



Asian Development Bank

# Supporting Technological Transformation in Indonesia

Yurendra Basnett

Country Economist – Indonesia, Asian  
Development Bank

*The views expressed in this presentation are the views of the author/s and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this presentation and accepts no responsibility for any consequence of their use. The countries listed in this presentation do not imply any view on ADB's part as to sovereignty or independent status or necessarily conform to ADB's terminology.*



# PROJECT

*Understanding the impact of fourth industrial revolution on  
Indonesia's economy for informed policy development.*

# PROJECT APPROACH

Collaborative work between



**INTERNATIONAL  
BENCHMARKING**



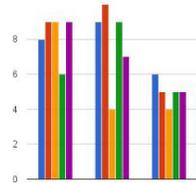
**Lessons from  
international  
experience**

**INDUSTRIAL  
SURVEY**



**Distributed by  
CSIS**

**STATISTICAL  
DATA**



**National and  
international  
databases**

**FOCUS GROUP  
DISCUSSIONS**



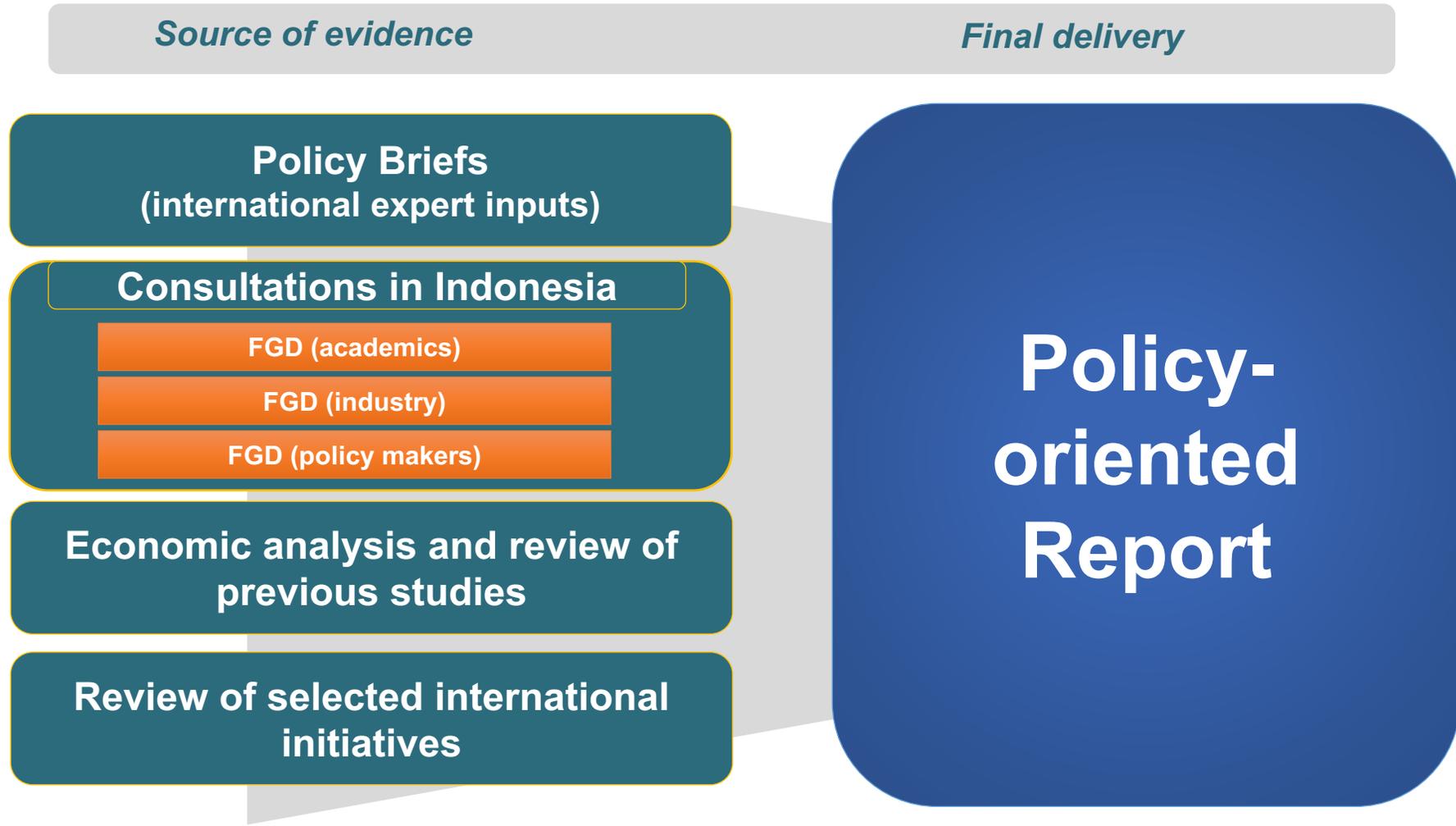
**Consultation  
with local  
stakeholders**

