TOWARDS INDUSTRIAL POLICIES TO SUPPORT TECHNOLOGY UPGRADING FOR SUSTAINABLE DEVELOPMENT IN CENTRAL ASIA (SPECA REGION)

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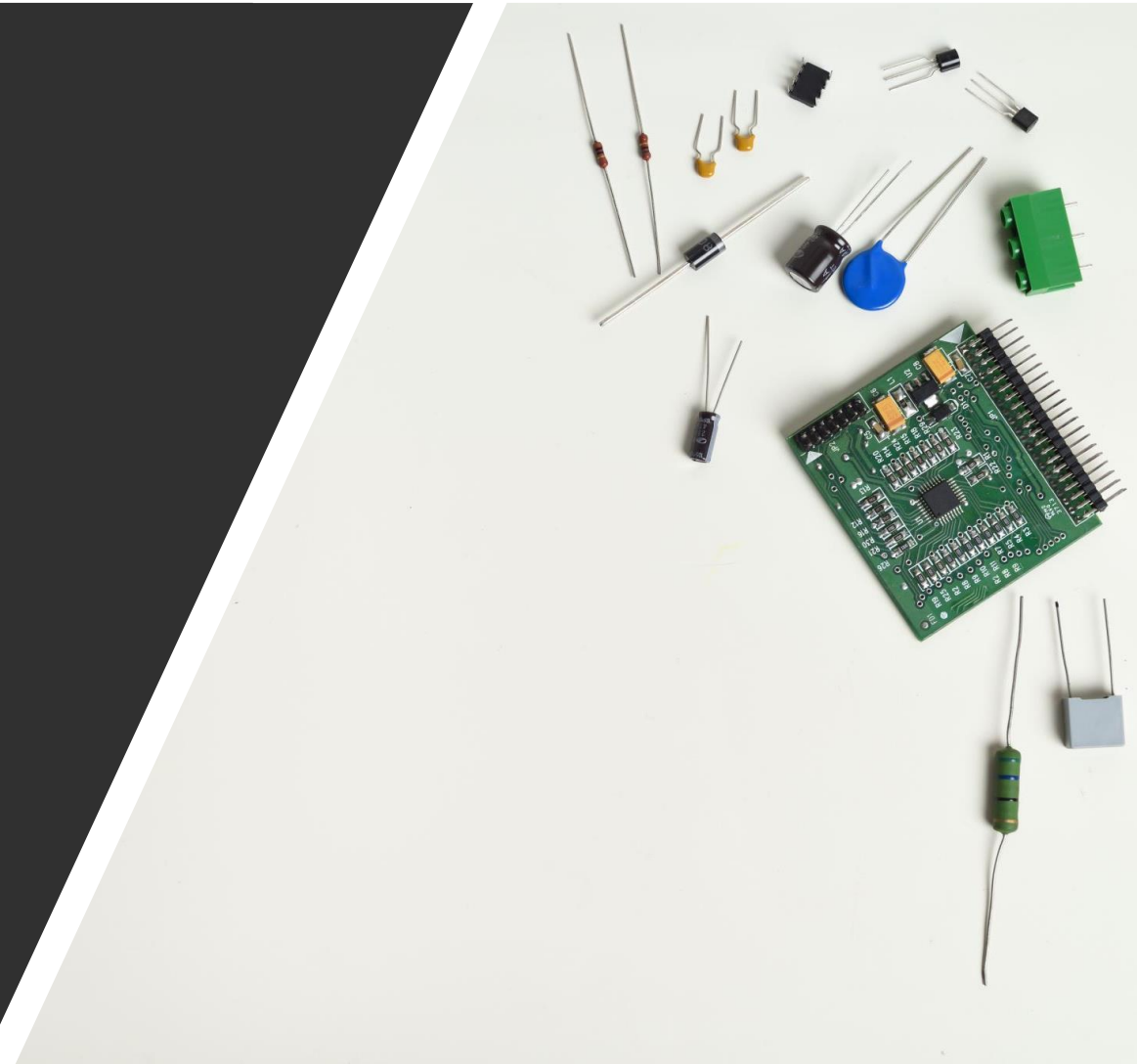
Science, Technology and Innovation (STI) gap assessment of SPECA member countries: paving the way to action under the SPECA Innovation Strategy for Sustainable Development

Webinar

26 November 2020



Aim and outline

- A new industrial policy approach (NIP) through technology upgrading, which can be implemented in the SPECA sub-region
- Why NIP?
- What is the NIP?
- Key features of SPECA region from the NIP perspective
- What would be the NIP approach to SPECA?
- Strategic NIP options for the SPECA region countries

Why new industrial policy approach? I

- Structural reforms are not sufficient
- Old industrial polices do not work in the conditions of fragmented value chains
- A need for softer market friendly approach
- NIP are oriented towards all sectors including services, agriculture, natural resources and manufacturing

