

# **STI Roadmaps incorporating SDGs and Implications for Policy and Capacity Building**

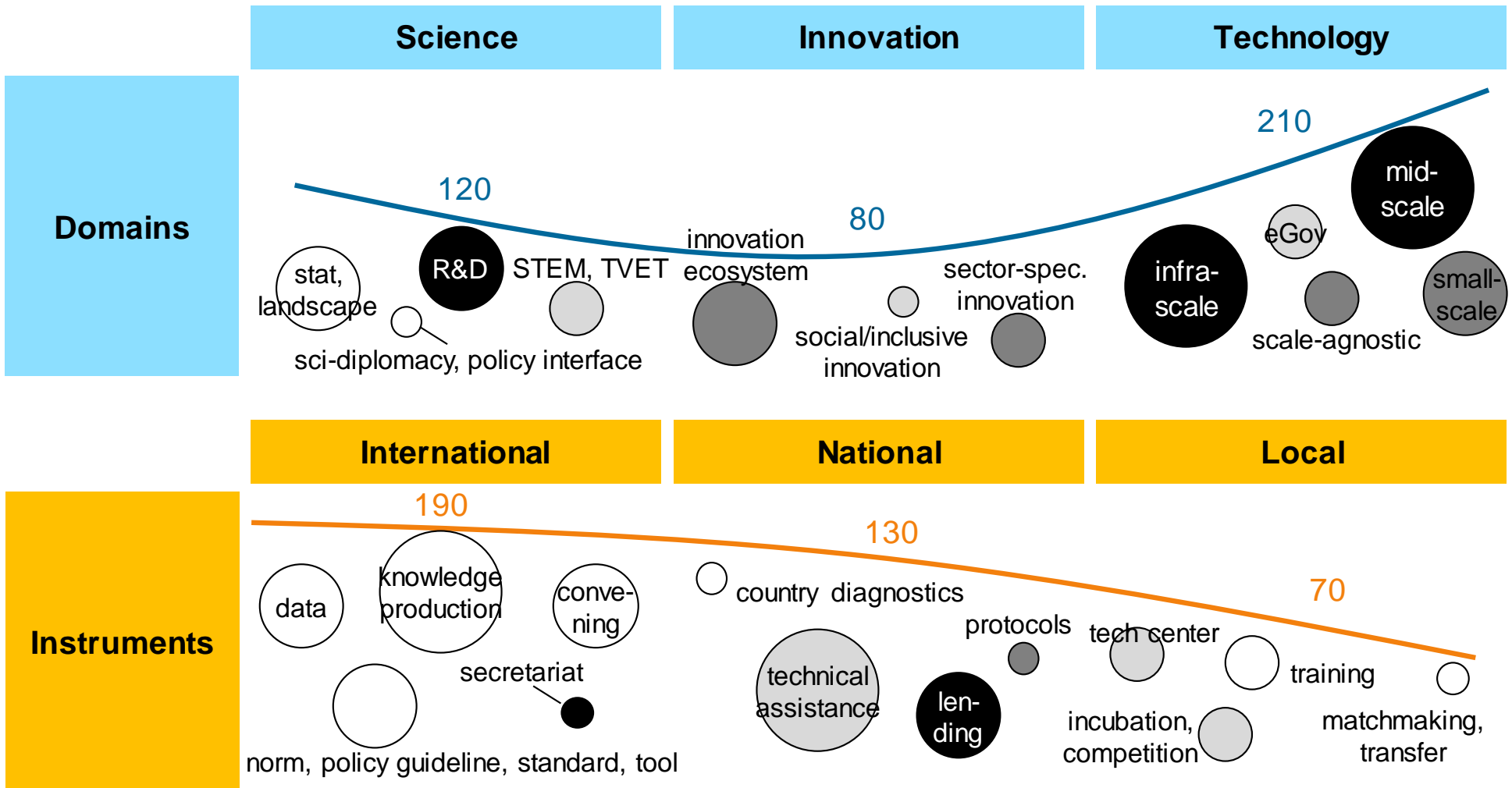
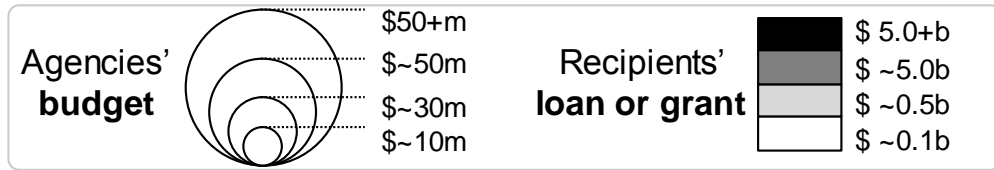
Klaus Tilmes & Naoto Kanehira  
World Bank Group  
November 30, 2017

