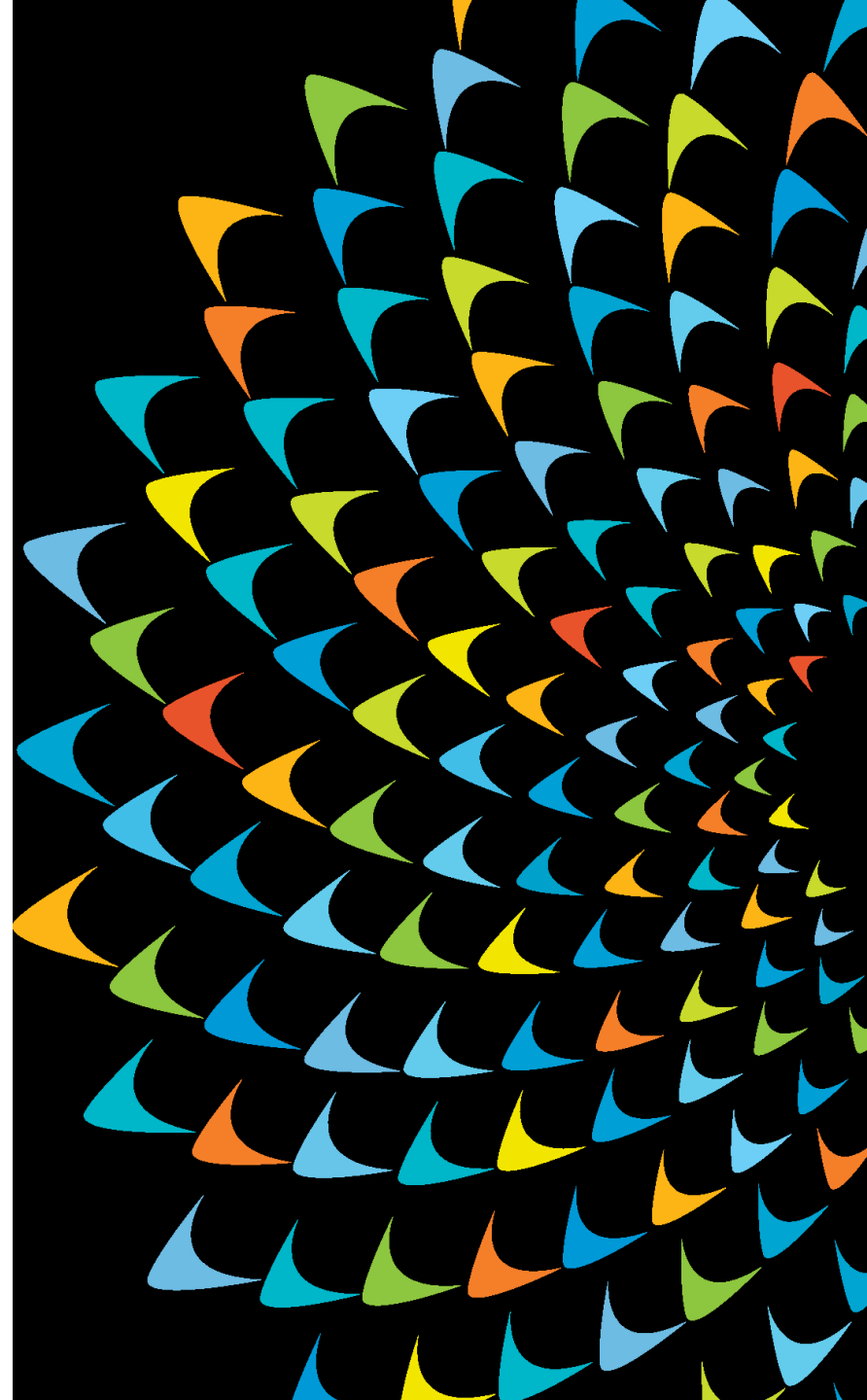




Labor markets in the age of 4IR

How is technology impacting jobs in developing Asia?

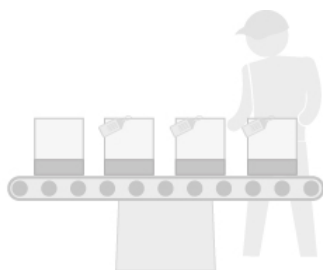
Sameer Khatiwada | 3 December 2019





The Fourth Industrial Revolution

Industrial Revolutions: From steam engines to smart phones



1st Industrial Revolution

1760s-1900
Use of steam and mechanically driven production facilities

2nd Industrial Revolution

1900-1970s
Electric power driven mass production based on division of labor

3rd Industrial Revolution

1970s- to date
Extensive use of controls, IT and electronics for an automated and high productivity environment

4th Industrial Revolution

Future
Smart: based on integration of virtual and physical production systems

Source: *Asian Development Outlook 2018: How Technology Affects Jobs.*

Drivers of 4IR (with Artificial Intelligence being cross-cutting)

- 1) **Physical** → autonomous vehicles, 3D Printing, advanced robotics, new materials
- 2) **Digital** → internet of things (IoT), distributed ledger (blockchain), on-demand economy/platforms
- 3) **Biological** → gene editing, synthetic biology, bio-printing



4IR: Is this time different?

Reasons why 4IR is distinct and more disruptive:

- **Speed:** the pace of change is exponential.
- **Breadth and depth:** builds on the digital technology and combines multiple new technologies.
- **Systems impact:** involves transformation of entire systems, across (within) countries, companies, societies and govt.

Source: Schwab, K. 2016. *The Fourth Industrial Revolution*, World Economic Forum, Crown Publishing Group, Penguin Random House, New York.



