

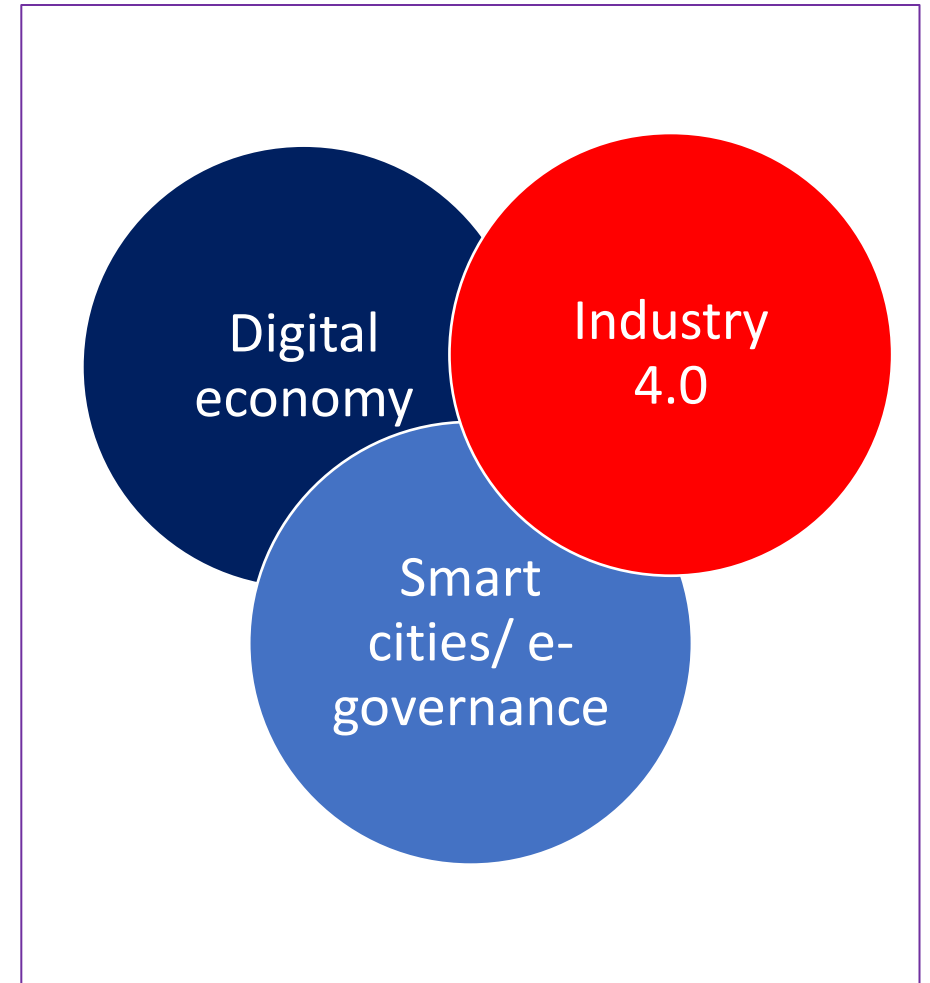
Industry 4.0 – what it might mean for productivity & employment in Cambodia

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Recap of key facts – Industry 4.0 & productivity

