

# CEE Growth & Development

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# CEE growth rates

**Table 1: Level of GDP per capita and average annual growth rates**

Country groups	Indicator	1991	1996	2000	2003	2007
CEB	GDP per capita					
	3-year average	-4.1	4.2	4.8	6.8	
	6-year average	0.3	4.4	5.8		
SEE	GDP per capita					
	3-year average	-1.9	4.4	3.7	5.9	
	6-year average	-0.2	4.2	4.8		
CIS, non-resource rich**	GDP per capita					
	3-year average	-16.4	3.2	7.3	8.1	
	6-year average	-8.0	4.5	7.7		
CIS, resource rich***	GDP per capita					
	3-year average	-12.2	3.5	7.8	11.9	
	6-year average	-6.6	5.8	9.9		
Non-OECD****	GDP per capita					
	3-year average	2.8	4.1	3.5	5.5	
	6-year average	3.9	3.8	4.4		
OECD****	GDP per capita					
	3-year average	2.1	3.7	2.0	3.3	
	6-year average	2.8	3.3	2.6		

\* real GDP per capita based on ppp 2005 international \$ (Source: WDI 2009)

\*\* CIS non-resource rich: Armenia, Belarus, Georgia, Kyrgyz Republic, Moldova, Mongolia, Tajikistan, Ukraine

\*\*\* CIS resource rich: Azerbaijan, Kazakhstan, Russia, Turkmenistan, Uzbekistan

\*\*\*\* excluding transition countries

Source: World Development Indicators 2009, authors' calculations.

# Designing policies for growth Innovation and Imitation (EBRD Report)

$$Y = Ak^\alpha$$

$$\dot{K} = I - \sigma K$$

$$I = sY$$

Assumption: Savings are constant share of output and investments are equal to savings.

$g = sAk^{\alpha-1} - \sigma$ , where  
 $g$  is growth rate of capital.

TE: Fully derive growth rate of capital.

TE: How do you define a steady state?

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TFP is affected by changes in institutional quality.

New growth theory argues that increase in TFP is closely linked to innovation. Innovation causes returns to capital that are above normal.

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- Better education
- Macroeconomic stability
- 'creative destruction'

Schumpeter (1942) coined the term 'creative destruction' describing how innovation is displacing old factors of production.

# Designing policies for growth Innovation and Imitation (EBRD Report)

Schumpeter's model of economic growth driven by innovation

$$Y_{i,t} = A_{i,t}^{1-\alpha} K_{i,t}^{\alpha}, \text{ where } (0 < \alpha < 1);$$

$A_{i,t}$  is the most recent technology used in industry  $i$ , in time  $t$ .

$K_{i,t}$  flow of a intermediate products used in this sector.

$Y_{i,t}$  is industry output.

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$Y_{i,t}$  is industry output.

- $A_{i,t}$  is generated by most successful entrepreneur. The entrepreneur in time  $t$  displaced an entrepreneur in time  $t - 1$  by innovating more productive factors of production. (TE: What happens in time  $t + 1$ ?)
- Higher economy growth rate implies higher firm turn-over. This is how process of 'creative destruction' generates entry of new and exit of former innovators.

# Designing policies for growth Innovation and Imitation (EBRD Report)

In this framework, countries can increase productivity by imitating or innovating.

Which path will countries choose, depends on the proximity to 'technological frontier'.

Countries can be either at

- 'tech frontier'
- imitators

$$\dot{A} = u_n(\gamma - 1)A + u_m(\bar{A} - A), \text{ where}$$

$\gamma$  is multiplier of pre-existing level of innovation

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$\bar{A}$  global technology knowledge

$u_{n,m}$  frequency of innovation and imitation which are affected by *institutions* built to foster one or another.



# Designing policies for growth Innovation and Imitation (EBRD Report)

If we define  $g$  as a rate of technology growth in time  $t$ , then

$$g = u_n(\gamma - 1)A + u_m(a_t^{-1} - 1)$$

TE: Fully derive the above equation.

$a_t = A_t/\bar{A}_t$ , inverse measure from distance from 'tech frontier'.

If  $a_t$  is lower it implies that country will grow faster. The country benefits higher knowledge spillovers from more advanced economies. (Historical examples: Japan and Europe after 1945)

# Designing policies for growth Innovation and Imitation (EBRD Report)

Imitator countries are those where:

- Large firms can take advantage of economies of scale
- Small labour mobility
- Limited competition and entry
- Financial markets are limited (bank finance)

# Designing policies for growth Innovation and Imitation (EBRD Report)

Innovator countries are those where:

- High labour market mobility
- Intense competition and low barriers of entry
- Focus on graduate education
- Larger role of non-bank finance

# Designing policies for growth Innovation and Imitation (EBRD Report)

*Where are transition countries from  $\bar{A}$ ?*

- In transition countries number of registered patents (investments in R&D) is well behind the OECD average or Asia.
- There is a large variation between transition countries in  $a_t$
- As a whole transition countries are lagging in TFP

TE: What are recommended policies?

# Designing policies for growth Innovation and Imitation (EBRD Report)

Policies for growth:

- Competition and Entry
- Education
- Financial Constraints
- Financing Reform