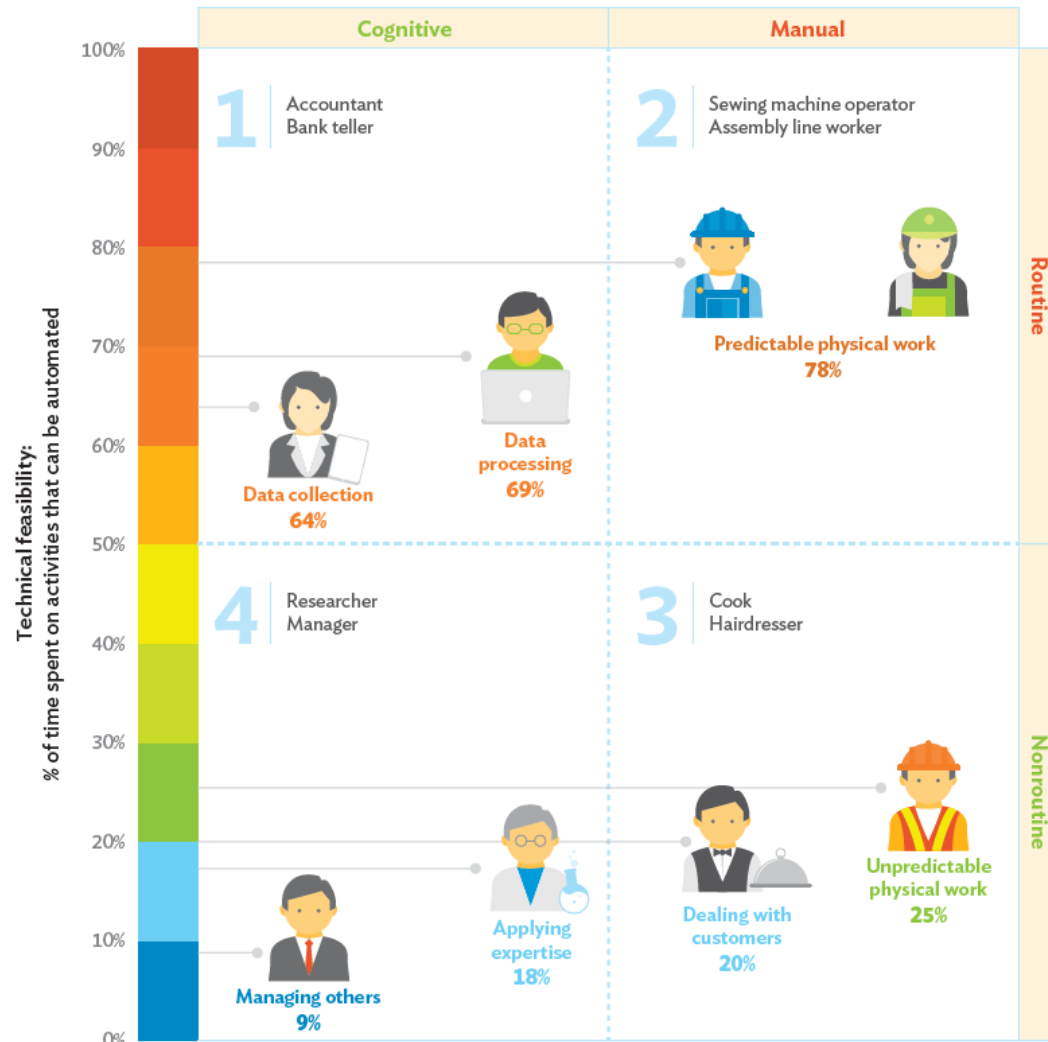
Impact of 4IR: Critical dimensions are growth and employment

Impact	Dimensions
Economy	Growth Employment The nature of work
Business	Consumer expectations Data-enhanced products Collaborative innovation New operating models
National and Global	Governments Countries, regions and cities International security
Society	Inequality and the middle class Community
Individual	Identity, morality and ethics Human connection Managing public and private information

Source: Schwab, K. 2016. *The Fourth Industrial Revolution*, World Economic Forum, Crown Publishing Group, Penguin Random House, New York.

Threat of automation: Should we worry?

Impact of automation on jobs



Note: Percentages refer to Frey and Osborne (2017) estimates on probability of automation. Framework is based on Acemoglu and Autor (2011).

Source: *Asian Development Outlook 2018: How Technology Affects Jobs.*



E.g. Occupational structure in the Philippines

		Manufacturing	Services
2005	Non-routine cognitive	19%	45%
	Non-routine manual	2%	16%
	Routine cognitive	6%	17%
	Routine manual	73%	23%
2015	Non-routine cognitive	24%	41%
	Non-routine manual	2%	20%
	Routine cognitive	6%	21%
	Routine manual	68%	19%

Note: Classification based on Acemoglu and Autor (2011).

