Structural Transformation in MENA and SSA: The Role of Digitalization

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Overall Appreciation MENA (1)

- From a globalization perspective, MENA defies geography
- MENA has lagged on servicification with low GVC upstream participation
- <u>Optimistic scenario.</u> Absence of services export growth outside GCC suggests strong potential and opportunities to leverage digitalization because of young computer-savy workforce….provided that governments get their act together on policy front.
- If digitalization signifies ultimate death of distance (properly measured for services trade via data), then how can MENA that missed the digitization boat jump on GVC train (presumably here to stay notwithstanding current some offshoring)?
- <u>Pessimistic scenario.</u>
- low values for indicators of network readiness
- Long term: Huge climate change challenge for adaptation (large CC migratory pressures)

Overall appreciation SSA (2)

- For SSA, the size of the digital economy is small,
- Digital-readiness is low, Cost of capital is high
- On the way to account for half of the growth in the global labour force over the first half of the 21st.
- Automation challenge presents a threat for employment. Arrival of digitalization could rob SSA from its demographic dividend opportunity offered by rising wages in China.
- Also large Climate-Change-related migratory pressures

- High GVC participation associated with higher future growth (WB 2020)
- Geography is an important correlate of trade costs at least for goods, less so for services.
- MENA countries are not landlocked so SMC connection necessary for GVC participation are good and good connectivity (see below)
- SSA GVC participation has increased
- Why hasn't MENA region which is at arm's length of EU participated more in globalization as one would have expected than GVC data to tell us (i.e. locate at the star in the figure with higher GVC participation and growth from 1990 to 2915)?
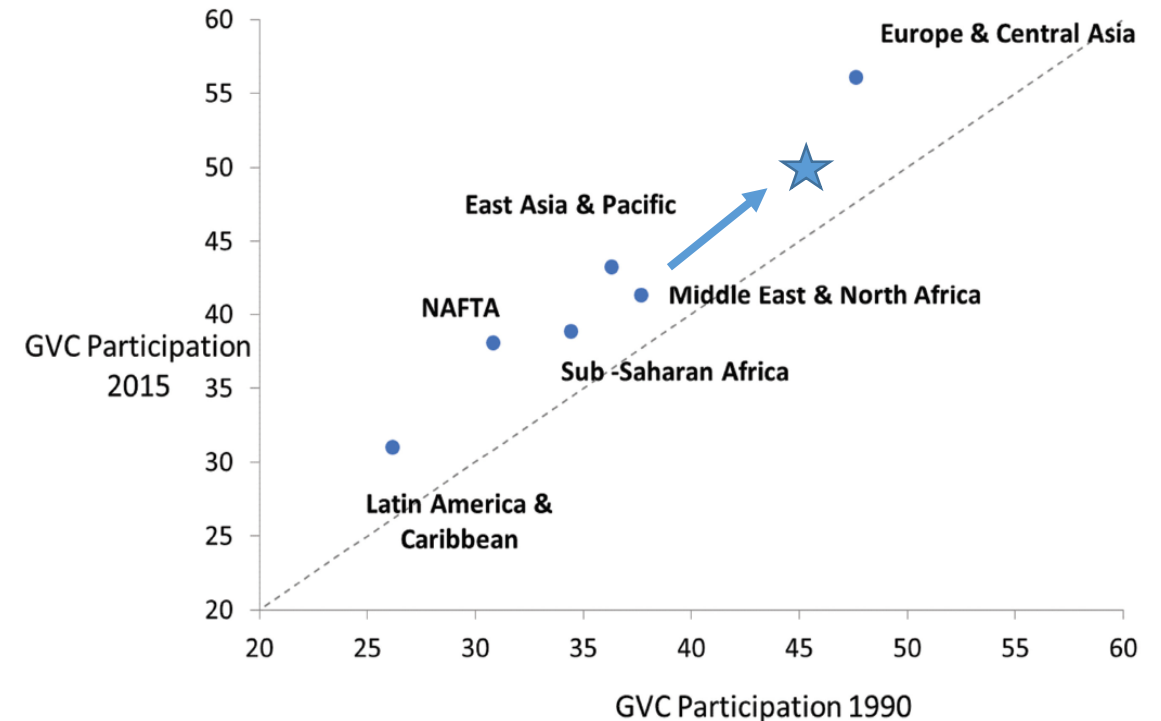
MENA defies geography

Figure 2 | Global Value Chain (GVC) participation by major geographic regions. *Source*: Authors calculation using GVC database from Borin and Mancini (2015, 2019). *Note*: See Annex A for full countries in regional groups. Points above 45° indicate an increase in GVC participation.

Source: Melo and Twum (2021)

The Thread

- MENA defies geography.
- SSA has persistent high trade costs
- Persistently high Trade Costs with mostly forward GVC participation
- Low servification (services trade concentrated in transport and tourism)
- High Mobile usage in MENA, but low network readiness

low digitalization reflected in low regional servicification in MENA (as captured in low Services share of exports) (A2)

- Digitization: <u>converting</u> analog representations of tangible objects or attributes into a digital format
- Digitalization: <u>applying digital</u> technologies to existing business processes
- Digital transformation: changing or developing new business processes and products using digitalization technologies
- <mark>Servicification: process of increasing intensity of the share of services in GDP</mark> (value added), or, at the firm level, a shift towards services in revenues
  - Average rate of increase in servicification of Arab countries below that observed in middle-income countries: 7.5 vs. 15 percentage point increase since 1990
  - **Services % GDP Arab states =**<mark>**49.7% vs, 54.7% in MICs**</mark> (structure of services exports show MENA specialized in transport and travel services and weak performance in non-tourism services)
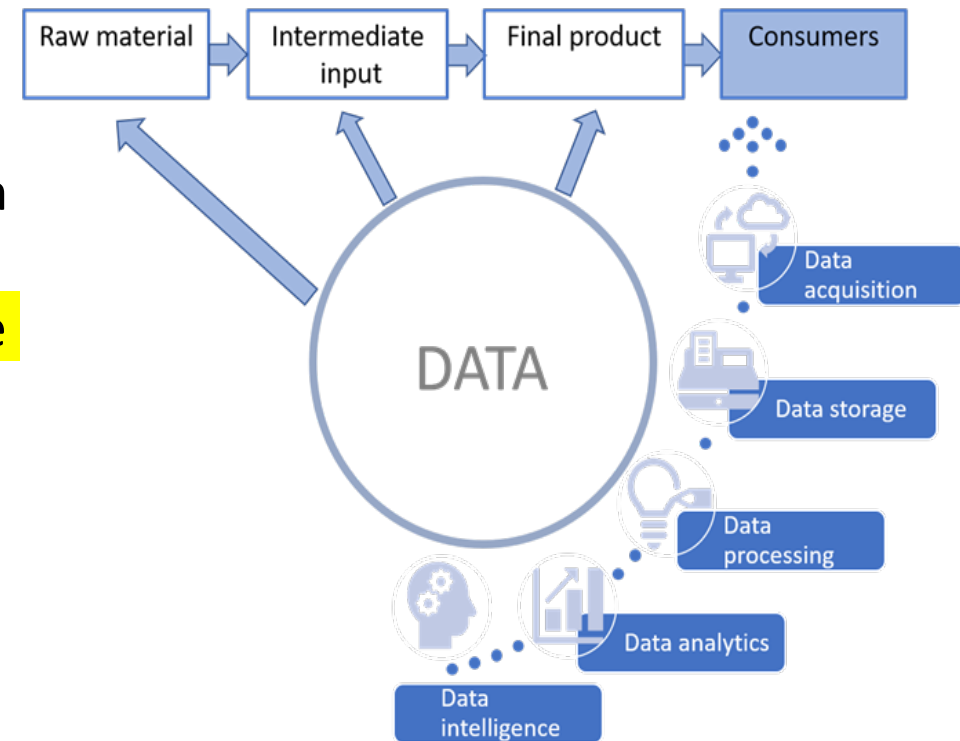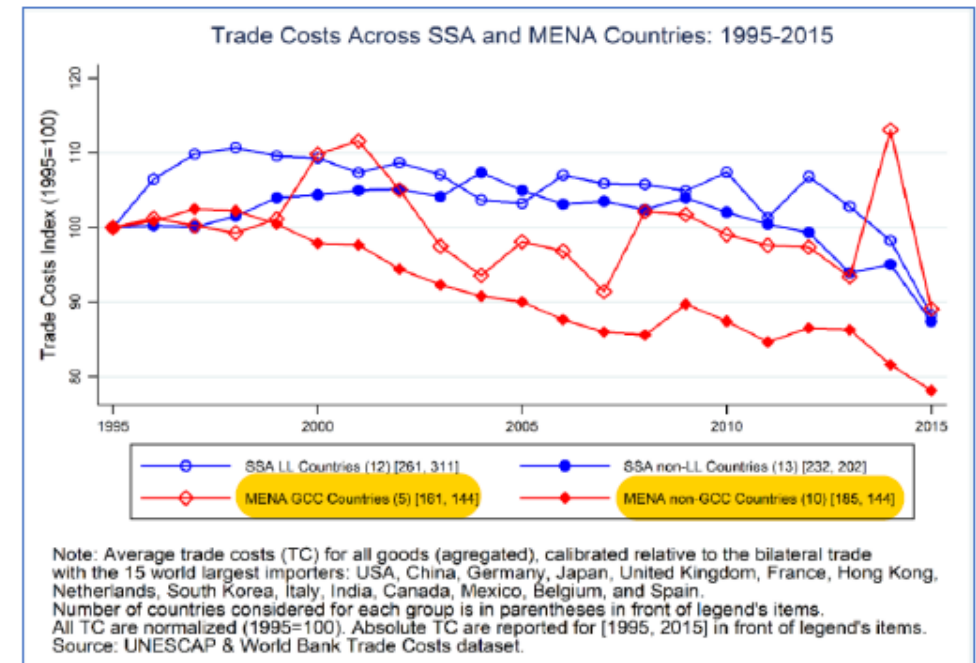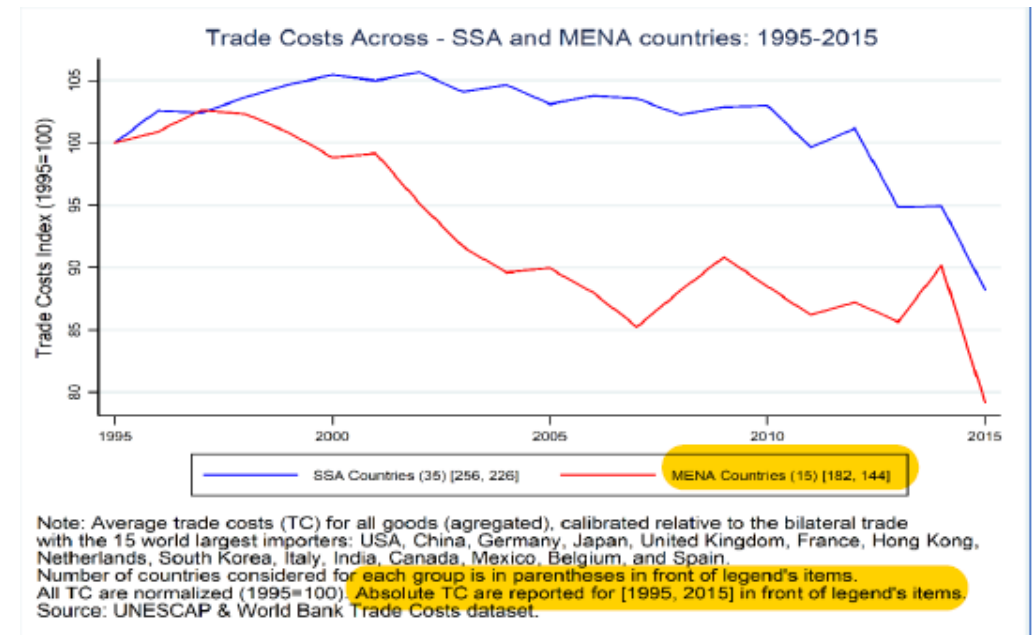

