOPMENT OF A LATIN AMERICAN DIGITAL SECTOR IS DUE TO A COMBINATION OF STRUCTURAL ECONOMIC FACTORS AND COORDINATION FAILURES

COMPARATIVE ADVANTAGE OF GLOBAL PLATFORMS

- Direct and indirect network effects reinforce the dominant position of global platforms in search and social networks
- Economies of scale in R&D allow global platforms to maintain an innovation leadership

COORDINATION FAILURES

- Inefficiencies in the distribution of public funds
- Lack of alignment between development plans and digital R&D investment
- Barriers for stimulating venture capital investment
- Limited production of human capital

Future development of digital industries could be also affected by structural imbalances in the value chain

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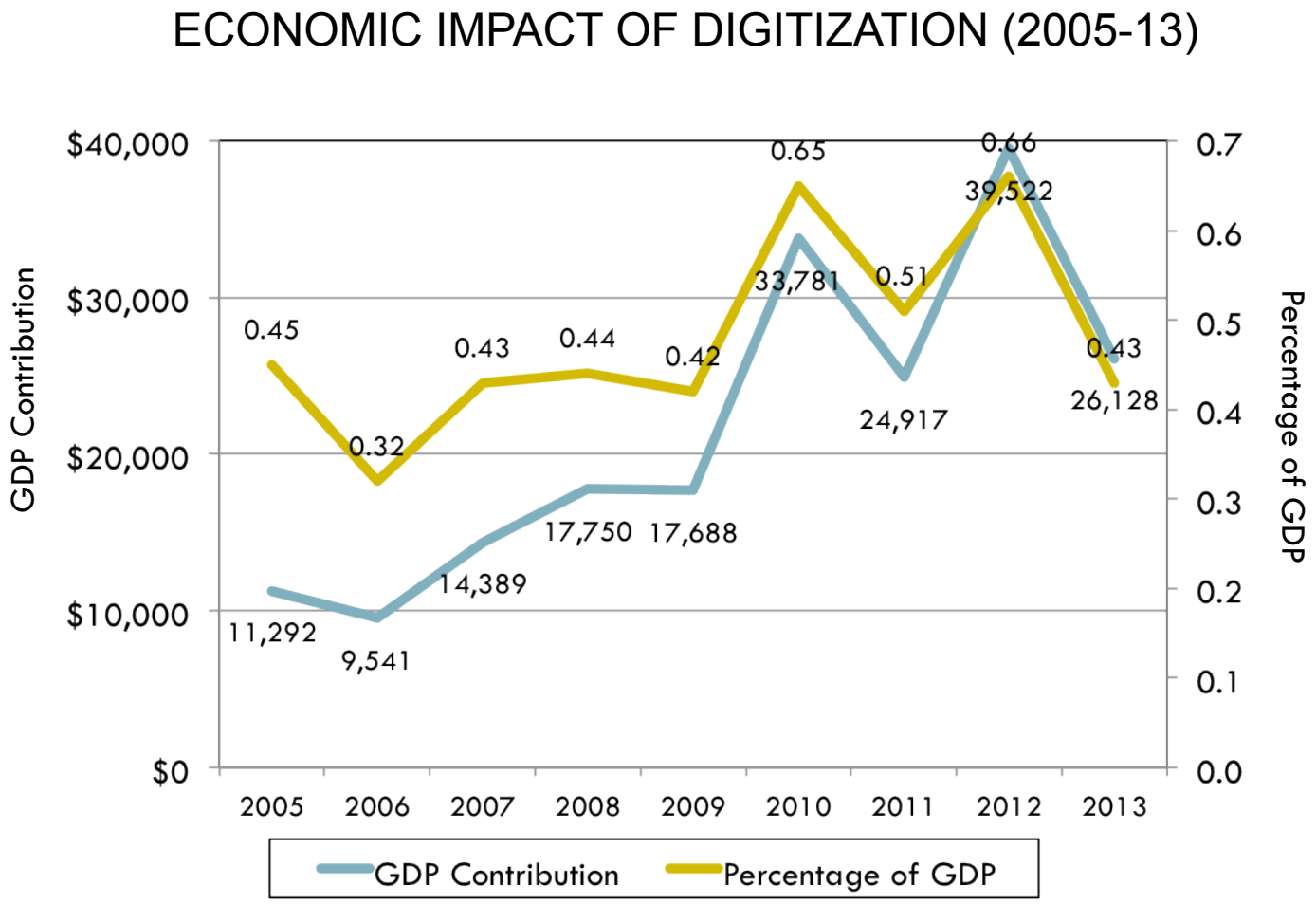
THE GROWTH IN LATIN AMERICAN DIGITIZATION HAS CONTRIBUTED TO 4.30% OF ACUMMULATED GDP BETWEEN 2005 AND 2013



Note: includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Trinidad & Tobago, Uruguay, and Venezuela

Source: Telecom Advisory Services analysis

THE VALUE CREATION BY STAGE OF THE ECO-SYSTEM PRODUCTION CHAIN INDICATES SOME STRUCTURAL DIFFERENCES ATTRIBUTED IN PART TO DISTINCT BUSINESS MODELS