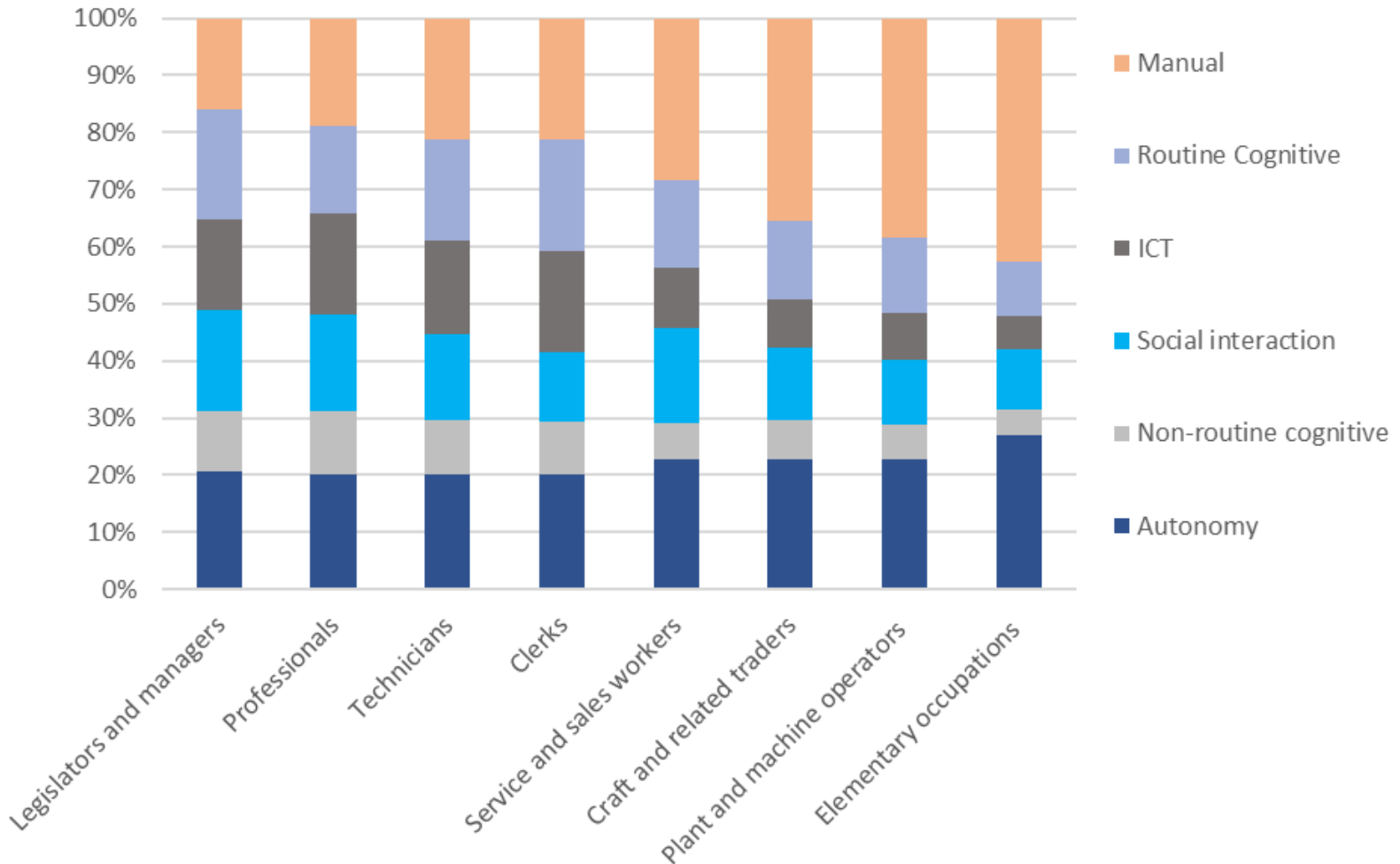
Source: Philippine Statistics Authority, Labor Force Survey, various years. Philippine Statistical Yearbook and Yearbook of Labor Statistics, various years.



There are compelling reasons to remain optimistic about developing Asia's job prospects

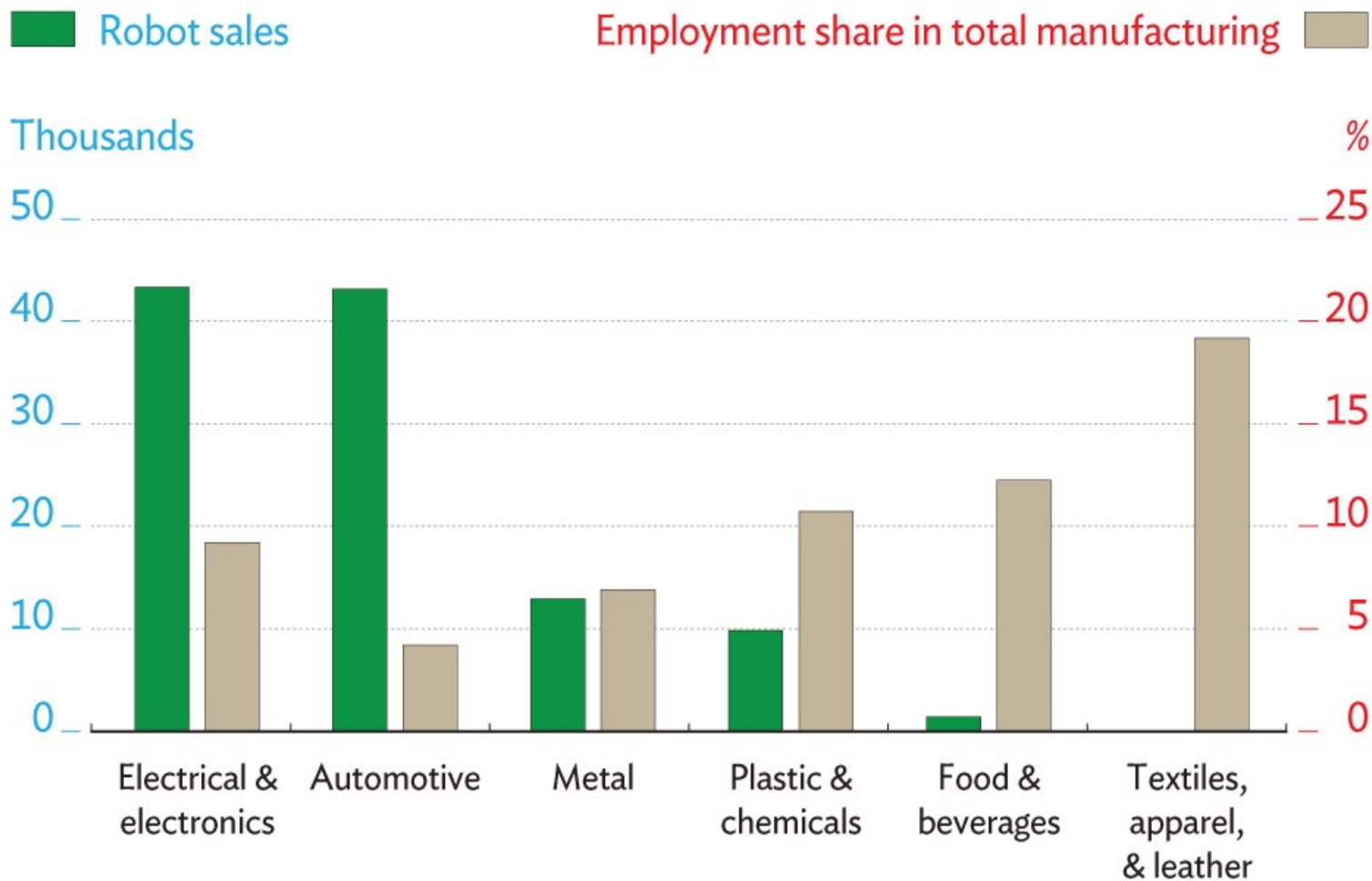
1. New technologies often automate only some tasks of a job.
2. Technically feasibility does not guarantee economic feasibility.
3. Rising income & demand.
4. New occupations and industries.

