New Technologies, dynamics of job creation and societal learning

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Harnessing Rapid Technological Change for Inclusive and Sustainable Development

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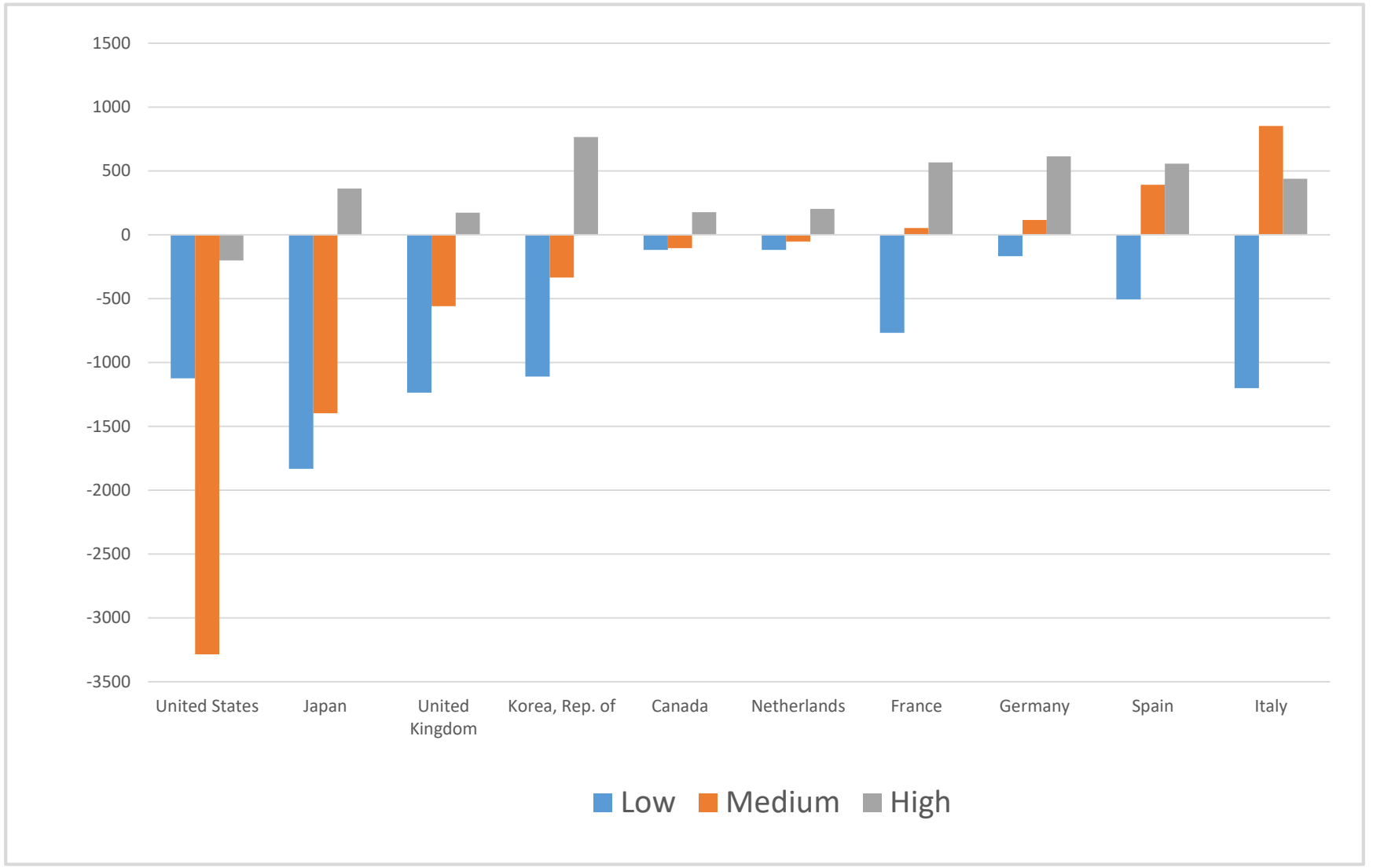
Impact of new technologies on jobs and employment

Long-term trends in labour markets in industrial production mode

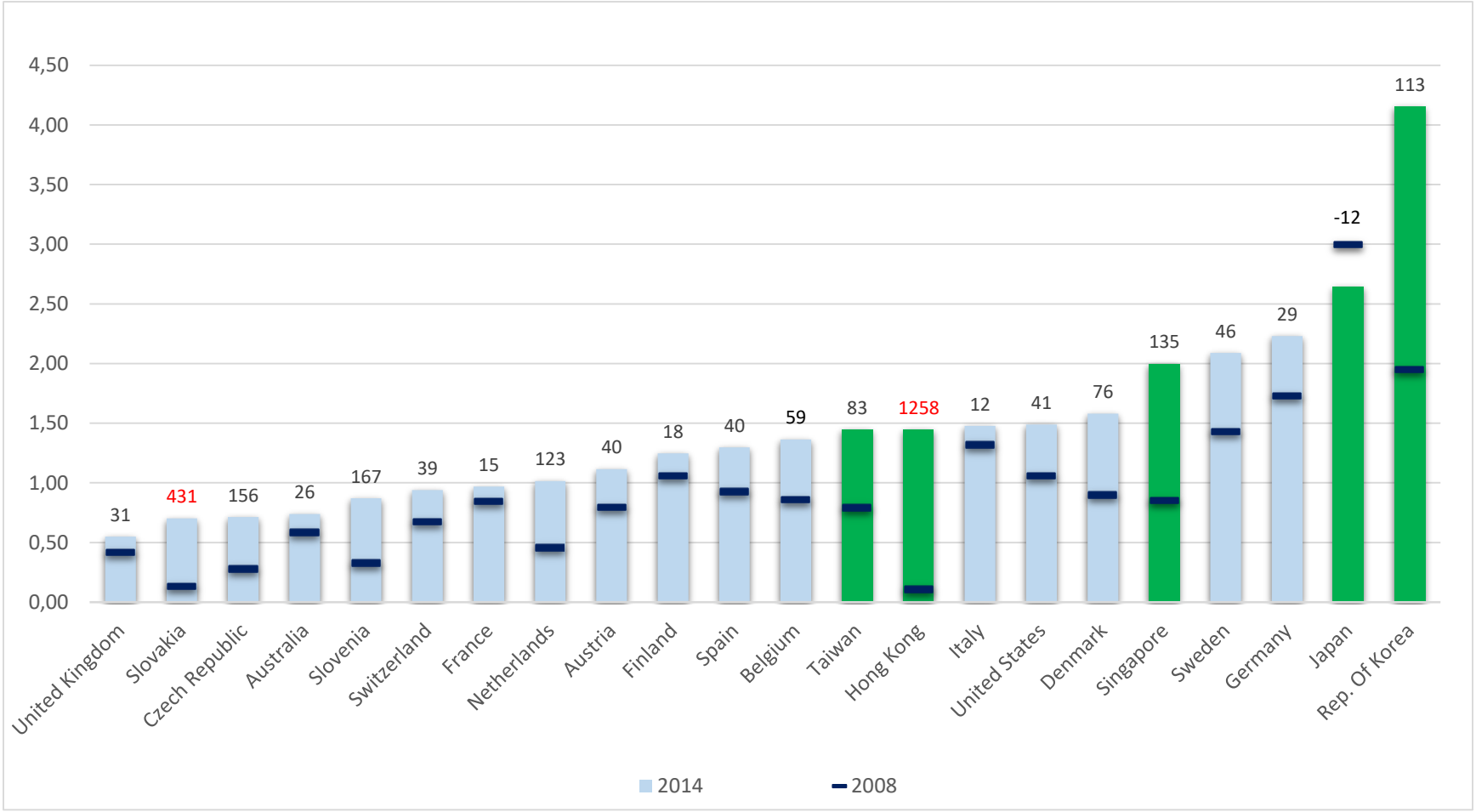
- *Productivity, process innovations, new business models destroy jobs*
  - Competition drives search for labour-saving technological change
  - Automation, robotisation replaces human tasks
  - Fragmentation of production process leads to new business models, division of labour, specialization, geographical relocation of tasks
- *Product innovation, market expansion generate new and different jobs*
  - New capital goods industries; Demand for R&D
  - Leisure industry (income, working time); Changing consumer behaviour, customisation of producdtion, Social and solidarity economy
- *Jobs, skills and wage polarization: complexity tasks, wages, institutions*
  - increasing complexity and human capital
  - Basic human competences, low wages
  - Labour market institutions to generate full and productive employment and decent work for all

