
Digital technologies and their impacts on the international knowledge gap and leapfrogging

Rolf Traeger

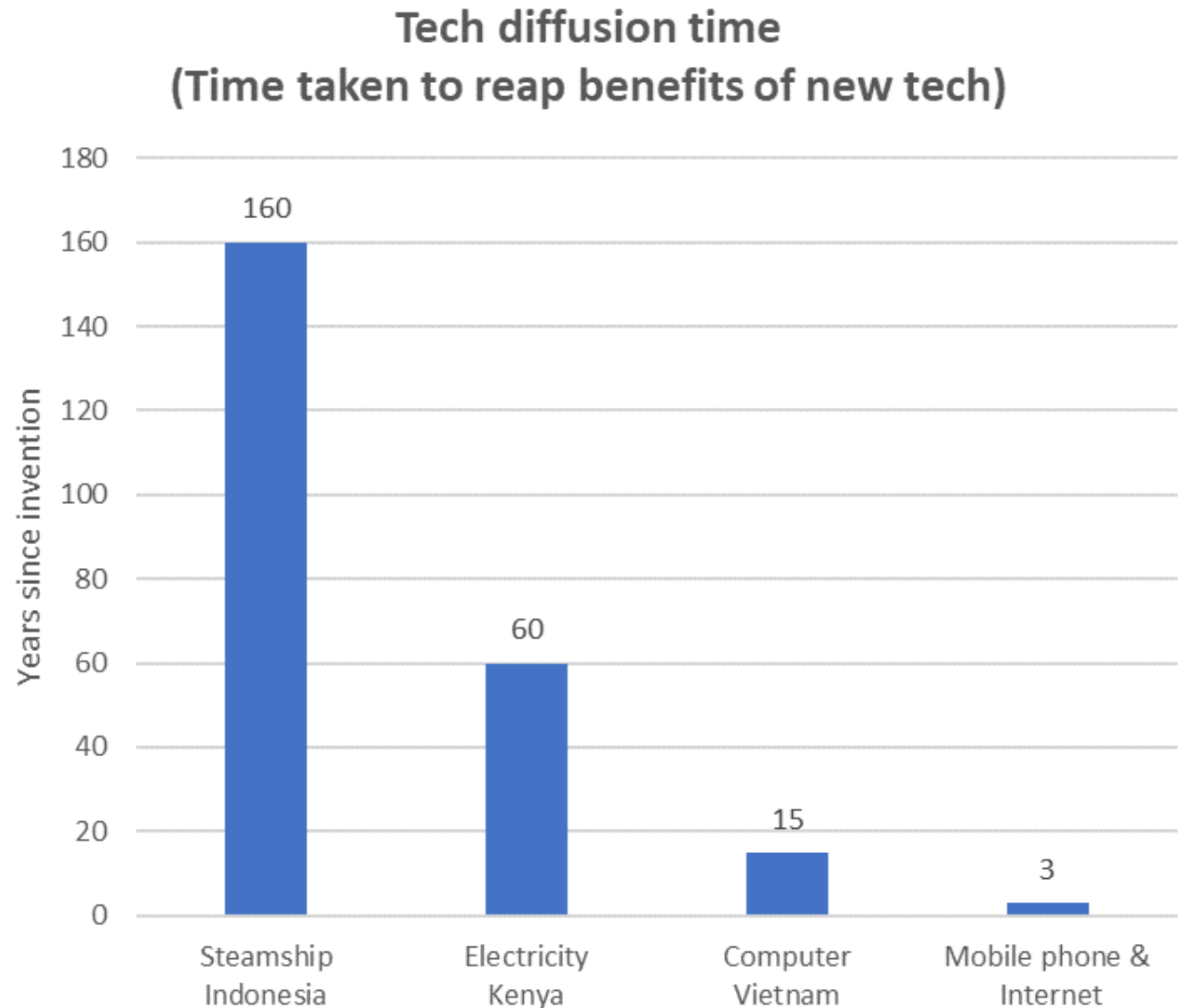
Chief, LDC Section, UNCTAD

Short courses for Geneva delegates

Geneva, 28 October 2019