Category shares in worker's activities by occupations



Source: Author's calculations based on PIAAC database.

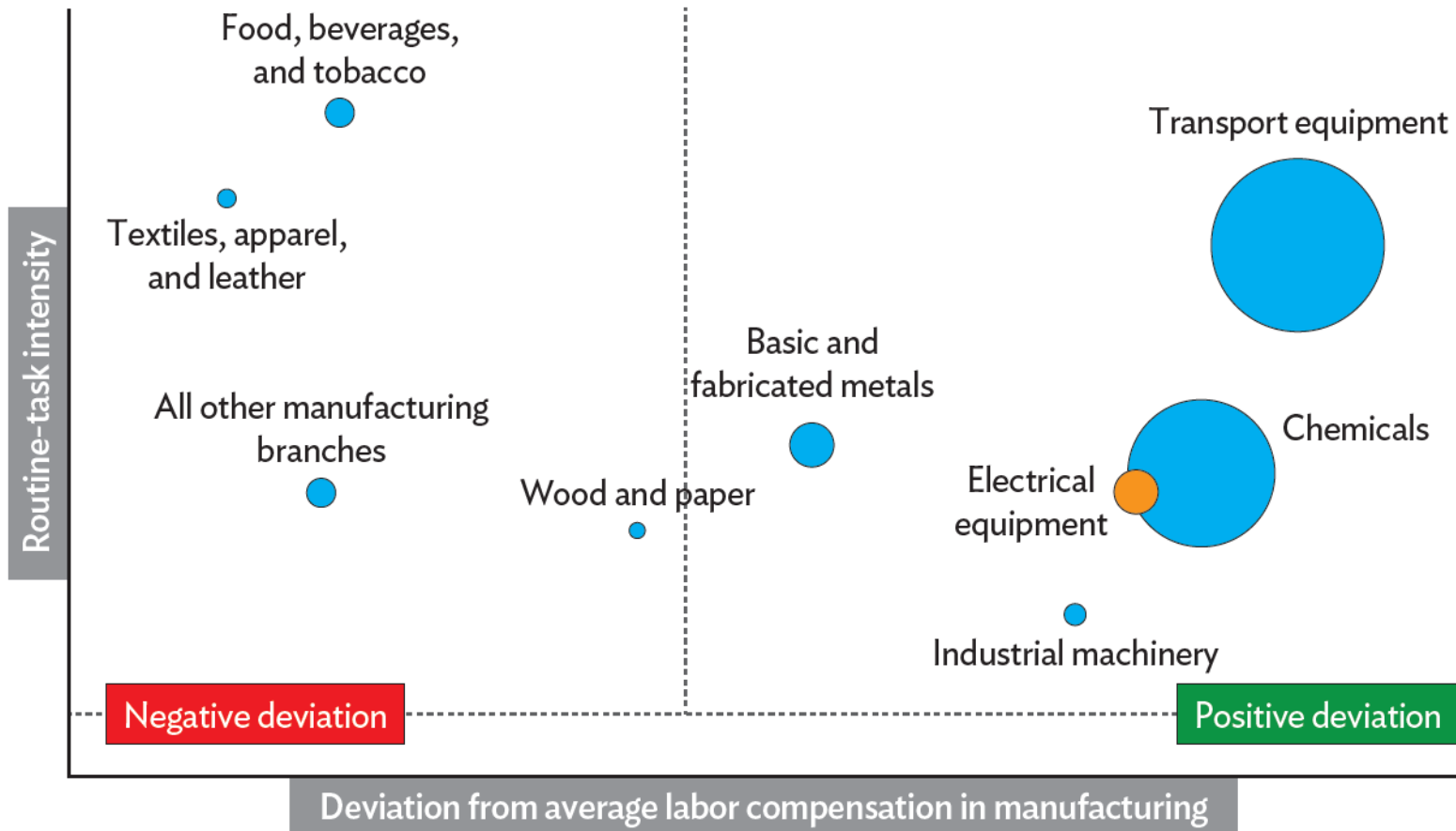
Industrial robots are concentrated in capital intensive sectors where employment shares are small



Source: *Asian Development Outlook 2018: How Technology Affects Jobs.*

Routine task intensity does not mean automation: Economic vs. technical feasibility