Why new industrial policy approach? II

- A changing policy landscape of industrial policy
  - '**Big push**' and old style '**picking winners**' policies: 'straw man'
  - **Structural reforms** (IMF/World Bank) and **horizontal policies** (EU): 'old man'
  - **New industrial policy landscape**: 'new man'
    - New structural economics: Justin Jifu Lin (China);
    - Smart specialisation policies: Foray et al (EU);
    - Mission oriented industrial policy: Mazzucato (EU, international)
    - Binding constraints to growth: Rodrik et al (World Bank);
    - Catching up and post-catch-up policies: Keun Lee (Korea);
    - Product space method: Hausman and Hidalgo (International)

New industrial policies I

- Pro-active and targeted focused on technology application areas ('sectors' and 'capabilities' cf. ICT in agriculture)
- 'Smart' because they recognize that the ultimate limits to growth and the relevant solutions are not known ex-ante;
- 'Market friendly' because they show respect for comparative advantages and export transformation;
- Use 'soft' policies to embed FDI and GVC as levers and linkage mechanisms for domestic technology upgrading

New industrial policies II

- Guided by the perceptions of system failure, not only market failure;
- Centered around the private sector and innovation ecosystems actors; not only resolving coordination failure but enhancing collective action
- Assuming either explicitly or implicitly some elements of experimentalist governance;

In new industrial policy the state can play all three roles..... depending on context

Role	Rationale
Regulatory state	Market failure
Developmental network state	Network (system) failure
Developmental state	Capability failure

Principles of new industrial policy in low institutional capacity environments like SPECA

1. The policy is about **upscaling the existing or emerging bottom-up initiatives (pockets of excellence)**.
2. The policy assumes that the principal (policy-making body) most often does not know what the agent's (beneficiaries) problem is. Hence, **the policy is a discovery process based on 'action learning' logic.** Within this logic policy maker still needs to have the **capacity to organise or facilitate firms** and other organisations to jointly work on finding solutions to their individual and collective problems
3. The policy is created and implemented **in coordination and 'co-production' with affected parties**. It is about **co-delivery and co-funding.**
4. The policy is learning activity about what works and what does not. Hence, '**think small' is its vital characteristic**

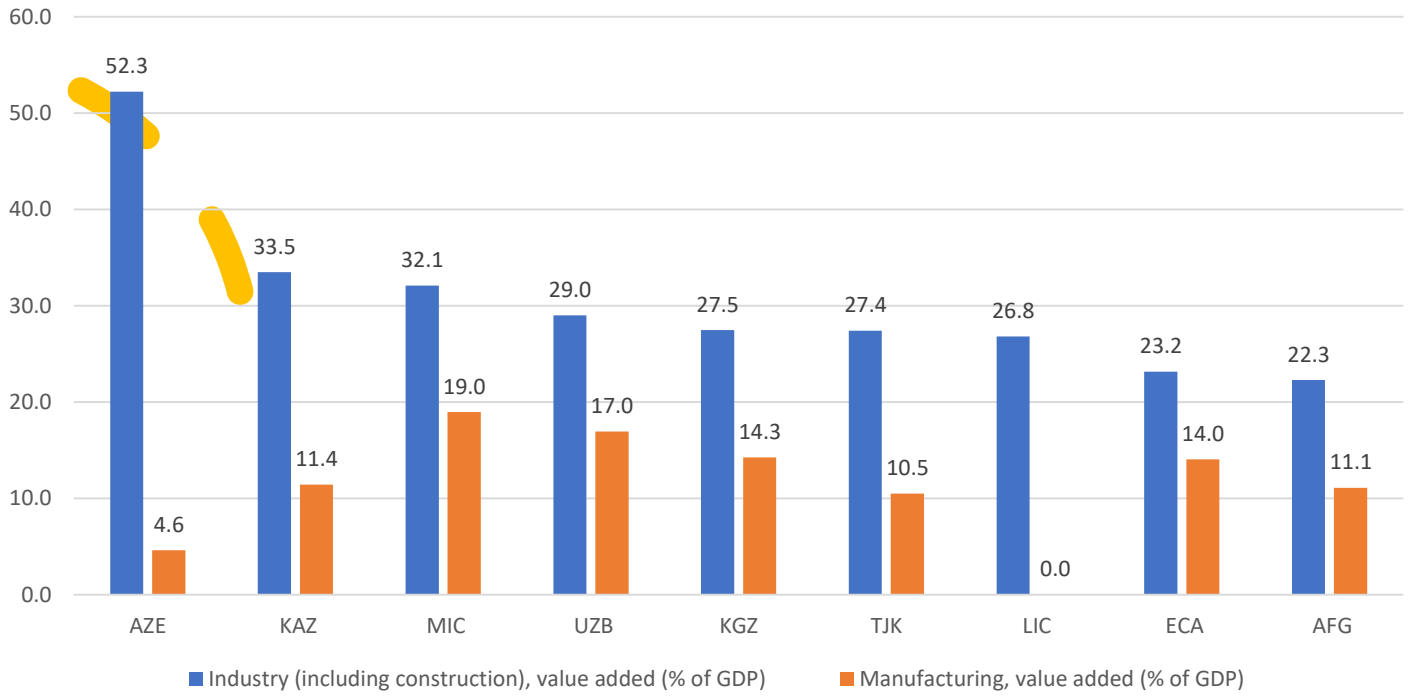
Principles of new industrial policy in low institutional capacity environments like SPECA II

1. Learning in policy requires experimentation, and thus **pilot projects are its essential mechanism.**
2. The policy is about **facilitating self-organisation for collective action**. Not necessarily resolving coordination failures among private sector actors. Hence, the capacity for policy action is **not prerogative only of governments but also of 'commons', i.**e., public bodies, coordination bodies, groupings of organisations. Policy in this perspective is about facilitation and moderation of self-organisation activities.
3. 'Smart' innovation policy is based on a careful assessment of institutional capacities for design, implementation, monitoring & evaluation of specific policy actions. Based on the principle of the **'best matches' smart policy will promote only those actions where there is a good match between policy intention and policy implementation capacity**.