DIRECT CONTRIBUTION BY VALUE CHAIN STAGE

Contribution	Digital Operators	Telecommunications Operators		Equipment Manufacturers	Terminal Manufacturers
		Total	Broadband		
Sales (US$ '000'000)	$ 9.242	$ 153.228	$ 49.217	$ 25.227	$ 25.227
Jobs	9.700	589.356	N.D.	21.026	10.836
Effective Tax Rate (%)	11,78 %	33,24 %	20,26 %	14,14 %	15,19 %
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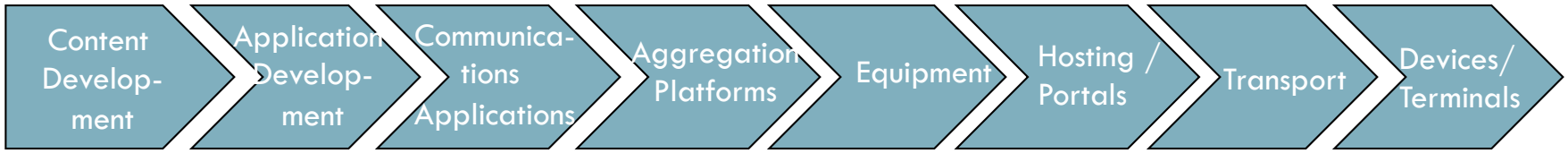
Sources: Telecom Advisory Services analysis

WHILE GROSS SALES ARE CONCENTRATED IN TRANSPORT AND EQUIPMENT MANUFACTURING, PROFITABILITY IS HIGHEST IN PLATFORM AGGREGATION

COMPARATIVE PROFITABILITY (EBIT/SALES) (2014)

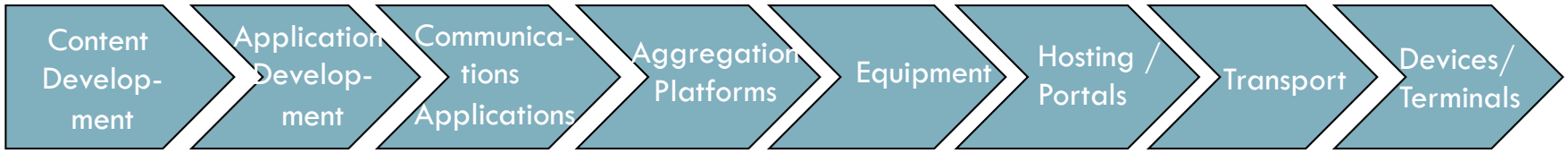


	Content Develop-ment	Application Develop-ment	Communica-tions Applications	Aggregation Platforms	Equipment	Hosting / Portals	Transport	Devices/ Terminals
AGGREGATED EBIT (%)	•Average: 22.65% (range: 23.64% -21.67%)	• Average: 1%	• Average: -0.8% (*)	• Average: 24.12% (range: 7.31% - 40.06%)	•Average: 9.62% (range: 7.37% - 11.87%)	•Average: 1.0%	•Average: 17.63% (range: 16.56% - 18.71%)	•Average: 22.40% (range: 16.08% - 28.72%)
EBIT LATAM (%)	•Average: 24.73% (range: 24.07% - 25.39%)	• Average: 28.62% (range: 32.49% - 24.76%)		• Average: 94.47% (range: 91.73% - 92.78%)			• Average: 16.42% (range: 7.71% - 20.81%)	

Source: Telecom Advisory Services analysis

AT THE SAME TIME, CAPITAL INVESTMENT IS MORE FOCUSED ON CONTENT CREATION, TRANSPORT AND EQUIPMENT MANUFACTURING

COMPARATIVE CAPITAL INVESTMENT (CAPEX/SALES) (2014)

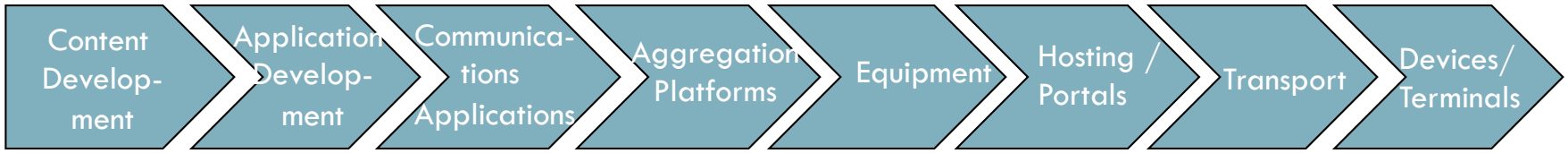


	Content Develop-ment	Application Develop-ment	Communica-tions Applications	Aggregation Platforms	Equipment	Hosting / Portals	Transport	Devices/ Terminals
AGGREGATED CAPEX / SALES (%)	• Average: 32.86 % (range: 34.64% - 31.07%)	• Average: 3%	• Average: 0%	• Average: 20.78 % (range: 40.12 % - 0.09 %)	• Average: 19.12 % (range: 29.52 % - 12 %)	•Average: 31.82%	• Average: 25.09% (range: 20.88% - 29.29%)	• Average: 16.07 % (range: 26.13% - 12%)
LATAM CAPEX / SALES (%)	• Average: 30.10 % (range: 33.46% - 26.71%)	• Average: 30.71 % (range: 27.95% - 33.47%)		• Average: 3.46 % (range: 10.38 % - 0 %)			• Average: 27.11% (range: 16.54 % - 34.37 %)	