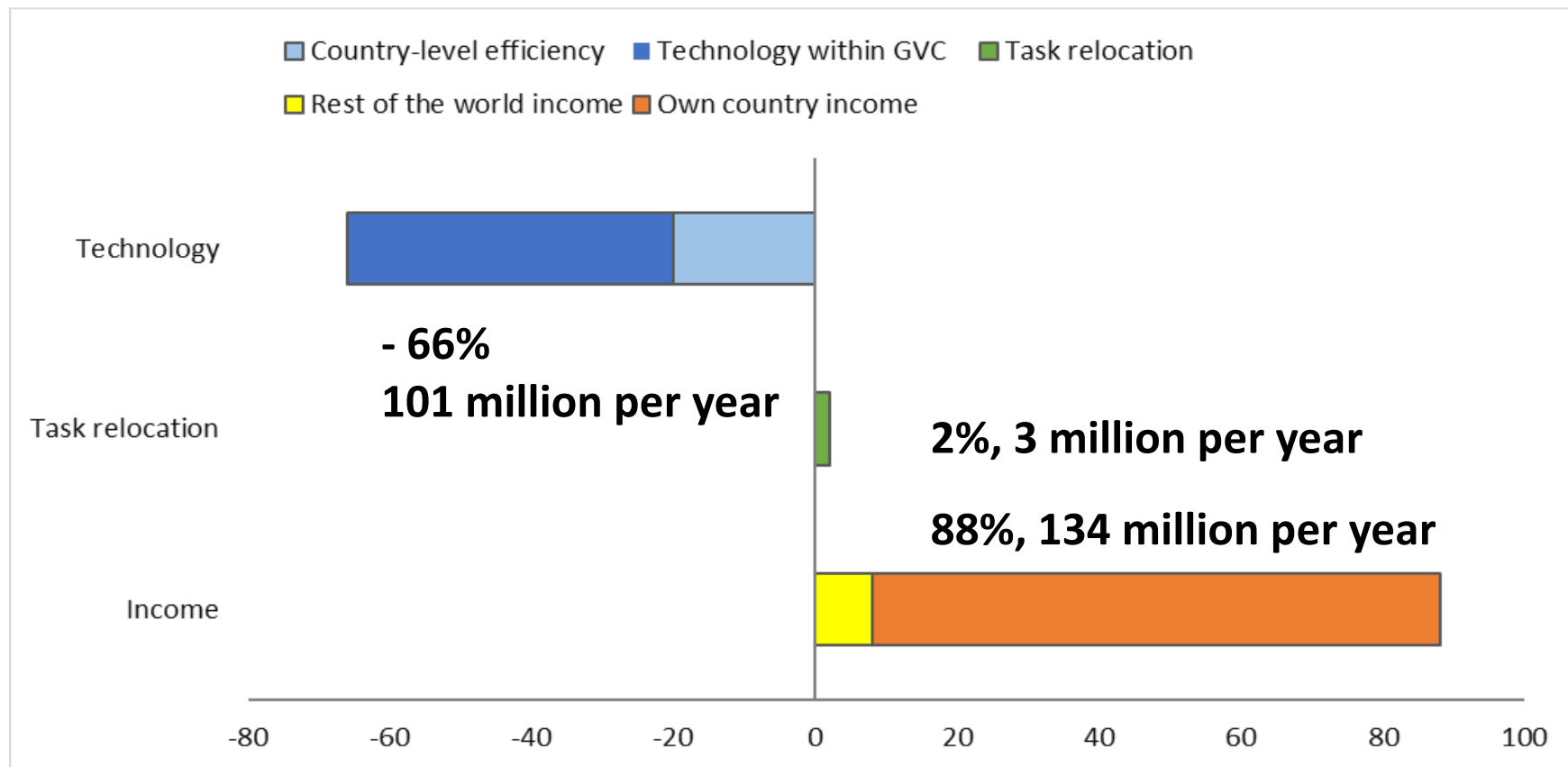
Evidence from manufacturing, selected Asian economies



Note: Wage and robot stock data cover India, Indonesia, Pakistan, the Philippines, Thailand, and Viet Nam.

Source: *Asian Development Outlook 2018: How Technology Affects Jobs*.