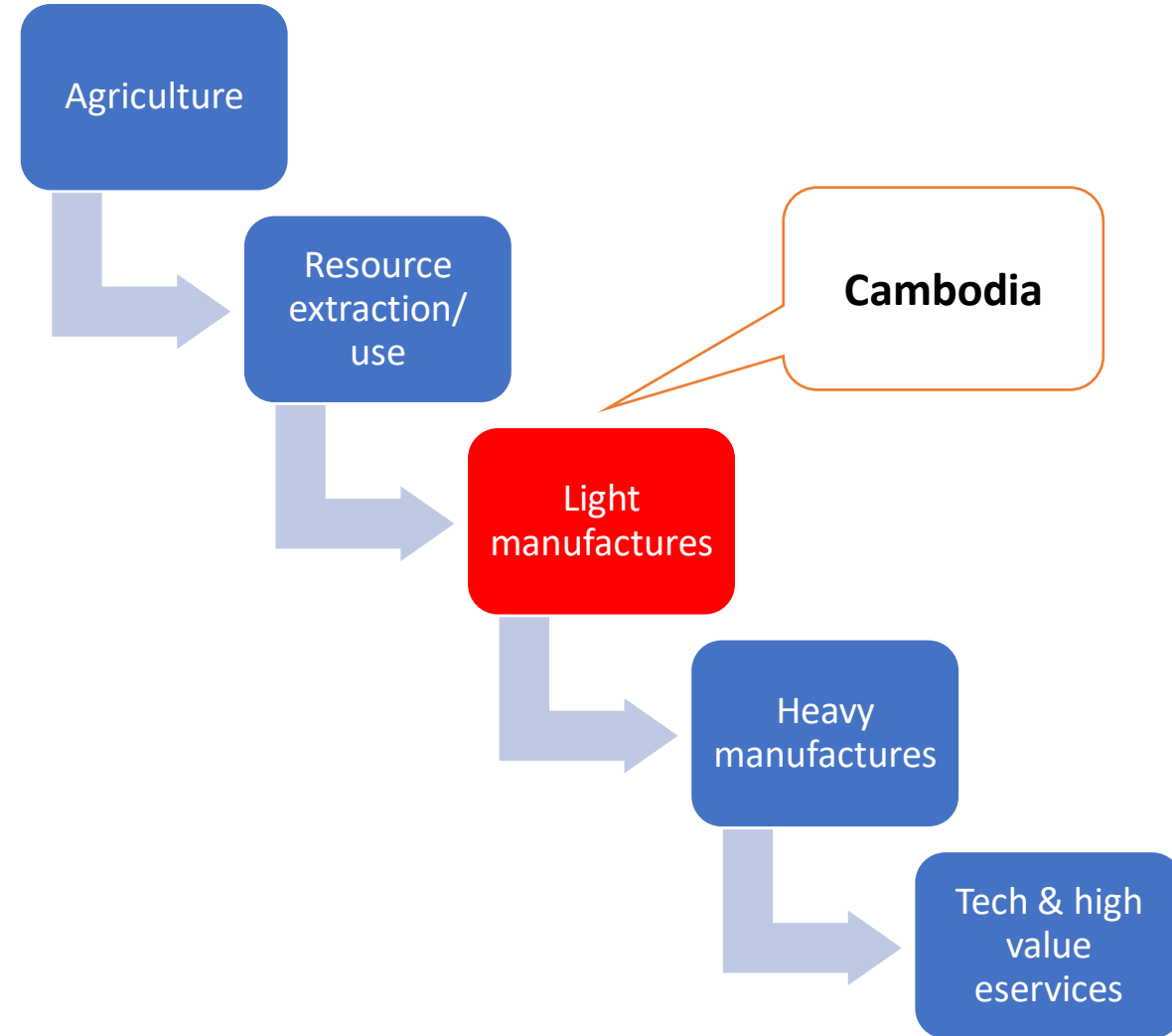
What is Industry 4.0, why does it matter?

- Productive technologies... linked to but not same as other developments
- Revolutionary for productivity, will change world of work
- But change the relative cost of labour & capital (Cambodia - like other developing countries - comparative advantage in labour)
- Technologies originate in high income countries, access is difficult
- Cambodia a user not an originator, would be an adopter/ adapter of technology
- Skills mix needed for this tech also constrained



Productivity & structural change

- **Productivity** - relation between inputs & outputs, labour, its combination with capital
- **Traditional development process**- growth driven first by factor use (extensive growth) & later by efficiency (intensive growth)
- **Parallels structural change** – as more capital is adopted & labour becomes more productive
- **Industry 4.0 potentially disrupts this** – premature de-industrialization
- **Can this be leap-frogged, short cut?**
Potential of I4.0?