Source: Telecom Advisory Services analysis

FURTHERMORE, PROFITABILITY AND CAPITAL SPENDING IMBALANCES ARE COMBINED WITH POTENTIAL DISTORTIONS IN TAXATION

TAX CONTIBUTIONS (EFFECTIVE TAXATION RATE) (2014)



	Content Develop-ment	Application Develop-ment	Communica-tions Applications	Aggregation Platforms	Equipment	Hosting / Portals	Transport	Devices/ Terminals
AGGREGATE ETR (%)	•Average: 32.85% (range: 31.07% - 34.64%)	• Average: 3%	• Average: 0%	• Average: 20.78% (range: 40.12% - 0.09%)	•Average 19.12% (range: 12% - (29.52%)	•Average: 31.82%	•Average: 25.08% (range: 29.29% - 20.88%)	•Average: 19.06% (range: 12% - 26.13%)
LATAM ETR (%)	•Average: 30.08% (range: 26.71% - 33.46%)	• Average: 30.71% (range: 27.95% - 33.47%)		• Average: 9.39% (range: 0% - 10%)			•Average: 27.11% (range: 16.54% - 34.37%)	

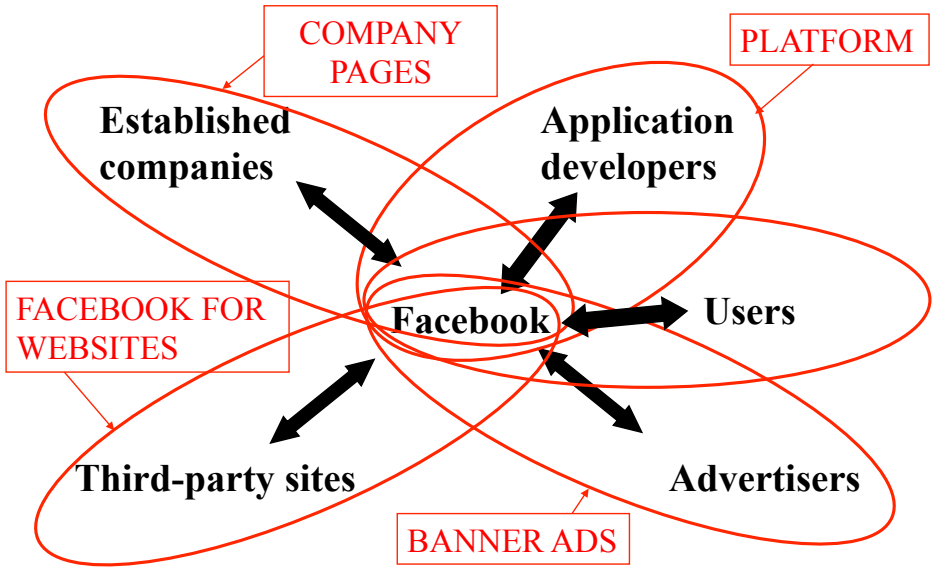
Source: Telecom Advisory Services analysis

IN SUM, WHILE THE DIRECT ECONOMIC CONTRIBUTION OF DIGITAL OPERATORS IS LIMITED WHEN COMPARED TO OTHER VALUE CHAIN STAGES, INDIRECT EFFECTS ARE SIGNIFICANT

- New business creation (platform applications, videogames, content)
- Productivity increase in certain sectors of the economy
- Price reduction in consumer good purchasing
- Increase in average household income
- Broadband adoption stimulus

FOR EXAMPLE, MULTI-SIDED NETWORK EFFECTS OF DIGITAL AGGREGATION PLATFORMS REPRESENT AN INCENTIVE FOR THE CREATION OF NEW BUSINESSES

FACEBOOK: MULTI-SIDED PLATFORM



LATIN AMERICA: VALUE OF NEW BUSINESSES CREATED BY DIGITAL PLATFORMS (2014)

Business	Jobs	Sales (US$ '000'000)
Applications	20.000	$ 788
Videogames	~ 7.000	$ 237
Total	27.000	$ 1,025

Source: Telecom Advisory Services analysis

IN SUM, WHILE THE DIGITAL ECO-SYSTEM HAS A SIGNIFICANT AGGREGATE ECONOMIC CONTRIBUTION, ITS INTERNAL DYNAMICS ARE AFFECTED BY STRUCTURAL IMBALANCES

VALUE ADDED CREATION

- In Latin America, ICT capital explains 0.5 percentage points of GDP growth
- Digitization growth has contributed 4.3 % of accumulated GDP between 2005 and 2013
- Regional digitization has contributed to the creation of 900,000 jobs/year

DIRECT CONTRIBUTION BY STAGE OF THA VALUE CHAIN

- The providers of connectivity, equipment and terminals generate 91% (US$ 109 billion) of annual gross sales and 98% (631,000) of total jobs

INDIRECT CONTRIBUTION OF THE VALUE CHAIN

- Digital firms contribute to new business creation (27,000 jobs and US$ 1,205 million in gross sales)
- Also provide a stimulus for broadband adoption, productivity, etc.