Rising demand offsets impact of automation

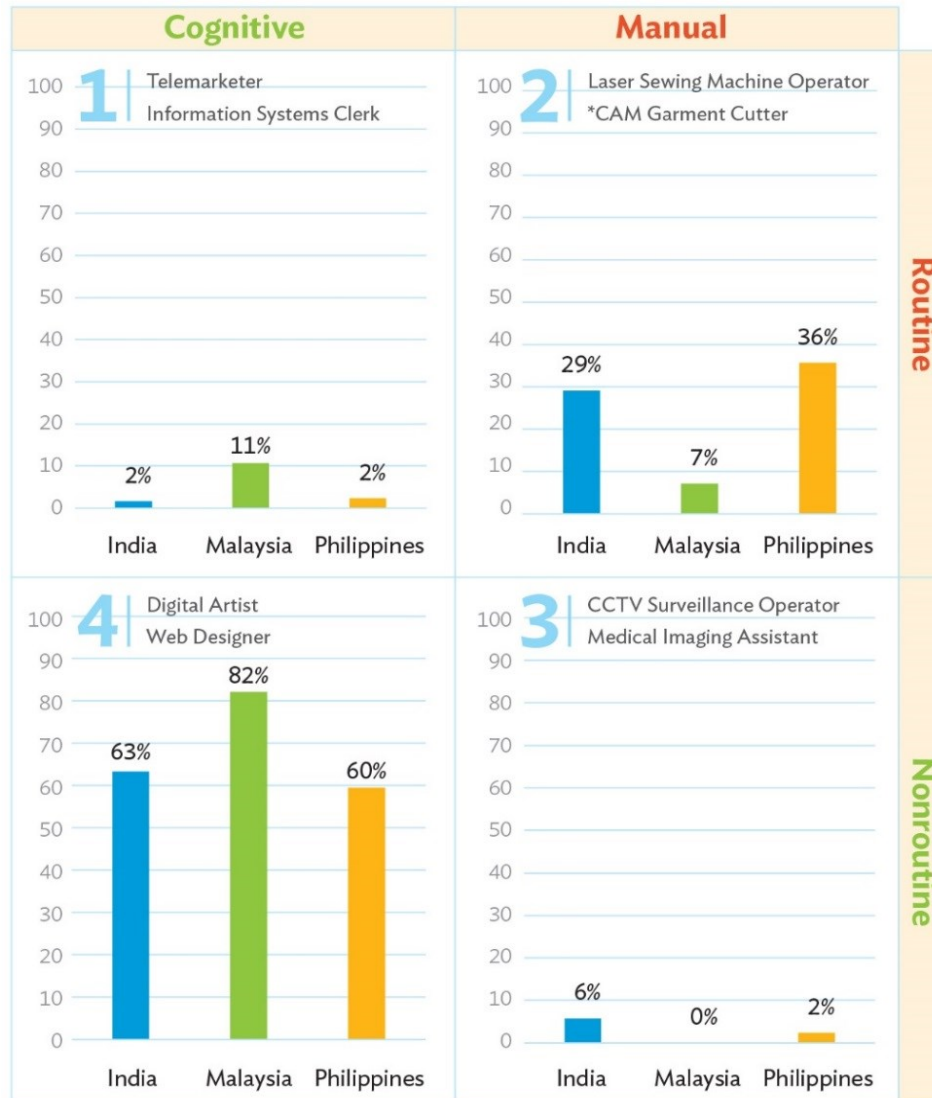


Note: Developing Asia in the decomposition analysis includes Bangladesh, India, Indonesia, Malaysia, Mongolia, the People's Republic of China, the Philippines, the Republic of Korea, Sri Lanka, Taipei,China, Thailand, and Viet Nam.

Source: *Asian Development Outlook 2018: How Technology Affects Jobs*.

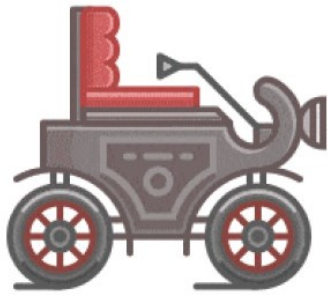
Technology also creates new work

Distribution of New Occupations by Job Type



* Computer Aided Manufacturing

For example: automobiles displaced 'old work' but also created new ones



1900's



- Horses
- Stableman
- Manure collectors
- Stockman
- Broodmare Manager
- Stallion Manager
- Exercise Rider



1920's



Mass Use of Cars

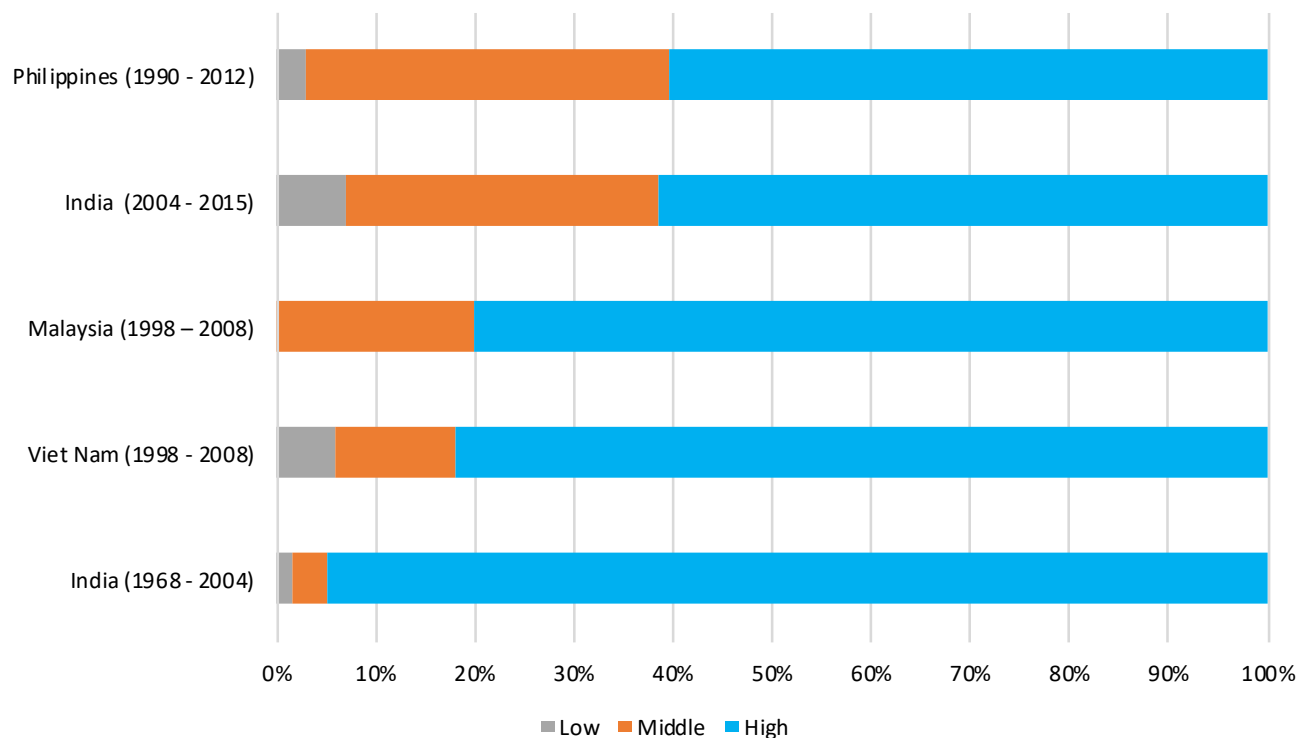
- Auto body technician
- Automotive engineer
- Auto sales manager
- Automotive instructor
- Car detailer
- Car rental agent
- Tire technician
- Vehicle inspector

Source: Khatiwada and Veloso (2019).