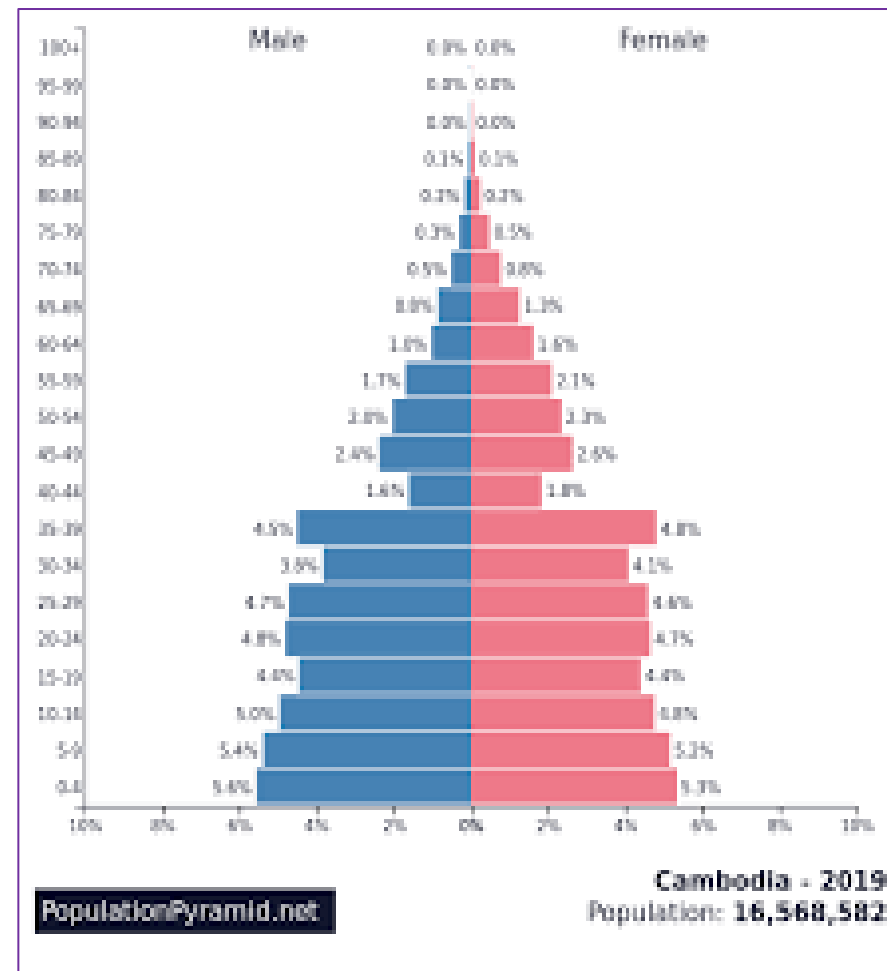
Employment effects of Industry 4.0

- **Complex**, productivity enhancing, **labour shedding**, net positive for labour in long run
- Short-run adjustment impacts – until new equilibrium emerges
- **Impacts unlikely to be equitable**, countries with surplus labour would gain less, particularly where labour can be automated (AI etc.)
- But I4.0 technologies are **democratizing & atomizing** – 3D printing could make the smallest workshop a manufacturer
- Rise of **new sectors**, the digital economy etc.
- Growth of **less effected sectors**, especially leisure, medical care, again associated with new equilibrium

Cambodia's productivity challenges & opportunities

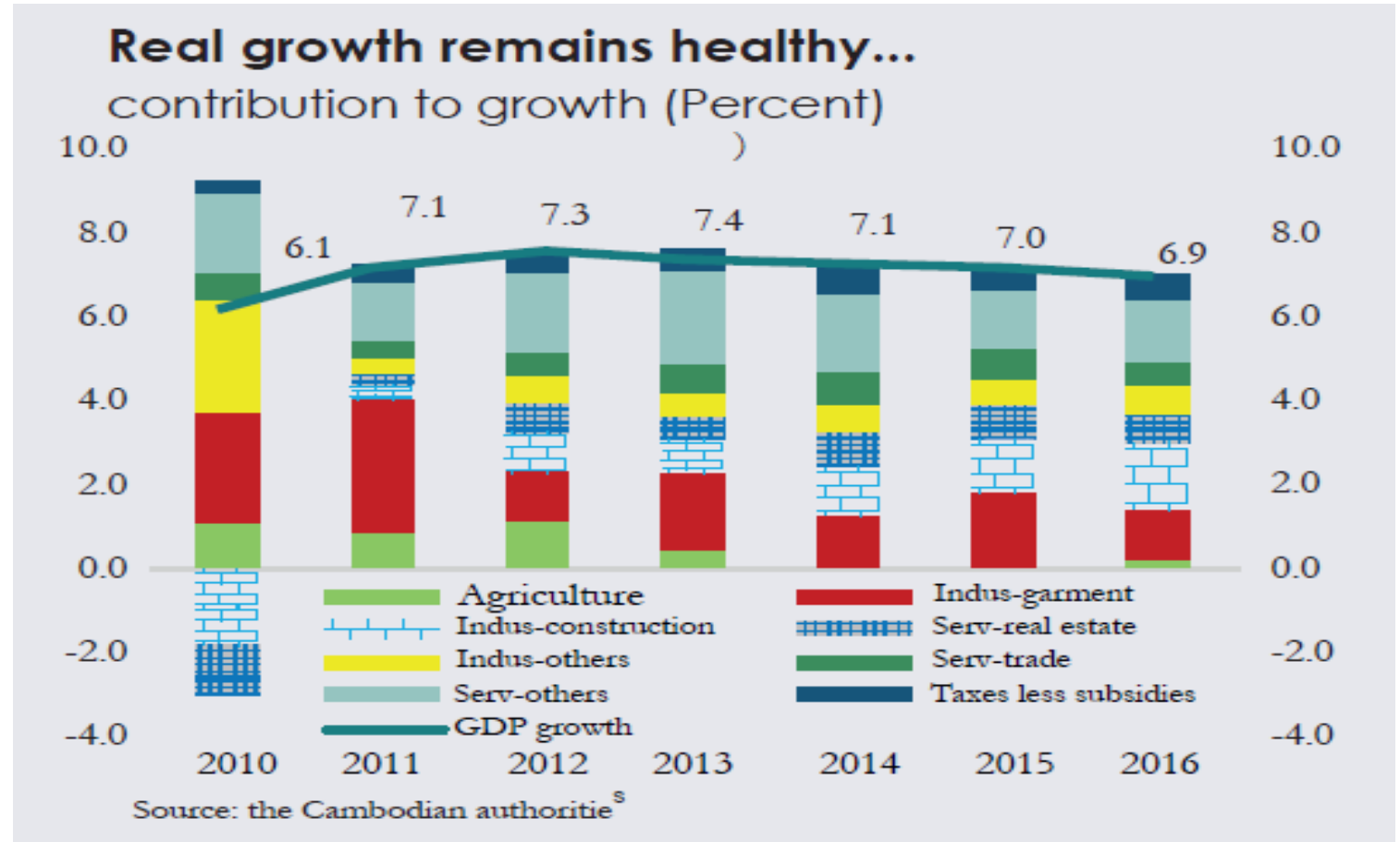
Cambodia's Core strengths/ opportunities