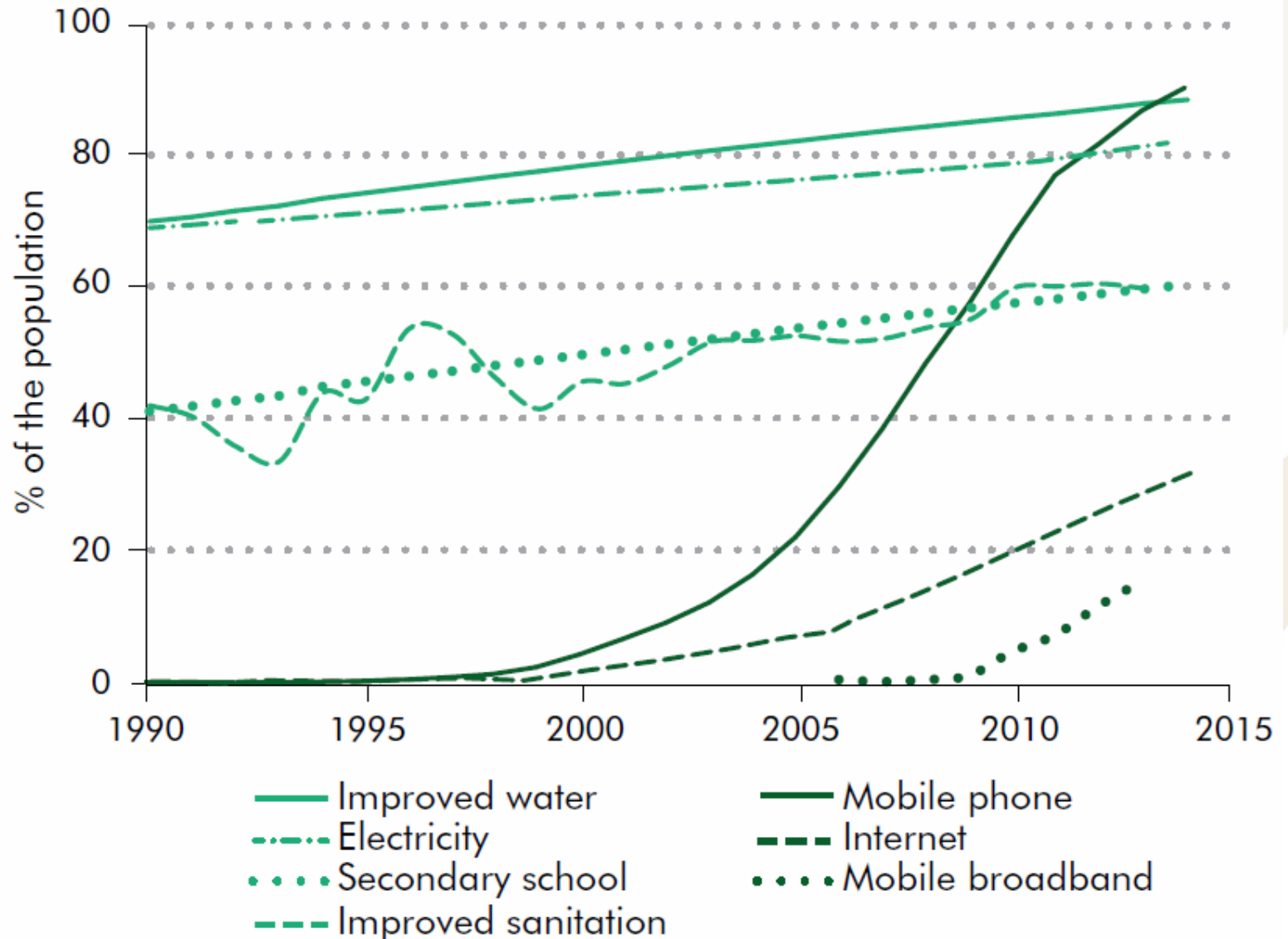
Digital tech diffusion

Intl tech diffusion is accelerating



Digital tech diffusion

a. Digital technologies are spreading rapidly in developing countries



Often digital tech with wider diffusion than “traditional” techs