Source: Hoekman (2021)

Bilateral trade costs high in MENA, SSA

Gravity-calibrated Trade Costs

- Bilateral trade costs of MENA (15 countries) relative to bilateral trade costs of top 15 world traders (182% → 144%)

- Non-GCC group started a little further to top than GCC (and especially from SSA) with slight catching up to GCC.

- ...but, controlling for geography factors, trade costs still stubbornly high.

- ... Reflected in low backward GVC participation.

Source: Melo/Solleder (2022a)

Trade Costs Across - SSA and MENA countries: 1995-2015

Note: Average trade costs (TC) for all goods (agregated), calibrated relative to the bilateral trade with the 15 world largest importers: USA, China, Germany, Japan, United Kingdom, France, Hong Kong, Netherlands, South Korea, Italy, India, Canada, Mexico, Belgium, and Spain.
Number of countries considered for each group is in parentheses in front of legend's items.
All TC are normalized (1995=100). Absolute TC are reported for [1995, 2015] in front of legend's items.
Source: UNESCAP & World Bank Trade Costs dataset.

Trade Costs Across SSA and MENA Countries: 1995-2015

Note: Average trade costs (TC) for all goods (agregated), calibrated relative to the bilateral trade with the 15 world largest importers: USA, China, Germany, Japan, United Kingdom, France, Hong Kong, Netherlands, South Korea, Italy, India, Canada, Mexico, Belgium, and Spain.
Number of countries considered for each group is in parentheses in front of legend's items.
All TC are normalized (1995=100). Absolute TC are reported for [1995, 2015] in front of legend's items.
Source: UNESCAP & World Bank Trade Costs dataset.

MENA and SSA : So far mostly forward GVC participation

Table 3: Trends in GVC participation by region

	Backward (GVCbs)			Forward (GVCbs)			Total (GVCs)			Trend
	1995	2005	2015	1995	2005	2015	1995	2005	2015	
By region										
World	0.25	0.29	0.28	0.19	0.20	0.20	0.44	0.49	0.48	
East Asia & Pacific	0.22	0.25	0.25	0.17	0.19	0.19	0.39	0.44	0.43	
Europe & Central Asia	0.31	0.35	0.35	0.20	0.21	0.21	0.51	0.56	0.56	
Latin America & Caribbean	0.19	0.20	0.19	0.13	0.13	0.15	0.33	0.33	0.33	
Middle East & North Africa	0.18	0.15	0.14	0.22	0.26	0.27	0.39	0.41	0.41	
North America	0.16	0.18	0.16	0.20	0.21	0.21	0.35	0.39	0.37	
South Asia	0.11	0.14	0.15	0.18	0.20	0.19	0.29	0.34	0.35	
Sub-Saharan Africa	0.15	0.14	0.13	0.22	0.25	0.25	0.37	0.39	0.39	
By Country										
Egypt	0.11	0.14	0.11	0.23	0.25	0.26	0.35	0.38	0.37	
Kenya	0.15	0.17	0.17	0.18	0.20	0.19	0.33	0.37	0.36	
Morocco	0.11	0.12	0.16	0.21	0.27	0.26	0.33	0.40	0.42	
Nigeria	0.11	0.08	0.06	0.25	0.26	0.29	0.36	0.34	0.35	
Rwanda	0.16	0.12	0.18	0.25	0.32	0.25	0.41	0.44	0.43	
Saudi Arabia	0.21	0.16	0.13	0.20	0.24	0.28	0.41	0.40	0.41	
South Africa	0.16	0.17	0.17	0.22	0.25	0.25	0.37	0.41	0.42	

Notes: Estimates from the sample of 148 countries listed in table A2. Simple average at the region level. (GVCbs) is the share of imports in gross exports and (GVCfs) is the share of gross exports that enters into exports of destination country. (GVCs) = (GVCbs)+(GVCfs)

Source: Melo and Solleder (2021, table 1).

● A large import content of exports (high backward GVC_{bs}), an indicator of TFPG is key ingredient for successful transformation

● GVC_{bs} lowest among regions for SSA anf MENA in 2015

Digitalisation in MENA : ICT (high); DIGITECH (low)→Servification(low)