IMBALANCES IN THE VALUE CHAIN

- Profitability of global digital platforms is on average 20-40 percentage points higher than other value chain players
- The effective tax rate of telecommunications operators in Latin America is 15 percentage points higher than digital operators

THIS SITUATION RAISES THE NEED TO IMPLEMENT PUBLIC POLICIES AND INITIATIVES AIMED AT DEVELOPING A LATIN AMERICAN DIGITAL INDUSTRY

- Latin America is progressing very slowly in the construction of a domestic digital industry
- The structural imbalance in the current value chain might contain potential barriers to the development of a local digital industry
- Low profitability rates in the transport stage could negatively influence capital spending in the development of access infrastructure
- Different tax regimes for firms participating in the eco-system could entail distortions that can ultimately affect consumer welfare

CONTENTS

- Demand transformation: from connectivity to digitalization
- The digital ecosystem: market structure and factors driving dominance
- Creation and transfer of value within the digital value chain
- The digital innovation challenge in Latin America

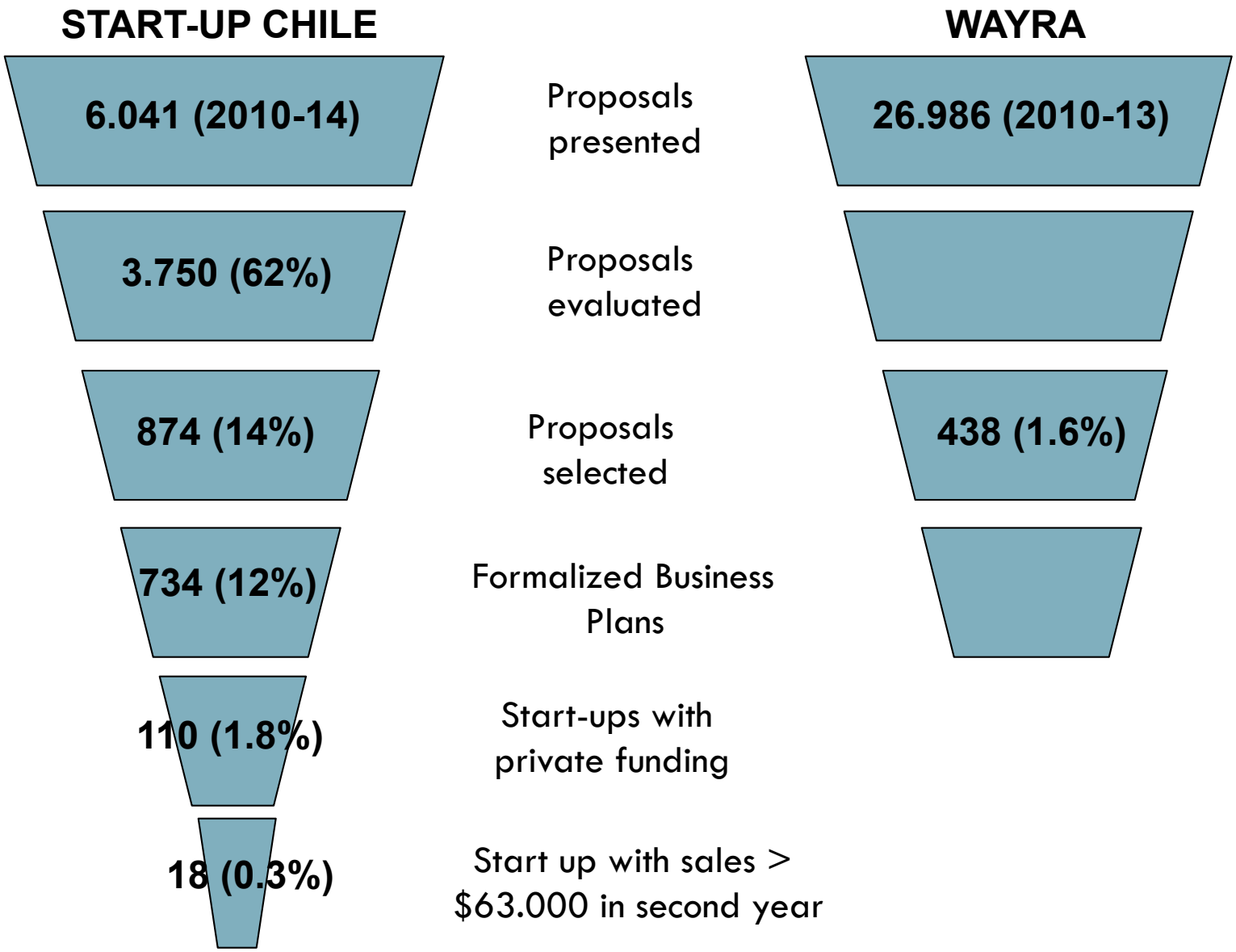
THE DEVELOPMENT OF A LATIN AMERICAN DIGITAL ECOSYSTEM REQUIRES IMPLEMENTING A NEW SET OF PUBLIC POLICIES

- Implement new practices in publicly-sponsored innovation for new business development (focus on few efforts, align with development objectives, rely on civil society inputs)
- Tackle the inefficiencies in private innovation (promote innovation in large enterprises, improve start-up selection and mentorship)
- Address the coordination failures in public spending (focus on scaling up projects, avoid redundancies)
- Generate necessary stimuli to increase private venture capital funding (IP protection, capital markets development, international accounting standards)
- Address structural imbalances in the digital value chain (asymmetric taxation rules)
- Promote investment of development banks (pooled financing procedures)
- Tackle the human capital gap (two-track talent development)
- Develop an integrated industrial policy for development of digital industries
- Address the fragmentation of institutions in charge of managing public policies in the digital domain