GVC participation and Job Polarization

Change in number of manufactures GVC related workers, 1995-2008 in '000, by skills type

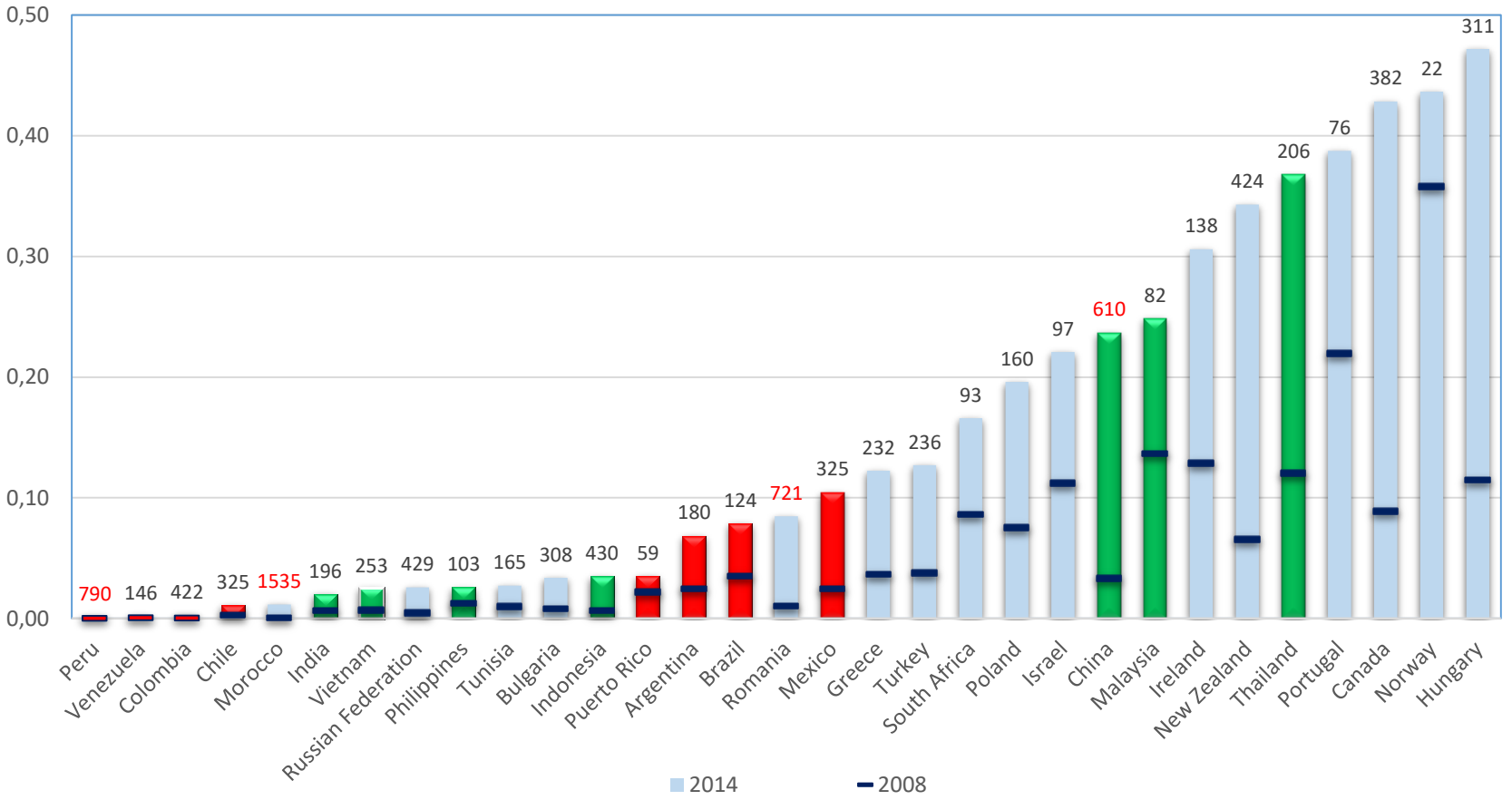


Robot Density across Countries in 2008 and 2014, High Density Countries (>0.5 in 2014)



