
Frontier Technology in Asia and the Pacific

Trade, Investment and Innovation Division
United Nations Economic and Social Commission for Asia and the Pacific
(ESCAP)



Agenda

- Frontier technologies
 - what technologies are we talking about?
- Impacts of frontier technologies on jobs
- Diversified capacities of ASEAN members for embracing frontier technologies
- Policy recommendations

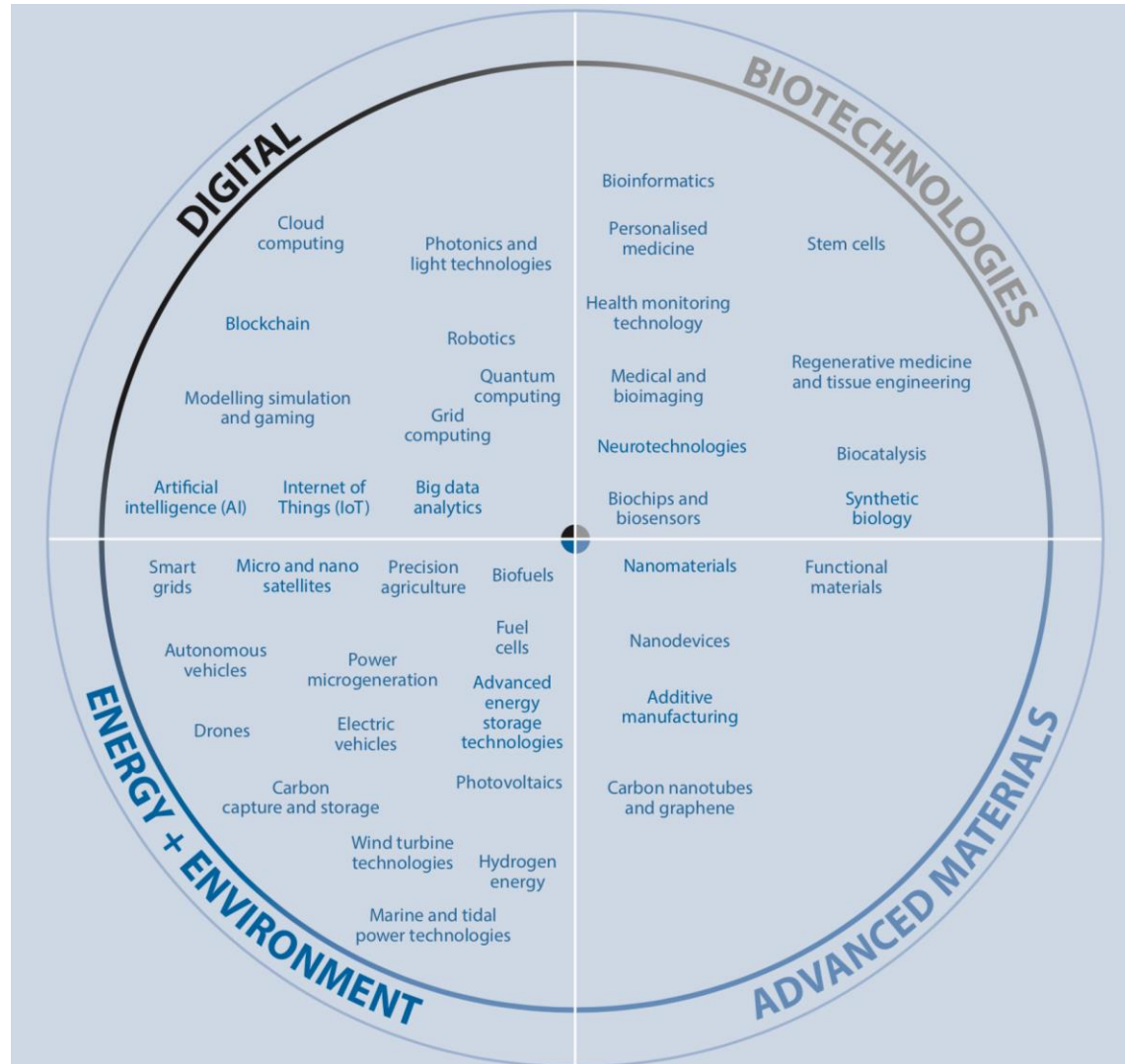


Defining frontier technologies

There is no universally agreed definition of frontier technology. However, there is a recurring common feature across the different technological advances in that they all “have the potential to disrupt the status quo, alter the way people live and work, rearrange value pools, and lead to entirely new products and services