**LITERATURE  
REVIEW**



**Sectoral impacts  
and country-  
specific  
implications**

# THE WORK-PLAN



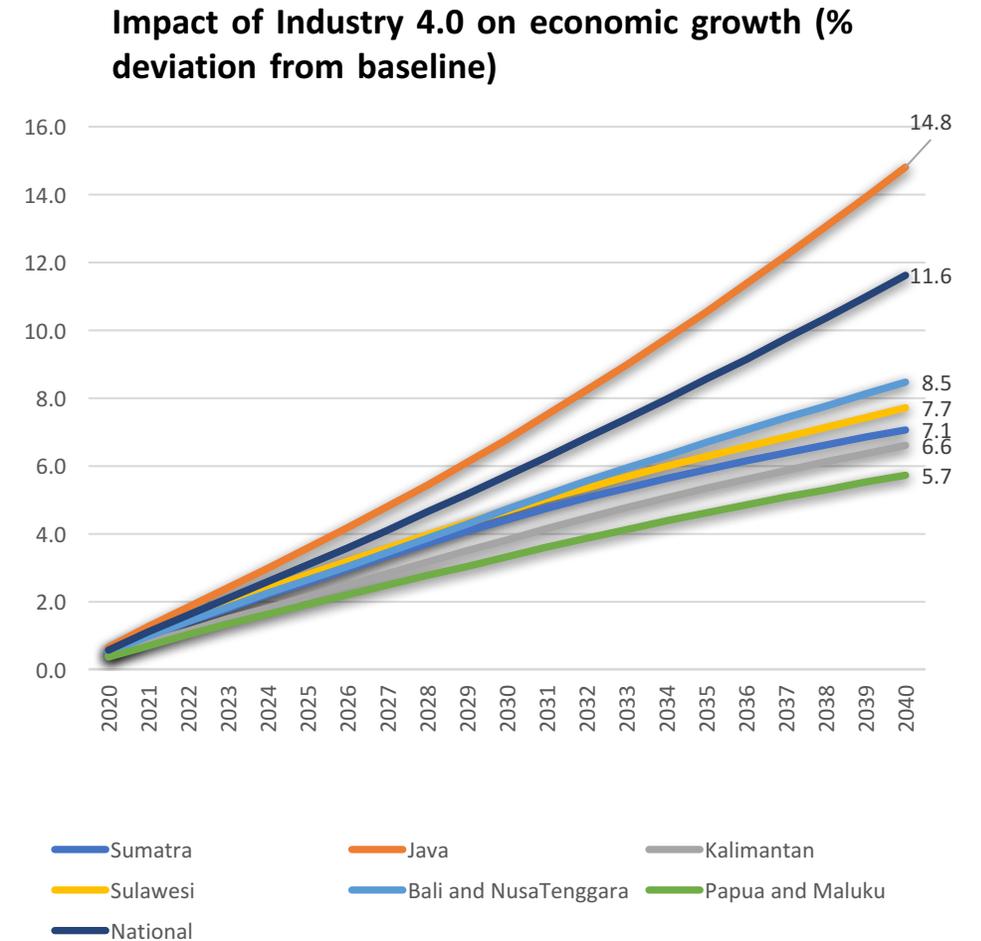


# PRELIMINARY FINDINGS

# IMPACT ON THE ECONOMY

	(a)	Indo VA-share (b)	Scale (c)	(a)*(b)	(a)*(c)	
<b>Global average</b>	<b>1.25</b>					
Indonesia scal. Factor	<b>0.97</b>					
Indonesia average	<b>1.21</b>					
Sectoral variation						
Agric	0.65	0.111	0.072	0.083	0.893	Agric
Finance	1.30	0.048	0.062	0.030	1.786	Finance
Extractive	0.86	0.131	0.113	0.149	1.181	Extractive
FoodProds	0.65	0.063	0.041	0.027	0.893	FoodProds
OthGoods	0.87	0.073	0.064	0.047	1.195	OthGoods
Chemicals	0.99	0.050	0.050	0.025	1.360	Chemicals
Metals	0.64	0.017	0.011	0.002	0.879	Metals
Machines	1.64	0.013	0.022	0.003	2.253	Machines
MotVehic	1.56	0.012	0.018	0.002	2.143	MotVehic
Utilities	0.87	0.014	0.012	0.002	1.195	Utilities
OthServices	0.66	0.183	0.121	0.222	0.907	OthServices
Trade	1.07	0.137	0.146	0.156	1.470	Trade
Transports	0.73	0.035	0.025	0.009	1.003	Transports
Communicaton	1.23	0.029	0.035	0.010	1.690	Communicaton
OthBuServ	1.05	0.073	0.077	0.054	1.442	OthBuServ
ICTConsult	1.22	0.011	0.013	0.001	1.676	ICTConsult
<b>AVERAGE</b>		<b>0.883</b>			<b>1.213</b>	<b>AVERAGE</b>

**Additional increase to labor productivity attributed to adoption of Industry 4.0 technologies**



Source: Preliminary findings from forthcoming ADB Study - *Supporting technological Transformation in Indonesia.*

# MANUFACTURING

- 54% of the companies in Indonesia are using (at least one) IR 4.0 technology.
- Majority view that use of IR 4.0 technology contributes to productivity gains.

		%				
		AI	Robotics	3D Printing	Cloud	Big Data
Production Efficiency	More Efficient	94.1	97.7	88.6	73.4	67.1
	More Inefficient	5.9	0.8	2.3	0.0	0.0
	No Impact	0.0	1.5	4.5	19.0	24.3
Production Cost	Cheaper	60.6	67.7	62.8	49.4	46.4
	More Expensive	15.2	12.8	7.0	6.3	10.1
	No Impact	18.2	18.8	23.3	35.4	36.2
Product Quality	Better	90.9	91.0	81.4	51.9	58.0
	Worse	6.1	1.5	2.3	0.0	0.0
	No Impact	0.0	6.0	9.3	41.8	36.2
Information System Management	Better	69.7	68.4	72.1	93.7	75.4
	Worse	3.0	0.8	0.0	0.0	0.0
	No Impact	21.2	27.8	20.9	2.5	15.9
Human Error	Less	75.8	85.7	72.1	65.8	94.3
	More	6.1	0.8	0.0	0.0	1.4
	No Impact	12.1	11.3	18.6	26.6	0.0

Source: Preliminary findings from forthcoming ADB Study Supporting technological Transformation in Indonesia.