# Outline

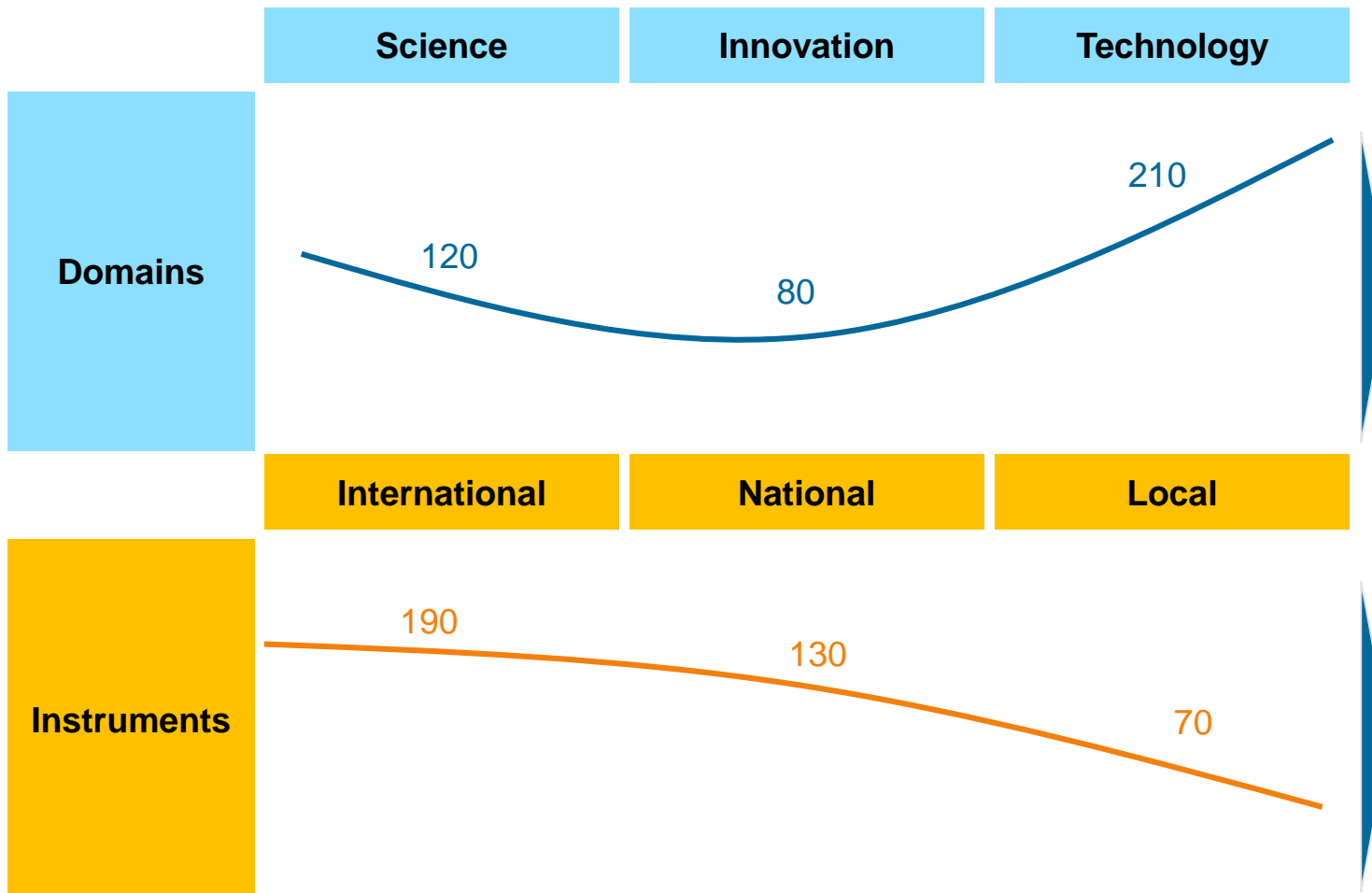
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- 1. Reflecting back on the 2017 UN STI Forum**
- 2. The Innovation Paradox**
- 3. Zooming in on Firm & Government Capabilities**
- 4. Implications for Policy & Capacity Building**
- 5. Building “Bridges” and shared Roadmaps**

# Mapping the UN Systems' rich and diverse STI initiatives

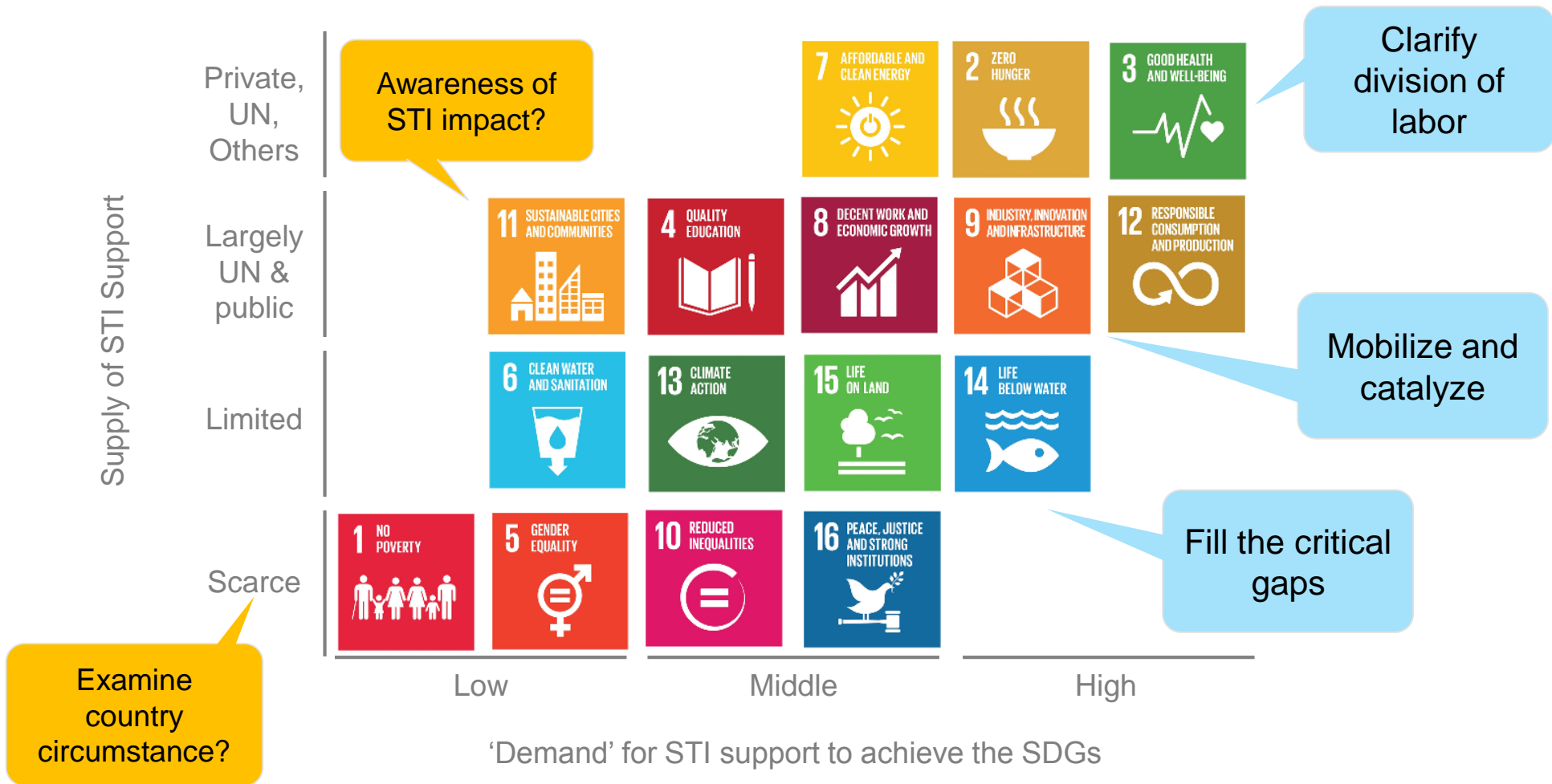


# Do we understand the Allocation Patterns?



- How can we **accelerate and scale** from research to solutions?
- Is there a “**valley of death**”?
- How can we better **learn and adapt** from global agenda to local actions?
- Are we too “**big-headed**”?