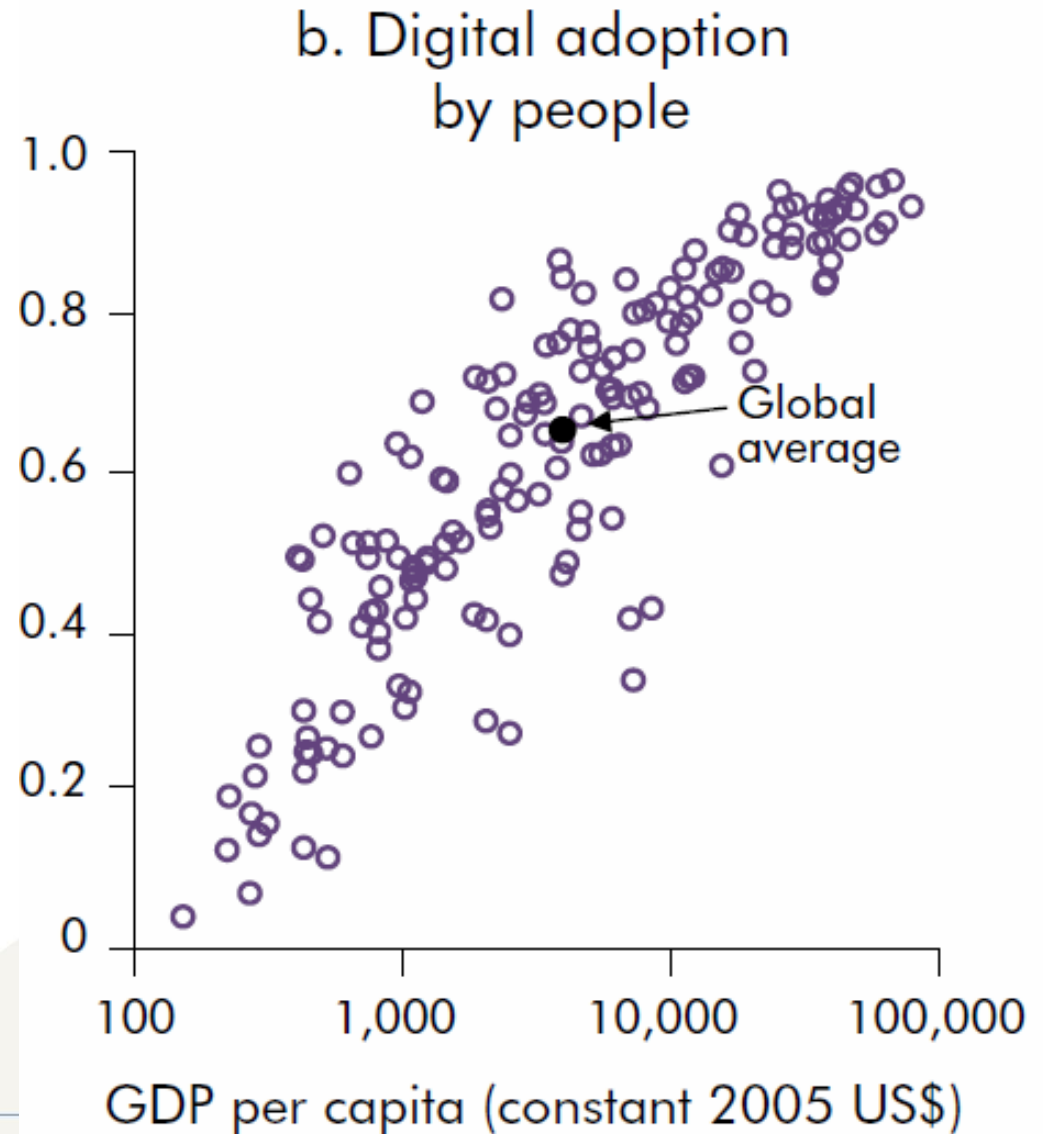
- E.g. electricity, roads

→ **What about the digital divide?**

Digital tech diffusion

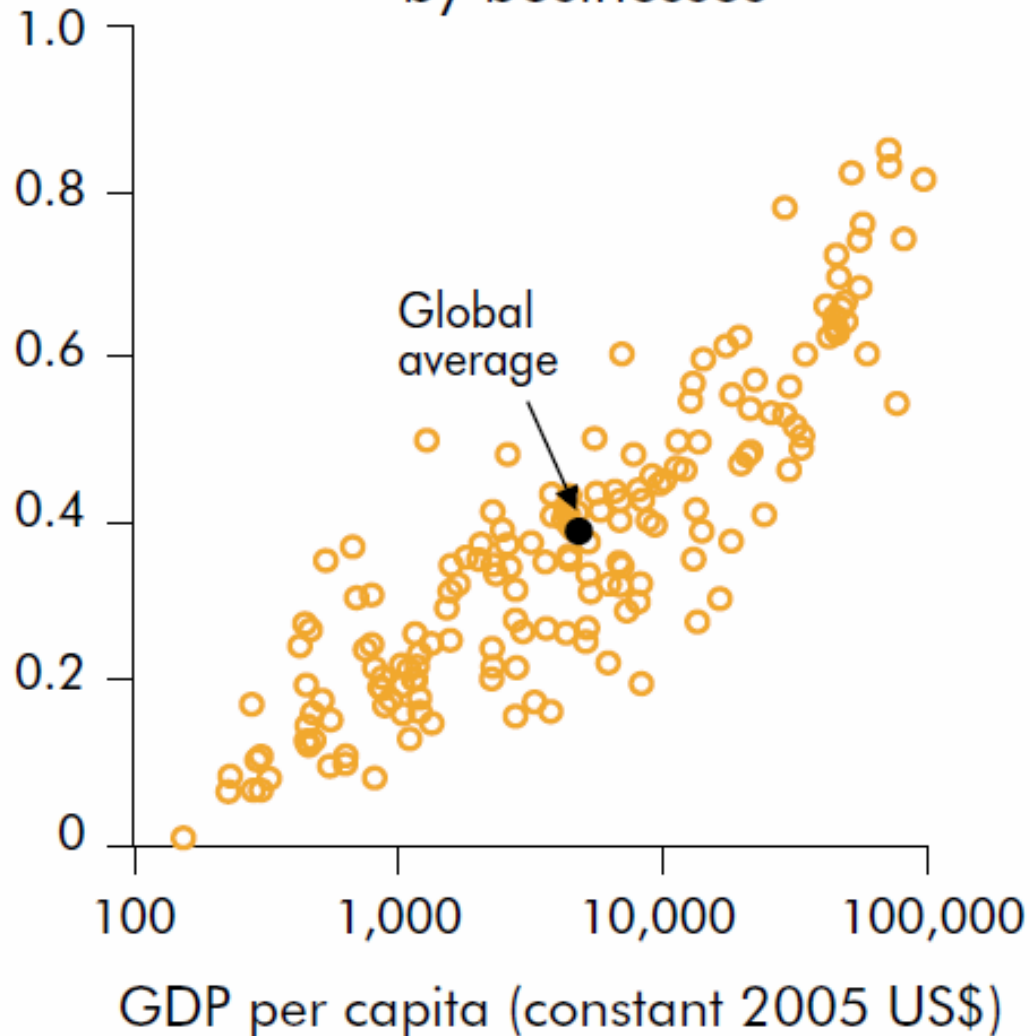
Access to internet
(% pop, 2014):