The 40 key emerging technologies for the future according to OECD



Frontier technologies identified by different organizations

OECD	World Bank	World Economic Forum	McKinsey Global Institute	Institute of Development Studies	MIT Technology Review 2018
Internet of Things	Fifth-generation (5G) mobile phones	Artificial intelligence	Mobile internet	3D printing	3D Metal Printing
Big data analytics	Artificial intelligence	Robotics	Automation of knowledge work	Collaborative economy tools	Artificial Embryos
Artificial intelligence	Robotics	Internet of Things	Internet of Things	Alternative internet delivery	Sensing City
Neuro technologies	Autonomous vehicles	Autonomous vehicles	Cloud technology	Internet of Things	Artificial intelligence for Everybody
Nano/micro satellites	Internet of Things	3D printing	Advanced robotics	Unmanned aerial vehicles/drones	Dueling Neural Networks
Nanomaterials	3D printing	Nanotechnology	Autonomous and near-autonomous vehicles	Airships	Babel-Fish Earbuds
3D printing (additive manufacturing)		Biotechnology	Next-generation genomics	Solar desalination	Zero-Carbon Natural Gas
Advanced energy storage technologies		Materials science	Energy storage	Atmospheric water condensers	Perfect Online Privacy
Synthetic biology		Energy storage	3D printing	Household-scale batteries	Genetic fortune-telling
Blockchain		Quantum computing	Advanced materials	Smog-reducing technologies	Materials' Quantum Leap
			Advanced oil and gas exploration		
			Renewable energy		