Figure 1: Inputs and outcomes of the digital economy
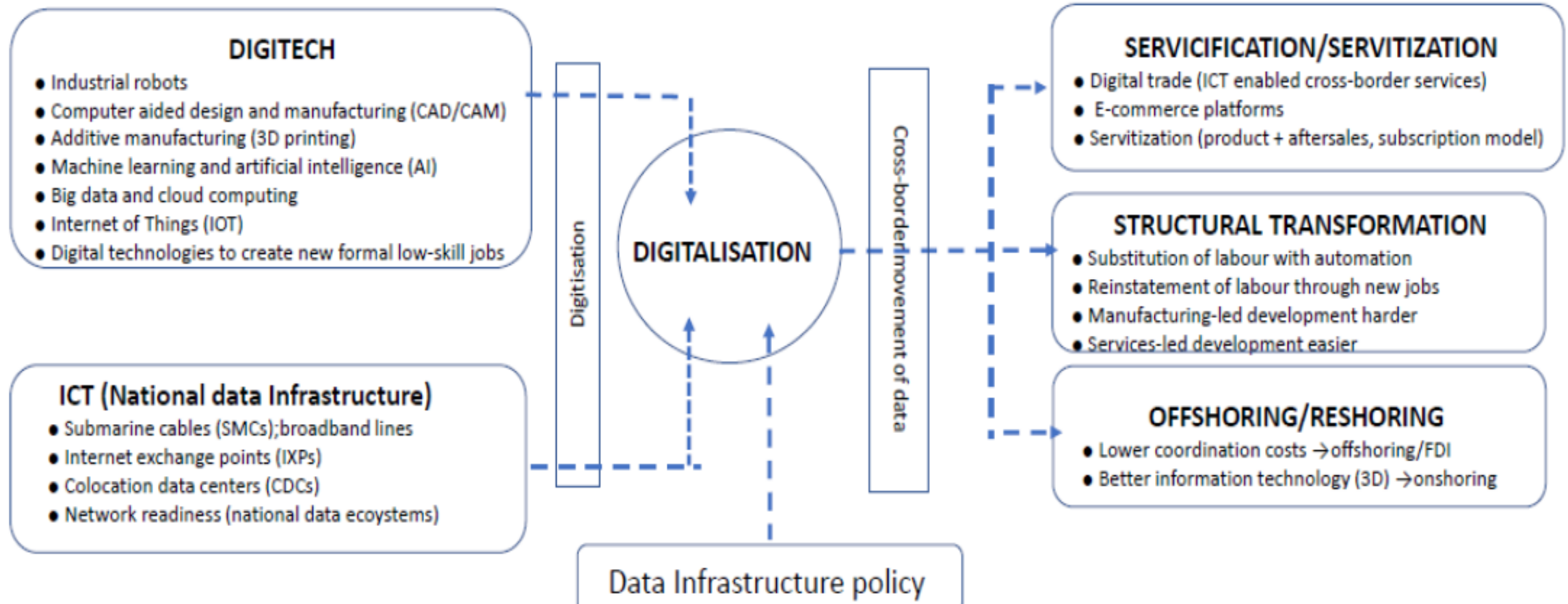
- Slide A1 gives estimates of the 'high hopes' of digitalisation for Africa and MENA
- MENA has done well on ICT (see mobile usage) but not on DIGITECH (due to low backward GVC participation?).
- Outcome: low servification (services share of GDP in MENA is low for MICs)

Two Challenges of digitalisation

DIGITECH should favor MENA countries that have missed the manufacturing-led stage of structural transformation, especially since well connected to the worldwide web (see high mobile usage on next slide)
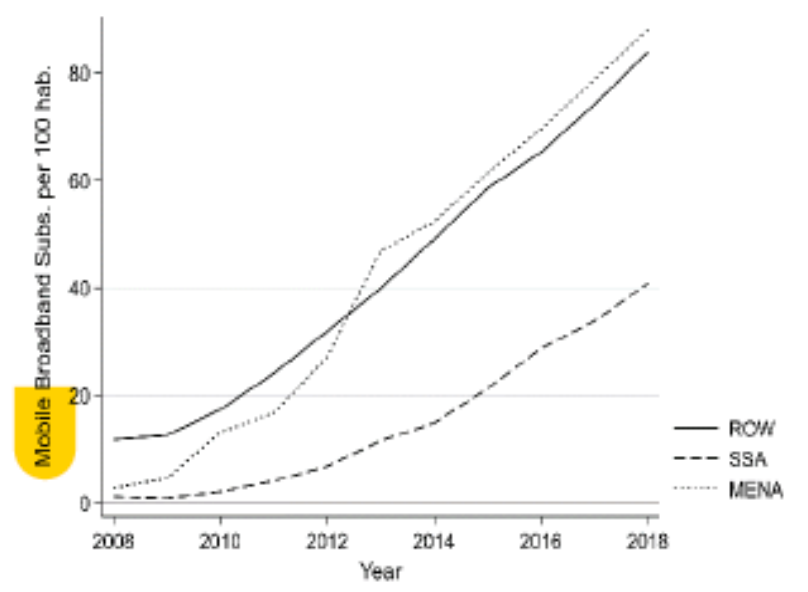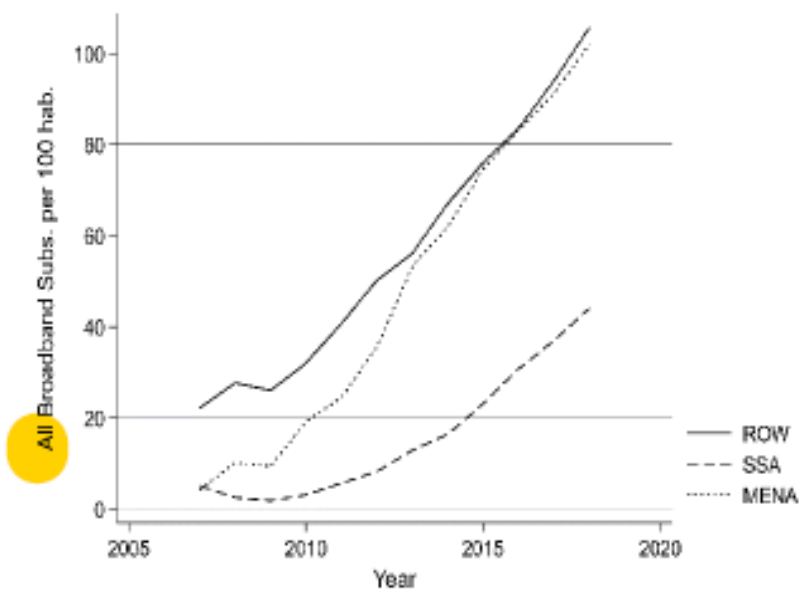
Figure 2: Two Challenges of Digitalization: (a) Globotics and (b) Disappearance of jobs
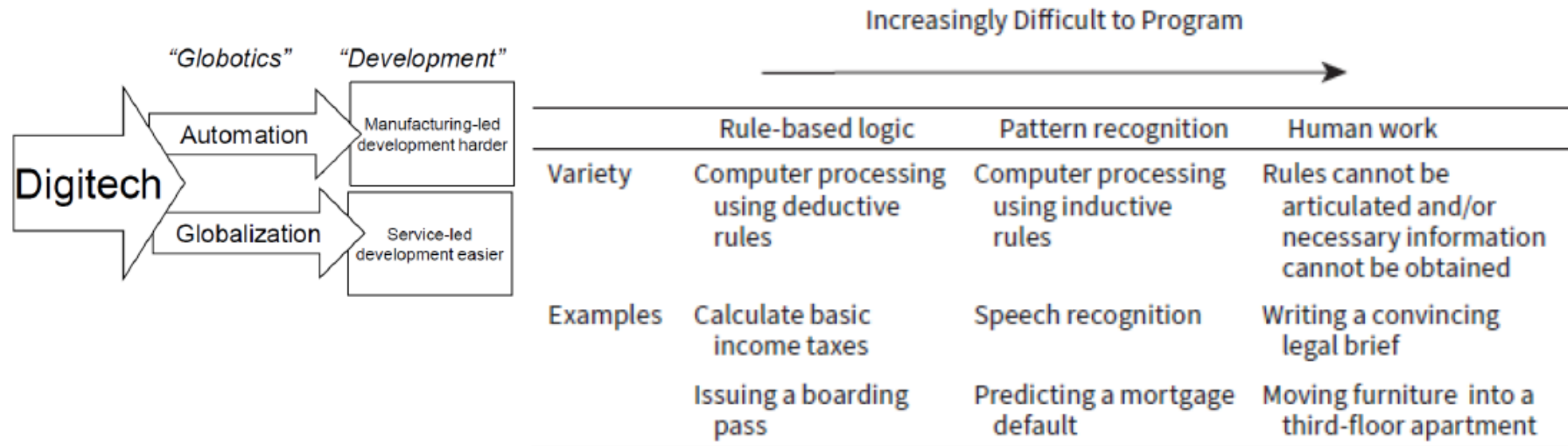
Source: (a) Baldwin and Forslid (2020); (b) Tirole (2017, table 15.1)