- ICs: 80%
- DCs: 31%



Digital tech diffusion

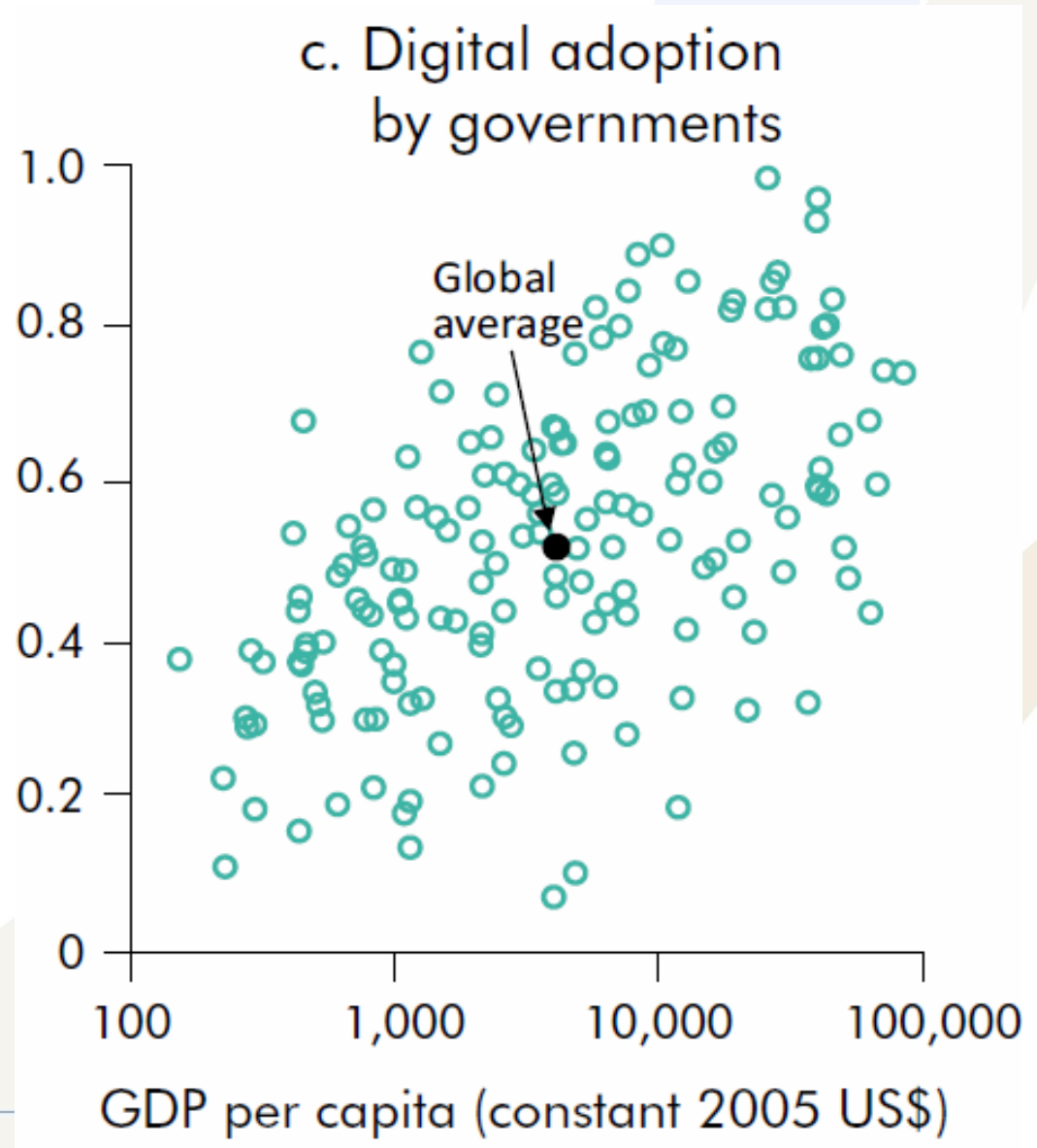
a. Digital adoption by businesses



→ Acceleration at higher end!