Common structural features of RDI in SPECA Region

- Very low share of manufactures export (‘premature deindustrialization’)
- Low production sophistication and management quality
- Very weak business and public sector R&D
- Outside of Global Value Chains except resource based activities

SPECA: Industrialized when compared to their income groups but very much ‘de-manufactured’ region



Shares of industry and manufacturing in GDP 2018

ECA – Europe Central Asia (low income part); MIC- Middle income economies; LIC-Low income economies

Very low R&D intensity is driven by low share of manufacturing (not industry) and a low share of medium and high-tech industry in manufacturing

Research and development expenditure (% of GDP) 2018

AZE	KAZ	TJK	UZB	MIC	ECA
0.2	0.1	0.1	0.1	1.6	2.0

Share of medium and high-tech industry (% manufacturing value added) 2018

UZB	AZE	KAZ	AFG	KGZ	TJK
19.9	15.6	14.5	9.5	2.8	2.8

- SPECA economies have weak public R&D and similar share of active R&D firms as their income groups but intermittently and marginally active.
- BES links with higher education are informal but strong through joint affiliation of researchers of Academy that are also teachers though the biggest number of teachers are not involved in organised R&D.
- A contribution of R&D is largely in facilitating absorption of foreign knowledge through contracts of Academy institutes and universities with enterprises in a wide range of downstream services like consulting, metrology, testing and problem solving.
- MIC-middle income; ECA Europe Central Asia (low income part)

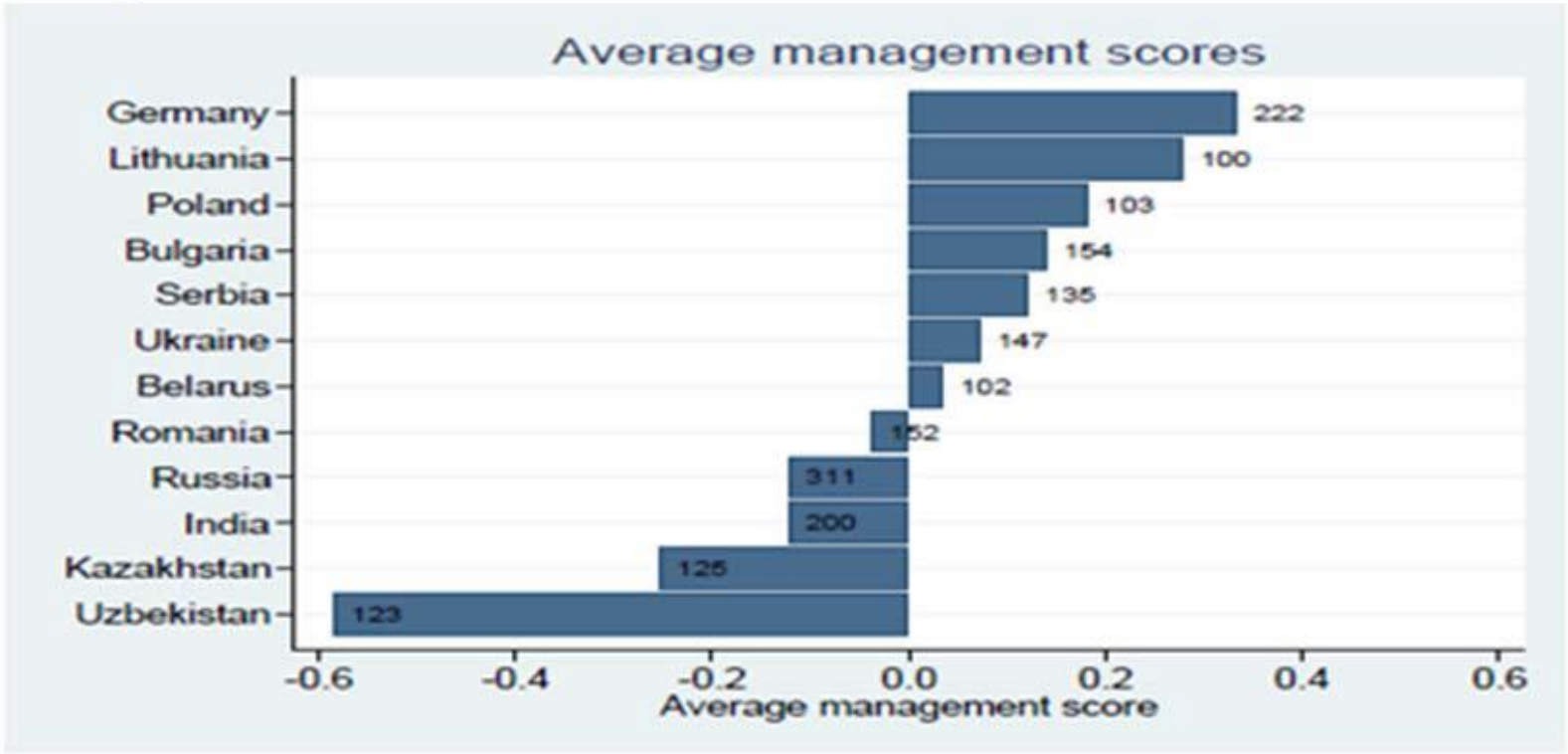
Quality certificates in SPECA economies 2019