- Young population, improving skills-set, tech savvy, language skills
- Few legacy technologies, late adopter advantages
- High level of foreign investment channels
- Open economy, few capital controls, macroeconomic stability
- Well positioned strategically & access to ASEAN & China
- **Implies flexibility & capacity to adapt**



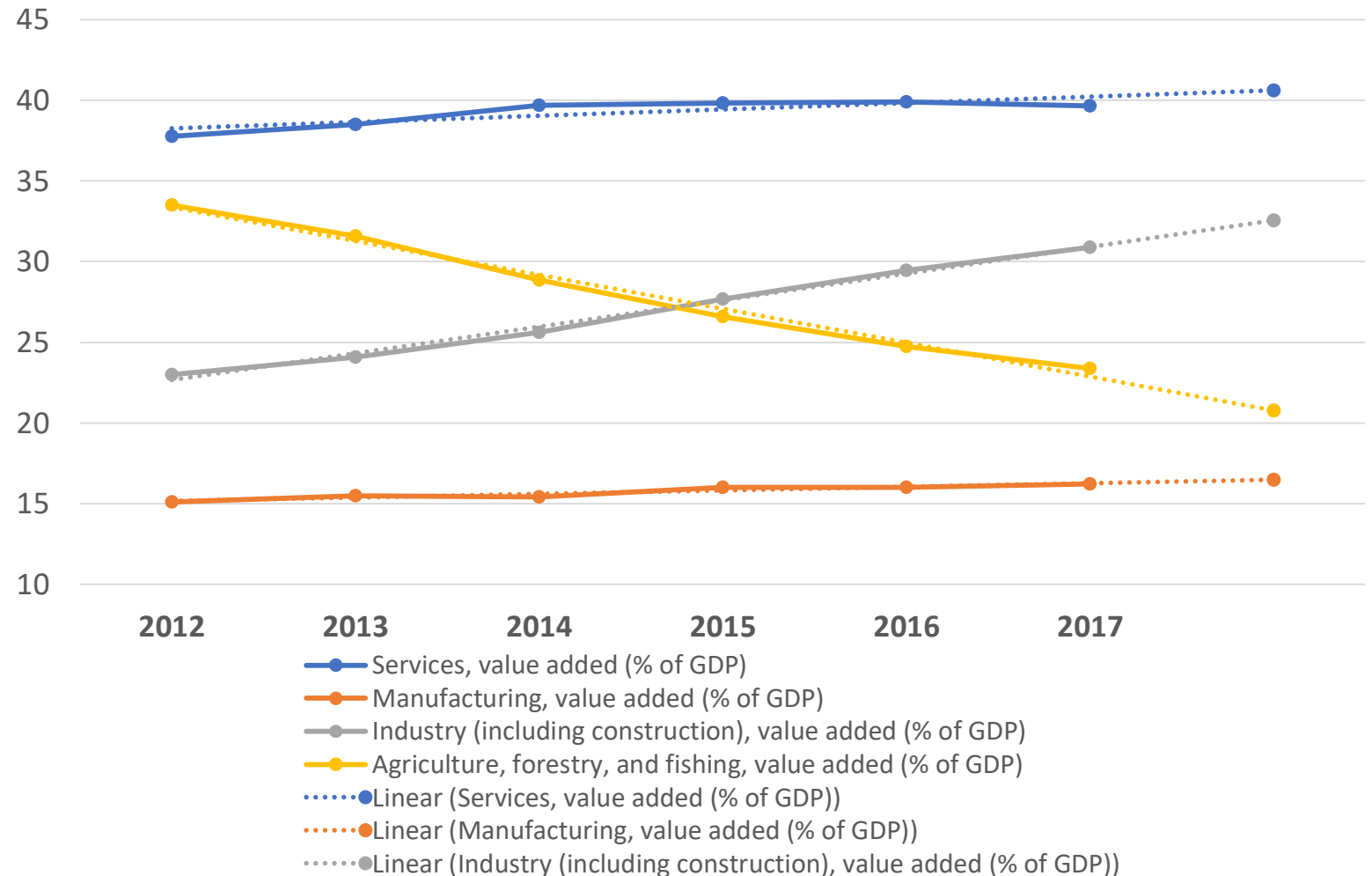
Challenges: Growth is favouring non-tradeable & lower value-added sectors