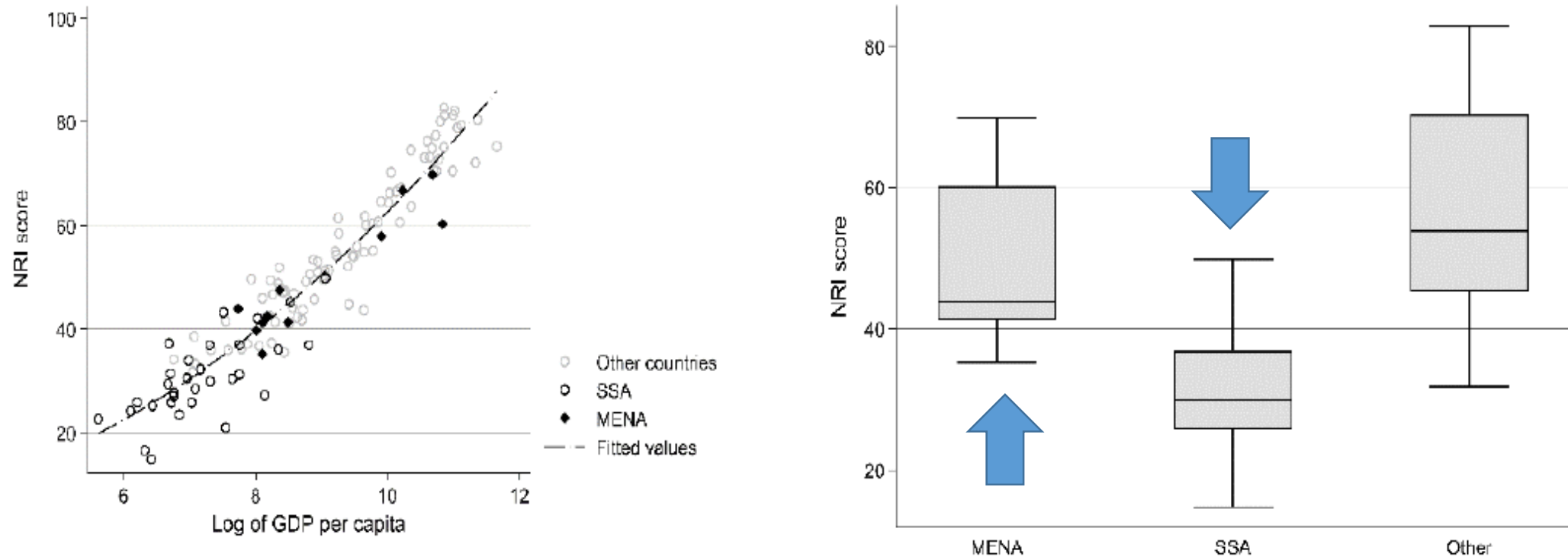# High Mobile usage in MENA, low usage in SSA...
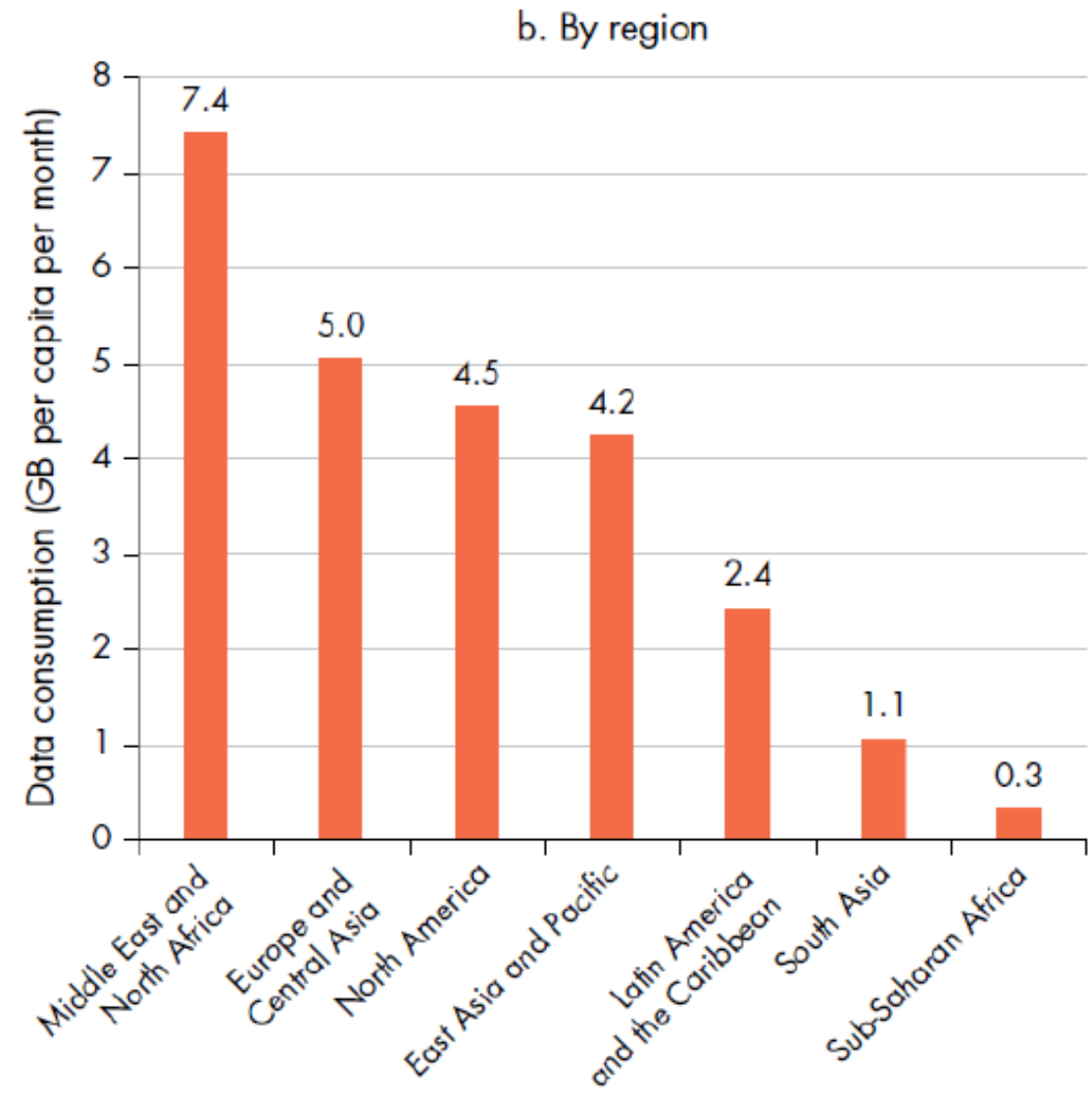
Source: ITU 2020

Source World Bank 2021, chp. 5, figure 10

… low Network Readiness Score for MENA and very low for SSA…

Figure 4: Network Readiness Index (NRI) scores in MENA and SSA

Notes: Scores based on a simple average of scores (number of indices per pillar in parenthesis) over four pillars: Technology (16), people (16), Governance (14), Impact (14). Except for technology, SSA and MENA, figure in the bottom of the regional rankings

Source: Authors' from NRI (2021) data for 132 countries (31 SSA and 14 MENA).

Source: Melo/Solleder (2022a)

…with low digital Trade Potential scores for MENA (1)

Table 1: Digital trade potential scores and ranking, selected Arab countries, 2016-2017 (N=111)

| | Digital infrastructure | | Digital trade potential | | Weighted overall |
	Score	Rank	Score	Rank	rank
UAE	1.014	22	0.045	26	24
Bahrain	0.816	31	-0.592	108	33
Kuwait	0.182	44	-0.406	92	47
Saudi Arabia	-0.176	56	0.192	16	50
Egypt	-0.638	82	0.015	28	70
Jordan	-0.621	77	-0.115	42	74
Lebanon	-0.75	85	-0.113	40	84
Tunisia	-0.623	80	-0.396	89	87
Algeria	-1.158	101	0.035	27	96
Memo items:					
Switzerland	1.894	1	-0.022	30	7
USA	-0.22	58	7.96	1	1
China	-0.788	87	5.054	2	5

Note: Scores derived from a factor analysis of indicators sourced from ITU, World Bank, WEF and UNCTAD: mobile telephone and fixed broadband subscribers per 100 inhabitants, credit card ownership (%), % of credit card owners making at least one digital payment in the past year, quality of logistics services and trade/transport infrastructure (5 point ordinal scale), use of ICT for B2B and B2C transactions (7 point scale), legal framework for consumer protection for online purchases and data protection (yes, no, draft), and GDP, total trade, and final consumption (USD bn).
Source: Ma, Guo and Zhang (2019).

Table 2: EGDI global ranking, 2020

Country	Rank
United Arab Emirates	21
Bahrain	38
Saudi Arabia	43
Kuwait	46
Oman	50
Qatar	66
Tunisia	91
Morocco	106
Egypt	111
Jordan	117
Algeria	120
Lebanon	127
Syrian Arab Republic	131
Iraq	143
Libya	162
Sudan	170
Yemen	173

Source: UN (2020).

EGDI: UN E-government digital index

Source: Hoekman table 1

… low ICT Skills for MENA and low education outcomes (2)

Table 4: Penetration of population with Basic, Standard, and Advanced Skills, 2020 or latest available year (%)

| Country	Basic Skills/1	Standard Skills/2	Advanced Skills/3
Arab countries			
Algeria	18	12	7
Bahrain	63	48	17
Djibouti	17	13	5
Egypt	55	43	11
Iraq	30	1	5
Kuwait		44	15
Morocco	40	28	10
Oman		37	8
Qatar	47	30	5
Saudi Arabia	61	64	21
Sudan	3	2	2
Tunisia	21	17	16
UAE	79	69	17
West Bank and Gaza	13	6	3
Advanced countries			
Finland	74		9
Germany	65		5
Ireland	58	41	7
Japan		49	4
South Korea	72	51	7
Sweden			11
Switzerland			10
United Kingdom	68		7

Source: ITU database, 2021

1/ *Basic skills* are defined as copying or moving a file or folder, using copy and paste tools, sending emails and attached files, and transferring files between a computer and other devices.