High-skilled workers benefit the most from rapidly changing labour markets

Share of new job titles by skill level

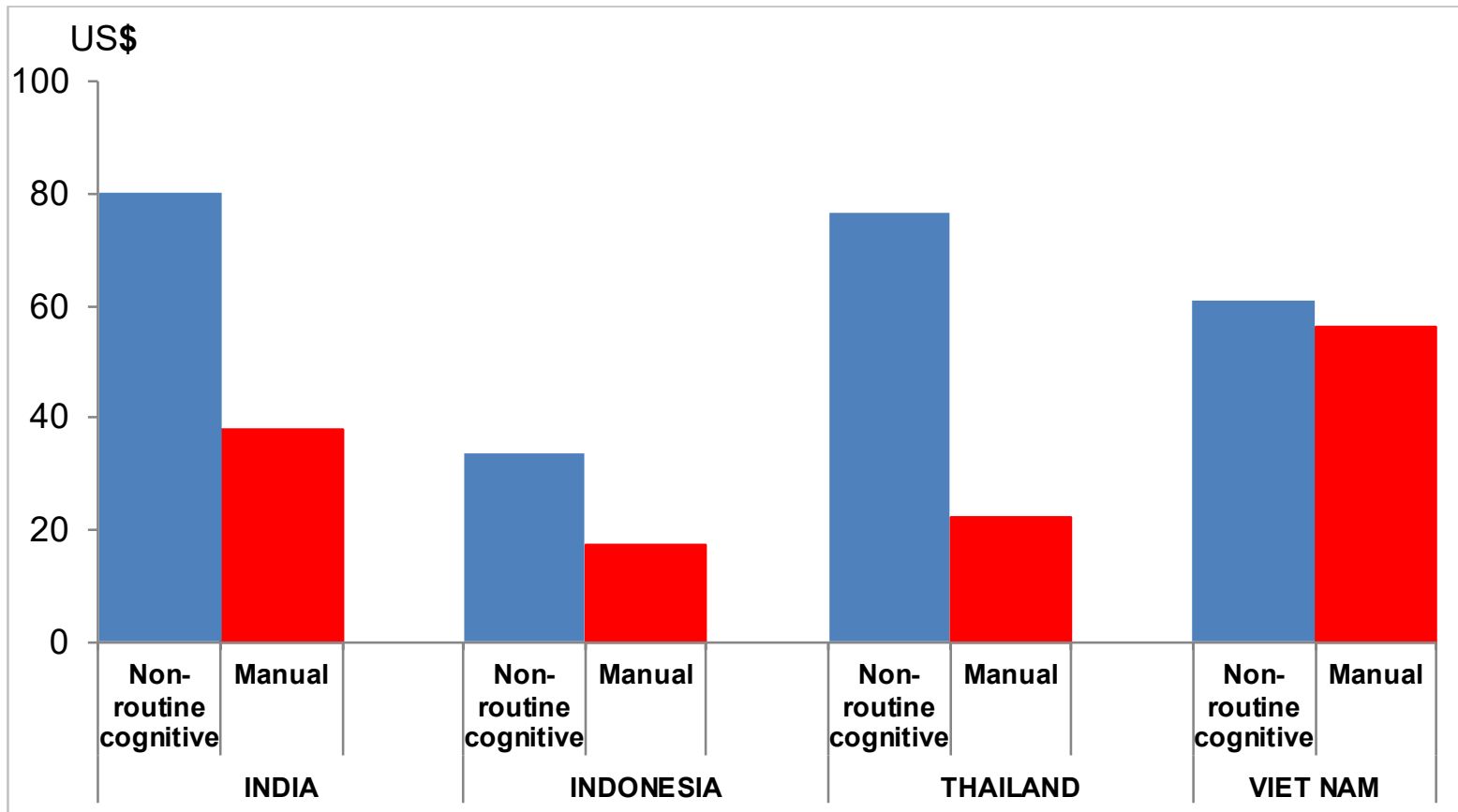


Source: Khatiwada and Veloso (2019).



Wages have also grown more for these workers, leaving low-skill workers behind

Change in average monthly wages, constant prices (in US\$)



Note: The time frames vary across countries, with Viet Nam the shortest (2007–2015), followed by Thailand (2000–2010), India (2000–2012), and Indonesia (2000–2014). Developing Asia refers to the five countries included in this analysis. Source: *Asian Development Outlook 2018: How Technology Affects Jobs*.