- Growth has been very strong & structural change in long run
- But process has slowed...
- Growth of most productive (value-adding) sectors is lagging



Rate of structural change has weakened...

- Chart - % of value-added
- Long term positive pattern
- But industry dominated by construction
- Manufacturing % share is flat
- Service growth also appears to have leveled off



Productivity growth good overall, disappointing in key sectors....

Table B2: Decomposition of per capita value added growth (by the Shapley method), employment by sector, in the period 2007-14.

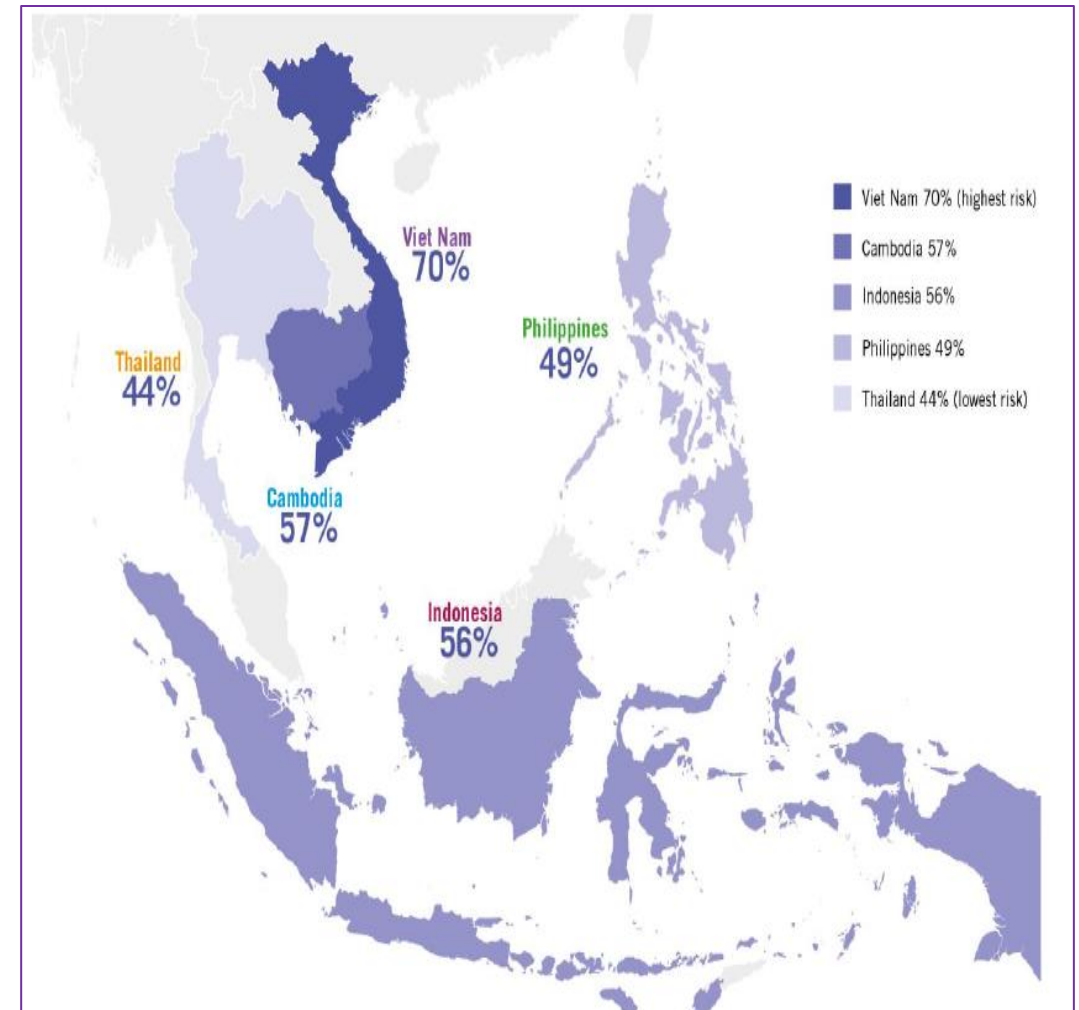
	Percent	% Contribution
Annual Growth per capita Value Added	4.26	100%
Change in Productivity	5.99	141%
Agriculture	1.87	44%
Mining & other manufacturing	0.05	1%
Utilities	0.03	1%
Garment & footwear	0.16	4%
Construction	-0.27	-6%
Trade	0.72	17%
Transport & Communications	0.31	7%
Real estate	2.70	63%
Other Activities	0.02	0%
Inter-sectoral Reallocation Effect	0.40	9%
Change in Employment rate	-2.86	-67%
Change in Participation Rate	0.32	8%
Change in Share of Working Age Pop	0.81	19%