	AFG	AZE	KAZ	KGZ	TJK	TKM	UZB
ISO 9001:2015 Quality management systems	7	269	452	9	2	0	481
ISO 14001:2015 Environmental management systems	0	72	181		3	7	33
ISO/IEC 27001:2013 IT -- Security techniques -- Information security management systems -- Requirements	0	3	11	0	1	0	0
ISO 50001:2018 Energy management systems -	23	0	42	0	0	0	9

- Very low number of quality certificates => a sign of isolation from global value chains as well as an indicator of the huge scope for improvements towards best practice in the management of production capabilities
- Example: Food industry is quite important for Tajikistan but no Tajik company has certified for ISO2200 food safety certificate in the last few years.
- ISO data show that there were only two Tajik companies in 2008 and 2009 that were sites covered by ISO 22000 certificates
- Source: UNECE Report 2015

Weak management practices, especially in large enterprises, unlike in other countries

Management scores across countries



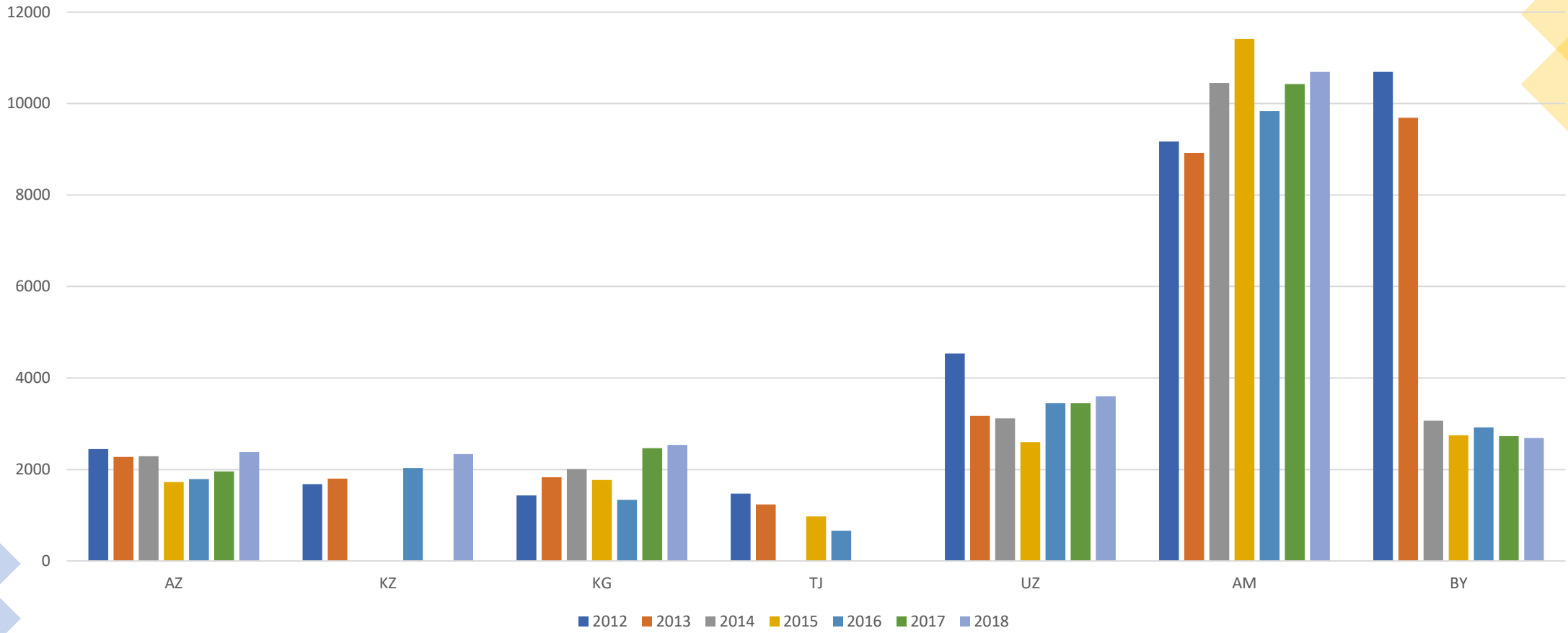
Source: MOI survey.

Note: Number of firms included is indicated in the chart. Scores are reported as z-scores, so are in deviations from the sample average of zero.