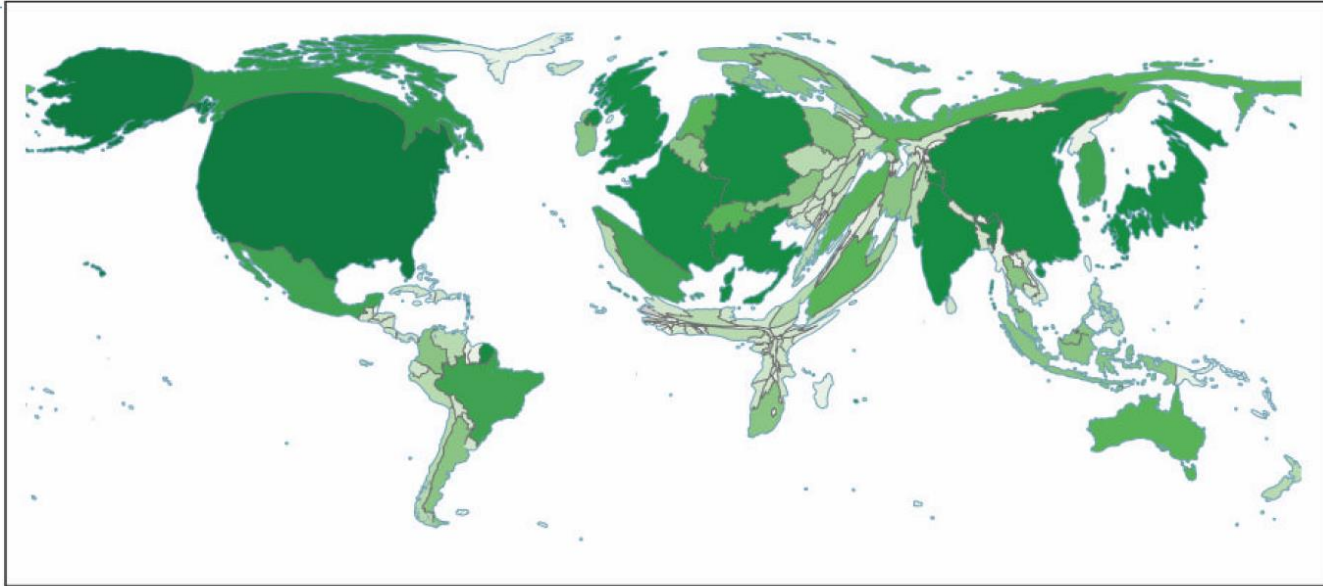
Digital tech diffusion

Gov't adoption
more widespread
/ variable than by
businesses /
individuals

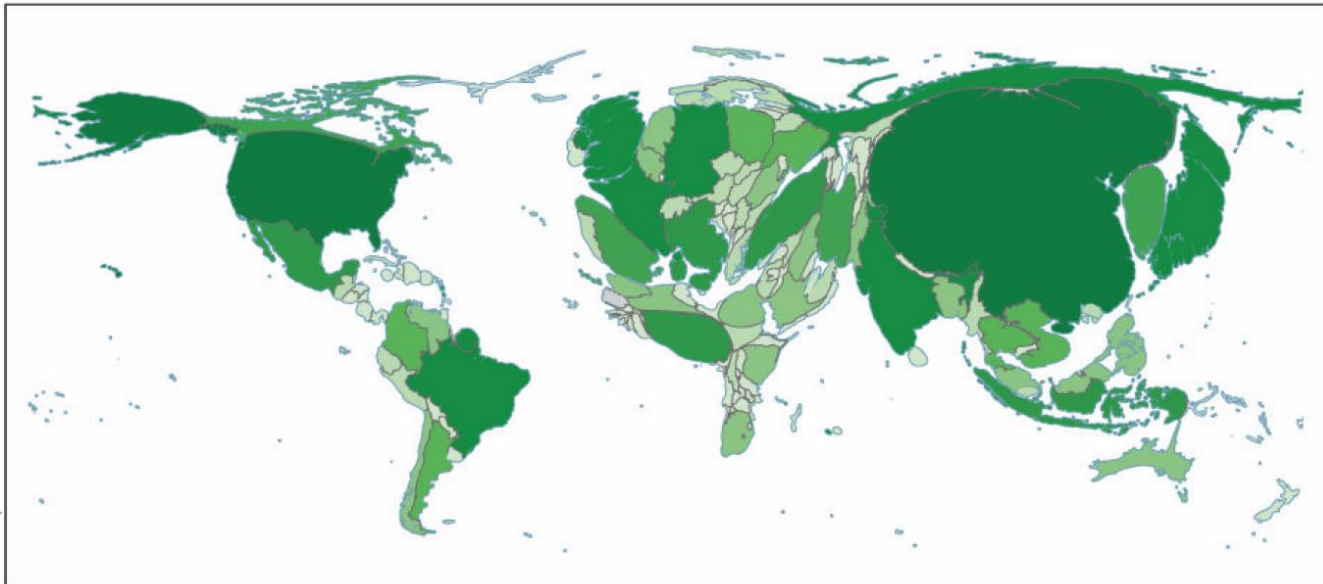


Map O.1 The internet is more evenly spread than income

a. Based on national income, 2014



b. Based on internet population, 2014