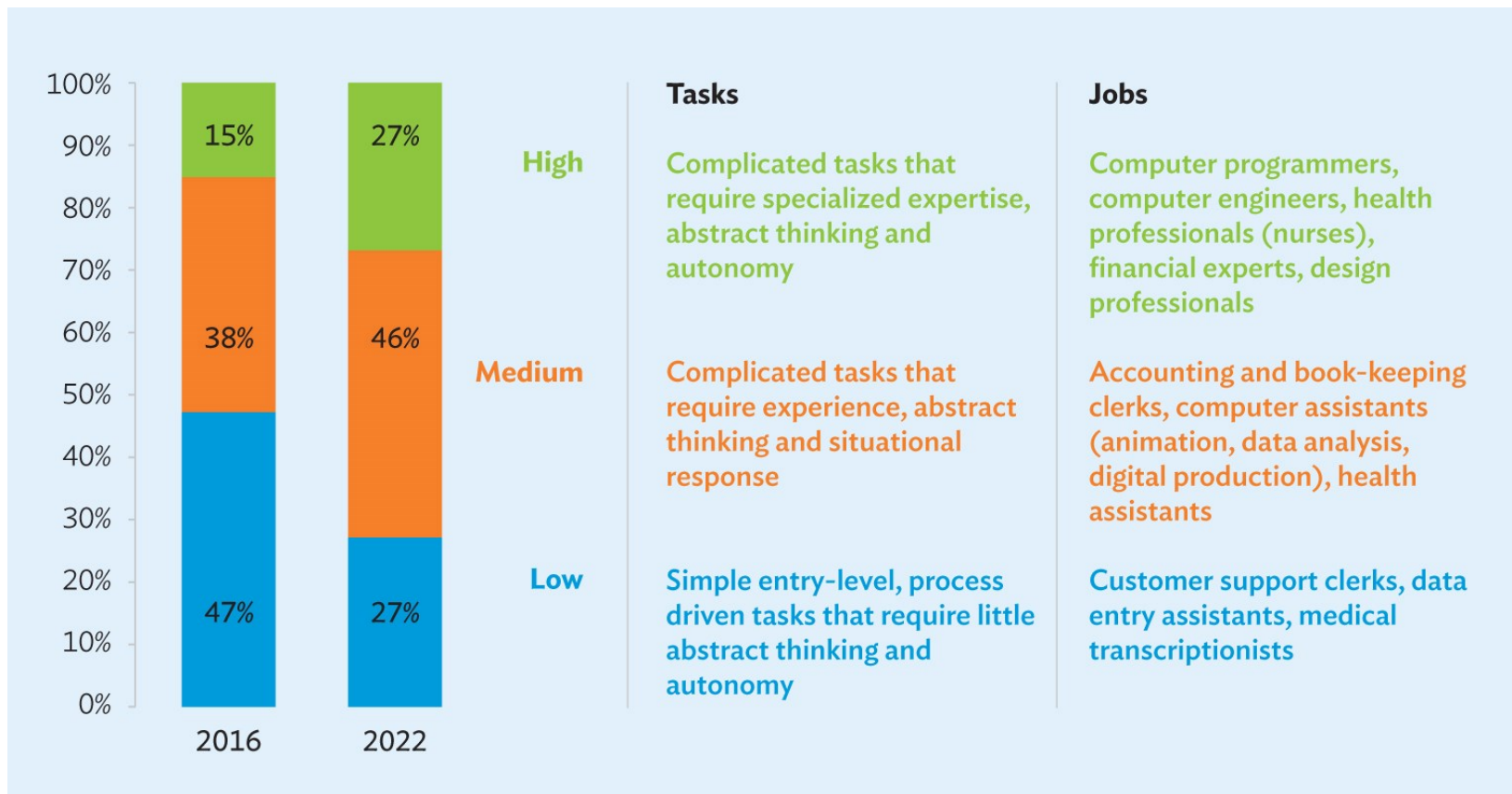


Robotic process automation is expected to transform the IT-BPO industry

- As the technology evolves from doing routine and transactional tasks → rules-based chatbots and cognitive automation → push for RPA adoption
- Customer experience has improved as the technology has evolved from basic automation to cognitive automation → high degree of accuracy and reliability.
- According to the ILO, 89 per cent of call center workers in BPOs are at risk of automation.
- Credit-Suisse shows that 50-55 per cent of all BPO jobs in the Philippines are automatable.

But technology will change the composition, while total employment will continue to rise

Adjusting to the impact of automation in the IT-BPO Sector in the Philippines

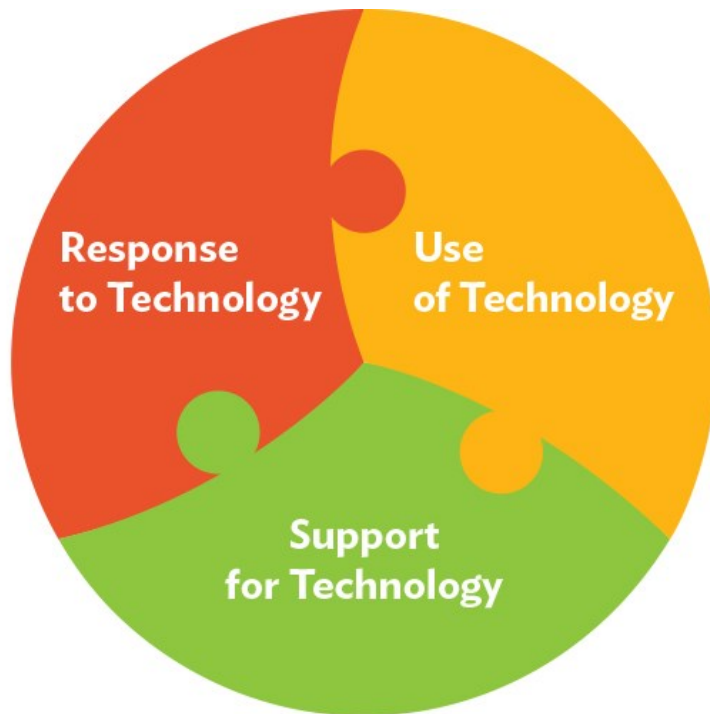


Source: *Asian Development Outlook 2018: How Technology Affects Jobs.*



Government has an important role to play in harnessing new technology

The new industrial revolution and the role of government



- **Education and training**
 - **Favorable labor regulation**
 - **Social protection**
 - **Tax policies**
- Facilitate skills development and job-matching
 - Provision of public goods and services
- Investments in ICT infrastructure
 - Antitrust and consumer protection
 - Innovation and technology adoption

Source: *Asian Development Outlook 2018: How Technology Affects Jobs*



Thank you.

