

# Economic Growth and Development Formation in CEE Countries

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1. Over three decades passed since the economic transformation in Central and Eastern Europe started
2. Two decades since the European Union enlargement
3. Profound institutional reforms
4. Strong convergence tendencies until 2008
5. Economic and non-economic shocks: the global financial crisis in 2008-2009, the eurozone crisis till 2013, Russian aggression on Ukraine (2014, 2022), the COVID-19 pandemic
6. A relatively long time series available to apply a novel econometric methodology
7. Strong theory - new institutional economics and empirical evidence supporting the relationship under study
8. Political similarity and cultural similarity/diversity

### The aim:

To determine the role of economic freedom and its components in the economic growth and development of Central and East European countries which joined the European Union after 2003

### Research questions:

1. Which component of the economic freedom overall indicator primarily impacts CEE economies' growth (GDPpc) and developmental processes (HDI)?
2. Was economic freedom necessary for growth and development formation in the long run, or instead, was it acting in the short term, while economic growth factors were dominant in the long period?

- The economies of CEE countries are connected due to their common economic history and policy.
- In the long run, relationships exist between GDP pc and economic freedom indicator and between HDI and economic freedom. When controlling for standard growth factors -imports play an essential role in the long run.
- In the short run, GDP per capita/HDI generally precedes the economic freedom indicator.
- Short-run adjustment coefficients are negative and significant (overall and across countries)
- Standard growth factors like gross capital formation, the employment-to-population ratio and human capital investment positively supported economic growth and development.

## The essential facts of CEEC economic transformation since the 90s (1/2)

1. **Political and Economic Transformation:** The fall of communism in 1989 and subsequent political and economic transformation in CEEC countries, led to the establishment of democratic governments and the transition from centrally planned to market-based economies.
2. **Privatization:** The privatization of state-owned enterprises, helped to increase competition, efficiency, and productivity in the economy.
3. **Liberalization:** The liberalization of trade and investment, enabled CEEC countries to integrate into the global economy, access new markets and technologies, and attract foreign investment.
4. **Macroeconomic Stability:** The establishment of macroeconomic stability, including fiscal and monetary discipline, price stability, and sound monetary policy reduced inflation, stabilized exchange rates, and increased investor confidence.
5. **Joining NATO** as an effective form of independence from Russia's economic and military influence.

6. EU Accession: The accession to the European Union helped to increase trade and investment and provide access to EU structural funds.
7. Economic Growth: Strong economic growth in many CEEC countries, particularly in the early years of the transition, helped to increase living standards and reduce poverty.
8. Financial Crisis: The global financial crisis of 2008-2009, had a significant impact on CEEC economies, causing a decline in economic growth, an increase in unemployment, and a reduction in foreign investment.
9. Structural Challenges: Structural challenges include the need for further institutional and legal reforms, improvements in infrastructure, and addressing regional disparities within countries.

## Two basic approaches to the transition from a socialist to a capitalist economy

Approach	Liberal	Evolutionary-institutional
Diagnosis of a socialist economy	The imbalance between supply and demand	The economy of scarcity
Target model	Market economy	Heterogeneity of the capitalist economy and the possibility of creating a new model
Analysis of changes	Transition	Transformation
Strategy	Shock therapy	Gradualism
Theoretical references	Neoclassical economics	Post-Keynesian economics Heterodox economics

## “Transformation” theory (2/2)

- Neoclassical economics provided the theoretical framework for policies to liberalize markets, reduce state intervention in the economy, and promote private enterprise in CEECs.
- Sachs - the "shock therapy" approach to economic transition, which involves rapid and comprehensive reforms to create a market economy.
- Lack of a good theory of transitioning from a centrally planned economy to a market economy in the CEEC countries.
- The road from transition - shock therapy (ex-ante) to transformation - gradualism (ex-post)
- Nölke and Vliegenthart (2009) - the emergence of dependent market economies resulted from the transition from centrally planned to market economies in CEEC countries – three factors of success: skilled but cheap labor, transfer of technological innovations within transnational enterprises; provision of capital via foreign direct investment.