2/ *Standard skills* include using basic arithmetic formula in a spreadsheet; connecting and installing new devices; creating electronic presentations; and finding, downloading, and configuring software.

3/ *Advanced skills* would allow writing computer programmes using specialized programming language.

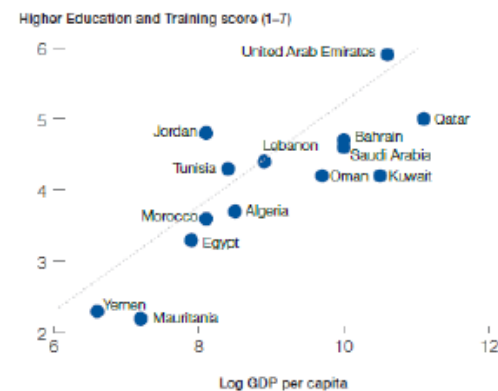**Figure 2:** Sectoral shares in value-added, Arab world, 1995–2015
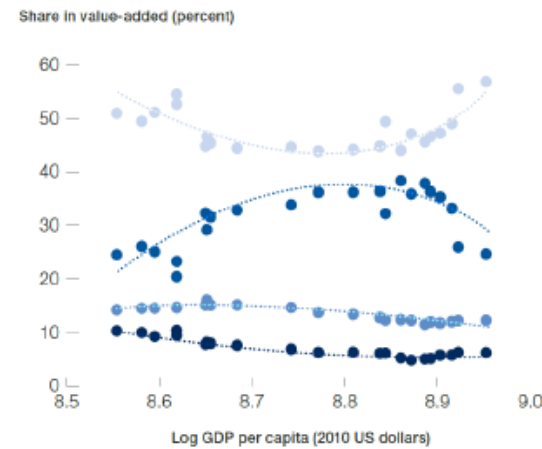
Figure 4: Economic complexity and per capita GDP, 2016

Figure 18: Higher education and training vs income level in the Arab world, 2015

Figure 20: TIMSS score vs income level in the Arab world, 2015
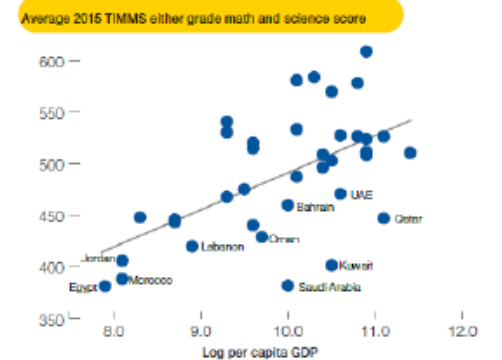
Digital Preparedness ladder (1)

28 countries
Low income : 48%
Lower middle income : 30%

67.3

5.6

29 countries
Low income: 38%
Lower middle income: 36%

21.3

4.5

13 countries
Low income: 14%
Lower middle income: 18%

11.9

2.3

7 countries
Lower middle income: 16%

4.8

Average price
US$ fixed broadband
per MB per month

0.8

Average price
US$ mobile broadband
per GB per month

Stage 0
- Data exchanged overseas

Stage 1
- Domestic data between ISPs exchanged at the IXP

Stage 2
- Diversity of participants at the IXP and presence of major international content providers

Stage 3
- IXP located alongside a co-location data center
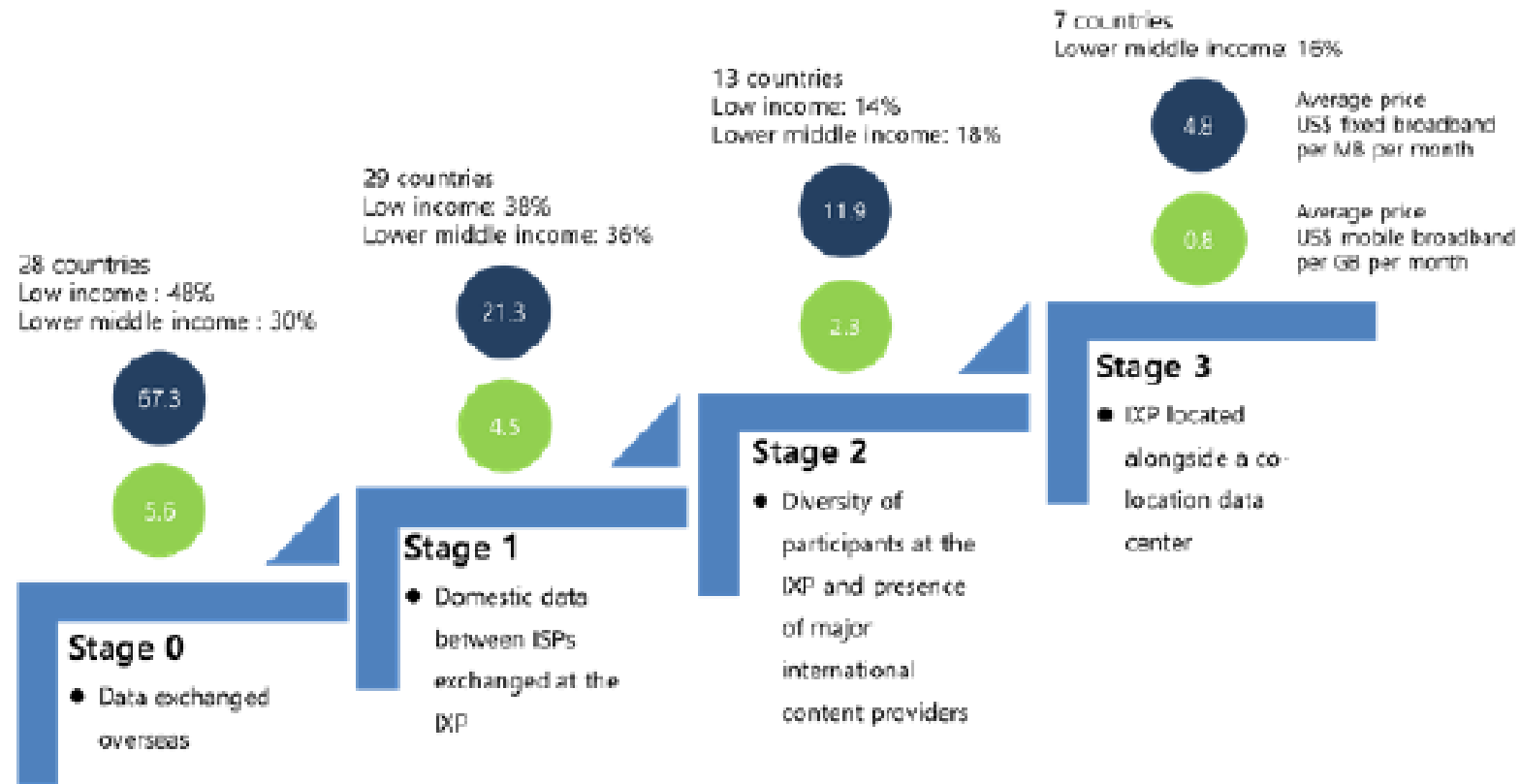
MENA and SSA dominate stages 1 and 2 in this group of 65 countries (all low and middle income countries)

No participant diversity in terms of providers

Notes: See table 2 for the list of MENA and SSA countries at each stage in the ladder. Number of internet exchange points (IXPs) per region and number of Colocation Data Centers (CDCs) in Comini et al. figures 7 and 10.

Source: Comini et al. (2021, figure 2). Sample of 65 LIC and LMIC countries. IXP: Internet Exchange Point

Digital Preparedness ladder (2)

Table 1: National Data Infrastructure in SSA and MENA: by stage and cluster

	Stage 0 (no IXP)	Stage 1(IXP)	Stage 2 (IXP with participant diversity)	Stage 3IXP + CDC
Cluster 1 Competitive market; relatively high levels of mobile and fixed broadband penetration; heterogeneous access to SMCs	CAR Mauritania Niger Somalia Yemen, R.	Burkina Faso Cameroon Cote d'Ivoire Egypt Madagascar Senegal Sudan Tanzania Sudan Tunisia Uganda Zambia	Congo, Dem.Rep. Morocco Mozambique Gambia	Ghana Nigeria
Other *	5	6	4	2
Cluster 2 Higher market penetration, fewer IXPs and heterogeneity in terms of access to SMCs	Cabo Verde Chad Guinea Bissau Lesotho Sao Tome & Principe. Sierra Leon South Sudan Syrian Arab Rep.	Benin Congo,Rep. Liberia Malawi Mali Rwanda Togo	WBank & Gaza	Kenya
Other *	3	3	2	1
Cluster 3 SIDS with no IXP or small markets with monopolies of duopolies	Comoros Eritrea Ethiopia	Eswatani		Djibouti
Other *	3	3	2	1

Notes: Data for 2018. Sample of 65 Low and middle-income countries. *: number of other LIC and LMIC countries in each stage and cluster.
Source: Comini et al. (2021, table 2). See description of characteristics in each stage on the ladder in figure 8. The three clusters are obtained from non-hierarchical clustering over the following characteristics: income status, mobile penetration (3G), access to SMC, and mobile market concentration (Herfindhal index).