# Needs and Gaps Framework



## Building momentum for a corporate STI vision @ WBG

- **STI Stocktaking → Disruptive Technology Day**
- **Corporate STI Vision Exercise (Spring '18)**
- **Sectoral & Thematic Deep Dives**
- **Focus on Africa (esp. STEM, ACE, Dig Entrepreneurship)**
- **Partnerships**
- **Link back to 'Cascade Approach'**

# Stocktaking of Technology & Innovation Initiatives

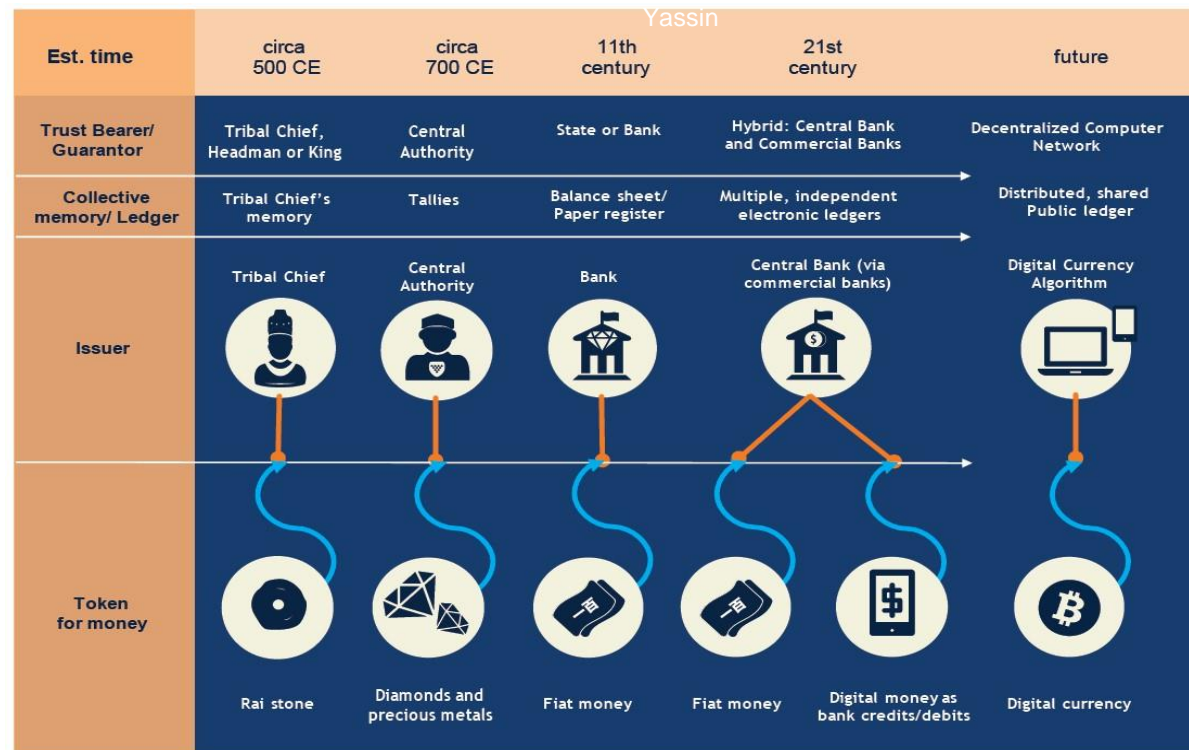
1. **WBG Support to Enabling Environment:** [T&C, IFC, ICT, F&M, DEC] – WBG advisory work focusing on enabling frameworks and platforms; fostering a technology entrepreneurship ecosystem
2. **WBG Support to Technology Enabling Infrastructure:** [ICT, IFC] – WBG lending/investing to build digital infrastructure and increase connectivity/internet penetration (broadband, towers)
3. **Technology Adoption through WBG Projects/Procurement:** [GPs, IFC, ITS] – Incorporating disruptive technology in WBG lending/investment projects; direct VC/PE investment in start-ups; sharing WBG expertise in cloud/cybersecurity
4. **Knowledge/Research: Impact of Technology on Growth Pathway:** [DEC, T&C, F&M, IFC] – Research papers, regional/country strategies (e.g. China Drivers of Growth); convening activities
5. **Global Standards and Partnerships:** [GPs, IFC, ECR, SVP]: Private sector (LinkedIn, Google, Airbnb, Microsoft, etc.); G20; World Economic Forum; UN STI (Science, Technology, Innovation); GSMA; OECD; research consortiums.
6. **Developed Country Partnerships:** [Regions, GPs, ECR, IFC]: MoU/EFO/Trust Funds with developed countries like Singapore, Israel, Korea, Australia, Finland, Japan



Photo credit: LIN

Leveraging fintech opportunities for financial inclusion, such as digital ID services (ID4D), blockchain, insuretech, Etc.

Yassin



Graphic designed by Yassin Al-Harazi (@yassin.alharazi)



Photo credit: World bank



**Working together with young leaders and innovators to use new technology for development!**



# “Growinclusive.org”: A WBG-WEF Initiative (2018)

## A new era

Across the world, growth and productivity have slowed while many of the world’s citizens face rising levels of inequality and insecurity. This is having real consequences as electorates push back against what they see as growth-at-all-costs and unfair globalisation. However, the short-term thinking characterising today’s markets has begun to shift. Asset owners and asset managers are proactively assessing opportunities linked to long-term and sustainable value creation, not just for the markets, but also for society.

‘700 million people are directly or indirectly employed  
in global and regional value chains’

While companies continue to expand the procurement of goods and services across national borders, stakeholders from the public and private sector grapple with incomplete data that is critically needed to measure the impact of global value chains on local economies. High-impact investments in Global Value Chains, to address Global Development Goals, require greater clarity to better evaluate risks and opportunities.

‘A \$2.5 trillion investment gap for the SDGs’