Source: EBRD Working Paper

A very low degree of product differentiation even when compared to AM and BEL

Resident trademarks per 100 billion USD GDP (PPP) (by origin)(2012-2018)



Logistical and ICT infrastructure lags behind the income level group

Logistics performance index: Overall (1=low to 5=high)

ECA	KAZ	*MIC*	UZB	KGZ	TKM	TJK	*LIC*	AFG
3.2	2.8	*2.6*	2.6	2.6	2.4	2.3	*2.3*	2.0

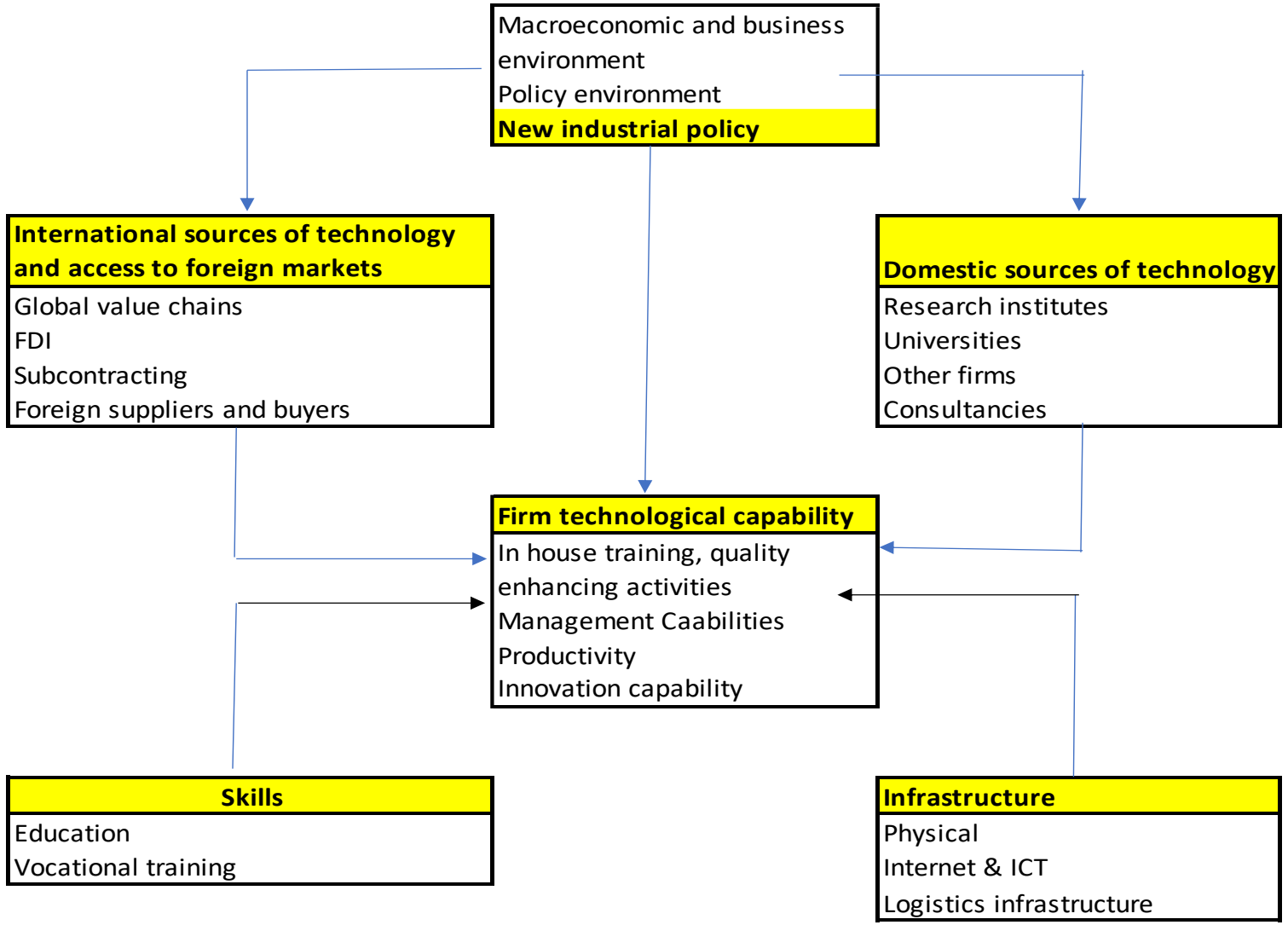
Only Kazakhstan ranks above the average of middle-income economies while other economies are behind their respective income level group.