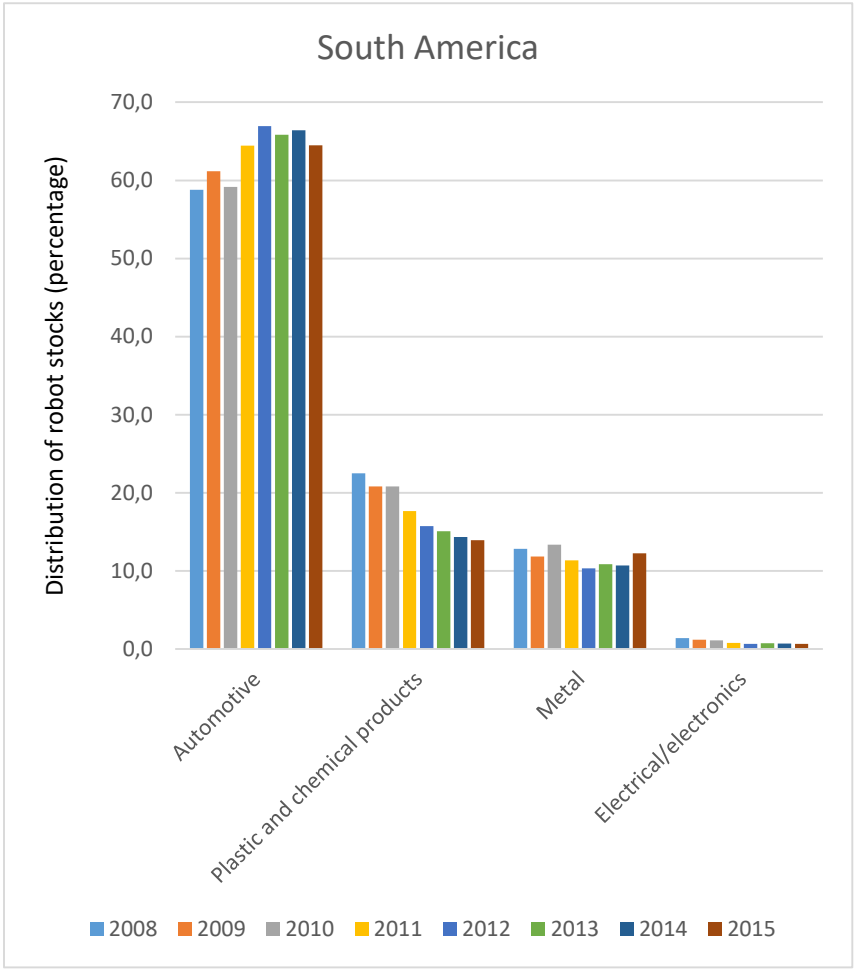
Source: International Federation of Robots, 2016

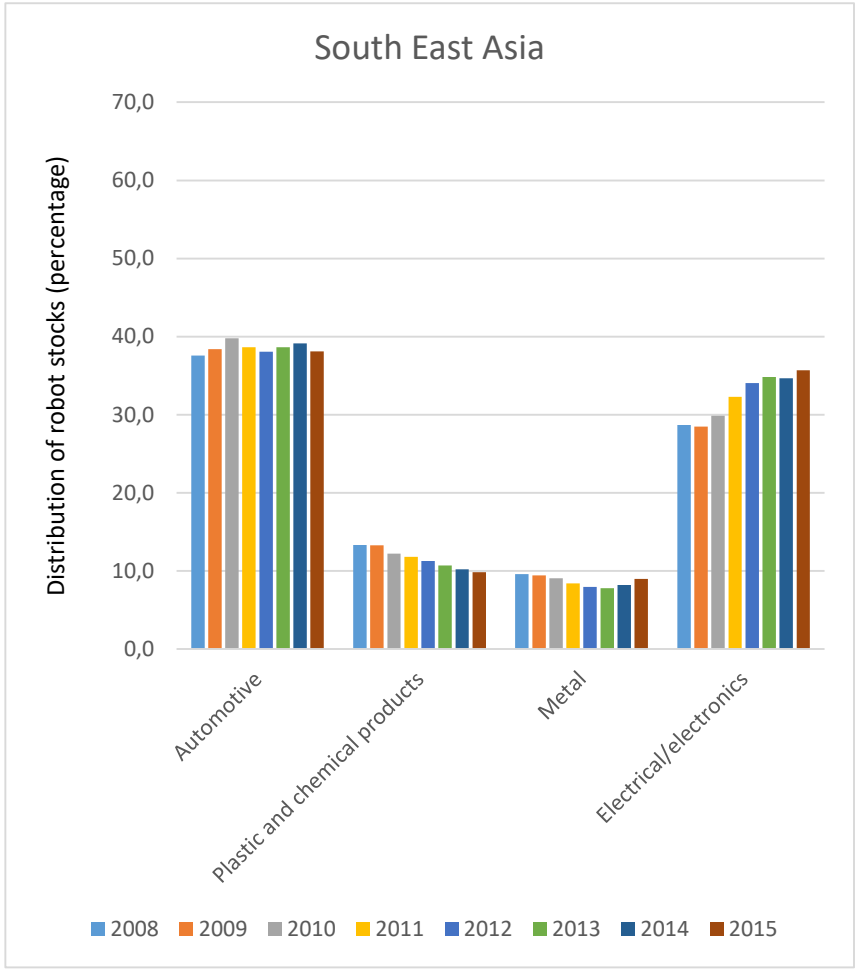
Robot Density across Countries in 2008 and 2014, Low Density Countries (<0.5 in 2014)



Source: International Federation of Robots, 2016

Distribution of robot stocks across the robot-intensive industries in South America and South East Asia, 2008-2015 (percentage)