world development report

2016

DIGITAL DIVIDENDS

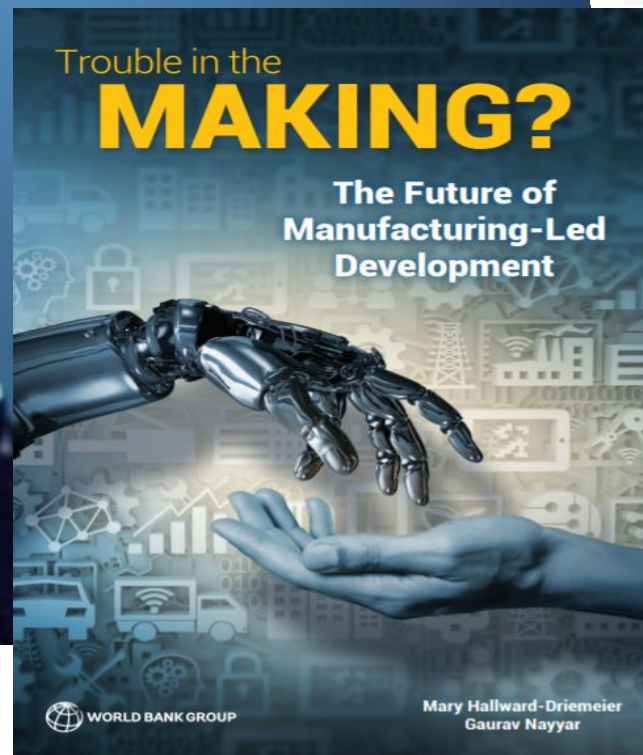
**JOBS NOTES**  
Issue No. 2



## THE FUTURE OF WORK REQUIRES MORE, NOT LESS TECHNOLOGY IN DEVELOPING COUNTRIES

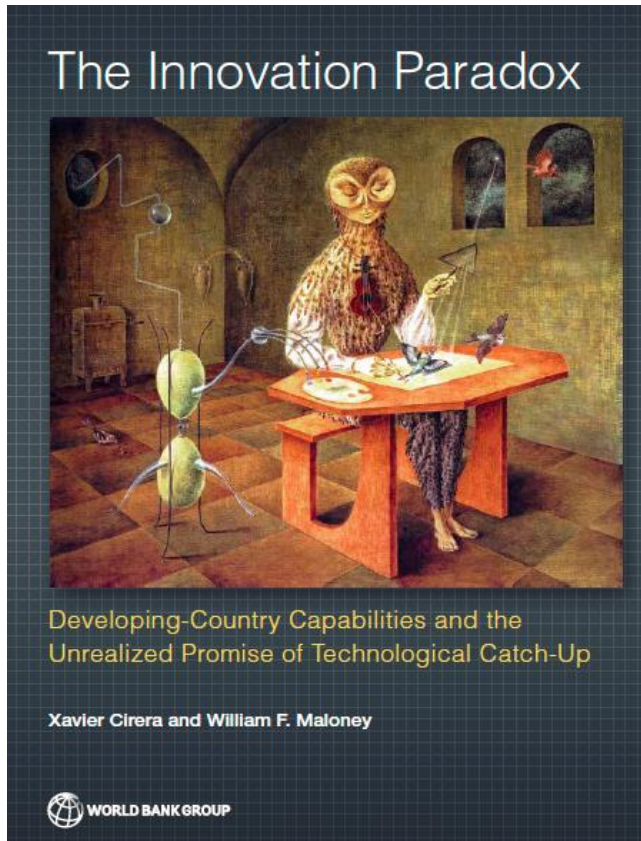
### KEY MESSAGES

- Digital technology is transforming the organization and location of production, and thus the future of work.
- It risks widening the gap between richer and developing countries, and between the better skilled and connected and the poorer population
- But technology also creates opportunities (leapfrogging), to generate jobs, increase earnings and be more inclusive.
- To take maximum advantage and counter the threat of rising global inequality, developing countries need to: [1] address bottlenecks in



# Thought Leadership, Analytics, and Knowledge Sharing

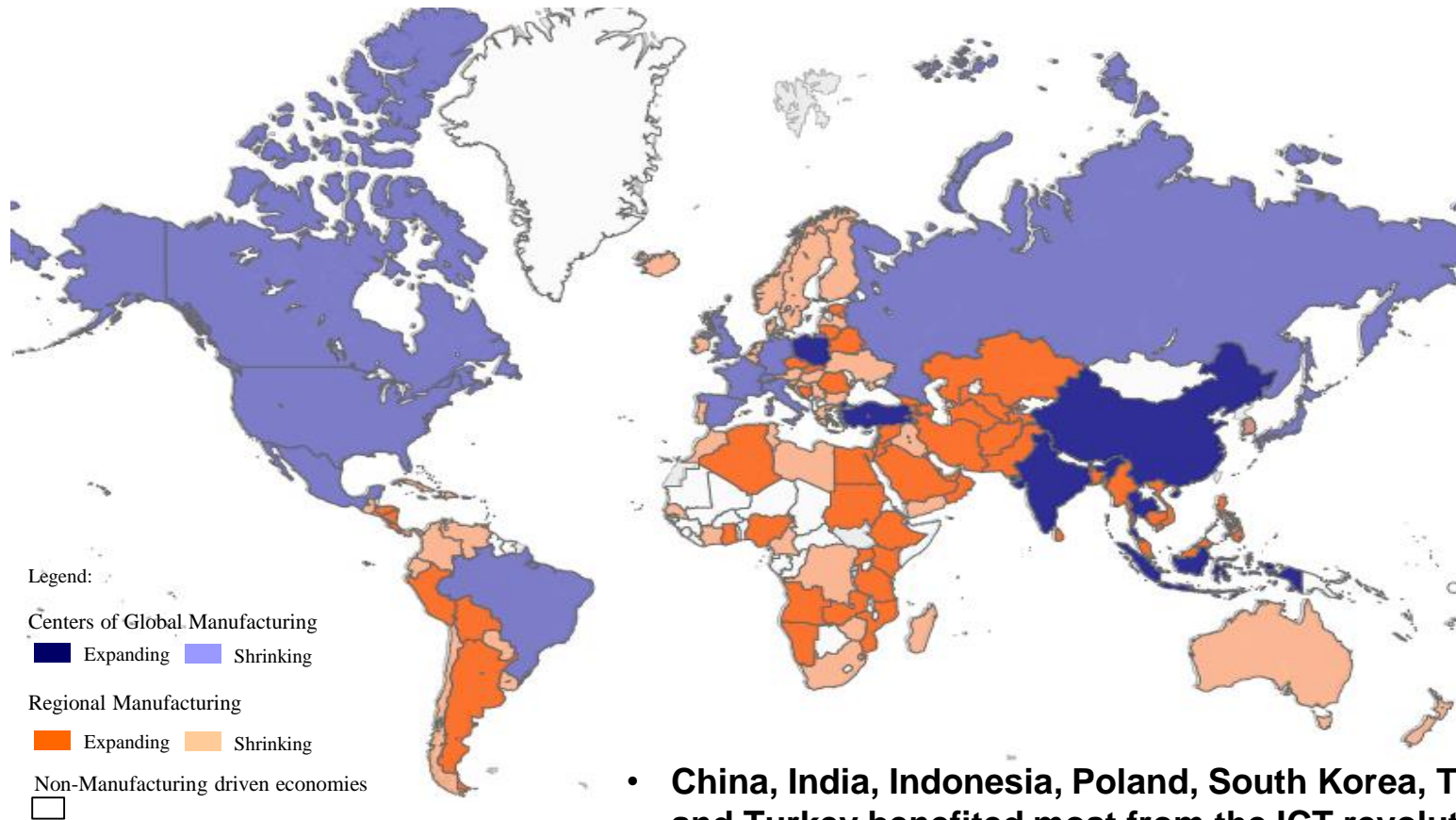
# The Innovation Paradox



- Schumpeter: the adoption of existing technologies accelerates growth, dwarfs impact of development aid...
- **yet most developing countries firms fail to reap these benefits and don't seriously innovate and ...**
- **most governments fail to develop innovation policies that effectively facilitate this process of technological catch up.**
- Why and what can we do about it?

