

# **Chapter 4: KYRGYZ INNOVATION CAPACITY IN INTERNATIONAL PERSPECTIVE**

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## The aim

- To explore the explore **the potential for further growth of Kyrgyzstan** especially for growth based on **skills** of its labour force, **productivity improvements** and **technology upgrading**
- The potential is explored based on **benchmarking** of Kyrgyz economy with its **peer economies** (Belarus, Russian Federation, Armenia, Georgia, Moldova, Tajikistan)

# Background

- GNI per capita of \$3.2K places Kyrgyzstan into a group of **lower middle-income economies (\$1-4k per capita)**.
- Growth is driven overwhelmingly by the services sector and, increasingly, construction while agriculture and industry grew well below average overall growth (cf. personal remittances = 25% of GDP)
- Export consists of **gold (43%)**, minerals (i.e. petroleum) (8%), vegetable products (i.e. dried fruits)(6%), clothing (6%), metal (i.e. copper)(6%) etc.
- **Deindustrialization** of economy (35% in 1990>27% in 2015)

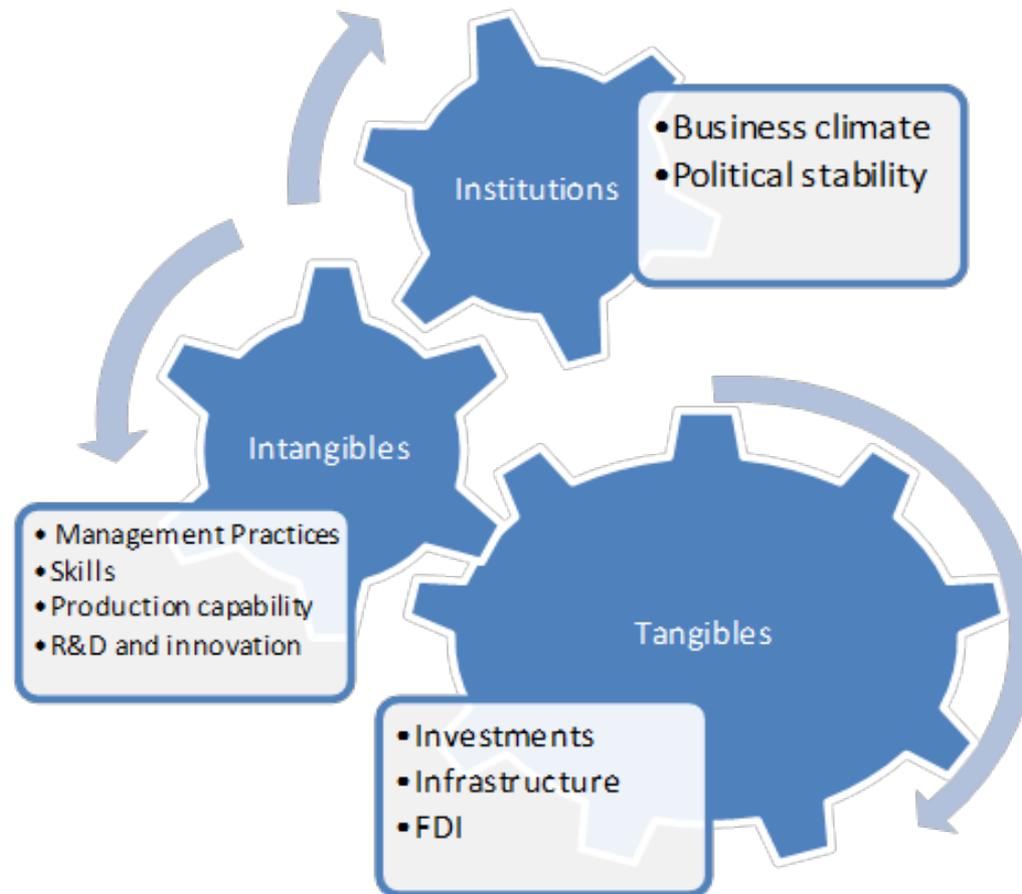
The technological effort in less developed economies like Kyrgyzstan is focused on **non-R&D activities** which are on the right-hand side of Table - **process and product engineering and production capability**