## Some references on transformation in CEEC

1. Blanchard, O., & Kremer, M. (1997). Disorganization. *The Quarterly Journal of Economics*, 112(4), 1091-1126.
2. de Melo, M., Denizer C., & Gelb, A. (1996) Patterns of Transition from Plan to Market. *The World Bank Economic Review*, 10(3), 397–424.
3. Gomułka, S. (2023). Global Long-term Economic Growth and the Economic Transformation of Poland and Eastern Europe, Warszawa, Scholar Publishing House, ISBN 978-83-67450-11-9
4. Gros, D., & Steinherr, A. (2002). Economic transition in Central and Eastern Europe: Planting the seeds. Cambridge University Press.
5. Kornai, J. (1984). *Socialisme et l'économie de la pénurie*. Paris: Economica.
6. Murrell, P. (1992). Evolutionary and Radical Approaches to Economic Reform. *Journal of Economic Perspectives*, 6(4), 45-62.
7. Nölke, A., Vliegenthart, A. (2009). Enlargement of the varieties of capitalism. The emergence of dependent market economies in East Central Europe. *World Politics*, 61(4), 670–702.
8. Roland, G. (1994). On the Speed and Sequencing of Privatisation and Restructuring. *The Economic Journal*, 104(486), 1158-1168.
9. Sachs, J. (1993). *Poland's Jump to the Market Economy*. Cambridge, MA: MIT Press.

We measure economic freedom based on 12 quantitative and qualitative factors, grouped into four broad categories, or pillars, of economic freedom:

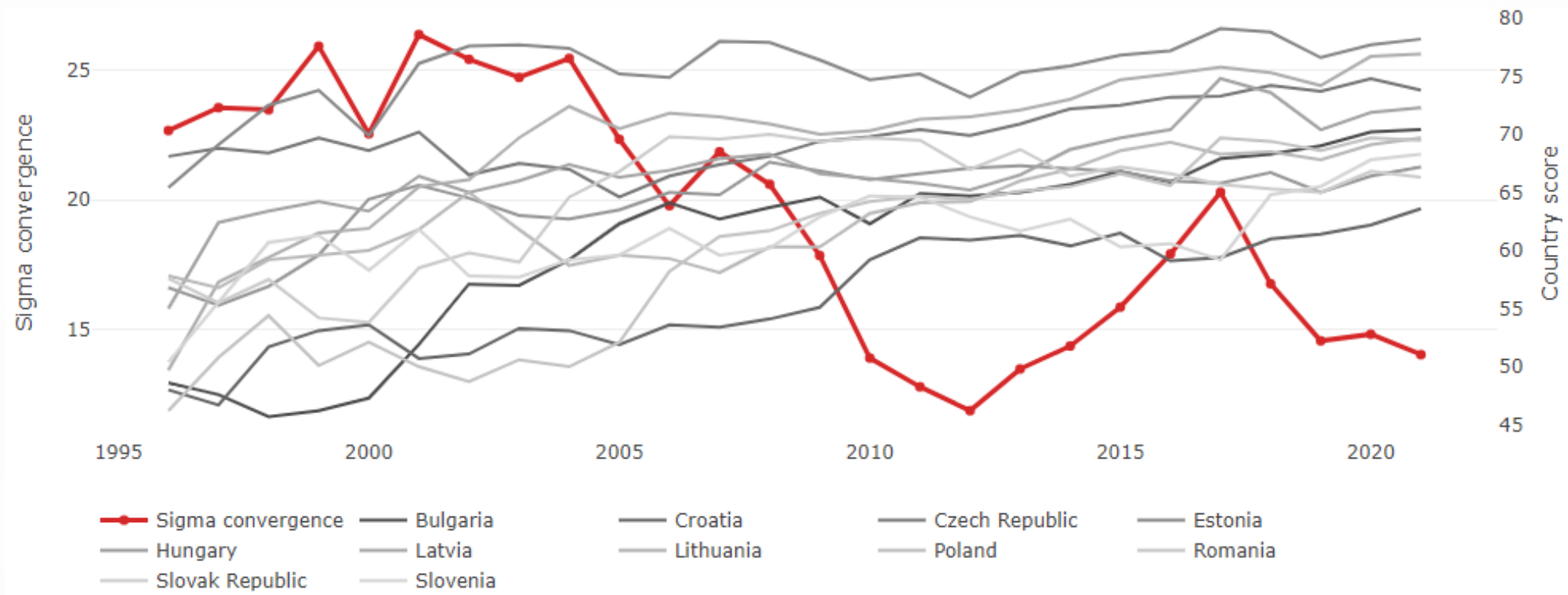
- **Rule of Law** (property rights, government integrity, judicial effectiveness)
- **Government Size** (government spending, tax burden, fiscal health)
- **Regulatory Efficiency** (business freedom, labor freedom, monetary freedom)
- **Open Markets** (trade freedom, investment freedom, financial freedom)