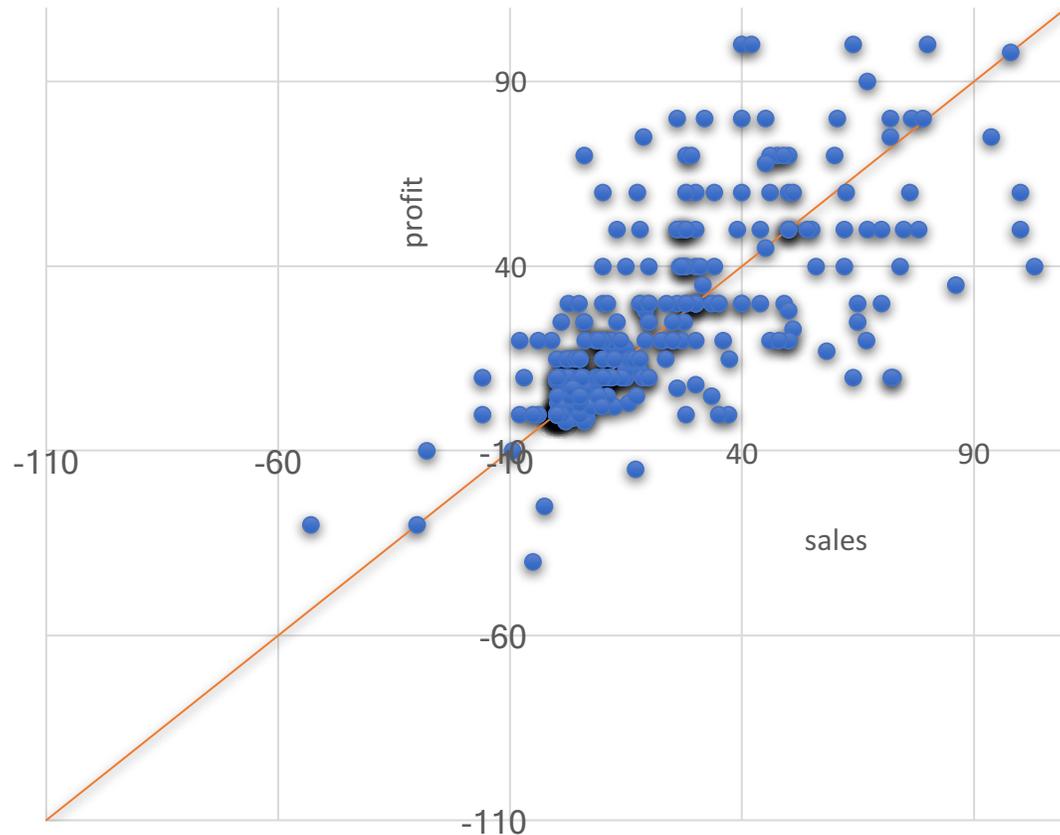
Asian Development Bank



Source: International Federation of Robotics

# ONLINE COMMERCE

Impact on sales and profit after switching to online commerce



**Online firms, either manufacturers or retailers, believed that e-commerce has a positive impact to their sales and profit.**

- Perception of retailers (69.2%) on potential sales **increase** is higher than manufacturers (62.7%).
- Irrespective of firms' size, online firms believed that e-commerce **increase** their sales and profit.
- While, offline firms view **no effect** on sales or profit from e-commerce.
- Majority of offline micro firms perceived e-commerce to **decrease** their sales (55%) and profit (55%).
- While majority of offline large (37.5%), medium (52%), small (52%) firms believed e-commerce penetration has **no effect** on their sales.

Source: Preliminary findings from forthcoming ADB Study - *Supporting technological Transformation in Indonesia.*