IXP Internet exchange access points.
No IXP implies tromboning

Colocation Data Centers (CDCs) . No CDCs implies less latency

Regulatory policies. AETR in 19 gold exporters 48% in mining and 68% in mobile sector.

Data Centers key to exports of information Services

Figure 11 : Correlation between exports of information Services in GDP and Data Centers
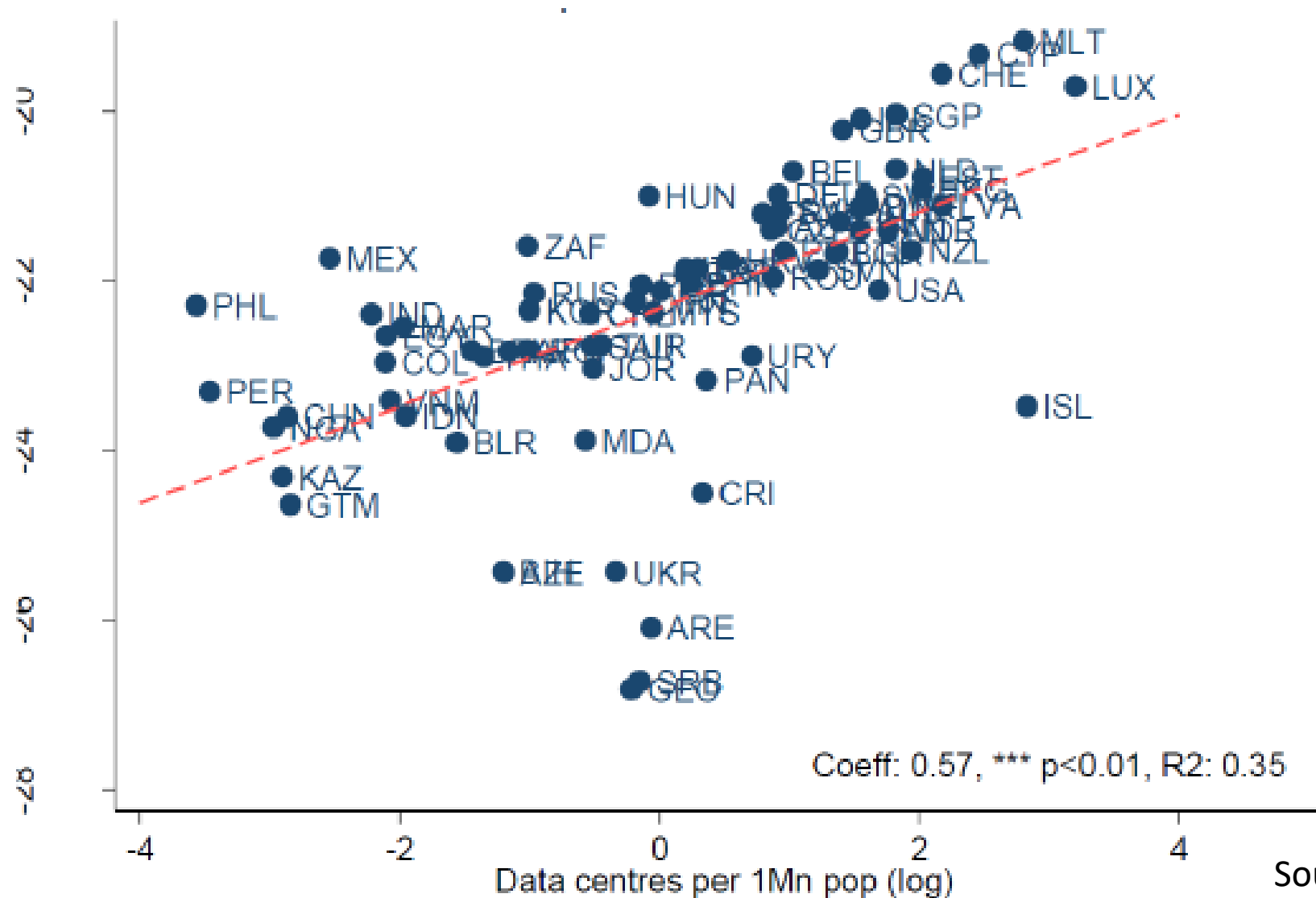
Access to hard infrastructure(CDCs) matters for exports of information services

Source: Van der Marel (2021)

Productivity-growth in Services: Mena and SSA

Figure 10: Labor Productivity Growth in industry and services by region, 1995-2018

CAGR of VA per worker (%)

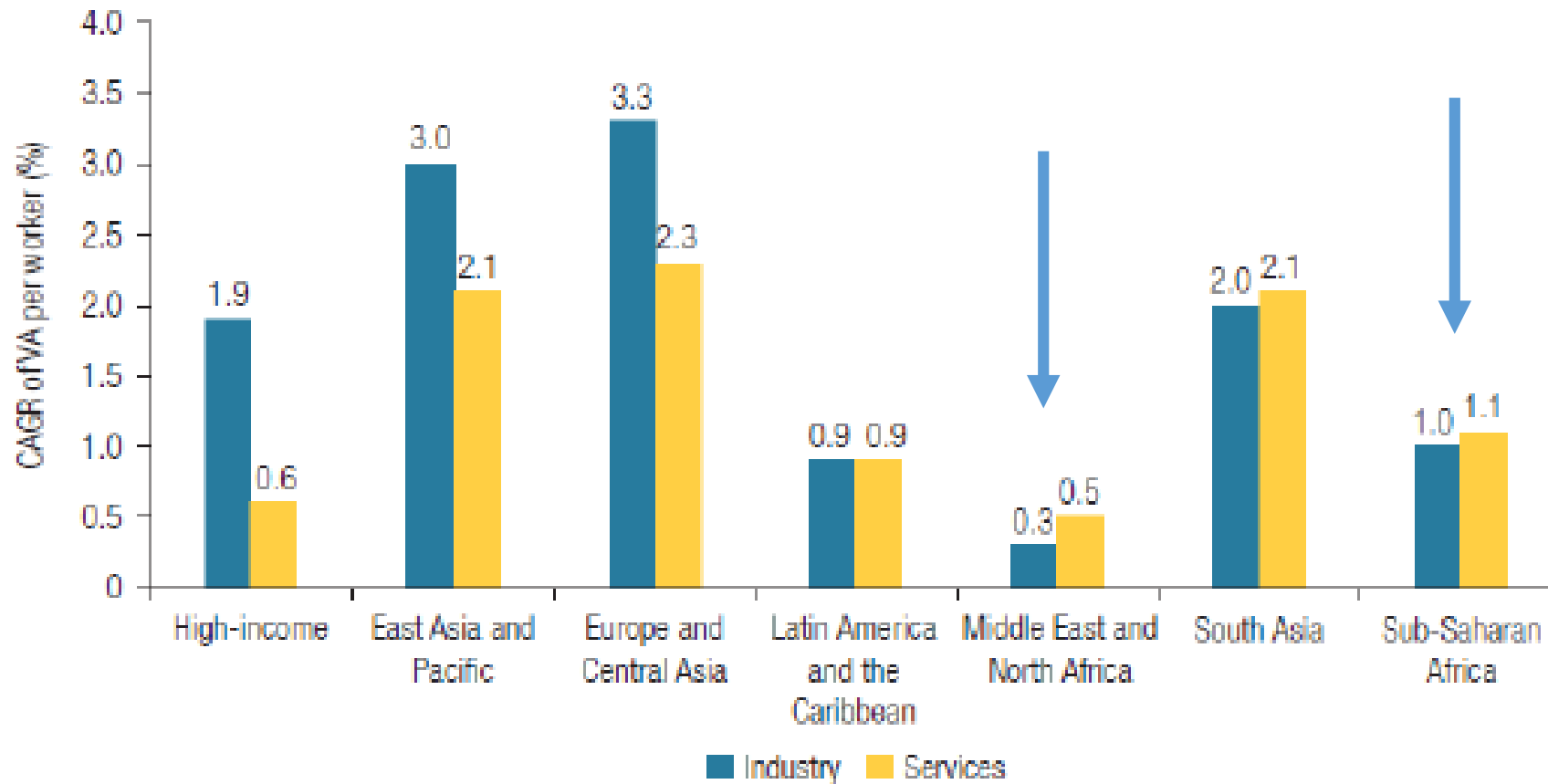| Region	Industry	Services
High-income	1.9	0.6
East Asia and Pacific	3.0	2.1
Europe and Central Asia	3.3	2.3
Latin America and the Caribbean	0.9	0.9
Middle East and North Africa	0.3	0.5
South Asia	2.0	2.1
Sub-Saharan Africa	1.0	1.1

■ Industry ■ Services

Notes: CAGR: Compound Annual Growth Rate. High income countries: GNI above $8995 in 1994. Industry includes manufacturing, mining, utilities and construction.
Source: Nayyar et al. (2021, figure 01) Data from WDI data base

- Slow servification in both MENA and SSA.
- In MENA half the rate in other middle income countries

- Low labor productivity growth in industry and services.