# Global manufacturing trends and developing countries

19 countries (Centers of Global Manufacturing) have about 82% of the share of global manufacturing value-added since 2000.



Legend:

Centers of Global Manufacturing

■ Expanding ■ Shrinking

Regional Manufacturing

■ Expanding ■ Shrinking

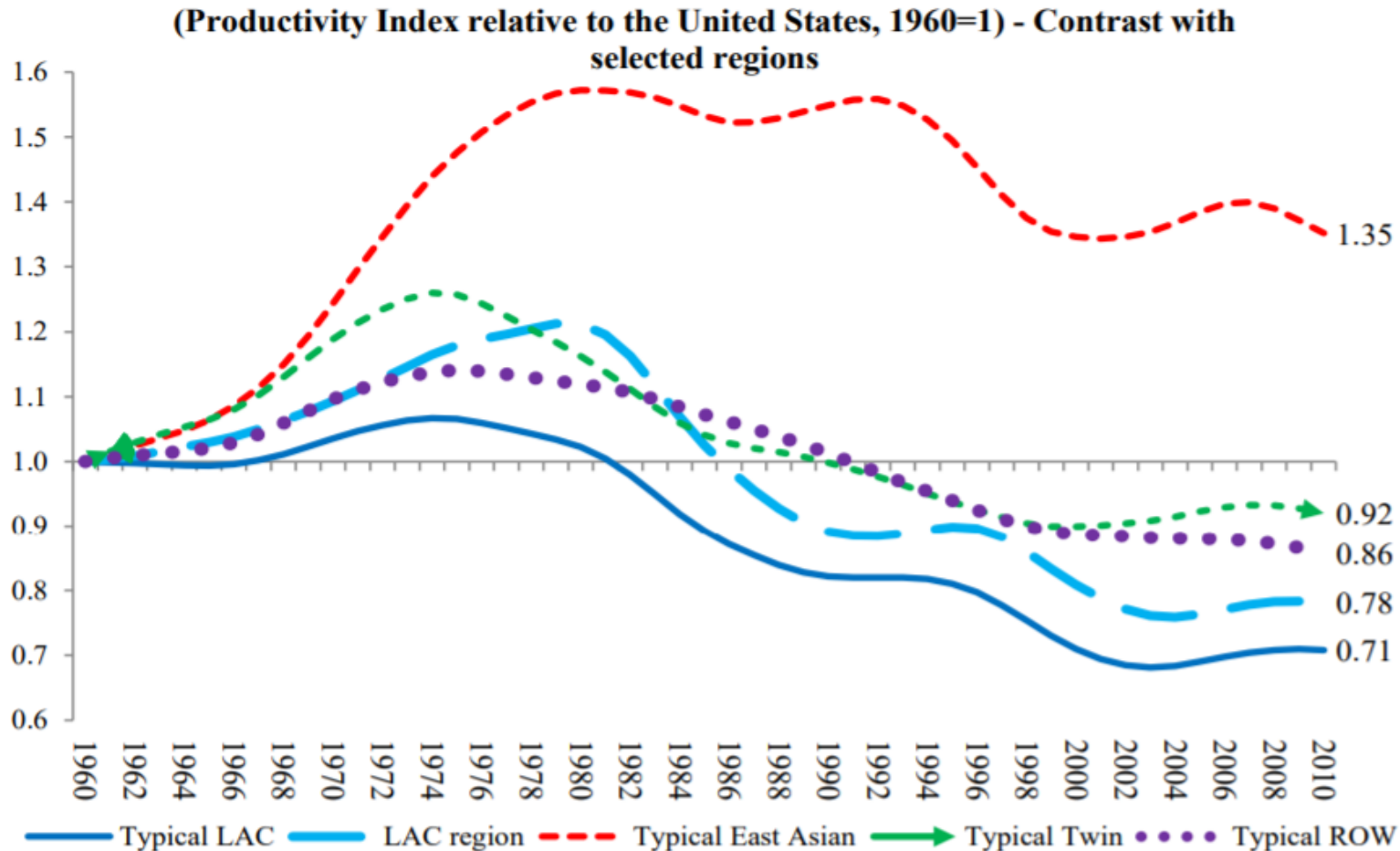
Non-Manufacturing driven economies



Source: Cirera et. al. (2014)

- **China, India, Indonesia, Poland, South Korea, Thailand, and Turkey benefited most from the ICT revolution and increased their share from 15,8 in 2000 to 34.2% in 2015.**

# The “Elephant” in the Room: Productivity Slowdown



# Example: LAC is a region of entrepreneurs BUT large firms do not grow enough, generate fewer good jobs & trade less

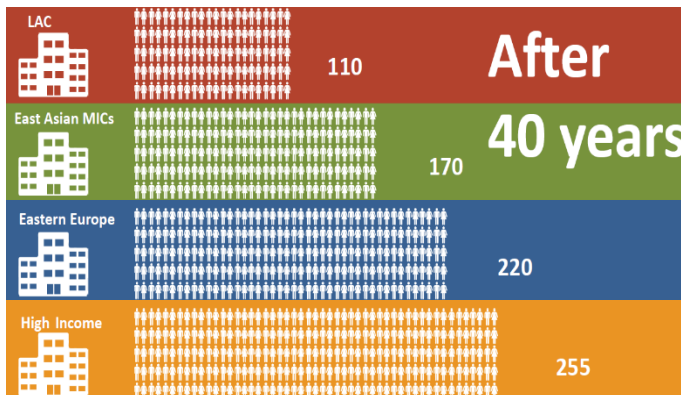
Lots of small firms (more than other regions)...