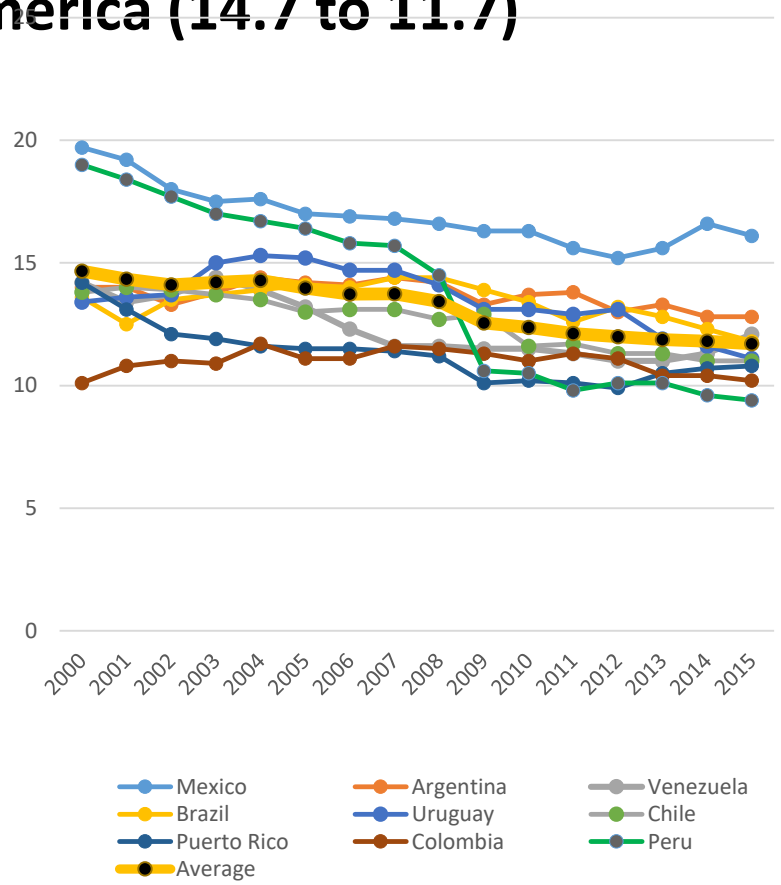




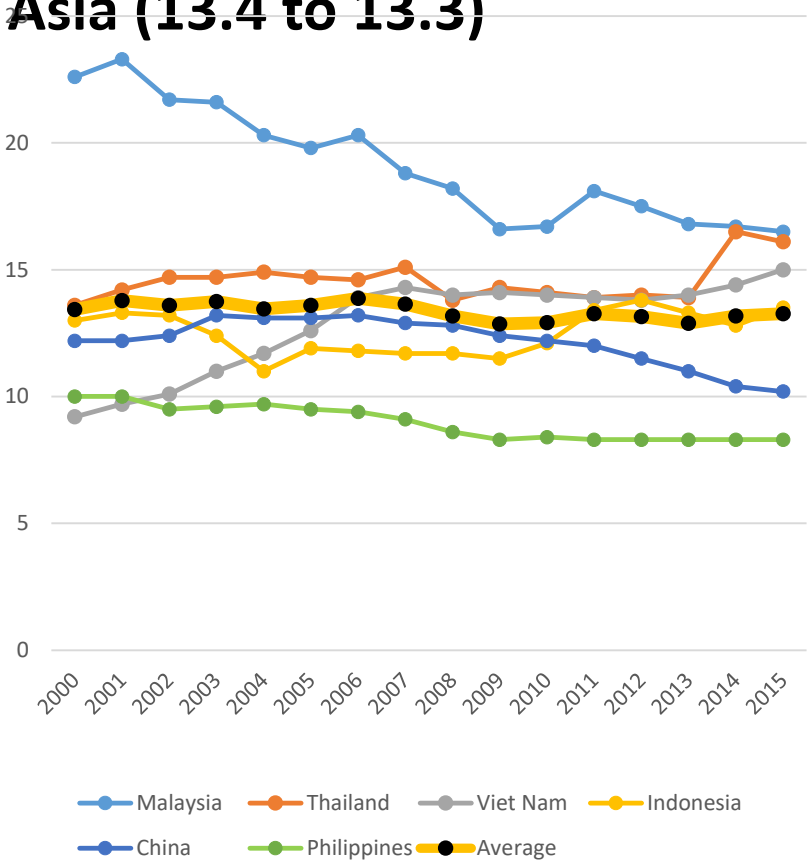
Source: International Federation of Robotics, 2016

Change in manufacturing employment as a share of total employment, 2000-2015

Latin America (14.7 to 11.7)