Note: services not very capital intensive, size matters less than for manufacturing, favorable characteristics for start-ups in capital-poor countries where achieving minimum scale is difficult

Final Thoughts

- Regional-level trends suggest MENA specificities have contributed in region having missed the industrialization cum manufactured exports structural transformation of the past observed in Asia.
- Good ICT infrastructure but low DIGITECH combine to present a challenge towards successful digitalisation, at least so far.
- Weight of distant history (Kuran 2010) still a brake on a successful digitalization?

Recommendations for policy-makers

- Summary UNDP-ERF report (Fardoust and Nabli (2022)—see A2-A5
- EIB report from 5800 firm surveys (Betz et al. (2022))—See A6

References (1)

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Rodrik, D. (2022), "Prospects for Global economic convergence under new technologies", in Z. Qureshi ed.

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Extra-Slides

Hoped-for gains from digitization (A1)

FIGURE 5.2 The Upside of Digital: Cumulative Gains in GDP per Capita in the Middle East and North Africa and in Sub-Saharan Africa, 2017–45
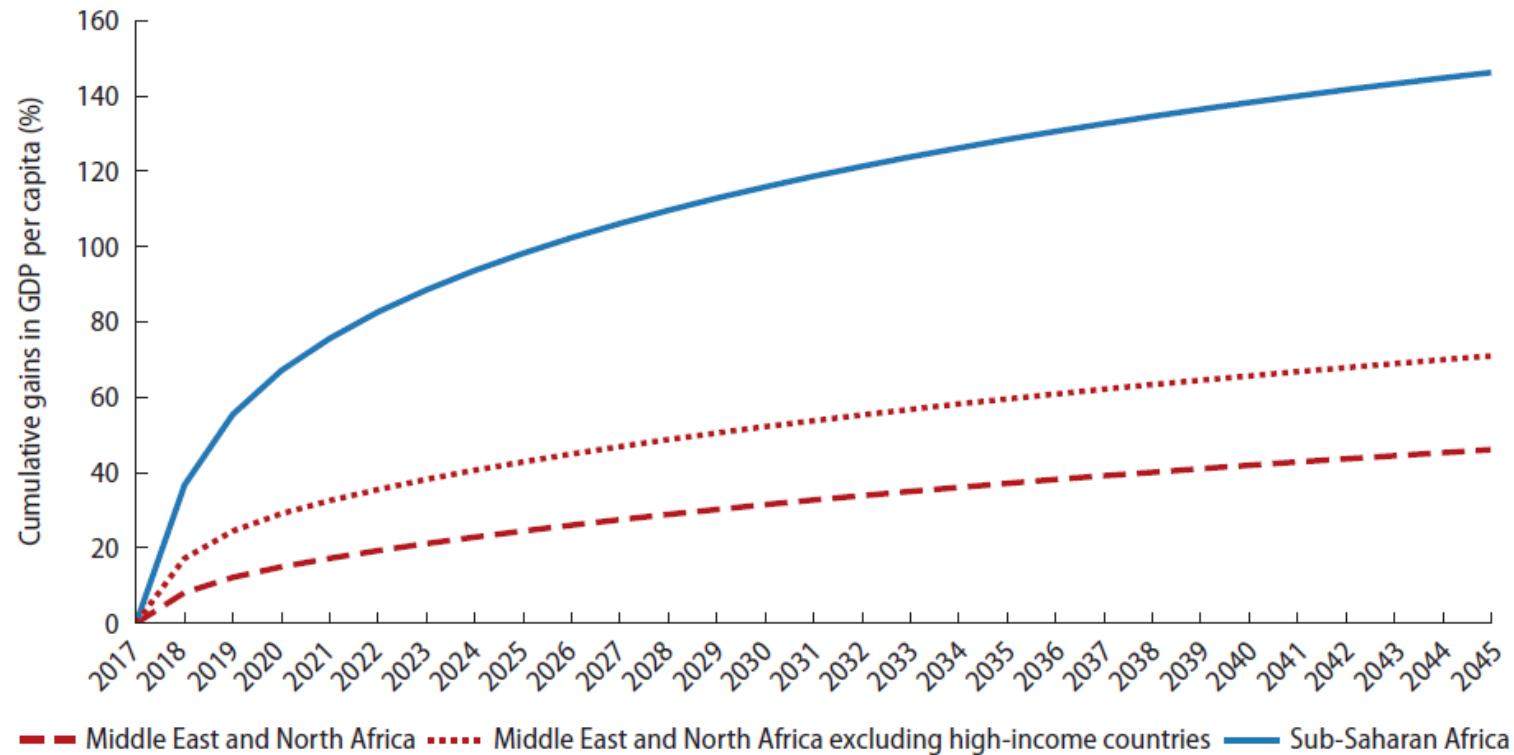

Source: Calculations based on estimates of the marginal effects of digital infrastructure on the level of GDP per capita presented in Calderon et al. 2019.
Note: The estimates of the marginal effects of expanding digital infrastructure services (internet use, mobile subscriptions, and broadband subscriptions) control for the preexisting level of GDP per capita and other indicators used in the various regression analyses. All countries are assigned the same marginal effect. The assumed adoption schedule follows the concave function discussed in the text. The data for each curve have been normalized to obtain start values of "0" in 2017.

Source: Cusolito et al. (2022)

Coverage by type of mobile network (A2)

Figure 1. Population coverage by type of mobile network, 2021
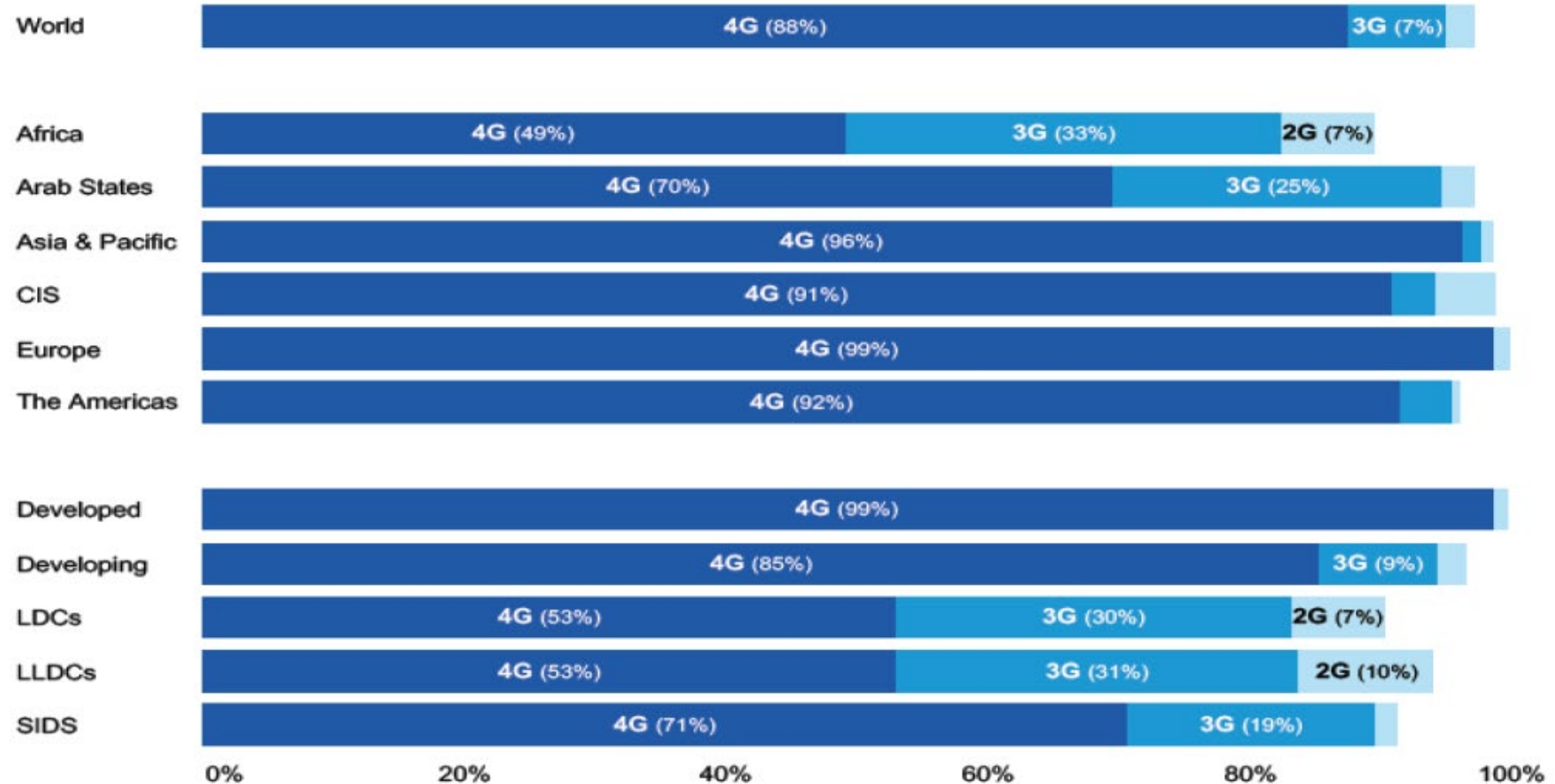
Source: (Fardoust-Nabli)