LATIN AMERICA HAS ALREADY STARTED TO DEPLOY PUBLIC AND PRIVATE INITIATIVES AIMED AT PROMOTING DIGITAL INNOVATION

INITIATIVES	EXAMPLES
National Public Programs	• Start-Up Chile • Apps.co (Colombia) • Start.Up Perú • Start-Up Brasil • Capital Semilla (Costa Rica) • Programa de Alto Impacto para Emprendedores (México)
Subnational Programs (provincial and municipal)	• Apoyo a la Investigación Científica y Transferencia Tecnológica al sistema Socio-Productivo (Santa Fe - Argentina) • Programa Distritos Productivos (Buenos Aires – Argentina) • Fundacao de Amparo de Pesquisa do Estado de Sao Paulo (Brasil) • Innova Bio Bio (Chile) • Instituto de Ciencia y Tecnología del Distrito Federal (México) • Programa de Estímulos a la investigación, desarrollo tecnológico e innovación (Jalisco - México) • BAITEC (Buenos Aires – Argentina) • Ruta N (Medellín - Colombia)
Private incubators	• Wayra • 21212.com • Start-Up Río (Brasil) • BA Accelerator • Founder Institute (Colombia) • NXTP Labs (Argentina) • Start-Up Studio Monterrey (México)

HOWEVER, THE HIGH ATTRITION RATES BETWEEN INITIAL PROPOSALS AND FUNDED START-UPS INDICATE THAT ONLY FEW VIABLE BUSINESSES ARE CREATED



Sources: CORFO; Wayra; Telecom Advisory Services analysis

PRIVATE DIGITAL INNOVATION NEEDS TO INCREASE SPENDING LEVELS AND FOCUS THE NUMBER OF START-UPS

- Promote digital innovation from large Latin American companies
  - Enhanced availability of financial and human resources
  - Possibility of accelerating digitization of production processes to build competitive advantage, and increase added value
- Private sector innovation needs to focus more its efforts in selection and mentorship
  - Increase selectivity of proposals
  - Increase the ratio of mentors per start-up
  - Select mentors among those that have scalability experience
  - Create relationships between entrepreneurs and business managers in order to expand support beyond start-up mentorship
  - Use large enterprises as environments for scalability

LATIN AMERICA HAS TO FOCUS ITS DIGITAL INNOVATION EFFORTS IN THOSE AREAS WITH HIGH IMPACT THAT LEVERAGE COMPARATIVE ADVANTAGE

- High social impact areas (health and education)
- Domains of high economic impact (agriculture, manufacturing, mining and natural resources, energy)
- Governments should provide direction for public investment, which could also be followed by the private sector
- Promote regional coordination to address funding redundancies, duplication of efforts and frictional costs, leveraging complementary areas of comparative advantage
  - Assign centers of excellence by country based on existing experience
  - Share funding on a regional basis
  - Migrate toward a digital single market
- Promote the common linguistic environment to gain scale

AT THE SAME TIME, IT IS CRITICAL TO EVOLVE BEYOND THE "TROPICALIZATION" OF FOREIGN DIGITAL BUSINESS MODELS

LOCAL DIGITAL PLATFORMS AND PRECEDING MODELS

Latin America Platform	Type of Platform	Geographic and year of launch	Preceding Model
Bebestore	Baby articles e-Commerce	Brazil (2009)	4moms (EE.UU.) (2004)
Beleza na Web	Cosmetics e-Commerce	Brazil (2006)	Beauty.com (EE.UU.) (1999)
Comparaonline	Insurance e-Commerce	Chile (2009)	E-ssurance (EE.UU.) (1998)
Dafiti	Apparel e-Commerce	Brazil (2010)	Bluefly (EE.UU.) (1998)
Despegar.com	Travel agency	Regional (1999)	Expedia (EE.UU.) (1996)
Easy Taxi	Taxi on demand	Brazil (2012)	Uber (EE.UU.) (2009)
EL07	Handicraft e-Commerce	Brazil (2008)	Etsy (EE.UU.) (2005)
Hotel Urbano	Hotel reservation	Brazil (2011)	Hotels.com (EE.UU.) (2000)
Kekanto	Travel guida	Brazil (2010)	TripAdvisor (EE.UU.)
Linio	E-Commerce	Mexico (2012)	Amazon (EE.UU.) (1994)
Movile	Content distribution and smartphone e-Commerce	Regional (1998)	Tencent (China) (1998)
Netshoes	Sports articles e-Commerce	Regional (2000)	Zappos (EE.UU.) (1999)
Oqvestir	Apparel and Ladies luxury items e-Commerce	Brazil (2009)	Gilt (EE.UU.) (2007)
Restorando	Restaurant reservation	Regional (2010)	Open Table (EE.UU.) (1998)
Vivareal	Real estate matching platform	Regional (2007)	Streeteasy (EE.UU.) (2005)
Wine.com.br	Wine e-Commerce	Regional (2008)	e-Vineyard (EE.UU.) (1998)