Innovation activities of the greatest relevance for Kyrgyzstan



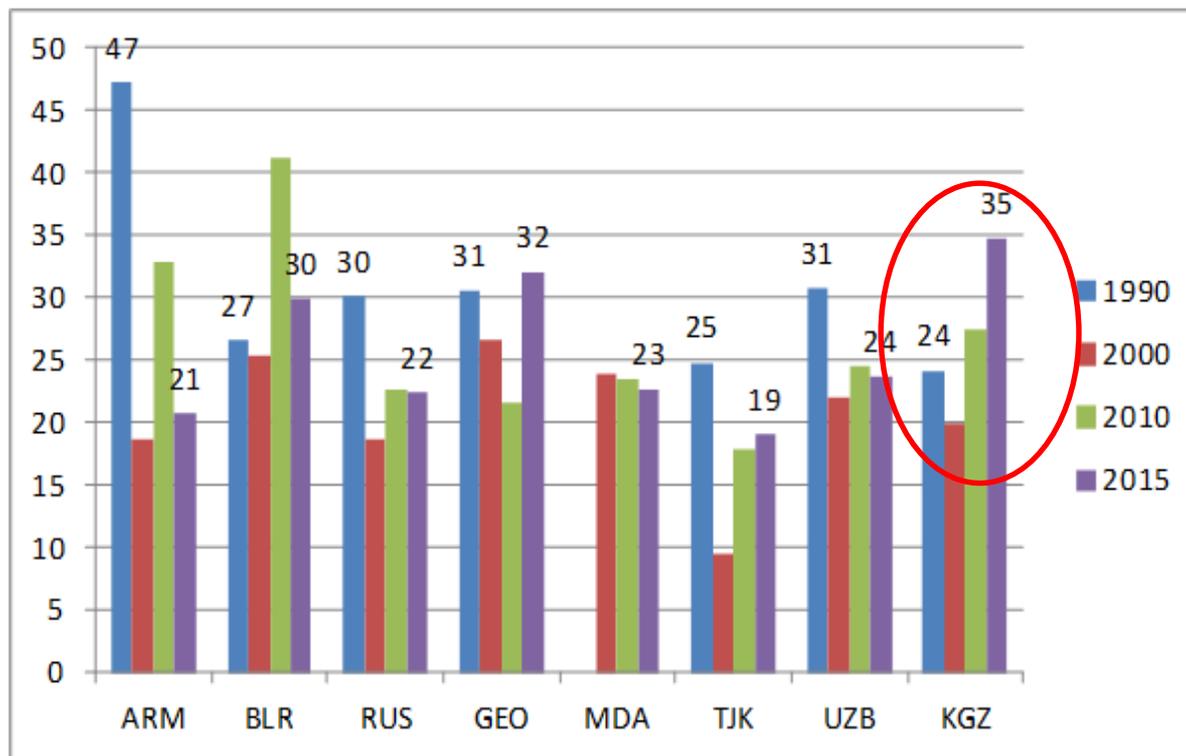
Pure science	Basic research	Applied research	Exploratory development	Advanced development	Process and product engineering	Production capability
Intrinsic knowledge	New knowledge for radically new marketable product	Differentiated product 'on paper.'	Prototype in a system	Prototype in manufacture	Improvements of existing products and processes	Improved quality of products and processes
Ph D	PhD required with experience in R&D		PhD not required/MSc and BSc required		Skilled engineers	Skilled technicians