The Gender usage gap by region is highest in MENA (A3)

The Internet user gender parity score (%), 2013 and 2019*
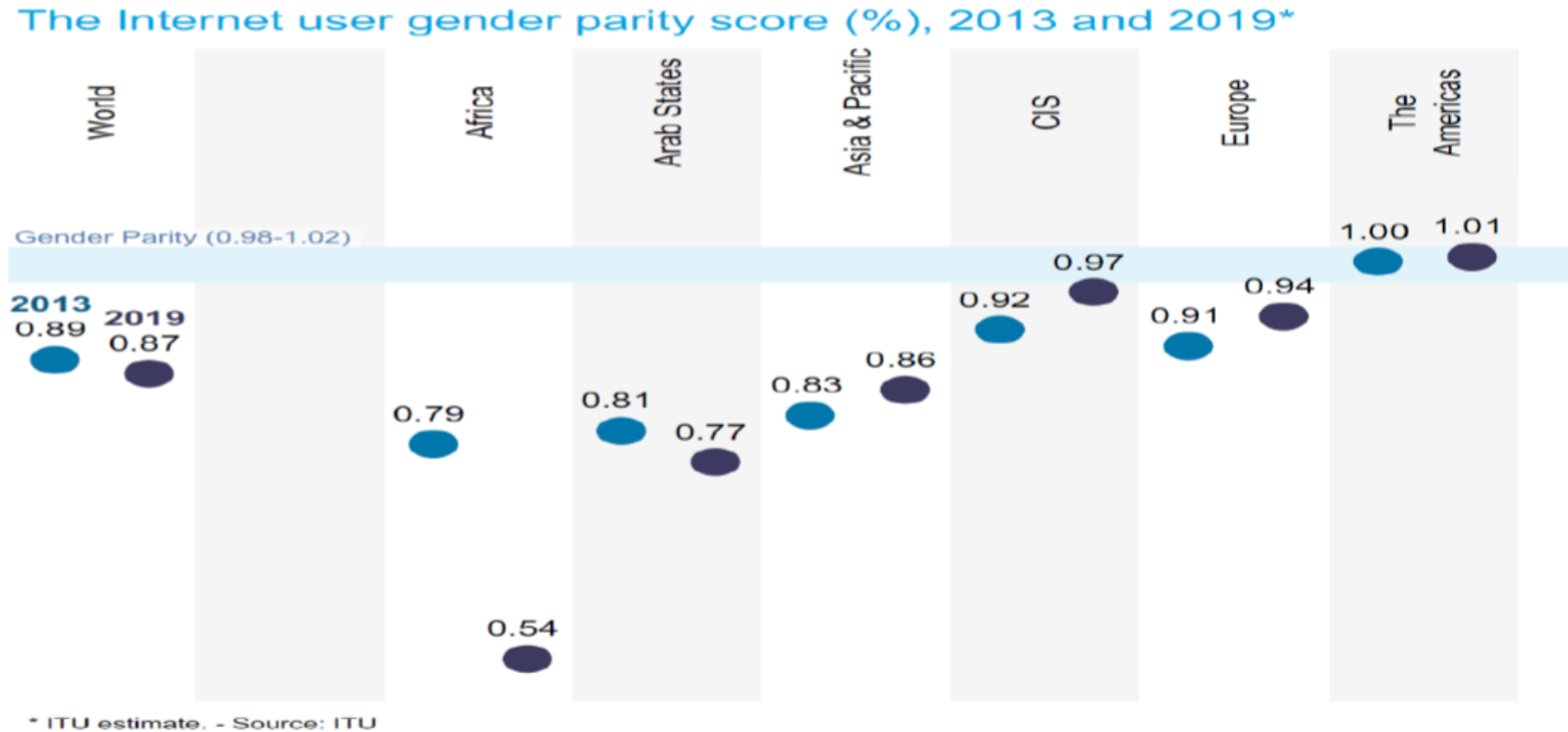
Source: International Telecommunications Union, *Measuring Digital Development: Facts and Figures 2020* (Geneva), https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf.

Note: The gender parity score is calculated as the proportion of women who use the Internet divided by the proportion of men using the Internet. A value smaller than 1.0 indicates that men are more likely to use the Internet than women.

Source: (Fardoust-Nabli)

Internet usage challenges (A4)

8 major bottlenecks on usage
UNDP-ERF summary

(Fardoust-Nabli)

Table 2: Digitalization and individuals (latest data as of January 2021)

Country	Internet connections % of population	Active social media users % of population	Mobile connections % of population
Sweden	98.0	82.1	141.6
USA	90.0	72.3	106.6
S Korea	97.0	89.3	118.3
Ireland	91.0	76.4	94.6
Malaysia	84.2	86.0	122.8
China	65.2	64.6	118.8
Chile	82.3	83.5	132.1
Turkey	77.7	70.8	90.8
Brazil	75.0	70.3	96.3
Vietnam	70.3	73.7	157.9
Kenya	40.0	20.2	108.9
India	45.0	32.3	79.0
Rwanda	31.4	6.5	73.9
UAE	99.0	99.0	171.5
Qatar	99.0	98.8	160.6
Saudi Arabia	95.7	79.3	112.7
Bahrain	99.0	87.0	128.9
Oman	95.2	80.2	110.7
Kuwait	99.0	98.8	161.4
Jordan	66.8	61.5	78.2
Egypt	57.3	47.4	92.7
Lebanon	78.2	64.3	67.3
Tunisia	66.7	69.0	150.0
Morocco	74.4	59.3	117.1
Algeria	59.6	56.5	105.8
Yemen	26.7	10.6	60.4
Iraq	75.0	61.4	98.3
Syria	47.0		79.6

Source: DataReportal 2021 January

1. Human capital, skills, and labour markets
2. Digital divides differences in access
3. The challenge of e-government
4. Digital technology adoption by businesses and innovation
5. Regional and global regulatory challenges
6. Taxation and regulation of digital transactions
7. Competition and regulations
8. Cybersecurity, privacy, and data protection

Source: (Fardoust-Nabli)

Table 3: Labour productivity growth (%), 1992–2019.

Country	Labor productivity growth (%) 1992-2000	2001-2010	2011-2019
Sweden	3.22	1.61	0.75
USA	1.98	1.66	0.8
S Korea	5.1	3.47	1.54
Ireland	3.13	1.97	4.45
Malaysia	3.56	2.01	2.18
China	8.78	9.62	6.98
Chile	4.4	1.45	0.97
Turkey	2.98	2.77	2.67
Brazil	0.4	1.44	-0.15
Vietnam	5.16	4.27	4.97
Kenya	-1.42	1.22	1.53
India	3.68	4.96	5.47
Rwanda	-1.09	5.2	4.12
UAE	-1.42	-8.81	2.66
Qatar		-1.84	-0.57
Saudi Arabia	-1.37	-0.99	-0.91
Bahrain	1.29	-3.25	-0.28
Oman	1.66	-2.82	-4.34
Kuwait		-0.2	-2.67
Jordan	-0.53	2.15	-0.77
Egypt	2.2	1.58	2.78
Lebanon	1.73	2.04	-3.56
Tunisia	2.26	2.24	1.15
Morocco	-0.12	2.53	2.83
Algeria	0.44	-0.91	1.22
Iraq	11.69	0.55	1.65
Libya		1.39	-4.85

EIB Recommendations (A5)

- MENA economies should lower regulatory barriers for businesses, promote competition and reduce disincentives emerging from political influence and informal business practices.
- Adopt reforms that facilitate innovation, the adoption of digital technologies and investments in human capital are crucial.
- Give companies incentives to exploit the benefits of participating in cross-border trade and global value chains more broadly.
- Improve management practices.
- Green countries' growth models by sound public policy, strong state institutions and determined political leadership
- Promote incentives for companies and consumers to think green, promote clean investment and remove barriers that prevent a smooth transition to the green economy.
- Devise labour market policies, skills training, social safety nets, and action to support regional economic development.

Source: (Betz et al.)