Source: Compiled by Telecom Advisory Services

DIGITAL INNOVATION SHOULD FOCUS ON A FEW CRITICAL BUSINESSES WITH HIGH POTENTIAL: EXAMPLES…

SOCIAL MESSAGING

- Service adapted to geographies with limited broadband bandwidth
- High volume of short messages indicate the potential for a substitute product that includes social networking features
- Despite WhatsApp Messenger dominance (38 million users), entry barriers are extremely low given low multi-hosting costs
- Required capital investment is relatively low (WhatsApp: US$ 111 millones)

VIDEO STREAMING

- Importance of Spanish and Portuguese content in the structuring of catalogs
- Low barriers to entry given the low multi-hosting costs
- Fixed broadband has reached a Latin American prorrated average of 38.49% of households(4Q2014)
- Average bandwidth hs reached 3,53Mbps (4Q2014)
- Despite low bankarization rates, providers could offer service through other payment systems

ELECTRONIC COMMERCE

- Accelerated market growth, especially in Mexico, Brazil and Argentina
- The success of Mercado Libre and brazilian sites indicates that knoweldge of local market dynamics and indirect network effects are important comparative advantages
- Venture capital is inclined to fund these ventures
- Development of these platforms could gain even further speed if five barriers are addressed (protection of consumer interests, legal validity of electronic invoice, privacy, logistics infrastructure, and bankarization)

DIGITIZATION OF PRODUCTION PROCESSES

- Leverage public and private initiatives
- Driven by public incubators
- Focused on health, transportation, natural resources, robotics, and biotechnology

COMPLEMENTS TO GLOBAL PLATFORMS

- Apps for Facebook Platform, Twitter and LinkedIn
- Increasing funding availability
- Public funding offering partial risk guarrantees or non refundable resources

THE EXPERIENCE OF PUBLIC INNOVATION IN THE REGION EFFORTS YIELDS SOME BEST PRACTICES TO BE FOLLOWED

- Focus on a limited number of start-ups in order to reach critical mass financing
- Focus financing of not early development stages, but also on start-up scaling
- Align start-up selection criteria with most important needs of local economy
- Refine eligibility criteria for financing, balancing the attracting of local talent
- Combine innovation support with improvement of legal and regulatory frameworks in support of entrepreneurship
- Create institutional and political consensus to ensure continuity of the innovation effort beyond political-electoral cycles
- Achieve a geographic and human talent balance
- Incorporate representatives of the private sector in program oversight
- Formalize alliances with local academic institutions
- Develop entrepreneurship social networks

SUB-NATIONAL PUBLIC INCUBATORS ARE ALSO A SOURCE OF BEST PRACTICES THAT COULD BE APPLIED AT THE NATIONAL LEVEL

Create strong local institutions for eco-system development

- Develop level frameworks for management of intellectual property
- Build technology transfer mechanisms
- Attract private venture capital for start-up financing

Promote local sharing of start-up ideas

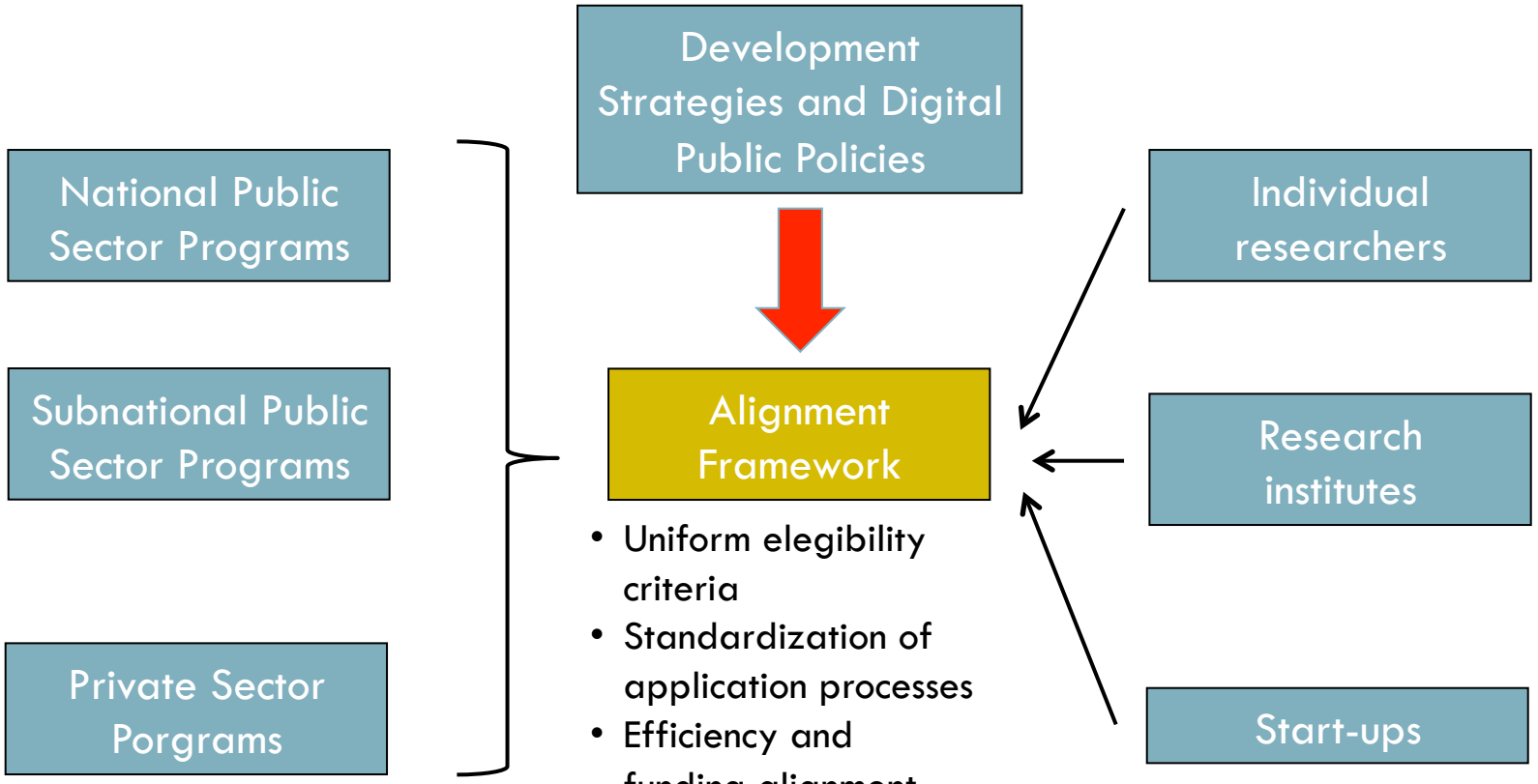
- Strengthen University-Private sector-Public sector collaboration mechanisms
- Promote innovation in tertiary education
- Create system to monitor trends and market opportunities
- Promote innovation in tertiary education
- Incorporate local population in the idea flow about new start-ups