Source: prepared by ESCAP

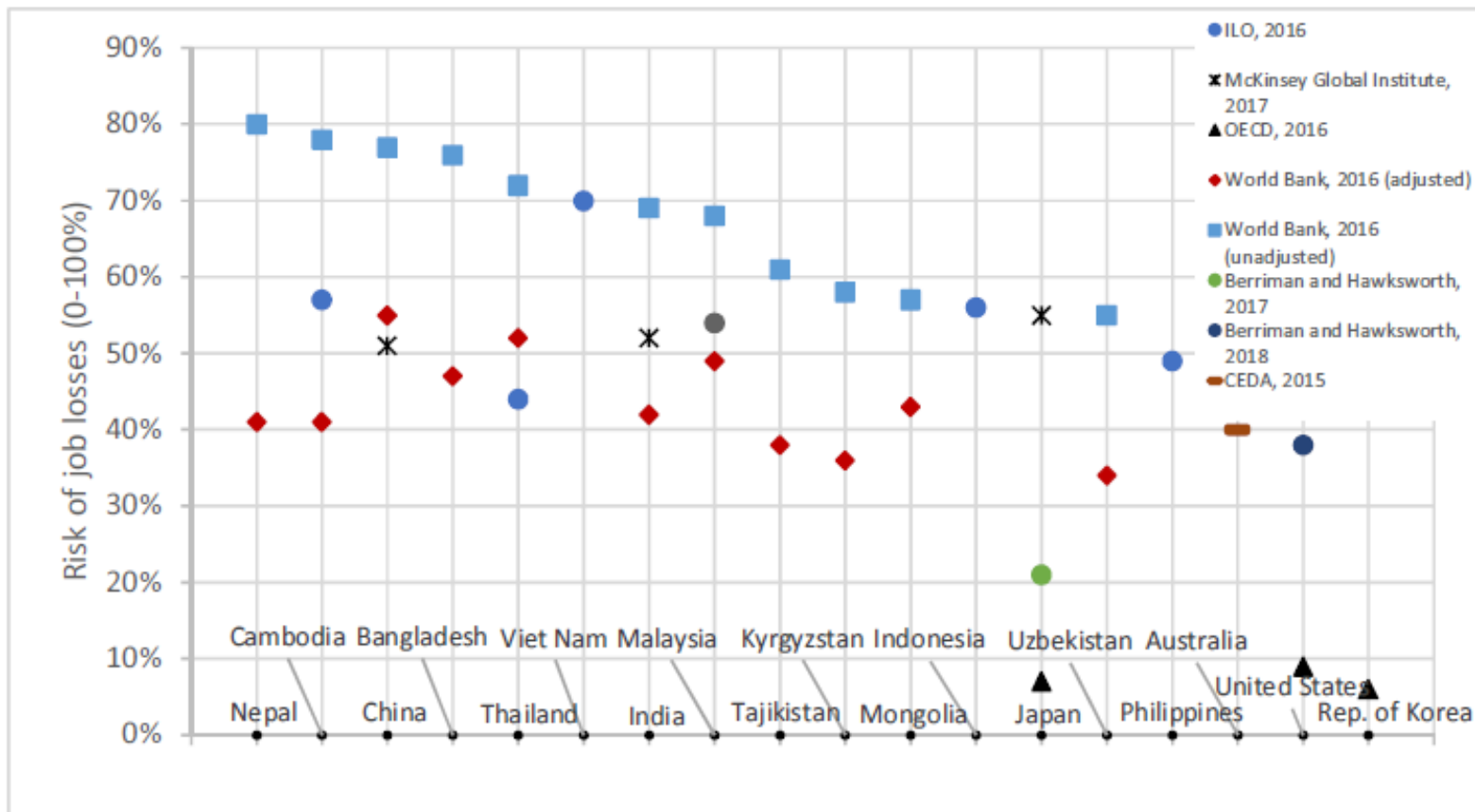
Agenda

- Frontier technologies
 - what technologies are we talking about?
- Impacts of frontier technologies on jobs
- Diversified capacities of ASEAN members for embracing frontier technologies
- Policy recommendations



Impact of frontier technologies on jobs: the scale and pace remain largely unknown

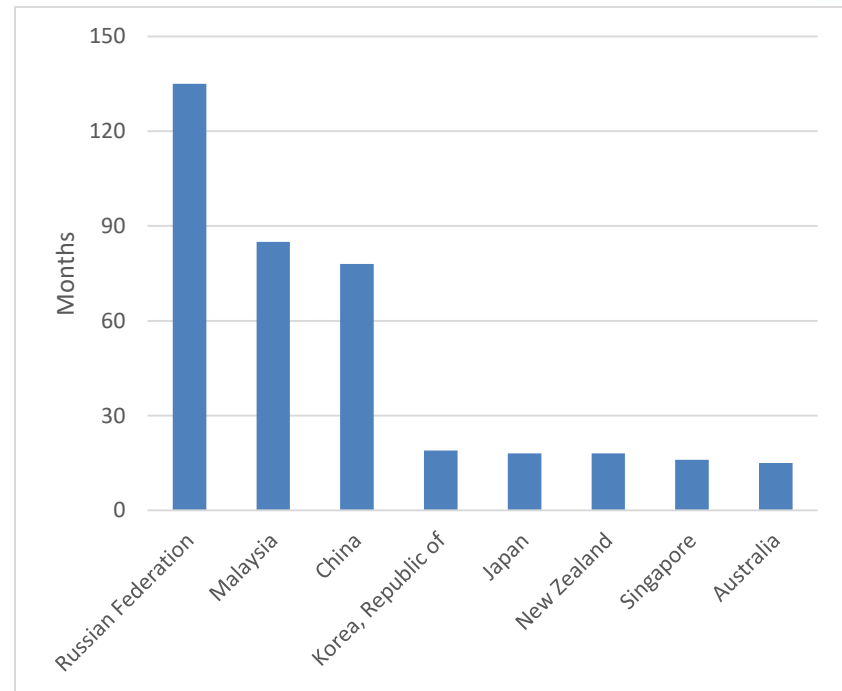
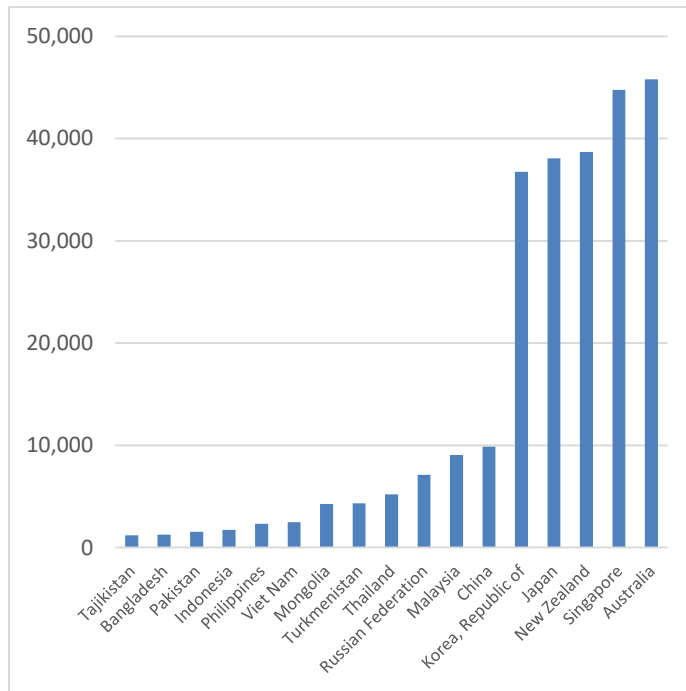
Range of estimates of the share of jobs at risk of being lost to automation