Digital tech diffusion

a ICT access by population

Total
global population

~7.4 billion

Within
mobile coverage
7 billion

Mobile phones
5.2 billion

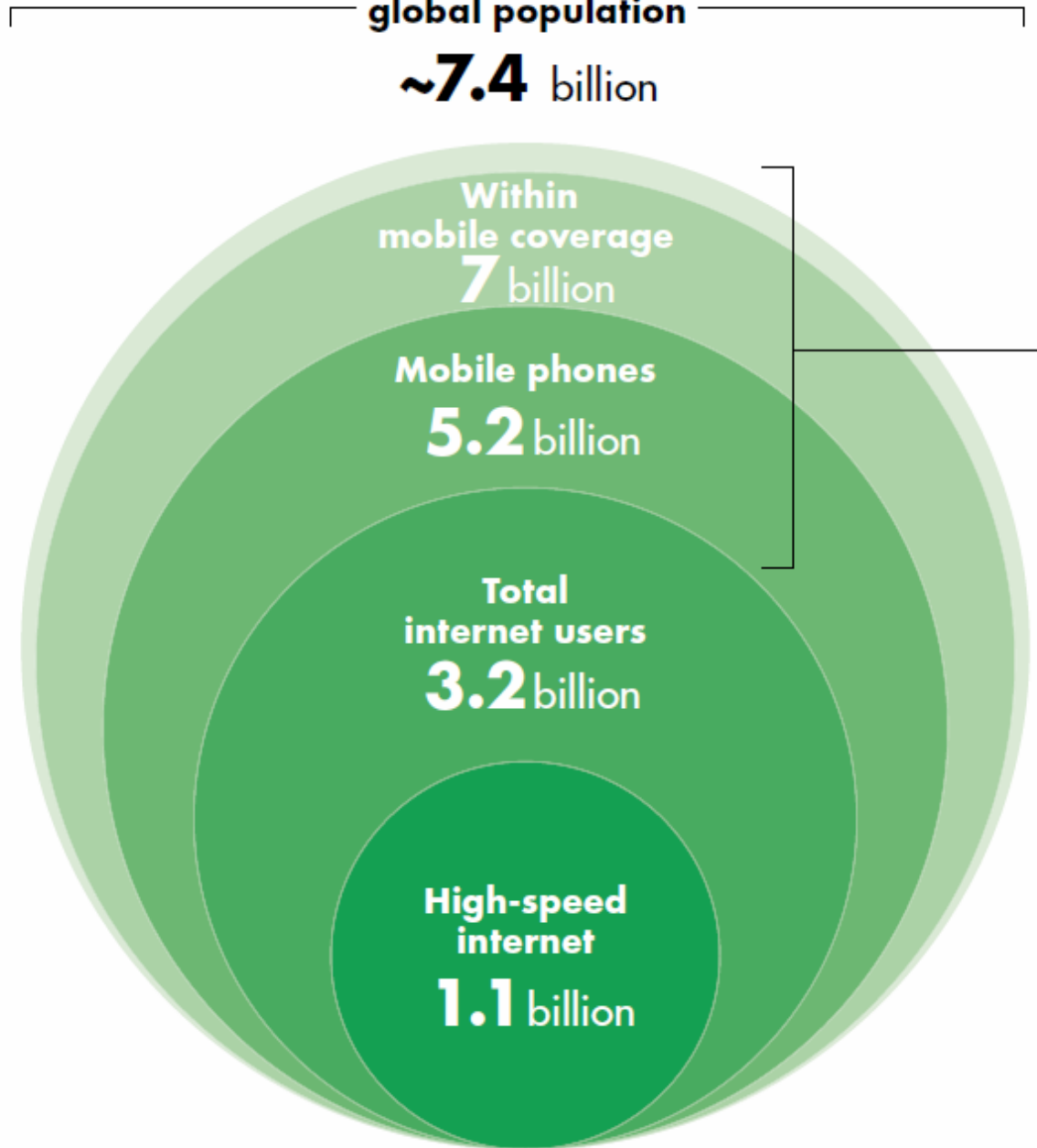
Total
internet users
3.2 billion

High-speed
internet
1.1 billion

≠ layers of access!