Reach funding critical mass

- Increase the allocation of local funding to local science and technology initiatives
- Engage local organizations in the investment of innovation
- Combine regulation and national investment funds
- Leverage purchasing power of innovative public organizations

IT IS IMPERATIVE TO CREATE FRAMEWORKS THAT ALIGN INNOVATION FUNDING WITH DEVELOPMENT OBJECTIVES, THEREBY REDUCING COORDINATION FAILURES

ALIGNMENT BETWEEN DEVELOPMENT STRATEGIES AND FUNDING OF INNOVATION



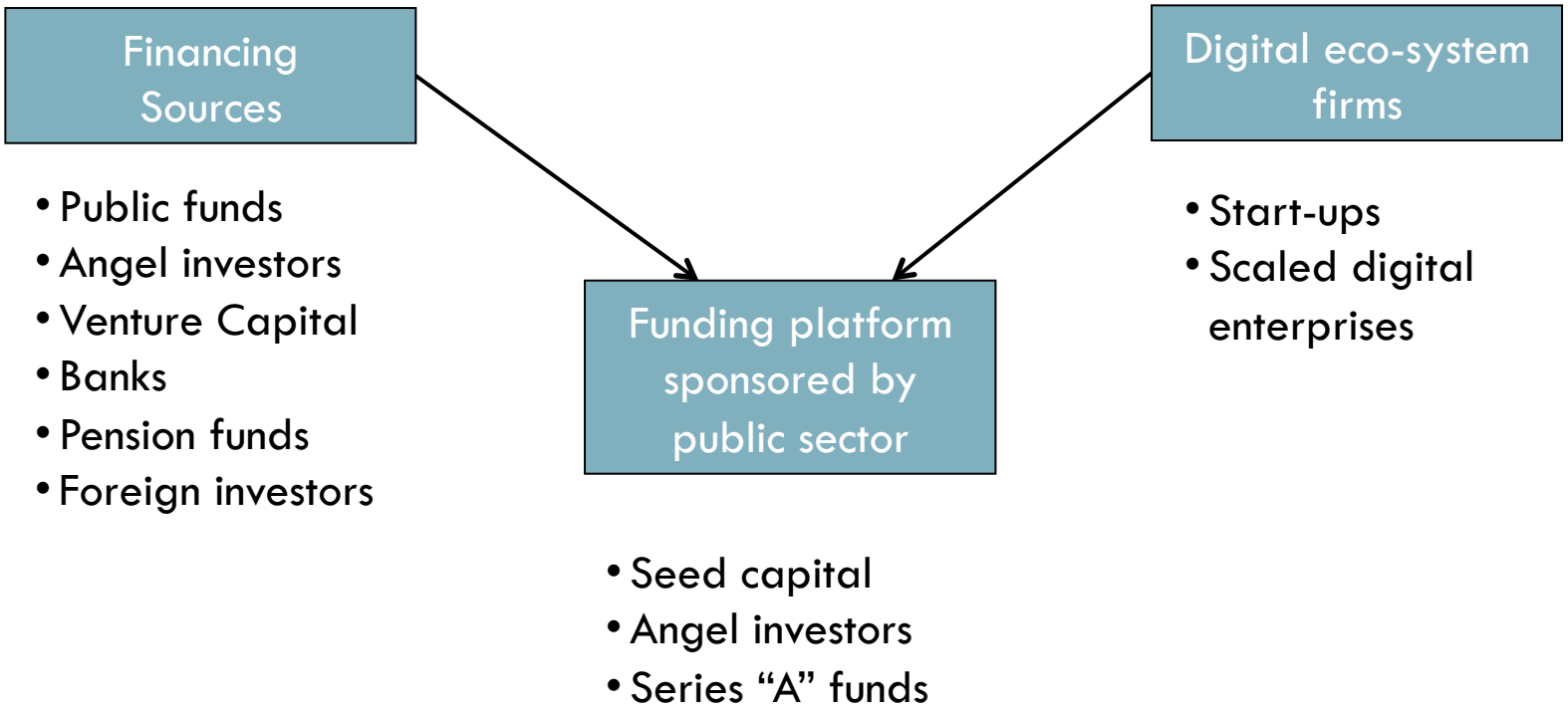
- Uniform elegibility criteria
- Standardization of application processes
- Efficiency and funding alignment principles according to national development strategies