Source: compiled by ESCAP

What is technically feasible is not always economically viable

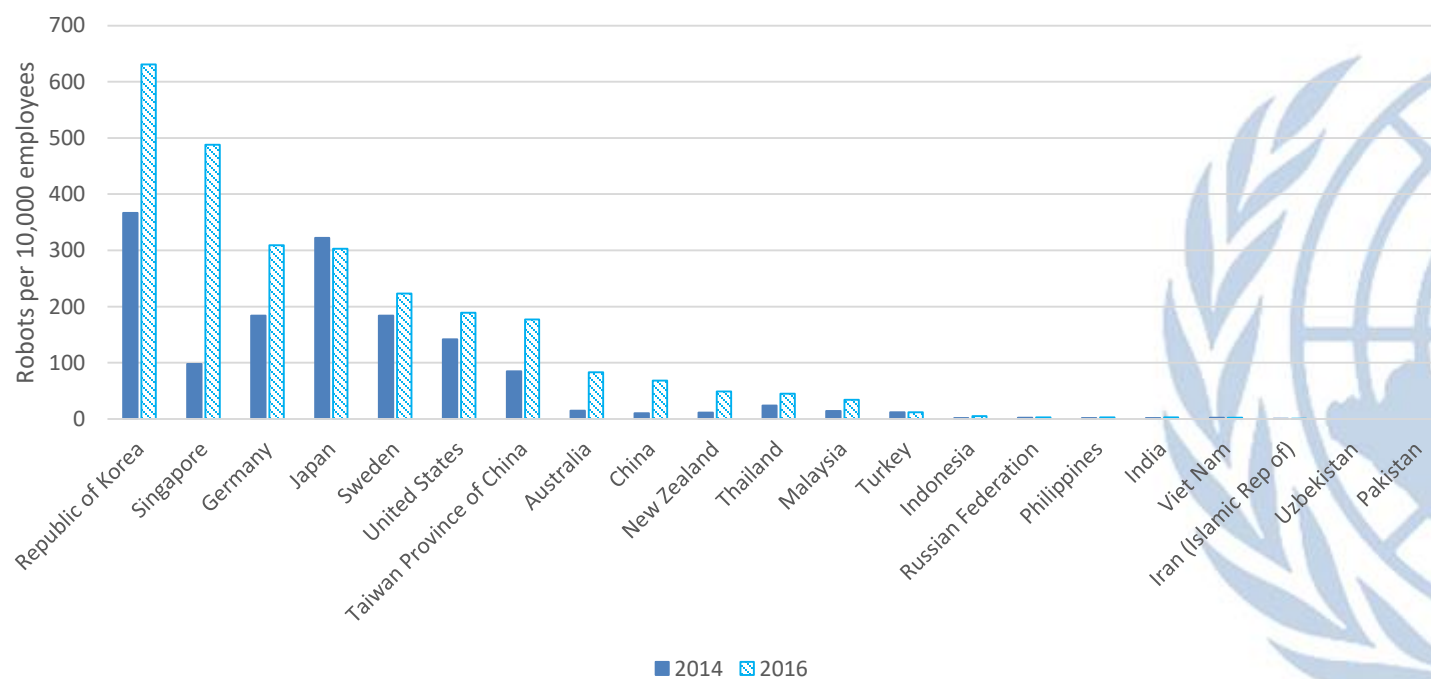
Dynamics between wages and machine costs: Scenario analysis