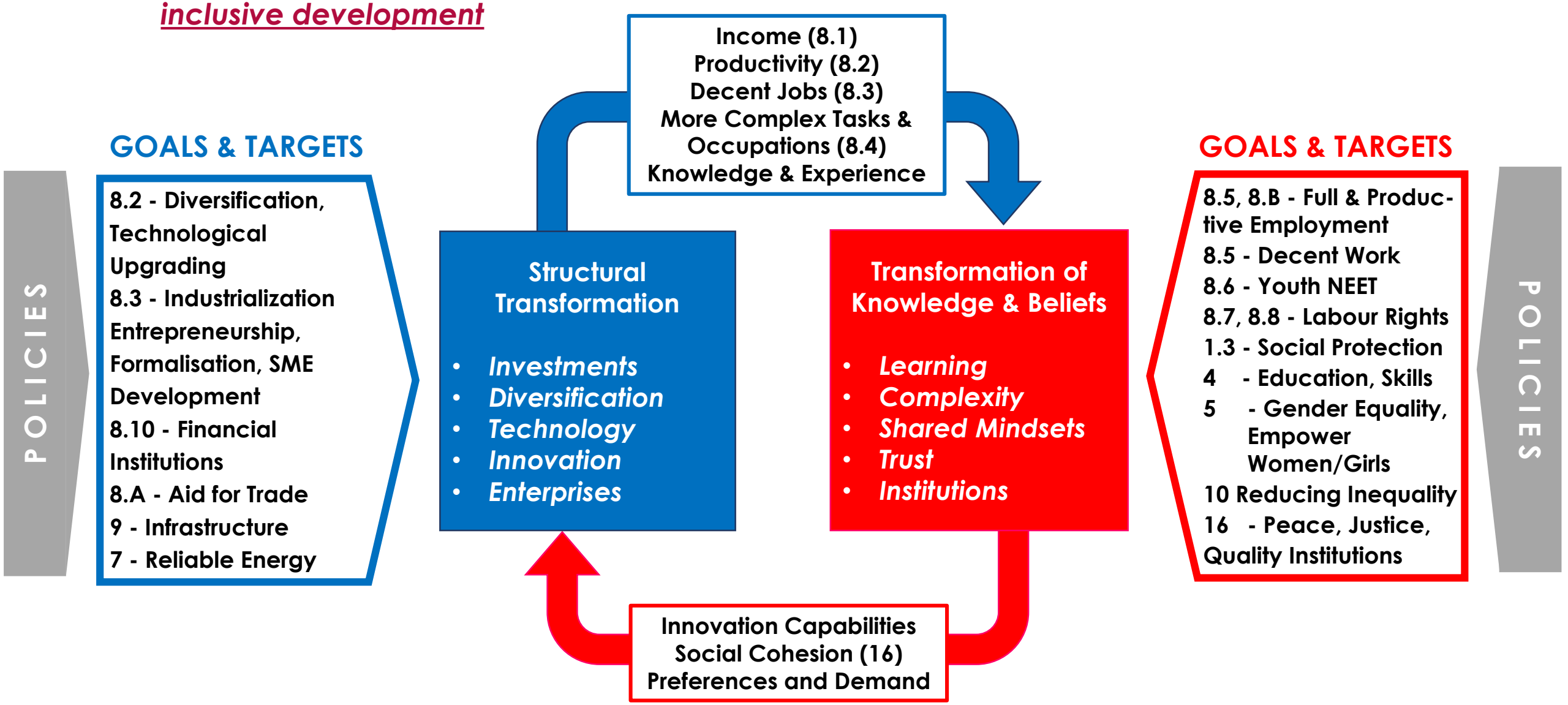


Asia (13.4 to 13.3)



Source: Trends Econometric Model database, ILO November 2016

The dynamics of sustained growth and inclusive development



For growth to be sustained and to create more decent jobs, policies and institutions drive a circular and cumulative dynamics of structural transformation and societal learning.

Thank you

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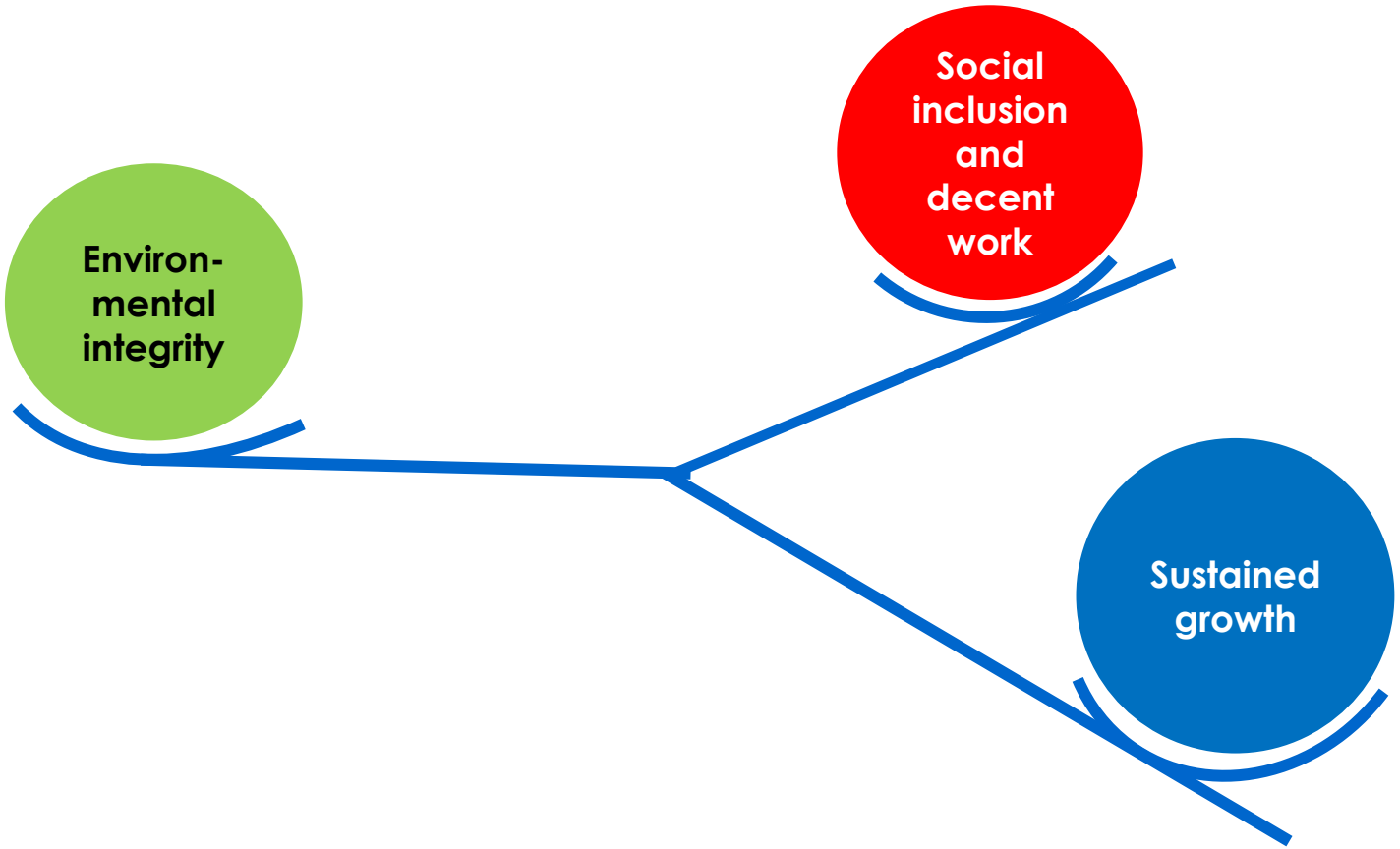
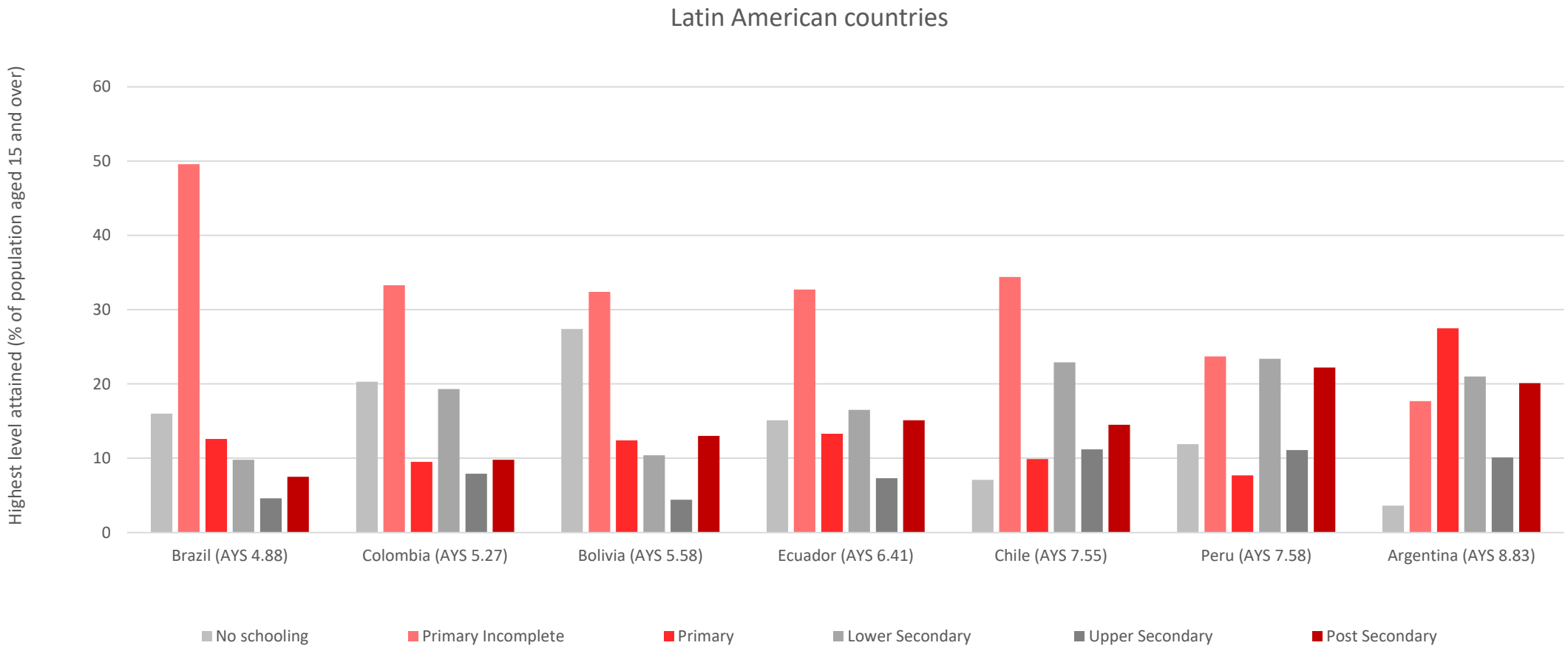
Sustainable development