# Analytical framework for benchmarking of the major drivers of technology upgrading of Kyrgyzstan

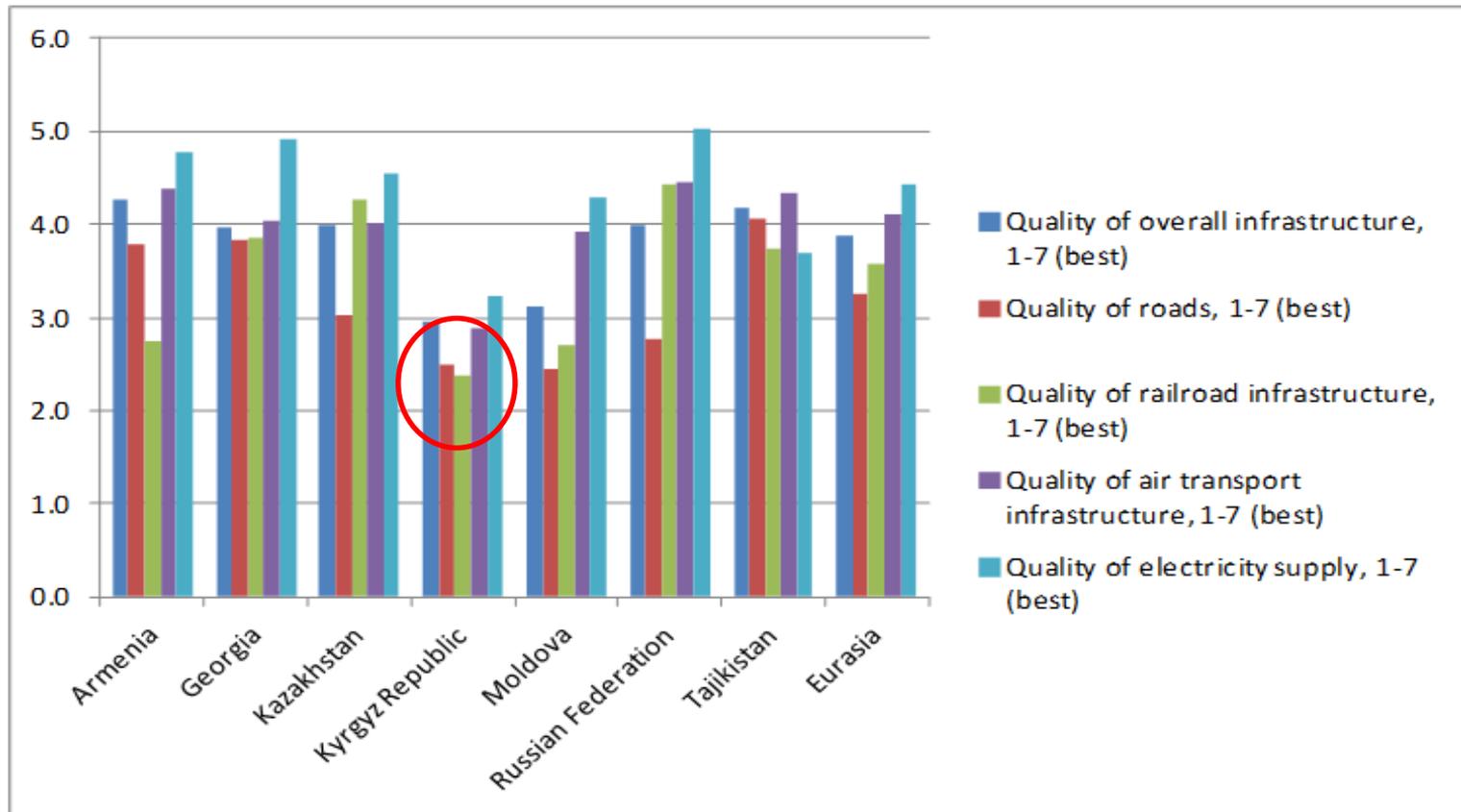


**Positive sign: recovery of investments but also large unmet needs ....**

## Gross capital formation (% of GDP)

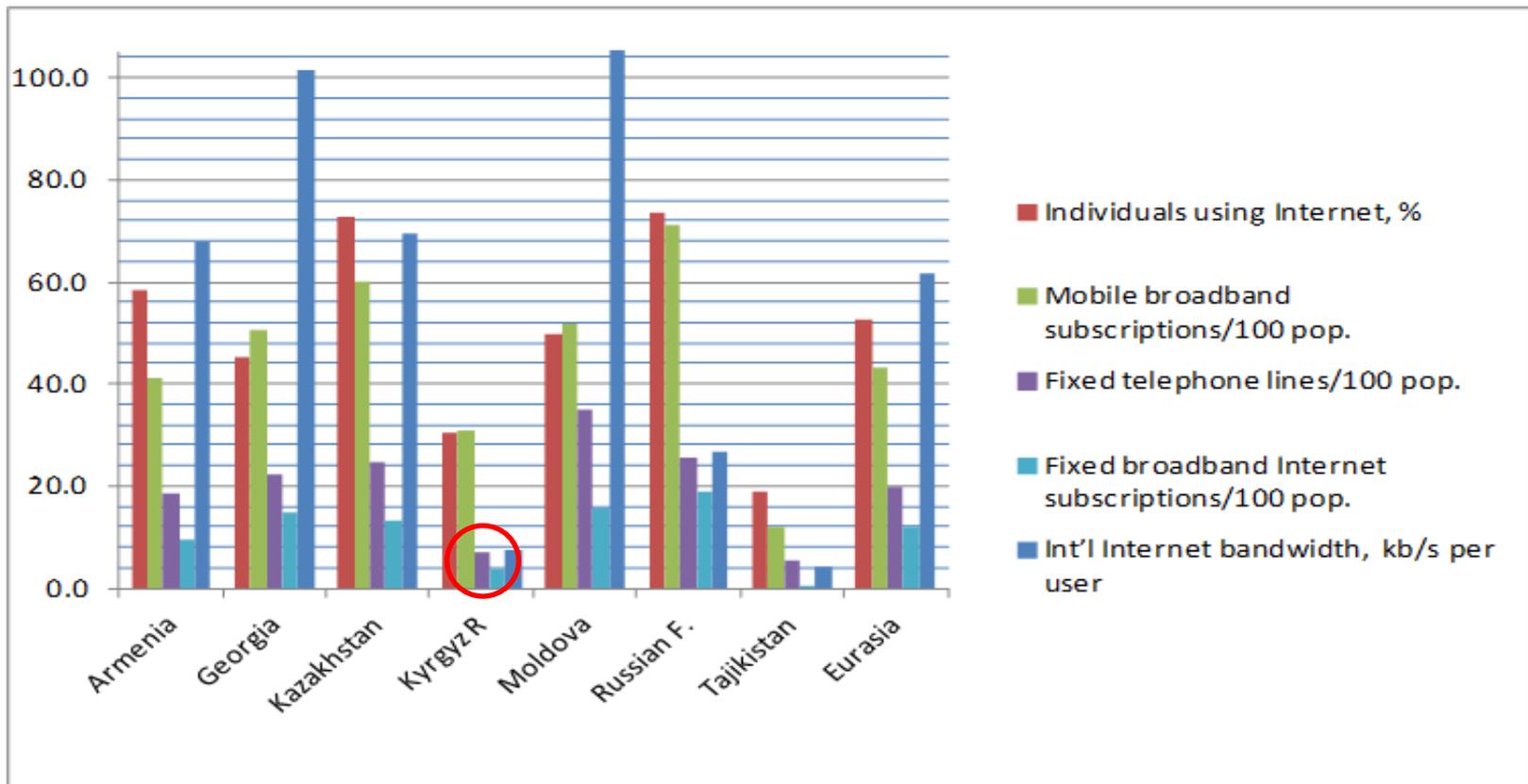


# KG ranks significantly behind in assessment of quality of overall infrastructure and electricity supply



WEF GCR2016

# Kyrgyzstan is well below the Eurasian average in all five indicators of Internet-related infrastructure (2015)

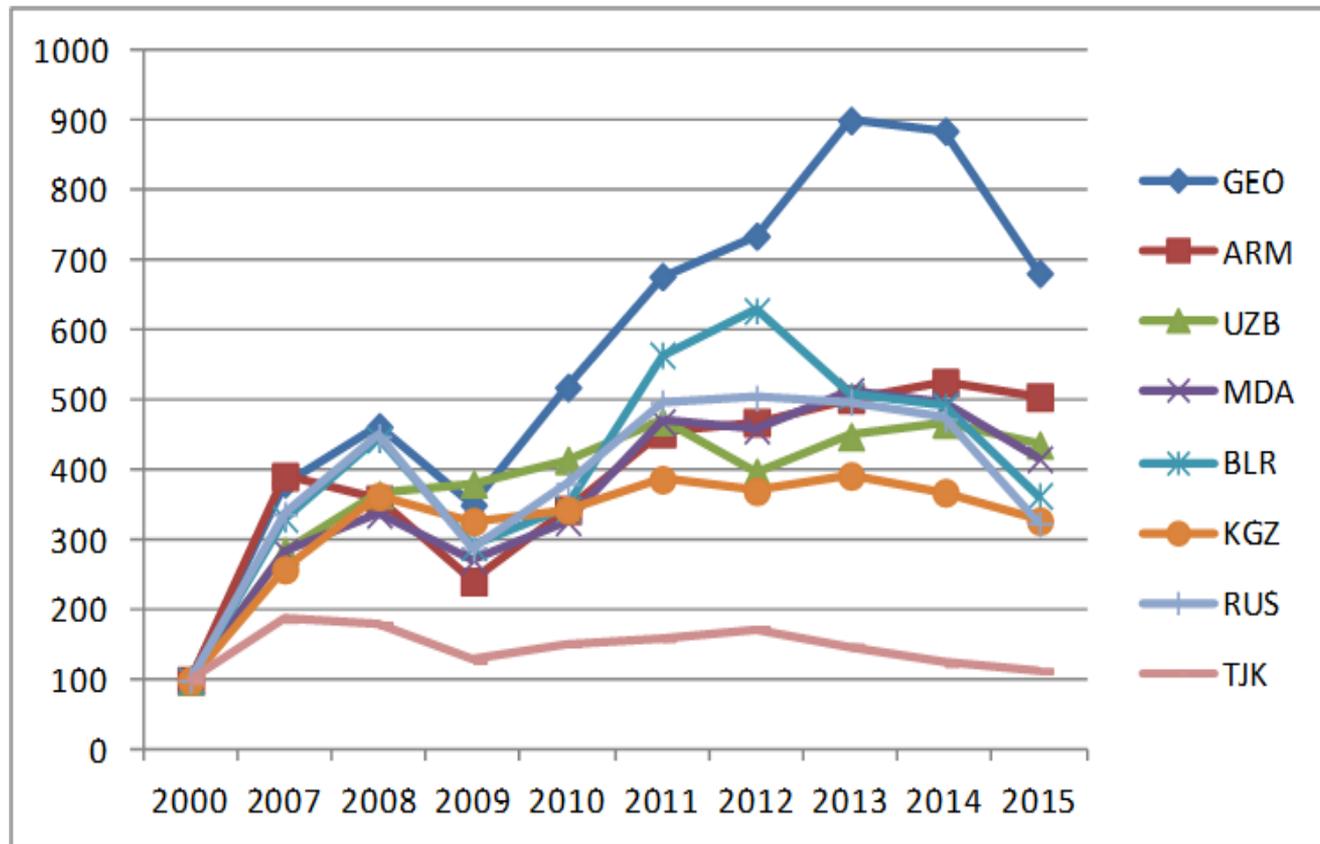


# Openness and acquisition of foreign knowledge via trade, global value chains and FDI

- Kyrgyzstan is the small open economy which requires access to foreign markets but also the intensive import of technology
- The relative **decline of export intensity** is confirmed by the index of export value which has been rising until 2008 but then remains stagnant (see next slide)
- Given its low unit value and distance from high-income markets, **Kyrgyz export is quite sensitive to transport costs.**
- In 2014, **costs to import (US\$ per container) was \$6000 and to export \$4760.** This was slightly lower than export/import for Uzbekistan (\$6452/\$5090) and much cheaper than for Tajikistan (\$10650/\$9090). However, **it is still 2-3 times more expensive than costs of trade for Armenia, Georgia or Moldova.**
- Kyrgyzstan shares **low attractiveness for FDI** with other CIS countries which all have been bypassed by the expansion of global value chains.
- On the positive side, **proportion of FDI inflows in GDP of Kyrgyzstan has not declined as in other countries which may be explained by the improved business environment.**
- FDI share in GDP is now **at the level similar to Georgia and well ahead of its peers.**