... and lower entry into export markets than other regions

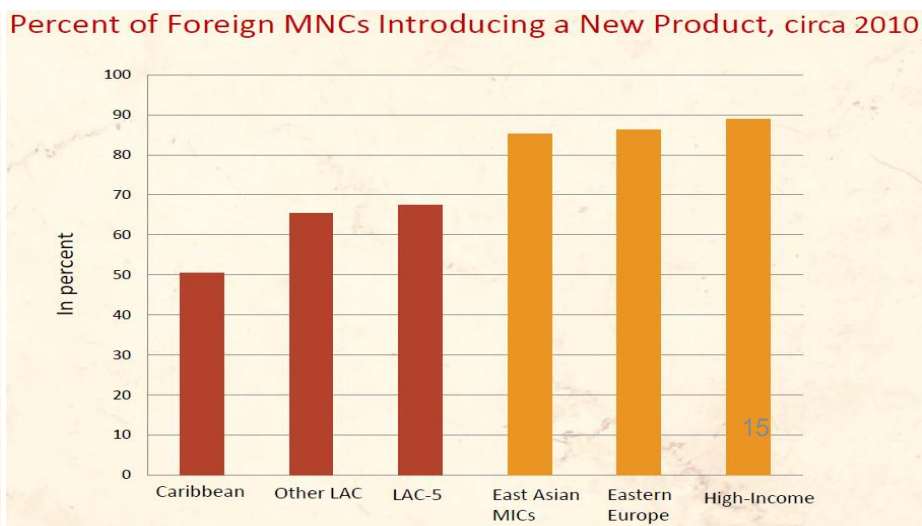
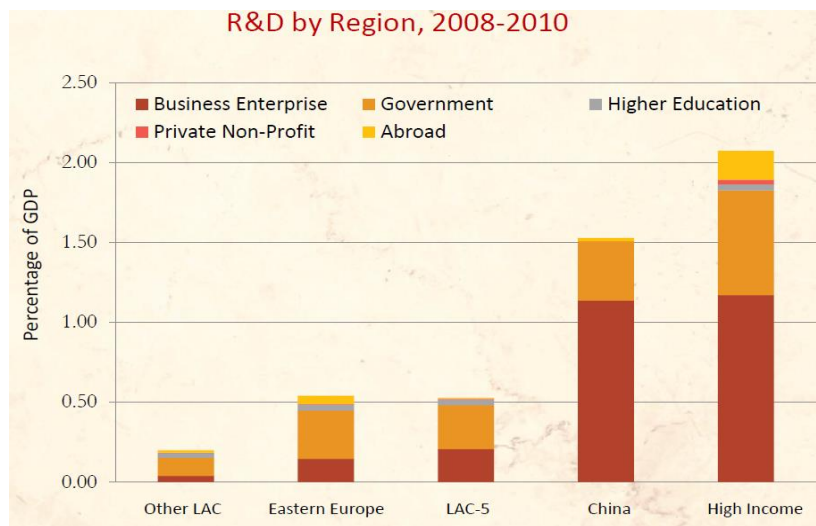
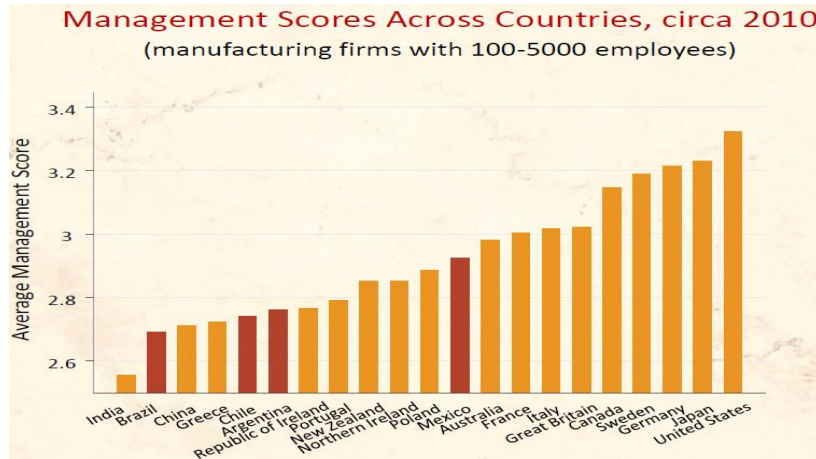


...but too few productive high-growth firms with good jobs



# Underlying low formal firm job dynamism, LAC firms under-invest in knowledge capital

Low investments in managerial and R&D capital... ...with both local and foreign MNCs under-investing in new products