- EF: In 2021- the top-performing CEE countries are Estonia, Lithuania, and the Czech Republic. These countries have consistently scored high in areas such as property rights, government integrity, and trade freedom.
- Over the longer term, Poland, Hungary, and the Czech Republic have seen sustained economic growth since the 1990s, with average annual GDP growth rates of around 3-4%. These countries have also made significant progress in terms of economic freedom, with relatively high scores on the Heritage Foundation's Index.

- **Hungary** - there have been some concerns in recent years about government interference in the economy
- **Romania** - there are still some challenges in areas such as corruption and the rule of law
- **Poland** - it has faced concerns in recent years about the independence of the judiciary, restrictions on media freedom, and efforts to exert greater control over state-owned enterprises until October 2023
- **Bulgaria** - some main concerns include corruption, limited government decision-making transparency, and inadequate property rights protection.
- **Croatia** - concerns about economic freedom include a slow pace of economic reform, high public debt, and limited competition in some sectors of the economy.
- The findings presented by Gwartney and Montesinos (2017) confirmed the observations.

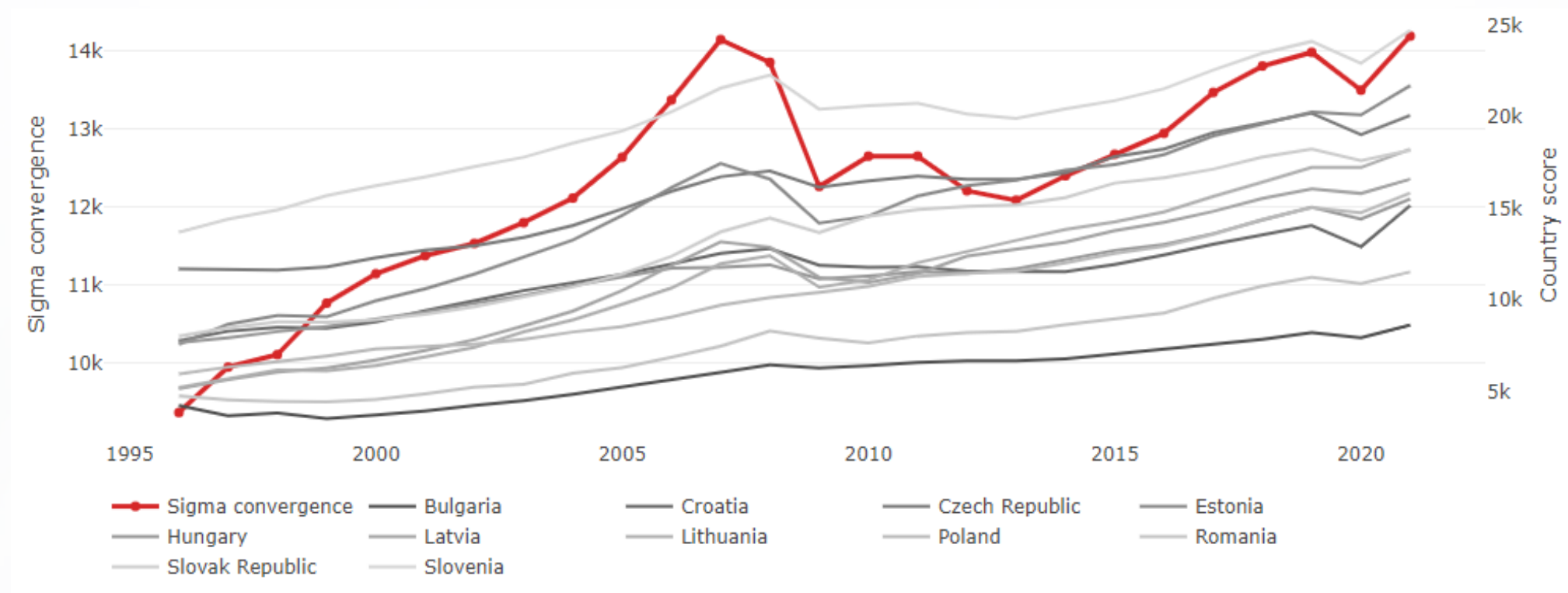
# Economic Freedom - Overall score (1996-2021)