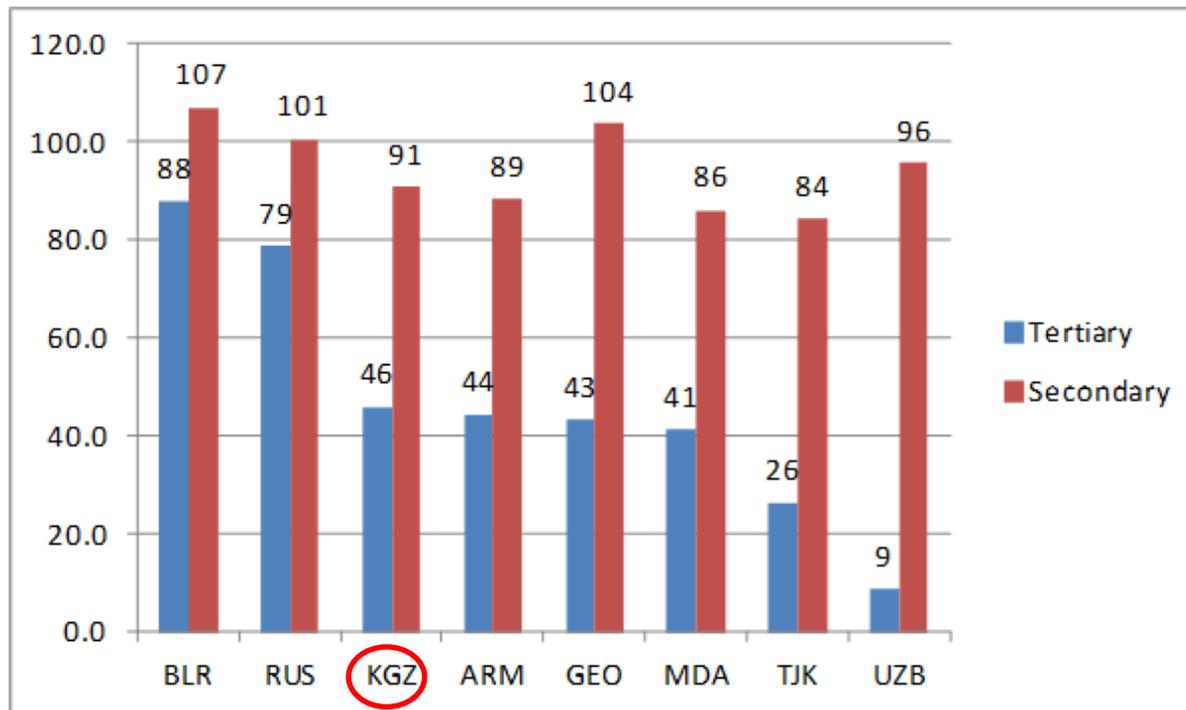
# Export value index (2000 = 100)

**Post-2008: export has not yet recovered**



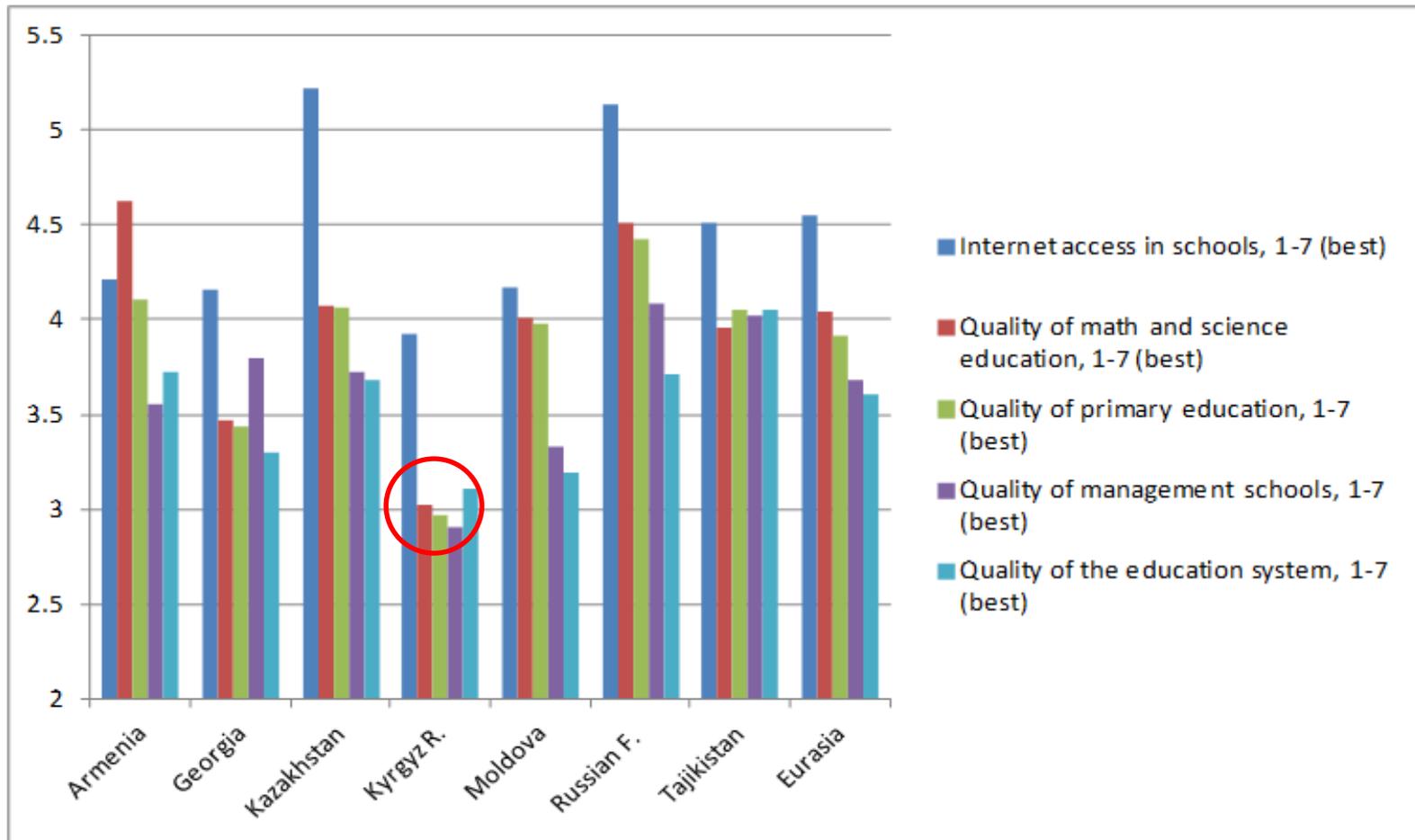
# Satisfactory enrolment rates .....