Balancing progress in social inclusion and decent work, sustained growth and environmental integrity while moving up the whole system in a circular cumulative process with social justice as the compass for policy choices, and social dialogue to create consensus.

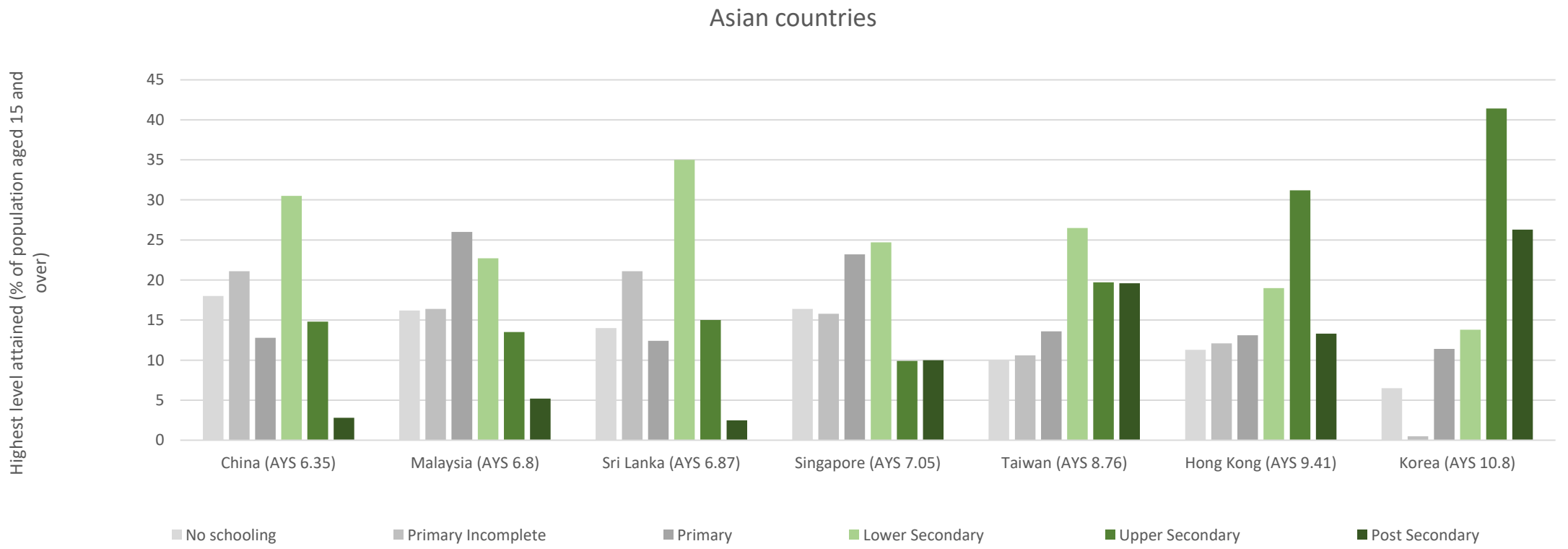
Educational attainment structure (EAS): Missing middle

Share of upper secondary at least 20 percent lower than post-secondary education



Educational attainment structure (EAS): Strong middle (bell shape)