Source: World Bank staff calculations

- World Bank Data (CEU,2017): Shapely decomposition of change in value added
 - Productivity + employment effects
- Productivity change (annualized) decomposed by sector
- Overall some 6% per year but over two thirds coming from agriculture & real estate
- Garments only 0.16% of 6% (4% of change in value added)
- Other manufacturers 0.05% of 6% (1% of change in value added)

Possible employment impacts

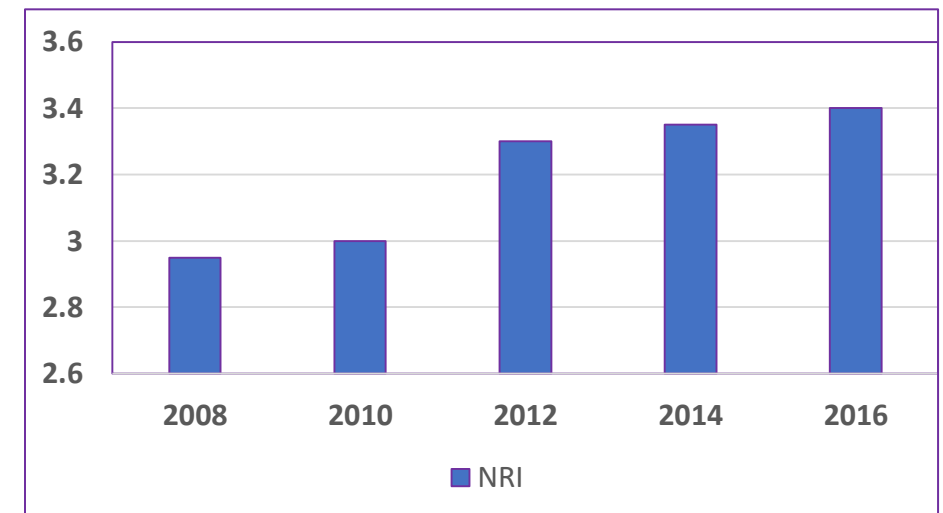
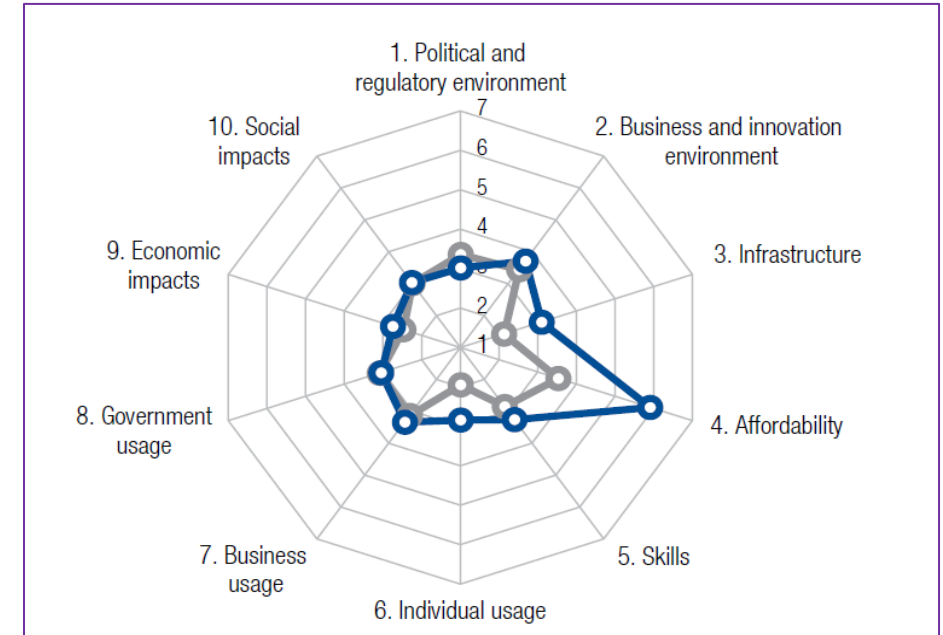
- Difficult to say – 3 competing effects:
 - New jobs generated by these technologies
 - Reduced labour where automation (or re-shoring) has taken place
 - New equilibrium effects
- But clearly, overall, labour shedding – **ILO study 57% jobs at risk in Cambodia**
- Does not mean will be lost. Other sources - impact (far) less dramatic
- Estimates are absent of policy & enterprise responses
- Impact: ability of workforce to retrain, potential of new & other sectors to grow