## Gross enrolment rates in 2015 (% gross)



**... but extensive education system generates the low overall quality of education**

## Indicators of quality of education system



**Production (not innovation) capability is the main focus of KG firms ... but still a huge gap regarding production capability or attention to quality which seems to be still marginal to Kyrgyz firms' activities**

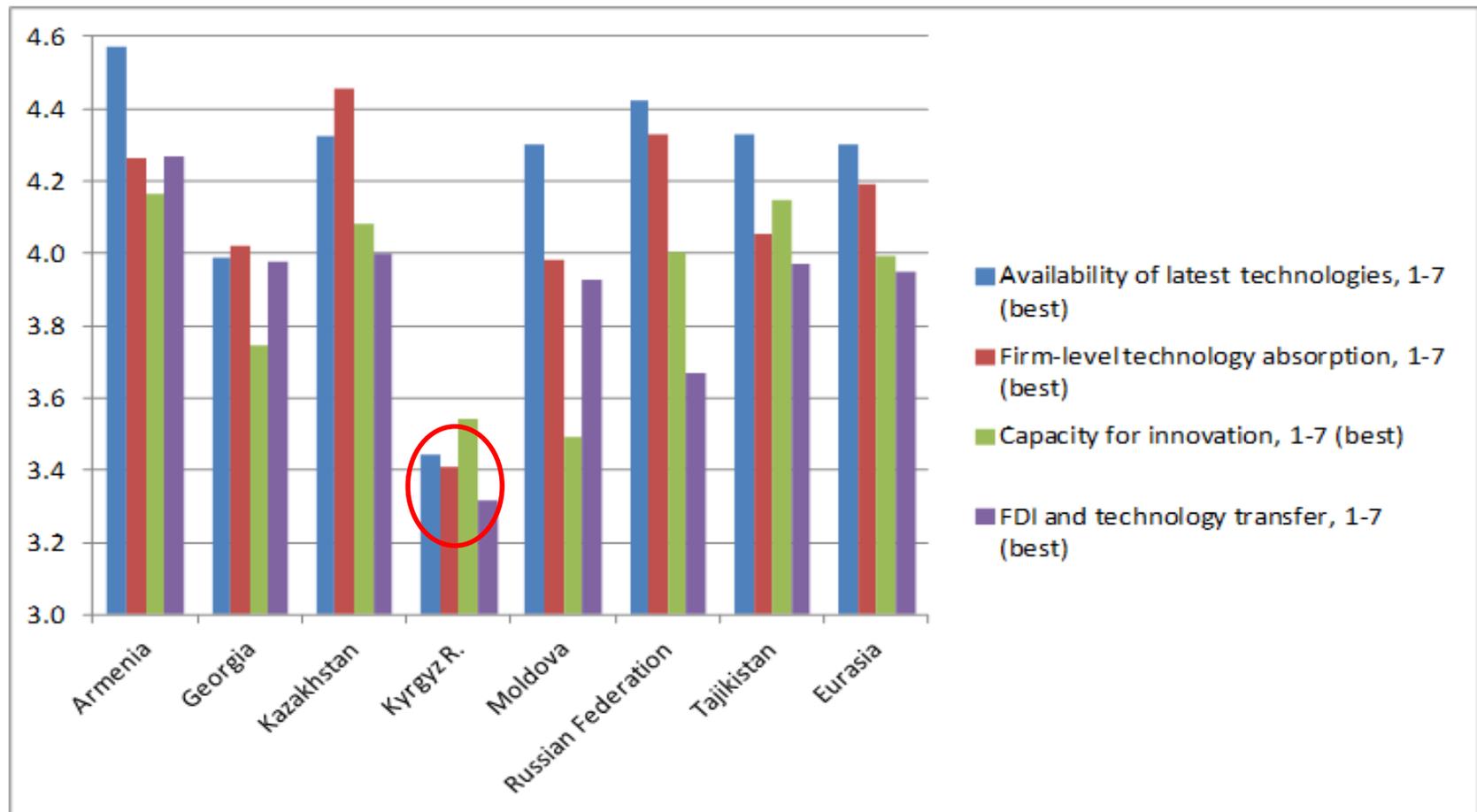
### ISO9001 certificates per 1mn population