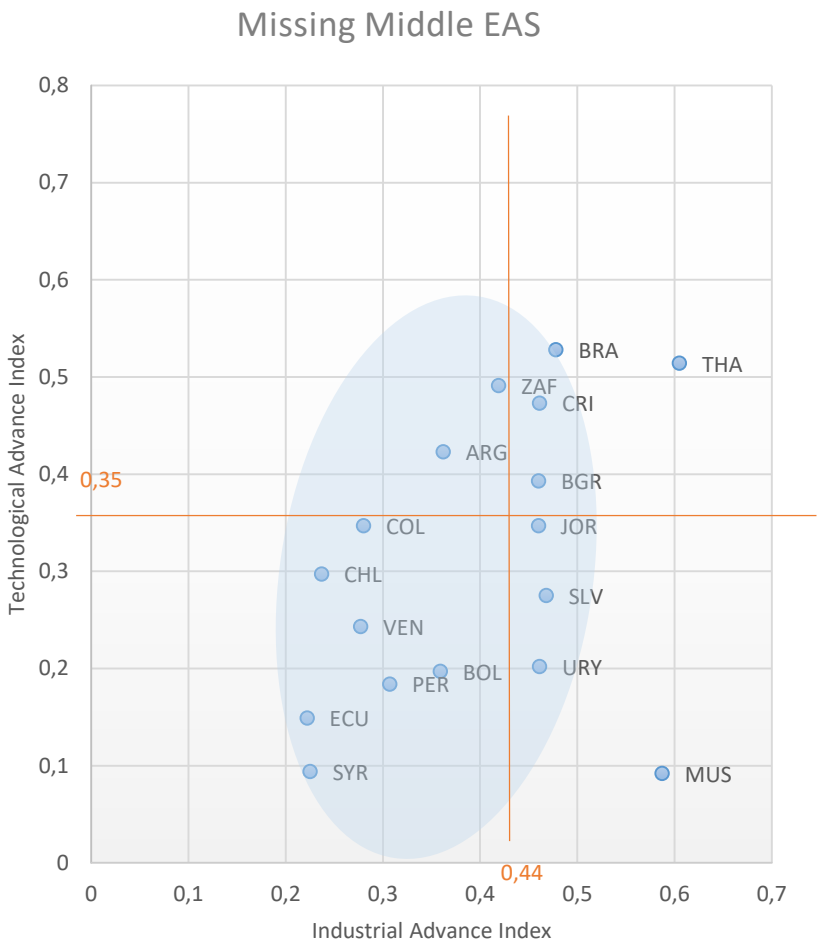
Share of lower and/or upper secondary education larger than post secondary education

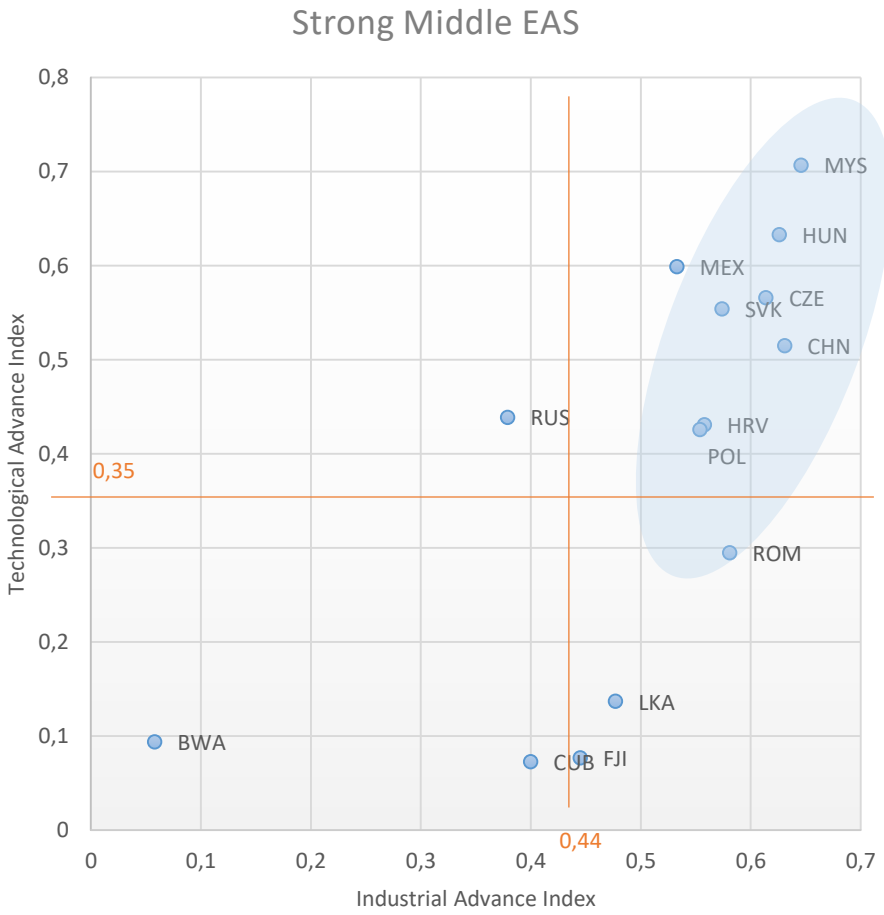


Source, Nübler, I., 2019 forthcoming, Capabilities for innovation and productive transformation, ILO, Geneva.

Data: Barro-Lee 2000

Industrial and technological development: middle income countries in Asia and Latin America