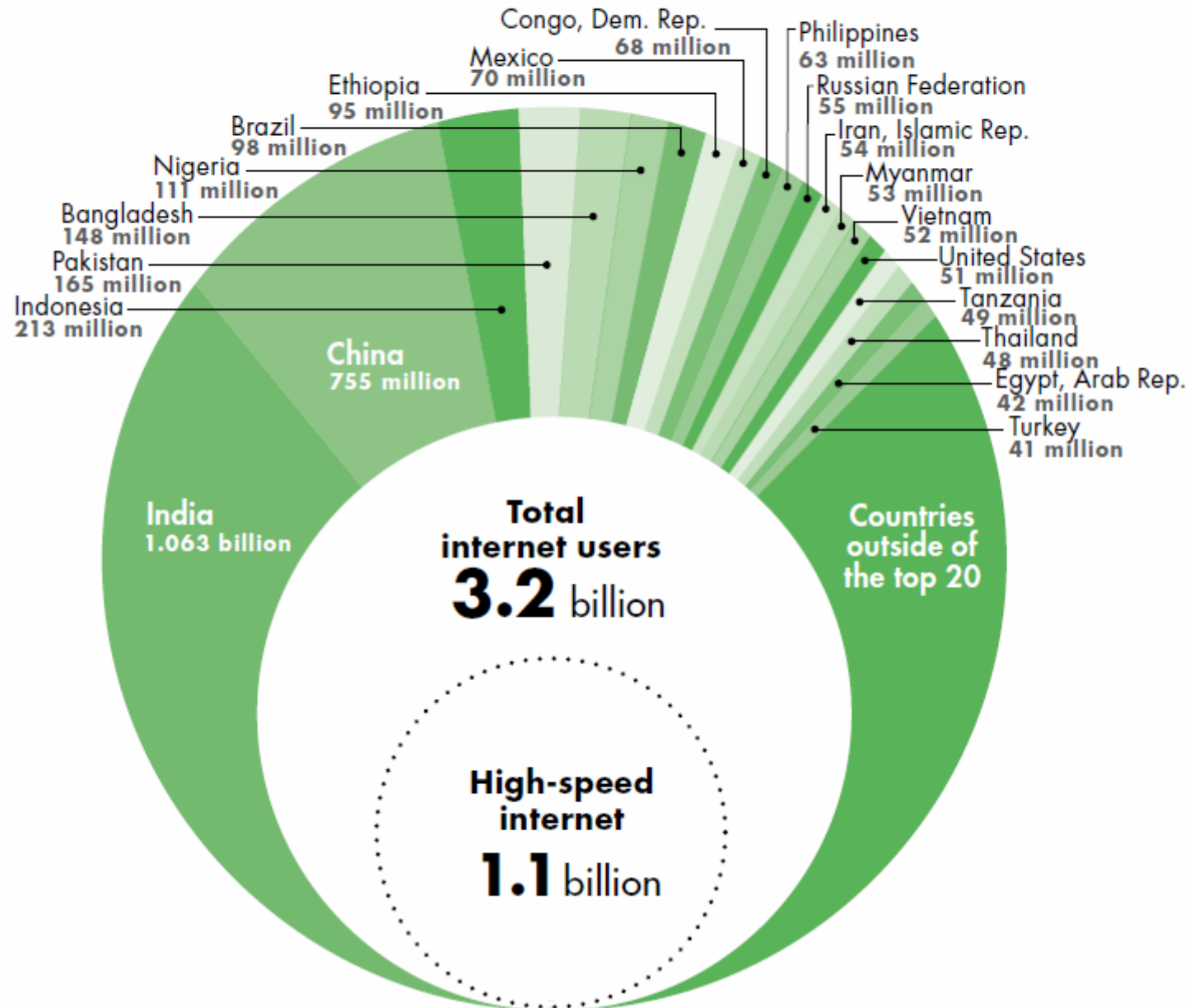
4.2 million without
internet access

→ **57% world
population!**



b. A closer look at the world's offline population

Digital tech diffusion



Digital tech diffusion

- In spite of rapid dissemination of digital tech...
- **...the digital divide is still very wide**
 - *among* countries
 - *within* countries
 - *quantitatively*
 - *qualitatively*

**Digital tech diffusion does
not *per se* narrow
knowledge divide!**

Why hasn't the diffusion of digital tech been wider / quicker?

1. Missing other techs: electricity, infrastructure
2. Digital & “Analog complement” need to *co-evolve*
 - Regulations → e.g. Competition
 - Skills
 - Institutions

Digital tech potential

**DIGITAL
TECHNOLOGIES**



```
graph TD; A[DIGITAL TECHNOLOGIES] --> B[Search and information]; A --> C[Automation and coordination]; A --> D[Scale economies and platforms]; B --> E[INCLUSION]; C --> F[EFFICIENCY]; D --> G[INNOVATION];
```

Search and
information

INCLUSION

Automation and
coordination

EFFICIENCY

Scale economies
and platforms

INNOVATION

Digital tech potential

DIGITAL TECHNOLOGIES



INCLUSION

EFFICIENCY

INNOVATION

BUSINESSES

Trade

Capital utilization

Competition

PEOPLE

Job opportunities

Labor productivity

Consumer welfare

GOVERNMENTS

Participation

Public sector capability

Voice

Digital tech potential

Table O.1 Benefits of digital technologies for workers and consumers: A scorecard

Channel	Impact so far		Potential impact	
	Poor	Nonpoor	Poor	Nonpoor
<i>Creating jobs</i>				
In the ICT sector and occupations	Negligible	L	Negligible	L
In sectors that use ICT	L	M	L	M
<i>Increasing worker productivity</i>				
Increasing returns to human capital	L	M	L	H
Connecting people to work and markets	M	H	H	H
<i>Benefiting consumers</i>				
Increasing consumer surplus	M	H	H	H

Who benefits most from potential?

Countries that are capable to swiftly adjust to evolving digital economy

Digital tech \Rightarrow NO shortcut for development, but

- **\uparrow quality of complements**

BUT digital dividend not fully realized → Why?