	2000	2007	2008	2009	2010	2011	2012	2013	2014	2015
BLR	5.8	136.8	183.6	211.8	15.9	18.1	18	13.7	306.6	385.4
RUS	7.7	80.7	112.4	372.3	435.9	93.1	87.2	82	78	63
MDA	4.1	14	26.9	46.8	23	24.2	36.8	33.7	34.6	36.6
GEO	1.6	21.6	26.6	28.7	18.3	19.9	20.7	25.2	25.2	22.9
ARM	1.3	26.4	22.9	26.3	20.6	11.8	8.7	5.7	5.3	8.9
UZB	0	3.2	5.7	8.8	4.5	5.1	6.4	2.1	2.4	2.2
TJK	0	0	0.1	0.1	0.1	0	0.4	0.6	0.5	0.5
<b>KGZ</b>	<b>0</b>	<b>0.8</b>	<b>0.6</b>	<b>3</b>	<b>1.3</b>	<b>0.9</b>	<b>1.1</b>	<b>1</b>	<b>0.7</b>	<b>0.2</b>

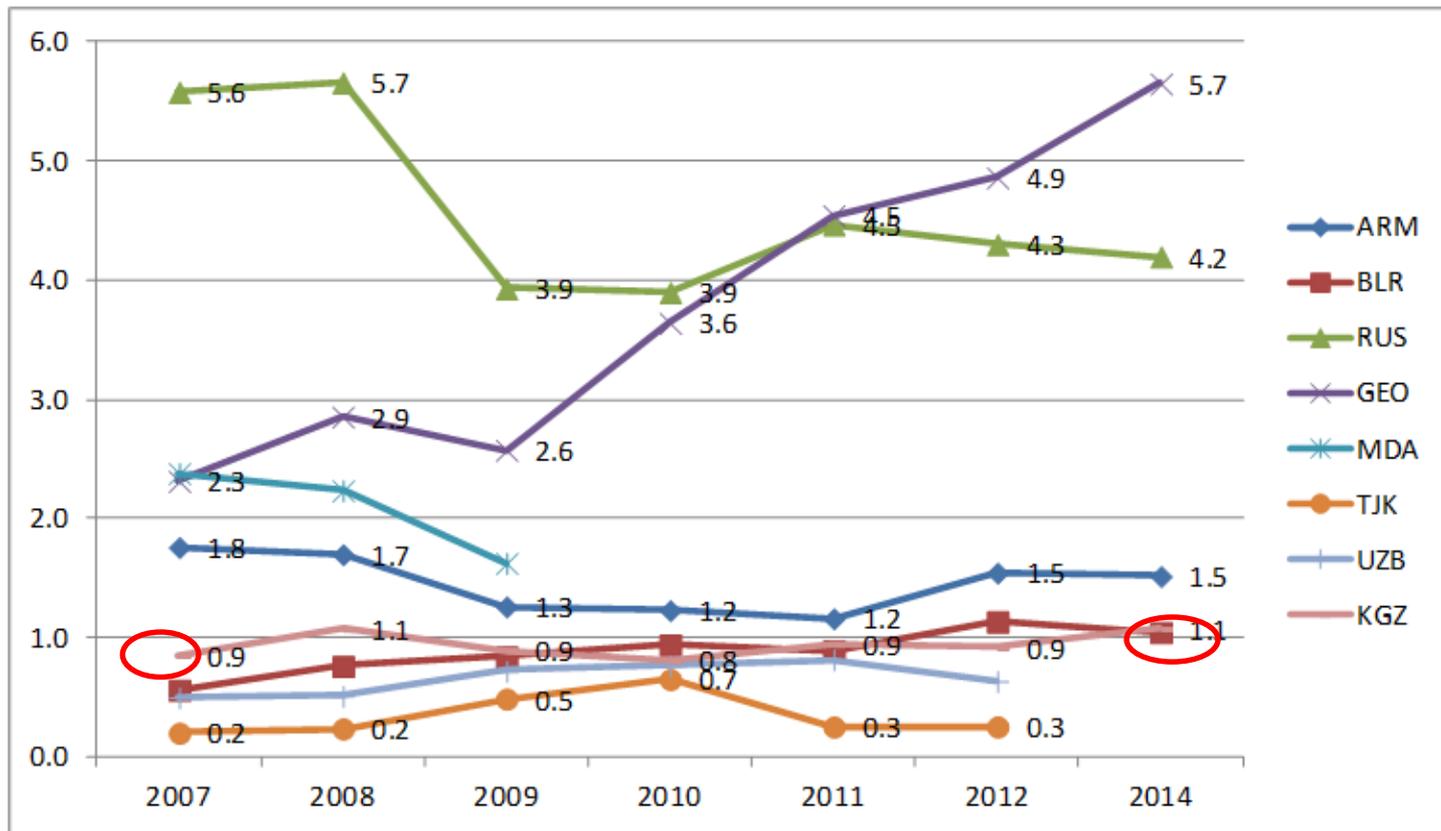
## **Innovation activity of KG firms is largely about purchase of machinery and software support**