Industry 4.0 in Cambodia - what is happening now?

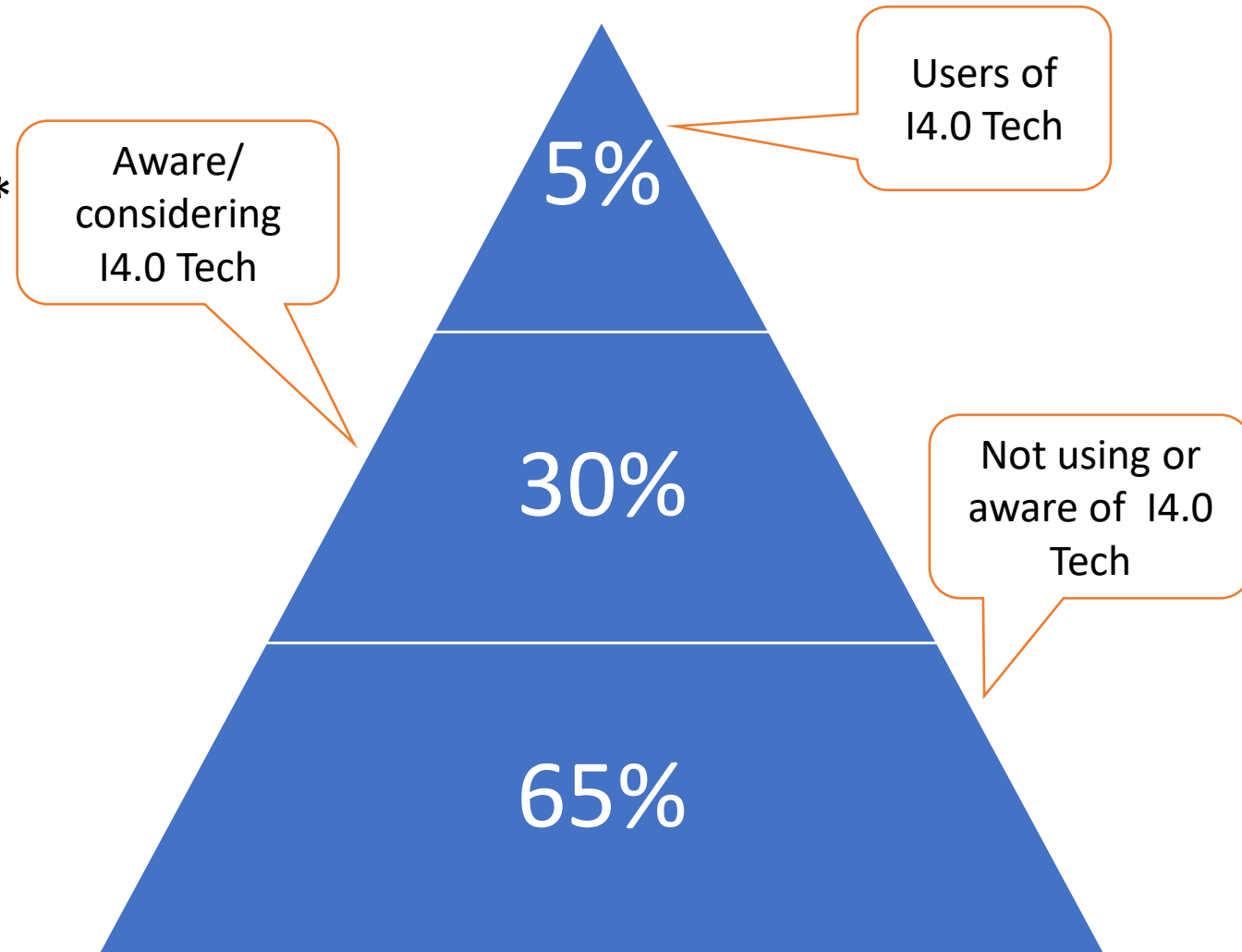
Within policy circles & government...