# FINANCIAL SECTOR

BANKS



Corporate loans and checking account



Deposits and term deposits



Home loans

Market segmentation

FINTECH



Payment services



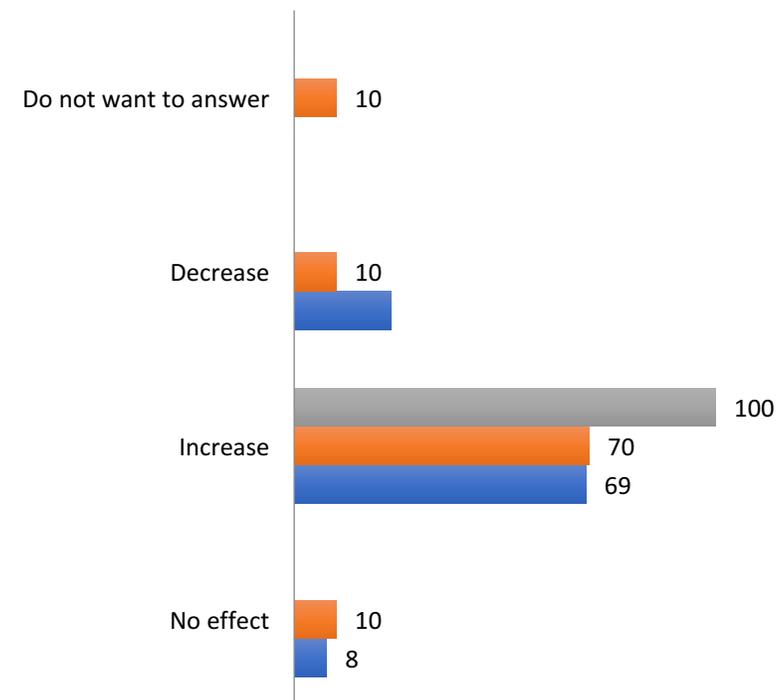
Micro & small loans



Vehicle loans

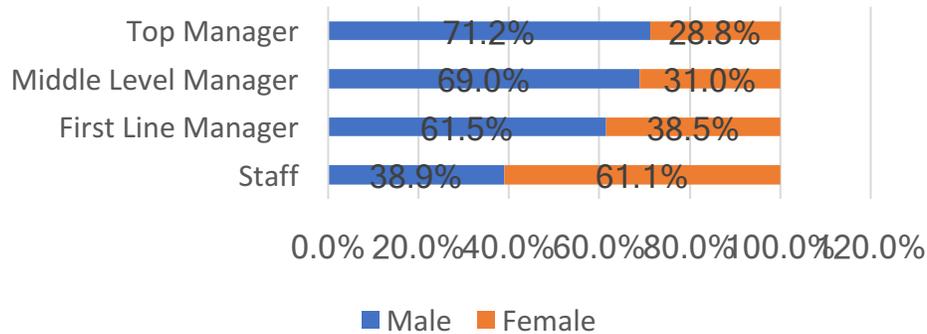
What is the impact of technology adoption on Return on Assets (ROA)

Legend: Large Banks (Grey), Mid Size Banks (Orange), Small Banks (Blue)



Source: Preliminary findings from forthcoming ADB Study - Supporting technological Transformation in Indonesia.