- 1. For potential of digital tech to deploy its potential, dissemination needs to be as widespread as possible**
- 2. Benefits are partly compensated by risks = downsides**

Downsides for developing countries

DIGITAL TECHNOLOGIES

```
graph TD; A[DIGITAL TECHNOLOGIES] --> B[Information without accountability]; A --> C[Automation without skills]; A --> D[Scale without competition]; B --- E[CONTROL]; C --- F[INEQUALITY]; D --- G[CONCENTRATION];
```

Information
without **accountability**

CONTROL

Automation
without **skills**

INEQUALITY

Scale
without **competition**

CONCENTRATION

Downsides for developing countries

Meso level

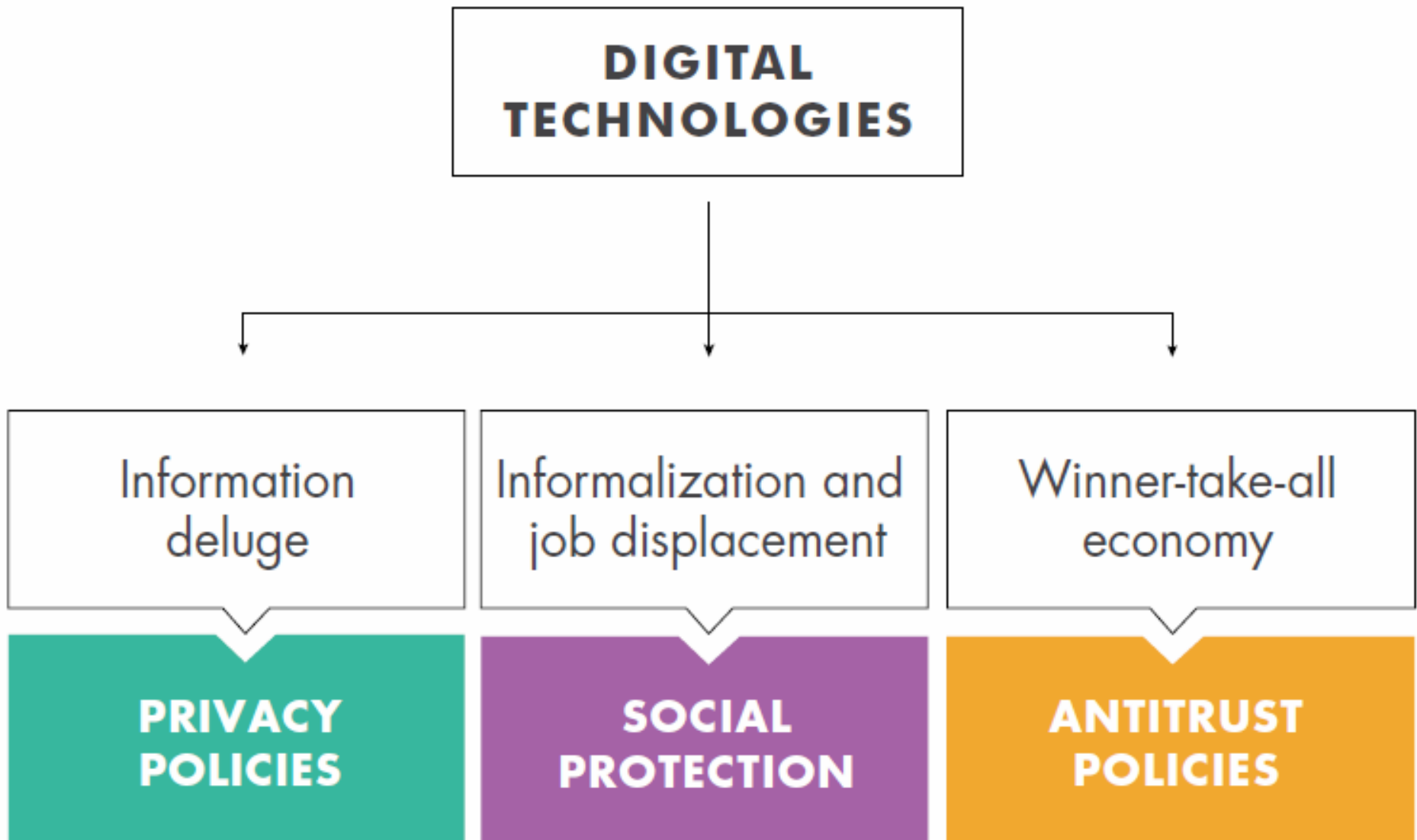
- Low marginal costs \Rightarrow creation of large monopolies
- Price dispersion persists
 - Because large firms differentiate between different segments of demand
- Creative destruction vs. offline firms
 - The latter (& related institutions) need to adapt
- \uparrow complexity \Rightarrow people don't understand what's going on

Downsides for developing countries

Intl level

- ↑ digital divide
- ↑ opportunity cost of being left behind
 - i.e. of being a laggard country
- Automated production can become cheaper than *any* work
 - Does re-shoring mean end of cheap-labour-based industrialization?
- Risk of some countries being caught in low-tech-poverty trap

Policies for digital tech



Policies for digital tech

- Govts to adopt STI policies which leapfrog techs with negative aspects (e.g. “grey / brown” techs)



- **Emphasis on sectors of present / future comparative advantage**
- **More flexible educational / training systems**

Thank you

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