- Based on a sample of 752 enterprises only 7.4% or 56 enterprises are engaged in innovative activities
- 55% of innovators purchase machinery and equipment and 24% purchase software **while only 2 of 56 companies do any R&D**

**In all dimensions of technological capability depicted in GCR Kyrgyzstan ranks well behind its peers which is quite unexpected, even taking into account the subjective nature of responses**



**New business density (new registrations per 1,000 people ages 15-64) fluctuates between 0.8 and 1.1 new registrations per 1000 people of working age. This puts KG well behind Georgia and Russia and at the level of Belarus which is dominated by large enterprises**



High ranking in the strength of legal rights is not reflected in a high ranking regarding Ease of doing business index > **the gap between *de jure* rules of the game and their *de facto* application**

2015	Strength of legal rights index (0=weak to 12=strong)	Ease of doing business index (1=most business-friendly regulations)
GEO	9	23
MDA	8	47
<b>KGZ</b>	<b>8</b>	<b>73</b>
RUS	6	36
UZB	6	82
ARM	5	43
BLR	2	50
TJK	1	130

## In overall, the institutional environment is not a factor of strength or potential advantage of Kyrgyz economy

- Liberal political reforms have not been converted into the institutional changes on the ground.
- A high share of the informal sector is very unfavourable to innovation and poor quality of state governance and linked to it poor easiness of doing business are holding local entrepreneurship.

# Assessing different drivers of growth based on international benchmarking: summary

- *Positive drivers* are limited but still present in:
  - Rising physical investments;
  - Limited but the increasing presence of FDI;
  - Extensive education accompanied by relatively high education expenditures;
  - Liberal reforms which represent good basis for the transformation of the business environment
  
- *Groups of constraints* :
  - Undeveloped infrastructure both transportation and the internet based which directly impinges on costs competitiveness of firms
  - Poor quality of education
  - Undeveloped production capabilities of firms which are faced with issues of export competitiveness and quality and lack strategic and coordinated approach to these activities
  - R&D system which is marginal to economy and does not operate as factor of absorptive capacity
  - Poor business environment

- The analytics presented in previous slides is **macro** and thus inevitably deficient in detecting potential sources of growth and catching-up.
- In the next slide we complement the macro picture with **micro insights** based on interviews and visits to firms and discussions with stakeholders

# Potential sources of technology upgrading and growth

	Opportunities	Constraints
<b>MNCs (FDI)</b>	Local market driven FDI	Limited market and big constraints in converting Kyrgyzstan in export location
<b>GVCs (subcontracting)</b>	Supply chain organisers (assembler, buyers) can support supply network of SMEs	Not yet local or foreign supply chain organisers
<b>Individual local firms ('islands of excellence')</b>	Island of accumulated past technical know-how and new technology-based firms growing based on skills of entrepreneurs engineers	Constraints in skills and lack of support for engineering labs
<b>Clothing</b>	Comparative advantages in labour costs	A lacking supply chain
<b>Food</b>	Comparative advantages in specific niches	Need to develop 'collective brand.'
<b>Free economic zones</b>	Potentially useful tools of regional development	Lack of funds for building attractive infrastructure
<b>IT outsourcing</b>	Skilled programmers Facilitating role of High Tech Park including training support Government support	Education system does not yet train quality programmers Undeveloped local public procurement
<b>Local innovation ecosystems of new ICT-based firms</b>	Bottom-up initiatives Potential for discovery of new business models	Uncertain potential of the existing initiatives to substitute for missing external preconditions for innovation ecosystem
<b>Tourism</b>	Comparative advantages	Undeveloped transportation and other tourism related infrastructure
<b>International aid organisations</b>	Good service delivery	Weak effects on development of local capabilities <sup>21</sup>

# Recommendations on further improvements to measuring innovation performance

- With only 0.1% expenditures for R&D and with a very limited number of innovative firms **innovation policy cannot be framed in conventional terms by focusing on R&D and organised innovation activities as they are very marginal**
- Given huge resource and institutional differences and constraints, **it would be a mistake to adopt an approach which would be an imitation of the best practice of high-income economies**
- Instead.....

## The overall approach: Neither horizontal nor vertical but **KG tailor made**

- Kyrgyzstan should embark on formulating **specific policy support actions in each of the ten areas** outlined in table *Potential sources of growth in Kyrgyz economy: opportunities and constraints*.
- Each of the areas would require **a tailored policy package** which can evolve over time based on the initial support measures and based on the active involvement of non –government actors, primarily industrial associations and other non-governmental organisations and their capacity to self-organise

## Or more specifically....

- Develop **strategic approach to FDI and Global Value Chains** (tailor made packages in areas like clothing, food, call centres, etc).
- Assist **export promotion of clothing and food industry** linked to program of improving quality and meeting international exporting standards
- Establish program of **transformation of the existing research institutes** (many of which are within the National Academy of Sciences) **into network of technology institutes that support SMEs**
- Increasing quality of education through a program **of international training for teachers**
- Develop **public procurement as instrument of innovation policy (cf. ICT)**
- Improve innovation statistics

Sincere apologies from Slavo who has not been able to join you today !!!

**THANK YOU FOR YOUR ATTENTION**