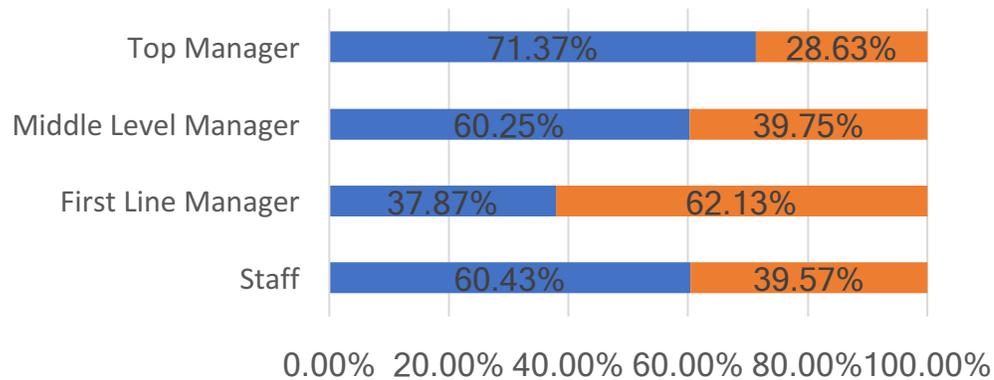
# GENDER PROFILE & TECH COMPANIES



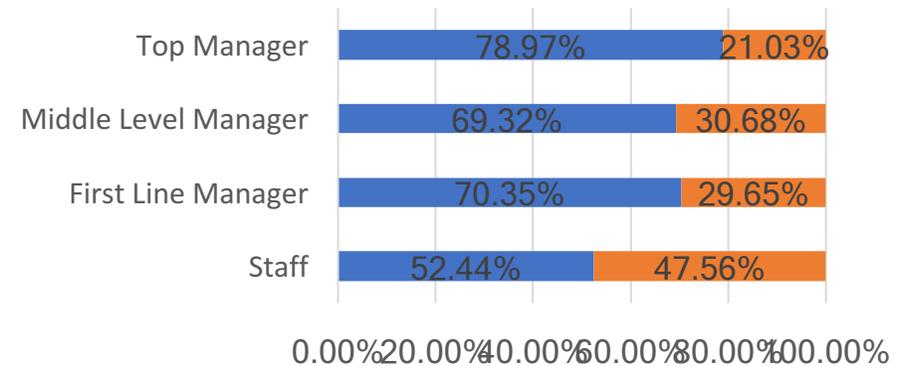
(a) High-Tech Companies



(b) Early-Level Technology Companies



(c) Enterprises with Online Store



(d) Enterprises without Online Store

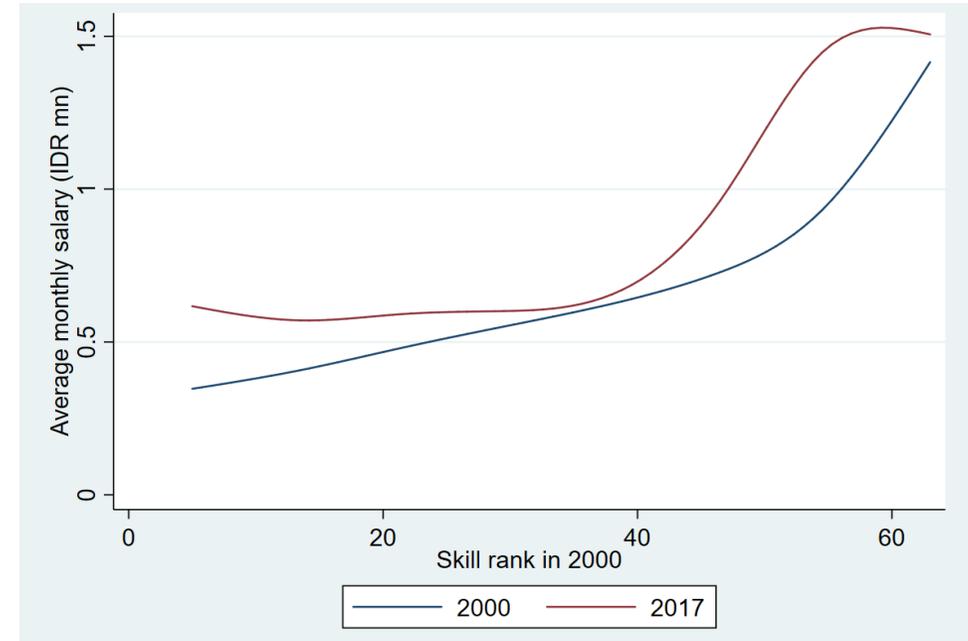
**MALE WORKERS**

**FEMALE WORKERS**

Source: Preliminary findings from forthcoming ADB Study - *Supporting technological Transformation in Indonesia*.

# LABOUR MARKET

- **Displacement of certain tasks**
- **Firms with higher technology use intensity tend to employ less (more) non-production workers (production workers)**
  - Technology appears to complement relatively lower-skill workers (production workers)
- **But highly innovative firms employ more (less) non-production workers (production workers)**
- **Firms with R&D division are more likely to employ college-graduate workers**



Relative wages for lower and very top rank grew significantly, while the middle job wages were stagnant. Any role of new technologies?



# POLICY IMPLICATIONS

- **Variety of impacts:** there is a diversity of potentially disruptive technologies that is expected to challenge industries and services. Implications can vary widely from sector to sector. Therefore it is important to integrate technology and sector specific analysis.
- **There is no unique “fit for purpose” solution:** there is the need to take into account the specific local context, including socio-economic, industrial, historical and political factors
- **Coordination:** given the cross-cutting impact of digital technologies, there is a need of enhancing coordination among policy institutions

- **Scope for government intervention** - challenges and opportunities arising from new technologies provide scope for government intervention:
  - **Digital infrastructure:** Investments in digital infrastructure may be needed to close any ICT infrastructure gaps and ensure the full exploitation of new technologies
  - **Ecosystem building:** New institutions for knowledge generation/diffusion in manufacturing; establishment of research and technology organisations (RTOs), supporting collaboration among firms (i.e. Large vs SMEs; foreigner vs domestic firms); Industry-university collaboration
  - **Workforce development:** Lack of high-skilled workers (policy to skilled labour from abroad), training from SMEs
  - **Regulation:** for workers and consumers; safeguards against monopolistic effects should be considered; cyber security, standards, regulatory sandboxes to test new services and products
  - **Other policies** such as: FDI policy to facilitate technology acquisition; Tax regimes for new business models; Tax incentives for new technology adoption