ADDITIONALLY, THE CONDITIONS AND FRAMEWORKS DRIVING VENTURE CAPITAL FLOWS NEED TO BE IMPROVED

- Eliminate restrictions to local institutional investment (for example, lack of legal framework of preferred shares, which obliges investor to assume majority capital ownership to ensure control)
- Develop capital markets to facilitate exit strategies
- Improve the taxation framework of funds and investments
- Facilitate bankruptcy proceedings and ensure minority investor rights
- Simplify requirements for registration funds
- Develop internationally recognized accounting standards to ensure better visibility and monitoring of investments
- Introduce laws that facilitate the launch and operation of investment funds
- Provide certainty in the protection of intellectual property rights

SOME FINANCING FAILURES CAN BE ADDRESSED THROUGH MECHANISMS THAT ALLOW A BETTER COORDINATION BETWEEN PUBLIC AND PRIVATE SECTOR CAPITAL

STRUCTURE OF TWO-SIDED FUNDNG PLATFORM



DEVELOPMENT BANKS COULD ALSO FULFILL AN IMPORTANT ROLE IN ADDRESSING COORDINATION FAILURES IN THE FUNDING OF DIGITAL START-UPS

Suuport of large enterprise innovation

- Proactive support of large enterprises for projects focused on research, engineering, development, technology assimilation, production, and product distribution, processes and services in the value chain

Non-financial innovation support

- Technical feasibility studies
- Advisory regarding project evaluation
- Incubator promotion agents, following the InfDev model
- Development of networks focused on the exchange of financing experiences

Deployment of innovative funding mechanisms

- Pooled financing mechanisms
- Coordination of public, institutional, and private investors
- Risk reduction through partil risk guarrantees

Combination of development banks' resources

- Participation in institutional financing platforms to provide stability and certainty in digital innovation, provide liquidity in correction periods, and create investor confidence, without crowding out private capital

THE STARTING POINT FOR THE DEFINITION OF PUBLIC POLICIES IN THE DIGITAL DOMAIN IS THE DEVELOPMENT OF A STRATEGIC VISION ADDRESSING SOME KEY ISSUES

- What is the key objective in terms of digital industrial policy?
  - Digitization of production processes?
  - Social digitization addressing inclusion and inequality?
  - Development of an export orientes sector?
  - What are the strategic options regarding the relationship with global platforms?
- This strategic vision should contribute to the creation of a holistic framework integrating initiatives that until now are fragmented
  - Data protection and cyber-security laws
  - Smart cities
  - Start-up promotion
  - Telecommunications infrastructure

THIS STRATEGIC VISION AND RESULTING INDUSTRIAL POLICIES HAVE TO BECOME PART OF NATIONAL DEVELOPMENT PLANS

- It is rare to find a development plan in Latin America that considers digital industries as part of the production matrix
- Governments in the region rarely recognize the importance of digital industries and its inductive effect in economic development
- The digital agendas in the region combine partial goals without linkage to macro objectives, such as a change in the production matrix, increase of value added by digitization of production processes, or poverty reduction
- Digital agendas should answer some key questions
  - Which sectors should digital technology be a priority to maximize value added?
  - Which is the way digital innovation should be linked to those sectors?
  - How should private, national and foreign funding we attracted to those sectors?
  - How should be invested?
  - What are the respective responsibilities of the public and private sectors?
- The role of government should go beyond planning, and assume promotion responsibility and project execution

THE EXPERIENCE OF COUNTRIES THAT HAVE BEEN SUCCESSFUL IN EXECUTING DIGITAL STRATEGIES ALSO YIELDS SOME INSTITUTIONAL RECOMMENDATIONS

- Centralize digital public policies within a cabinet-level ministry with responsibility for infrastructure, ICT, applications and services industrial development
- Build stable technical teams
- Establish consultative mechanisms that include the private sector (telecommunications operators, manufacturers, ICT providers), public enterprises (municipal and national operators, cooperatives) and civil society (academia, unions, consumers and regional groups) in policy decision making
- Leadership from highest level of executive branch in the execution of digital policies
- Cross-ministerial coordination (Education, Industrial development, Finance, Culture, Health, Security)
- Involvement of regional and local governments

TO CONCLUDE, THE STUDY HAS PROVIDED GUIDELINES AND A ROADMAP FOR LATIN AMERICA TO TACKLE THEONGOING FUNDAMENTAL CHANGES IN THE DIGITAL ECO-SYSTEM

- The digital eco-system has been undergoing a fundamental transformation
- Until now, the primary public policy focus has been in networks and infrastructure
- The future policies had to be underpinned by an integrated vision of the co-system
- The risk of not implementing these changes is that Latin America will continue to be a mere consumer of content, applications and services developed beyond its frontiers, with a limited capacity of adding value to production processes

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