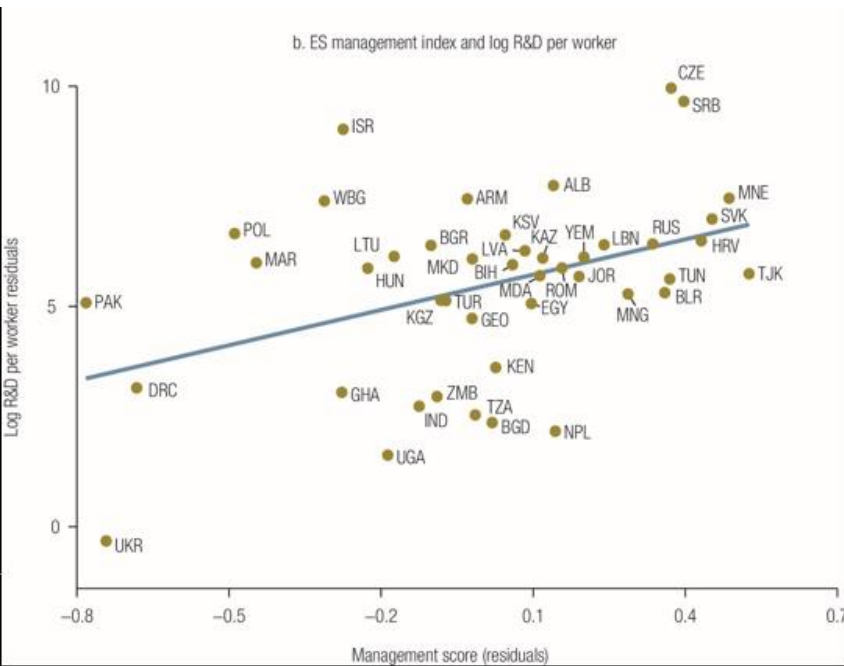




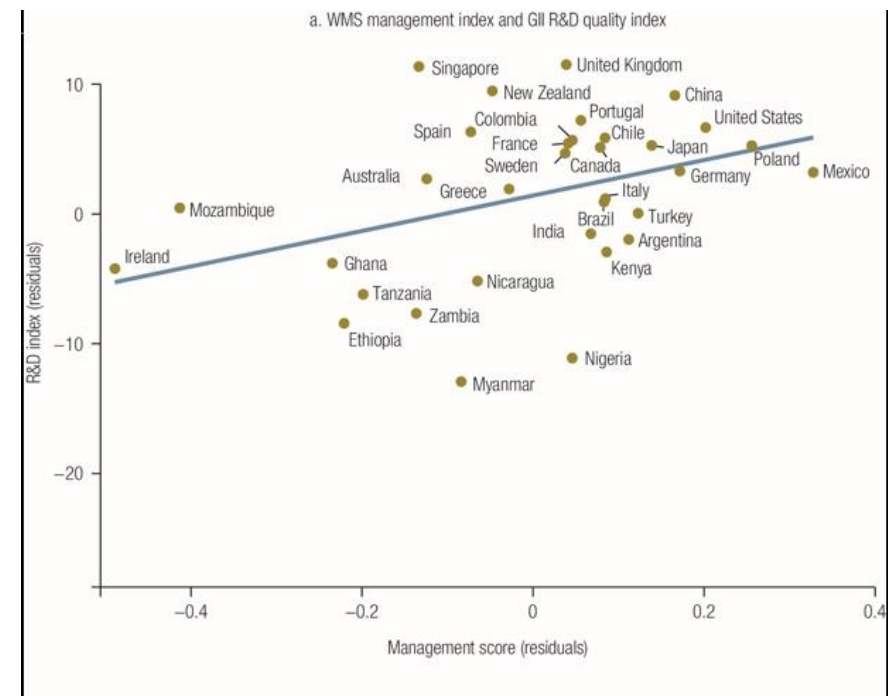
# Zooming in on Firm Capabilities

## Management Quality: Key for Innovation (R&D)

### Enterprise Survey

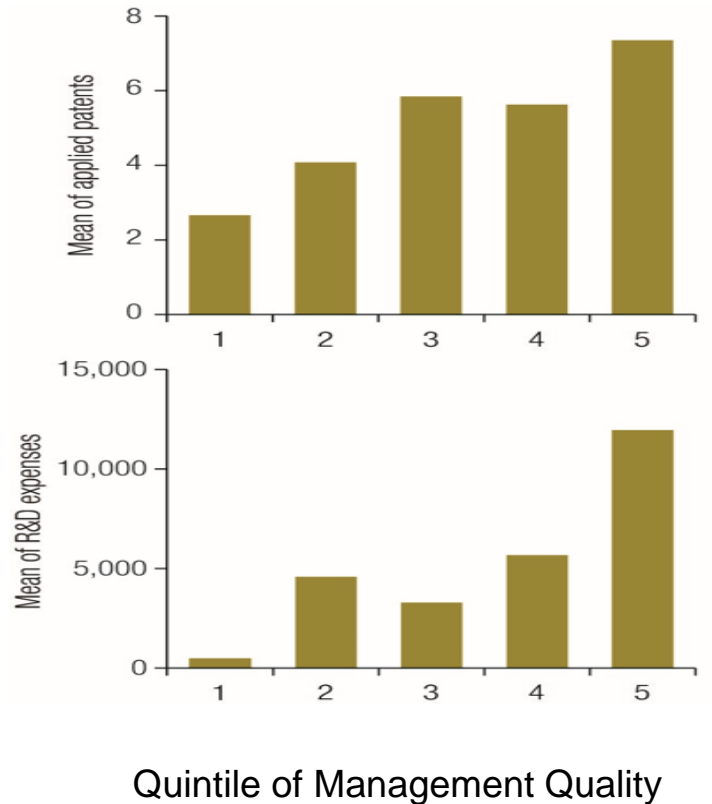


### World Management Survey



# New analytics on management quality and innovation

Firm R&D and Patents



- **MQ has a direct effect on patents after controlling for R&D.**
- **MQ increases R&D**
- **MQ increases impact of R&D on productivity**

# Focus on Gov't Capabilities: The Innovation Policy Dilemma

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For developing countries:

- **Multiplicity of market failures, missing complementary factors and institutions increase policy complexity....**
- **....However government capabilities to design, implement, and coordinate an effective *policy mix* to manage these failures and gaps are weaker.**

# Addressing the Innovation Policy Dilemma

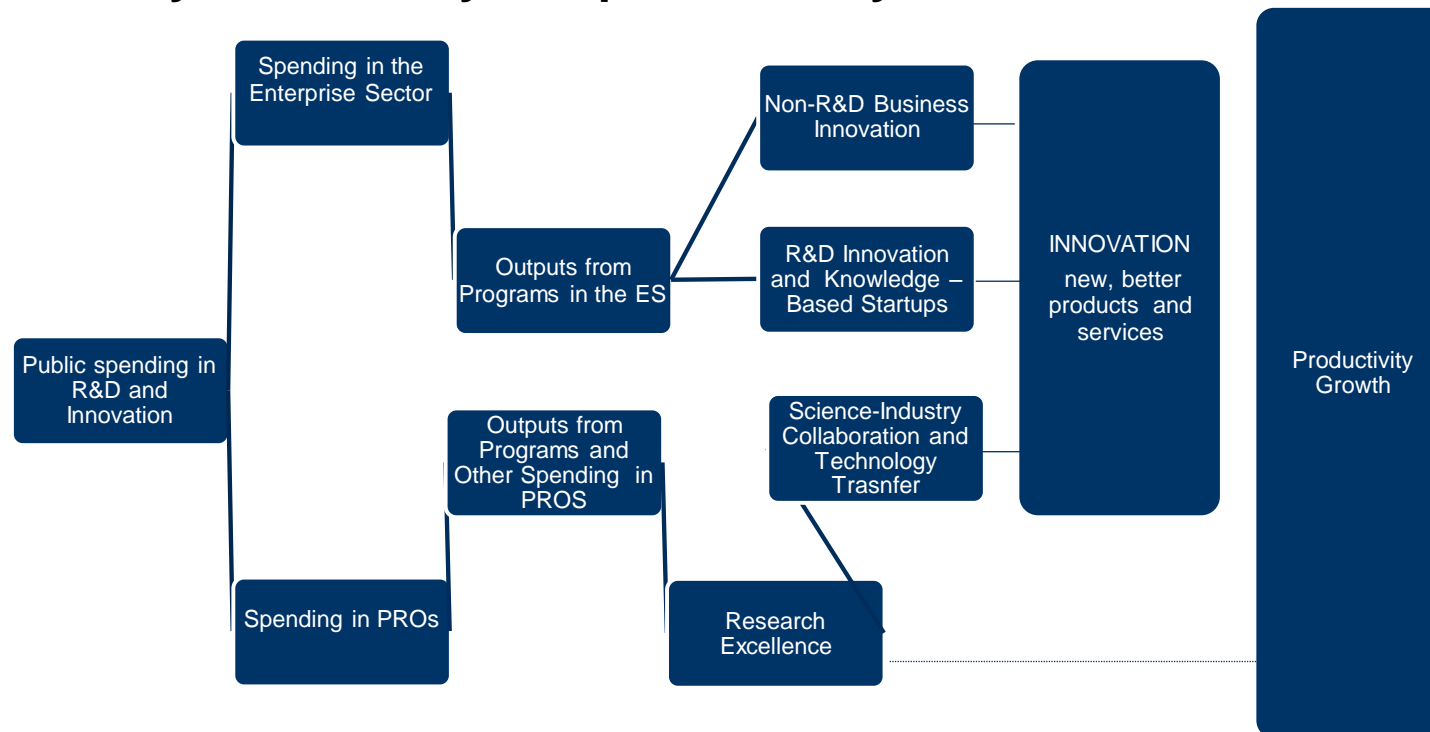
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1. The *use of good practices and principles* in the design and implementation of innovation policies, and agile institutions with the right mandate and incentives
2. Addressing the information gap regarding specific innovation policy instruments available, their implementation requirements and the evidence of impact – the *STI-Public Expenditure Review*
3. Design the policy mix in a gradual way - The *capabilities escalator* - selecting of an appropriate mix of instruments that can facilitate the accumulation of innovation capabilities at different stages of technological development