Source: ESCAP

Wages vs. machine costs: Evidences

Estimated robot density in manufacturing, 2014 and 2016



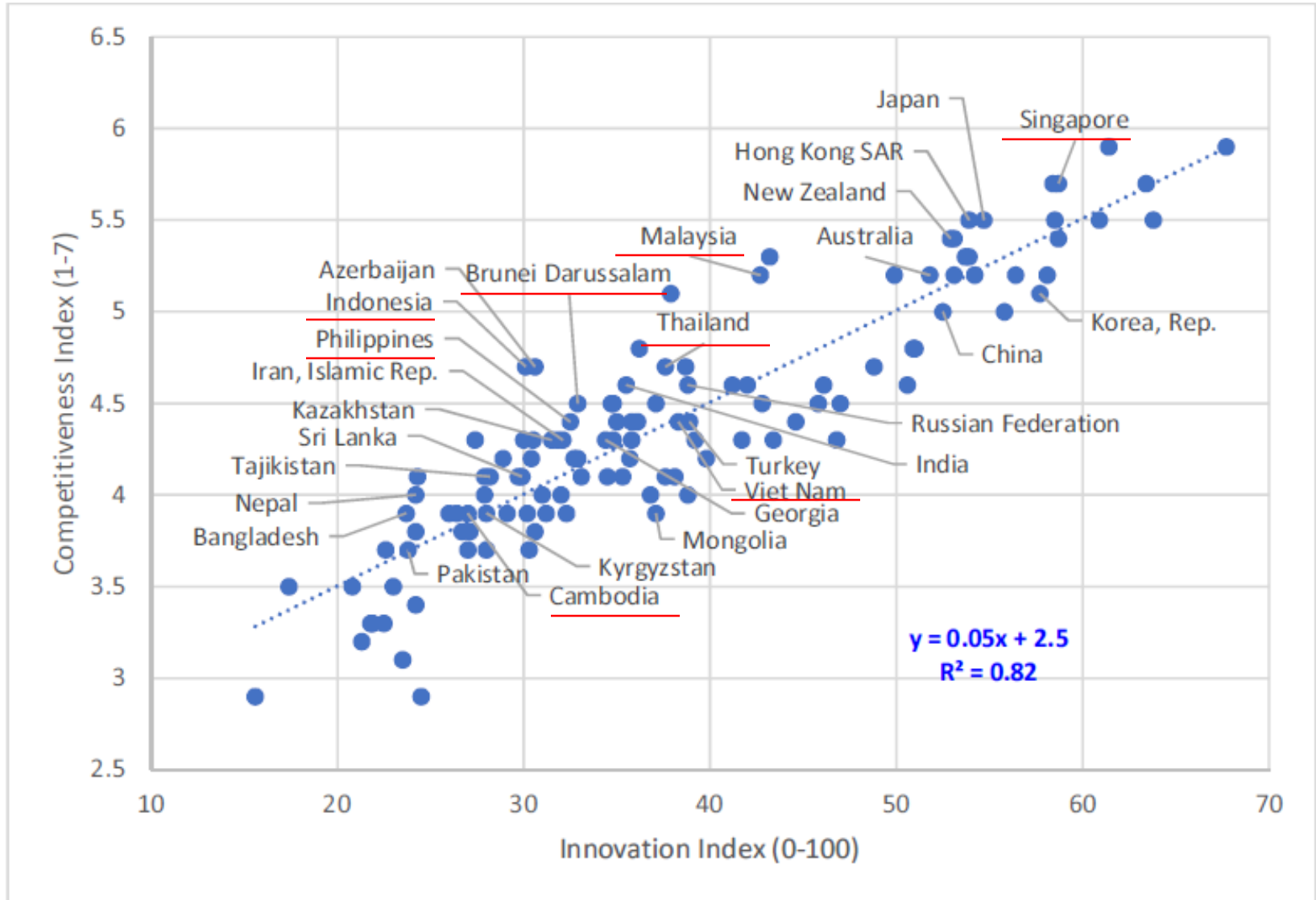
Source: prepared by ESCAP based on UNCTAD, 2017