Secure Internet servers (per 1 million people) 2018

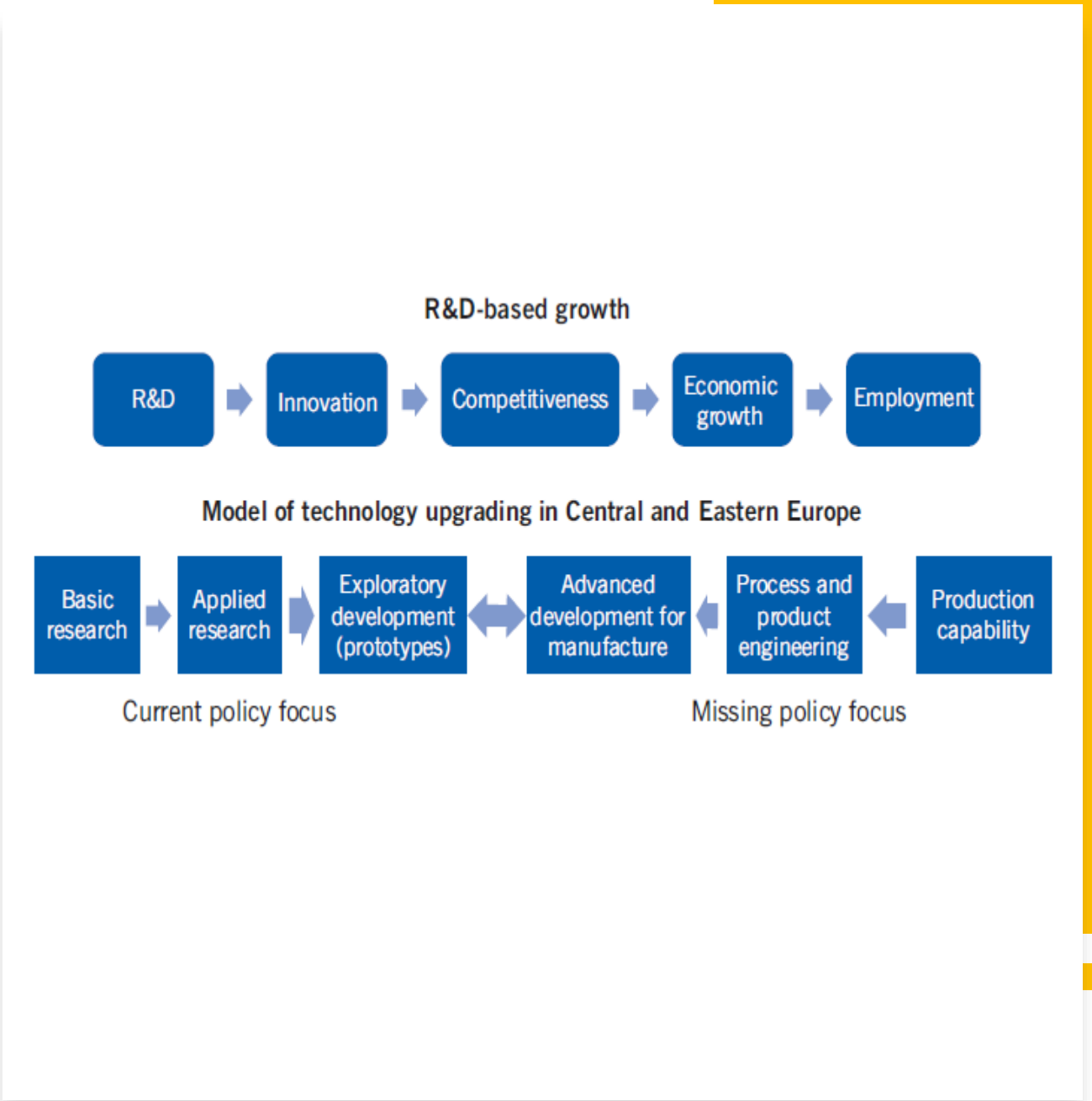
ECA	KAZ	*MIC*	UZB	AZE	KGZ	TJK	AFG	TKM	*LIC*
26678	2359	*1237*	453	369	288	71	28	20	*11*

Only Kazakhstan fare quite well fairing slightly behind the ECA average.
However, all other SPECA economies have lower shares when compared to their respective income groups