- High level commitment... RS IV, NSDP
- Policy level not in question – issues with implementation
- Some translation to the delivery level – TVET reforms, STEM
- But much more needed - Networked Readiness Index, Technology Readiness (WEF) 3.4 ,109th (139 countries)
 - Thailand 62nd, Viet Nam 79th
- Ranks well on affordability, but poorly on other dimensions
- Over time improvement has also slowed



Within private sector enterprises

- Hard to say - few good data sources
 - UNDP/ Cambridge University study*
 - CDRI (2018) & CDRI/ ODI*
- Take-up of technologies – weak, but growing business awareness
- Sector variations – agriculture, services, ahead of manufactures
- Again weakest in value-adding sectors
- No clear pattern within FDI flows of investment in I4.0



Skills/ employment

- Outset – Cambodia employment participation remains exceptionally high – 84% (80% women, 89% of men)
- But recall (1) need to upgrade, to leapfrog...
 - High internet & mobile usage, but Cambodia (still) lags neighbours
 - Digital/ I4.0 skills-sets – good familiarity/ basic user skills but weaker complex user & technical skills
 - Training provision not tailored to new skills-sets, TVET system dated
 - Mirrors employment distribution, no clear progress towards high skills jobs
- And (2) to grow new/ existing less affected sectors
 - Ongoing growth in labour alternatives – within established sectors e.g. tourism
 - New digital economy sectors – e-commerce mobile- services emerging
 - Sunrise sectors, healthcare, medical tourism only limited progress

**Future directions for policymakers &
enterprises**

Where are we headed?

- Difficult to say - complexity & little hard data, business as usual scenario not clear – policy initiatives yet to kick-in
- Positive dynamics, but weaknesses, especially in high value-added sectors
- Widespread adoption of I4.0 technologies is in doubt
- Industrialization is slowing – is current productivity growth sustainable?
- Without action, transition/ realization constraints will continue
- Trends not sufficient to deliver self-sustaining transition to higher value-added – a below potential equilibrium?
- Employment impacts mirror this, very limited movement to higher paying jobs

Economy-wide policies (*& suggestions*)

- Better data, better knowledge of position: many studies underway, CDRI/ ODI – *Skills for Digital Transformation*; UNDP – *Industry 4.0 Readiness*
 - ***But more needed – a regular barometer of productivity & I4.0 take-up***
 - ***Regular labour force survey***
- Activist industrial policies – revision of IDP to recognize I4.0
 - ***But substance - deliver incentives, credit, tax & regulatory changes to encourage tech transfer***
- Private sector initiatives – I4.0 within SEZs, small-scale I4.0 business parks

Employment & skills policies

- Transforming training provision: TVET & schooling reform (STEM)
 - *Alternative models of delivery, recognition of in-house training, a voucher system*
 - *Supporting alternative sectors which can absorb labour*
- High level skills – National Polytechnic Institute, new courses/programmes within NUM, RUPP, ITC
 - *Learning by doing components/ links within industry*
- R&D capacities - Centers of Excellence in Universities, ITC & NUM
 - *Links to industry are limited, need to build R&D in enterprises*

Thank you for your attention. Any questions?