Agenda

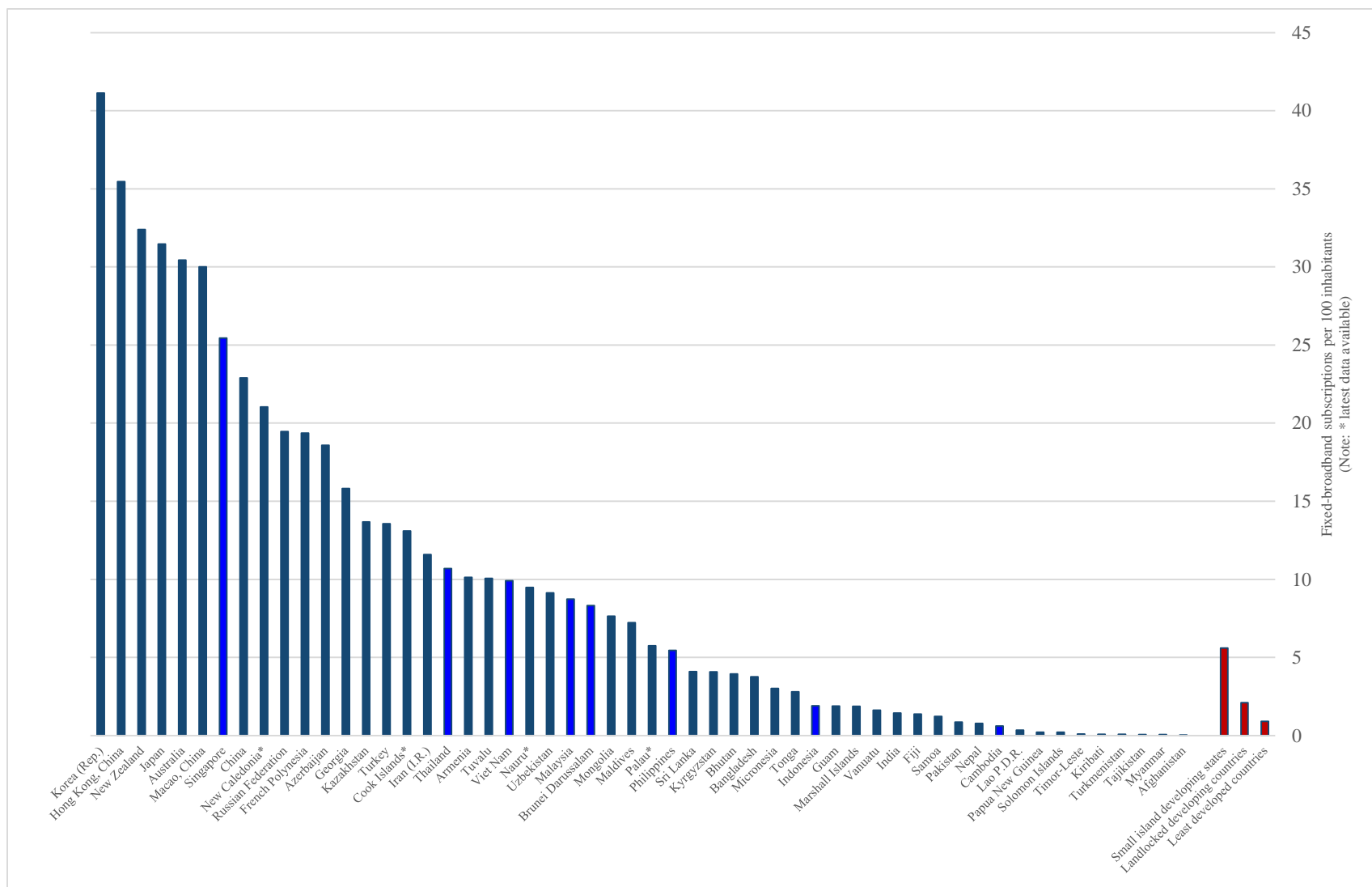
- Frontier technologies
 - what technologies are we talking about?
- Impacts of frontier technologies on jobs
- Diversified capacities of ASEAN members for embracing frontier technologies
- Policy recommendations