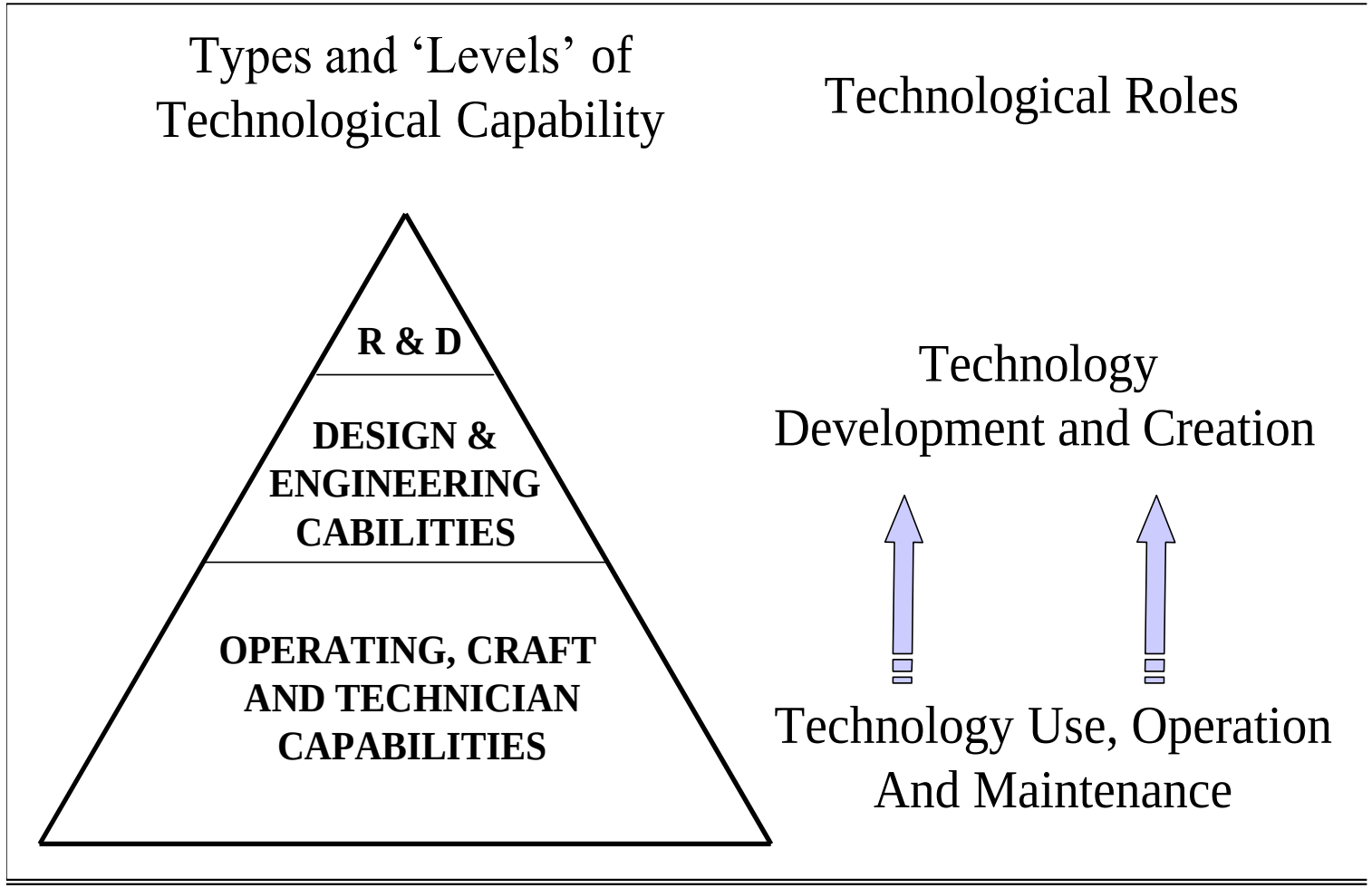
New industrial policy: firm focused and addressing domestic and foreign sources of technology



…. focused on manufacturing (services) and engineering capabilities … SPECA as magnified picture of the EU13 (CEE)



… and on the basis of the technology capability pyramid



Martin Bell (2007) Technological Learning and the Development of Production and Innovative Capacities in the Industry and Infrastructure Sectors of the Least Developed Countries: What Roles for ODA?, UNCTAD The Least Developed Countries Report 2007 Background Paper, University of Sussex

Main strategic options for new industrial policy…..

1. Increase R&D, engineering and innovation capacity in both private and public sector
2. Build strategic policy to embed local supply chains into FDI and international supply chains
3. Prioritize structural reforms in sectors which are priorities for strategic FDI/GVC policy
4. Establish actions on building basic technology upgrading infrastructure services and training programs linked to export agenda
5. Public innovation procurement
6. Inclusive and pro-poor innovation programs

……. and considering country specific priorities

- Resource based industries: diversification related to resource based industries*
- Labour intensive industries: supply chain development programs
- ICT intensive services: clustering and collective promotion
- Pockets of excellence in engineering intensive and other activities

For example, **Kazkhstan**: *a concentrated effort to master the selected processing industries technologies: from large-scale commodity based process innovations through medium-scale specialties (chemical, biotechnological, nanotechnological) to small-scale customized materials and special applications*

1. Increase R&D investments and facilitate engineering and innovation capabilities

- Increase to 0.5-1%% GERD/GDP
- Expand R&D to facilitate absorption of foreign knowledge through contracts of Academy institutes and universities with enterprises in a wide range of downstream services like consulting, metrology, testing and problem solving.
- Support should be extended to engineering and innovation management including support to quality improvement programs like ISO9001 standards, ISO14000 environment standards and industry specific international standards (CMM Certificates)
- The public funding of R&D should be also focused on adaptation of imported technologies to local conditions (agriculture; climate change)

R&D to help innovative enterprises to improve productivity and upgrade processes and products

- R&D does play a role, but its effect on local and national economic development is modest in the short to medium term.
- Instead, greater attention should be paid to helping innovative enterprises to improve productivity, upgrade processes and products and thus generate greater demand for R&D, which would also accelerate the structural changes that have been slowly taking place in the R&D sector.
- The gap between ex-branch institutes and universities on the one hand and enterprises on the other hand could be bridged with the introduction of innovation vouchers.
- These would be given to enterprises and would allow them to purchase different types of innovation services; including innovation audit, training, new business and service development, knowledge transfer projects and many others
- Innovation Vouchers can be used for innovation activities such as: innovation / technology audit; tailored training in innovation management; new business model development; new service delivery and customer interface; new service development; knowledge of product and service testing, economic impact assessment and efficiency audits.