# Core Practices & Principles of Good Innovation Policy Making

Governments require capabilities for policy making across 4 key dimensions:

1. **Rationale and design of policy**
2. **Efficacy of implementation**
3. **Coherence of policies across the NIS**
4. **Policy consistency and predictability over time**



# Motivation for Public Expenditure Review on STI

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- Governments are expanding STI budgets (investments and policies) but these may fail to generate the expected outcomes.
- Increasing evidence through ecosystem assessments that National Systems of Innovations are fragmented, uncoordinated and with little evidence of impact.
- But can we respond with greater certainty basic questions?
  - **How much is spent?**
  - **For what?**
  - **What is the quality of the policy mix?**
  - **With what results?**
  - **How efficient is this investment?**

**FIGURE 7.1 The Innovation Policy Space**



Source: World Bank 2017.

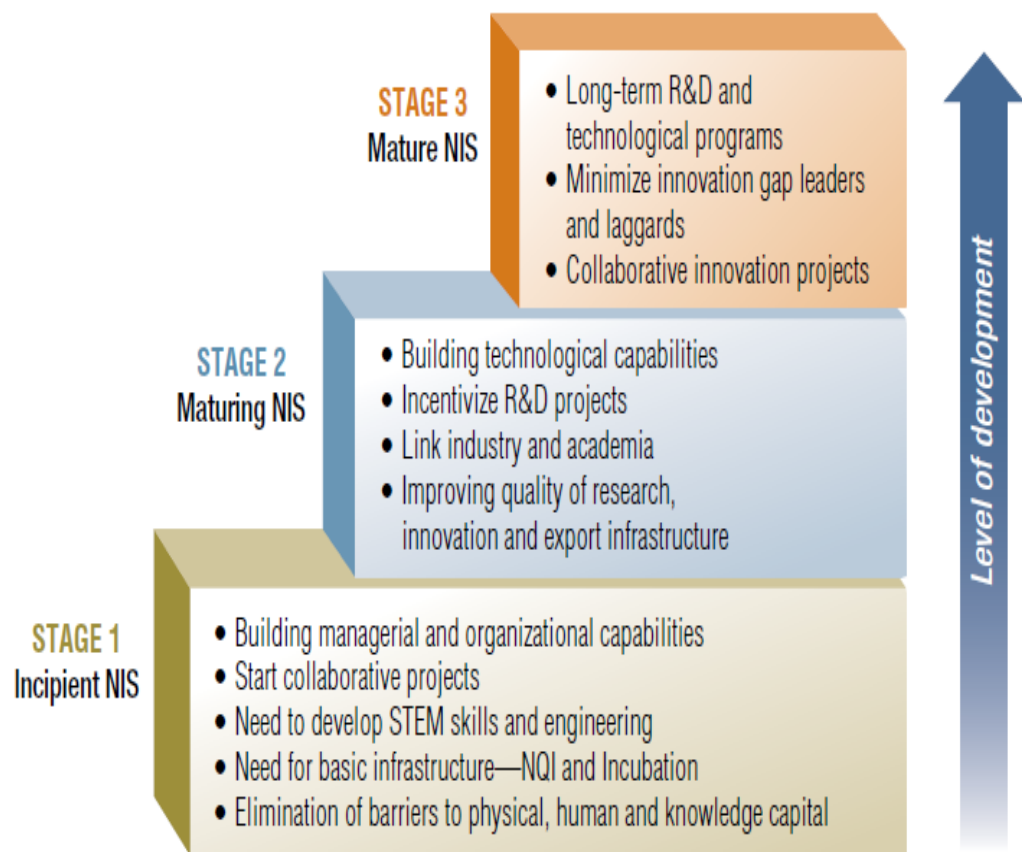
# Some Findings from Colombia STI-PER

- More heterogeneity **within** agencies than across them
- There are best practices in each and every one of the participating agencies...often even in areas where institution's score is on average low
- Best practices, however, are heavily clustered (in programs within agencies)
  - *“good programs not good agencies”*
- Overall better performance in the implementation dimension than in design
- Best practices are related with core programs that have specific objectives
- **Key areas to improve:** Justification; Logical Framework; Choice of Instrument; Calls for Proposals; Monitoring & Evaluation



# Gradual Development of Firm Capabilities for Innovation

**FIGURE 7.2** The Capabilities Escalator: Innovation Policy Needs



**Sequence policy mix to build appropriate firm capabilities**  
**Not deterministic- S&T agenda a project of decades**  
**But allocate resources to stage where country is weakest**

Note: NIS = National Innovation System; NQI = national quality infrastructure; R&D = research and development; STEM = science, technology, engineering, and mathematics.

# Building “Bridges” towards an Integrated STI Roadmap

1. Bridging **Policy & STI Communities** through dialogues, shared frameworks
  - + STI Forum
  - Roles unclear; no systematic engagement (yet); lack of shared framework
2. Bridging **Public and Private** through ecosystem and inclusive governance
  - + Appreciation for private sector; SDG as opportunity; ‘Better Business/Better World’
  - Lack of common metric; lack of enabling environment for ‘disruptive change’
3. Bridging **Analysis and Action** through learning loops
  - + STI-PER; various reviews/assessments; pilots
  - No infrastructure for continuous learning; lack of coherence/consistency/action/scale;
4. Bridging **Country and Global** dimensions to match national efforts with complementary international efforts, fill the gaps
  - + Mapping of global UN-STI program
  - Limited baselines/data to measure STI progress under SDGs (national SDG reviews w/ limited attention to STI; fragmented efforts;
5. Bridging **People, Planet and Prosperity**
  - + Emerging understanding of STI interlinkages;
  - Lack of robust science to understand non-linear implications for policy

# Recommendations on Next Steps

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## 1. Galvanize collective action

- IATT sub-working group to bring together methodologies and frameworks
- Broader participation beyond policy circle: scientific & private sector

## 2. Experiment with roadmap architecture and business model

- Pilot country engagements (developing countries, developed / donors)
- Multiple levels (e.g. Goals, subnational / local, projects)
- Multiple funding sources

## 3. Set a roadmap to STI Roadmap

- 2018: Principles and Pilots
  - February meeting: launch taskforce, define parameters (e.g. “bridges”)
  - April workshop: collect early experiences & lessons
- 2019: Paths to operationalize at scale, HLPF to UNGA