National competitiveness and innovation capability

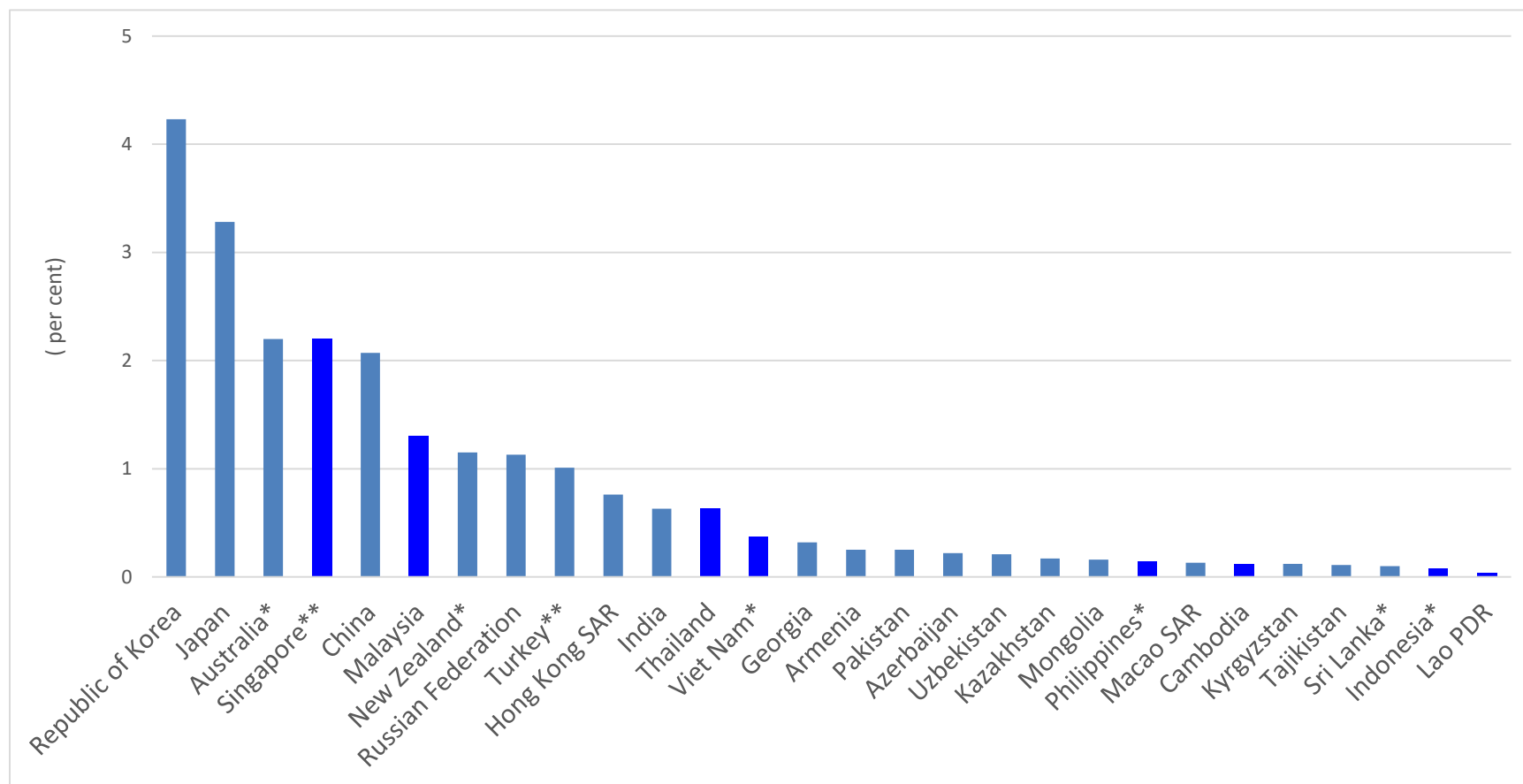


Fixed-broadband subscriptions per 100 inhabitants in ESCAP member countries



Source: prepared by ESCAP according to the data from ITU

Gross domestic expenditure on R&D as a share of GDP




Source: prepared by ESCAP

Agenda

- Frontier technologies
 - what technologies are we talking about?
- Impacts of frontier technologies on jobs
- Diversified capacities of ASEAN members for embracing frontier technologies
- Policy recommendations



Policy recommendations

1. An inclusive ICT infrastructure.
 2. A workforce fit for the emerging scale and speed of the technological revolution. In this context, there is a need to promote lifelong learning, reskilling and entrepreneurship development to develop a cadre of job creators.
 3. A responsive and adaptive regulatory framework that doesn't stifle innovation.
 4. A private sector that pursues responsible frontier technology development to tackle social and environment concerns; and to strengthen the quality and sustainability of growth by creating "shared value" through a focus on corporate sustainability.
 5. A catalyzing role of government in frontier technologies' evolution.
- 

Further reading