2. Develop strategic approach to FDI and GVC

FDI and GVC as part of the wider industrial upgrading strategy

- The identification of suitable inward investment projects and the active servicing of the strategic needs of foreign-invested firms once they are established.
- In view of this constraint promotion of free economic zones should be done on piecemeal basis in order to accumulate experience, attract investors and learn from other countries experiences > seek international assistance and learn form past failures
- In the case of potentially major FDI investments try to negotiate with investors' arrangements that are based on explicit contracts with their subsidiaries to generate skills that can be useful also for other firms > cost-sharing partnerships with MNC subsidiaries in order to expand the scale of their training in technical skills beyond their own requirements in order to increase the pool of skills available to the industry as a whole

Linkage program requires competent FDI non-state agency

- A compact between TNC, local firms and government agency to secure early commitment to mobilize linkages
- The need for pro-active but subtle industrial policy approach
- Use TNC as levers for learning and upgrading productive capabilities
- Learn from CzechInvest how to work with foreign and domestic firms
- FDI support should extend to subcontracting and program should be set up which would incentivize foreign companies to involve local suppliers in their value chains.
- Funding should be given on matching funding basis to assist potential suppliers to bring them to required international levels of efficiency and productivity

3. Advance process of sectoral structural reforms and improving business environment but linked to industrial policy agenda….

Why? …. because a trade-off between need for technology upgrading and need for regulatory reforms is false dilemma

Also, sectoral regulatory reforms are not sufficient without sector- or technology-specific innovation policy measures.

Regulatory reforms should be inextricably linked to potential areas and sources of growth… how?

- Potential areas of medium term and long term growth should be exactly those areas where regulatory reforms should be prioritized.
- These should involve not only the removal of general obstacles for doing business but equally very sector-specific obstacles which are most often the major barriers, targeting specific areas with potential such as ICT or food processing or machinery industry.
- This would require addressing failures in inadequate training and investment in human capital in these areas as well as designing technology-, sector- or area-specific investment promotion packages which would not give unfair advantages to foreign investors
- The degree of sector or technology specificity of support can vary and there is not blueprint.
- However, the bottom line is that regulatory reforms and innovation policy measures should be implemented complementary to each other.

4. **Establish actions on building basic technology upgrading infrastructure services linked to export agenda**

- Given unfavourable geographic location of several SPECA economies and ensuing high transportation costs the best this can be overcome is by being able to offer quality which will be able to sustain these costs differentials (cf. Japan in 1960s).
- In addition, being able to offer world quality is today the key precondition to be plugged into global or regional value chains.
- The infrastructure services should be the basis for the national quality programs. Initially in specific sectors where there is critical mass of awareness that quality is key precondition for exporting.
- For example, sectoral programs in food processing, or in software, or in clothing or metals sectors (cf. Tajikistan)(UNECE Report 2015).

5. Public innovation procurement (PIP)

- PIP is quite demanding and prone to failure instrument but some SPECA economies (Kazakhstan etc) should consider public innovation procurement for small technology based firms similar to known US SBIR program
- This would stimulate technological innovation while at the same time provide government agencies with new, cost-effective, technical and scientific solutions to meet their needs. Procurement programmes designed to stimulate the demand for innovation should:
  - Specify the goals to be met without pre-judging the technological ways through which these goals could be achieved;
  - Be open to both established companies and new ones;
  - Include a grant element and other forms of support for innovative companies to help them overcome potential problems with raising financing to develop technologies;
  - Involve single company contracts with no requirement for collaboration;
  - Allow companies to retain the rights to intellectual property developed through the use of public funds, with no royalties owed to the government, which will retain free use for a specified period; and
  - Be run through open competition under rules that are suited to the risky nature of innovation projects

6. Inclusive and pro-poor innovation programs

SDG agenda

- Innovation for poor is not yet developed in SPECA regions
- Examples: affordable solar panels; small hydro power stations for isolated communities; ID (identity documents) tied to mobile devices; various apps for farmers, etc.
- These innovations to be developed and implemented with assistance of international organisations.
- A first step: feasibility study for the regional program of international assistance in this area for SPECA region > excellent opportunity for regional cooperation

Key challenges of NIP implementation in low institutional capacity environments

- Capacity to coordinate actions across public sector agencies and to effectively engage in collaboration with private sector actors is essential to new industrial policy.
- In states with weak institutional capabilities, policy overreach is a real possibility
- The challenge is how to design low cost policy measures and how to establish communication with local entrepreneurs and ensure both incentives for technology upgrading as well as performance requirements.
- Copying the ‘best policy practice’ does not necessarily represent a response to the local context but more compliance to external requirements.

In search of solutions: how to apply NIP principles in conditions of poor innovation governance

- In conditions of conventional public programs we do not have an organisational solution to experimental governance (accountability vs experimentation).
- The solution is to be found in **the 'best matches** ie policy solutions that correspond to limited administrative capacities.
- The aim is not to try to turn weak institutions into strong institutions as this is ‘chicken and egg’ problem but instead take the existing institutions as given and select ‘the best matches’ policy instruments.
- Start NIP with the existing ‘pockets of excellence’ (departments; agencies, NGO, chambers of commerce, business associations etc)… and embark on risky but potentially very rewarding trip