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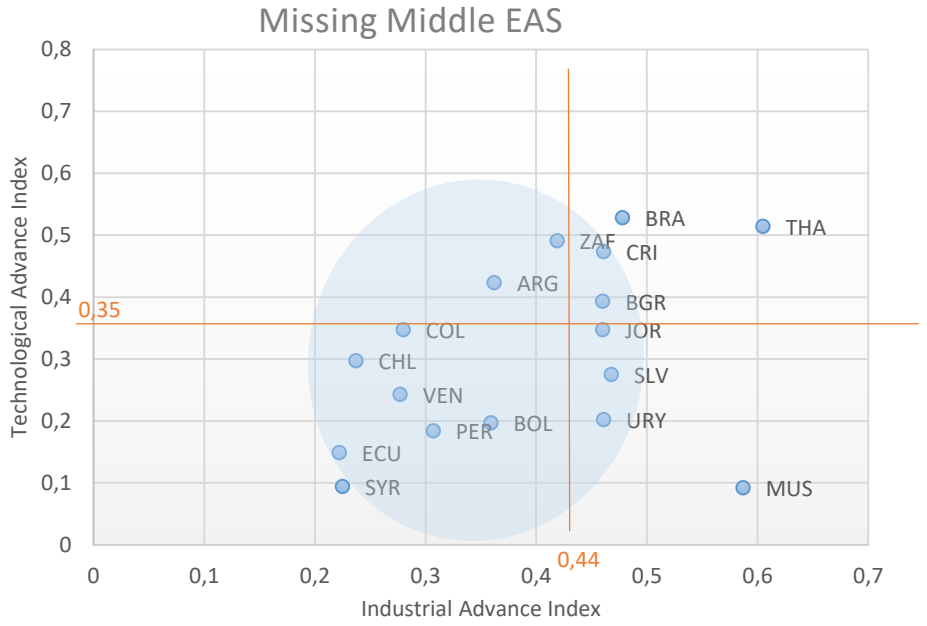
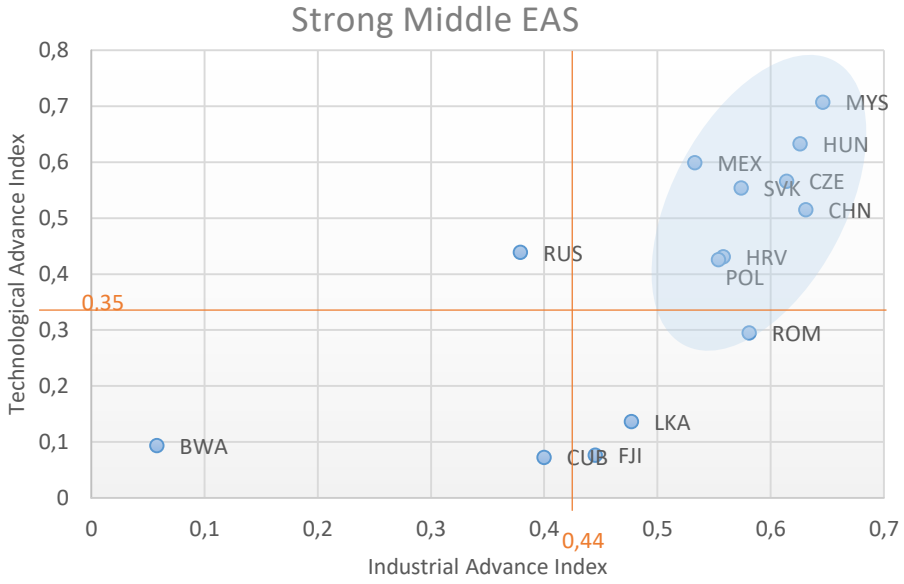
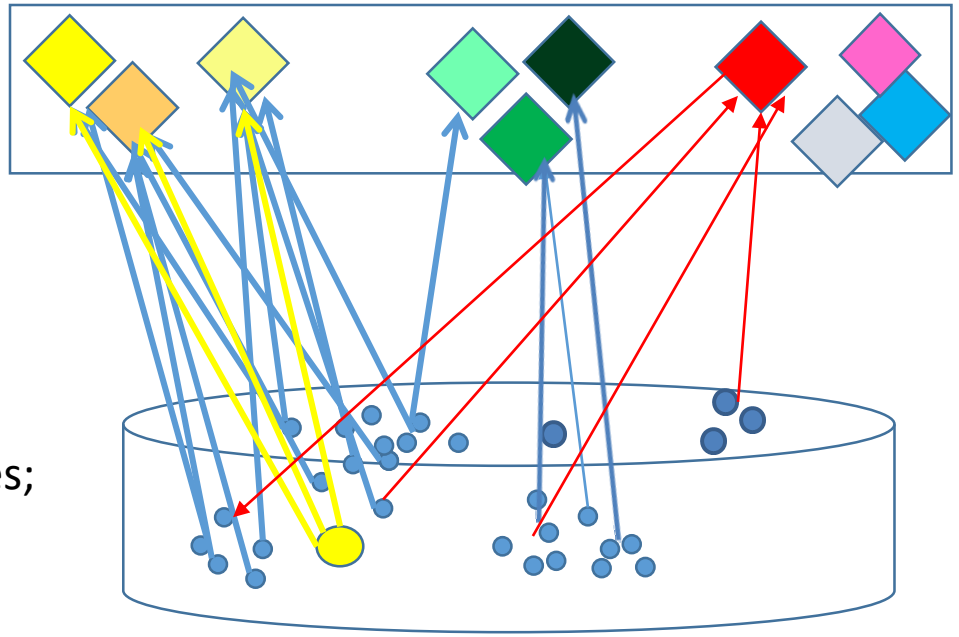




Capabilities:
feasible options for innovation and dynamics of structural transformation

A product as the combination of distinct, complementary knowledge sets

Tangible, material sphere:
Products,(Goods, services, industries)



Intangible knowledge sphere:
Knowledge, (mix of skills, competences; Socially shard beliefs; attitudes, mindsets)

Understanding capabilities: combination, complemenarities, relatedness, co-occurrence, complexity, diversity
Leapfrogging (red); technological core competence (yellow)

I. The nature and carriers of dynamic capabilities

- **The particular mix of technical, vocational, professional skills and kno**wledge (diversity, complexity, specificity of the knowledge base)
  - determines the possible patterns of structural change, incremental differentiation and leapfrogging
  - the type of new technologies and innovations that can be adopted
  - the range of feasible new products that can potentially be produced

- **Regional-specific mindsets, "spirits"** (e.g. precision, design, craftsmanship; entrepreneurship)
  - created through dominant activities performed in the past and inherited" from past generations
  - endow regional labor force with specific competences
  - drives innovations and product diversification along these knowledge paths
  - example: cuckoo clock in 18th century Black Forest and precision industry today.

- **Commonly shared belief systems** (culture, ideologies, religion, philosophies)
  - determine choices, attitudes, values;
  - align individual behavior and choices;
  - develops joint visions of the way forward, the development goals and aspirations
  - (example: consumer society in the US A since1930s)

- **Institutions (**rules and enforcement mechanisms),
  - restrict individual behavior, create regularities and trust,
  - reduce transaction costs
  - promote investment, innovation, risk taking, and managing change and risks

III. Shaping the future of work

Market forces alone cannot achieve such transformative processes.

It requires governments and societies to learn and develop new social demand and policy choices.

Build capabilities in labour force, entrepreneurs and societies that

- enable the country to take advantage of emerging technologies, and
- innovate and transform production structures to create new economies and jobs.

Education and training policies is key as it plays a dual role:

- enriches the knowledge base of society and thus enhances capabilities to innovate
- fills skills gaps and matches demand with supply once a new activity has been created.

Develop social institutions that reward entrepreneurship, craftsmanship to

- encourage creativity, investment, innovation and new jobs, and
- redistribute productivity gains created by new technologies to workers for new demand.

Design mission-oriented technology, science, innovation and industrial policies to

- shape the direction of technological and structural transformation
- for development, employment and social justice.

New institutions need to regulate work and protect workers in newly emerging non-standard forms of employment

Create social dialogue for new consensus on the way forward, new social demand and policy choices