Country score and sigma convergence



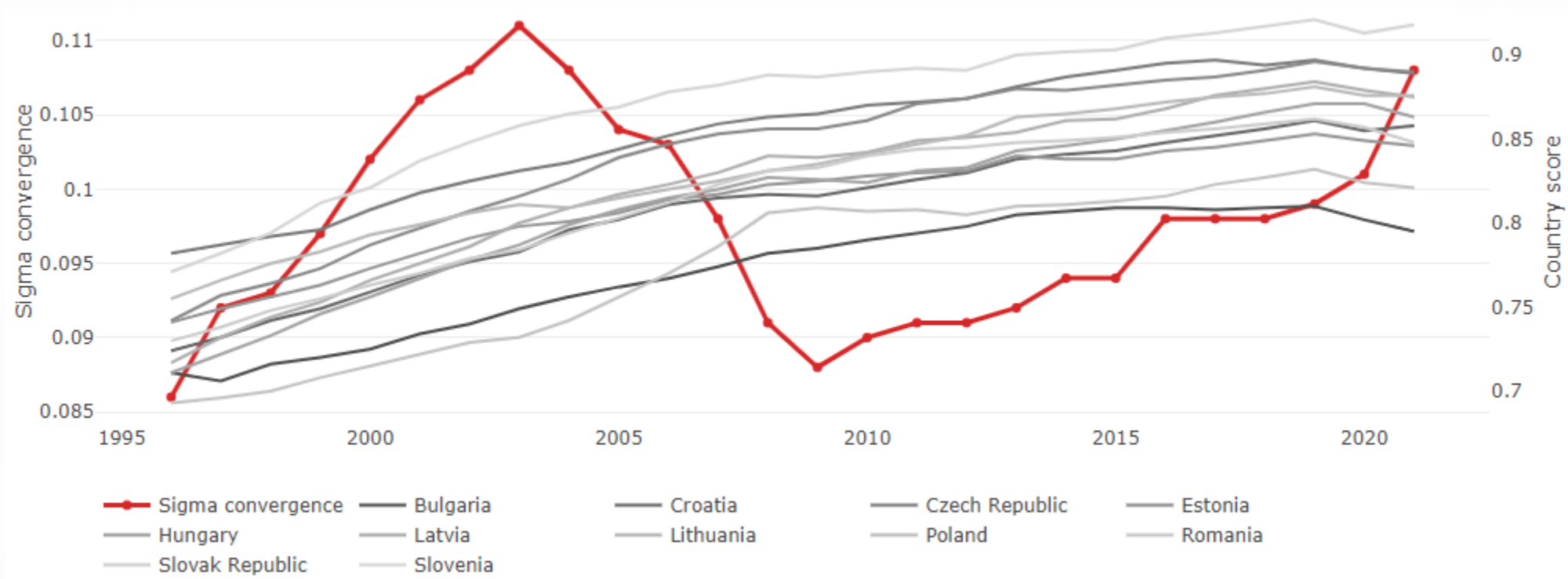
# GDP per capita (constant 2015 USD; 1996-2021)

Country score and sigma convergence



# Human Development Index (1996-2021)

Country score and sigma convergence



- **Clustering method**

The clustering procedure was performed using complete-linkage clustering, which is one of several agglomerative hierarchical methods (Everitt, Landau, and Leese, 2001). The distance between objects (countries) was calculated using Euclidean distance for each variable separately.

- **Panel ARDL model** – Pesaran and Smith (1995) and Pesaran, Shin, and Smith (1997)

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=1}^q \delta'_{ij} X_{i,t-j} + \mu_i + e_{i,t} \quad (1)$$

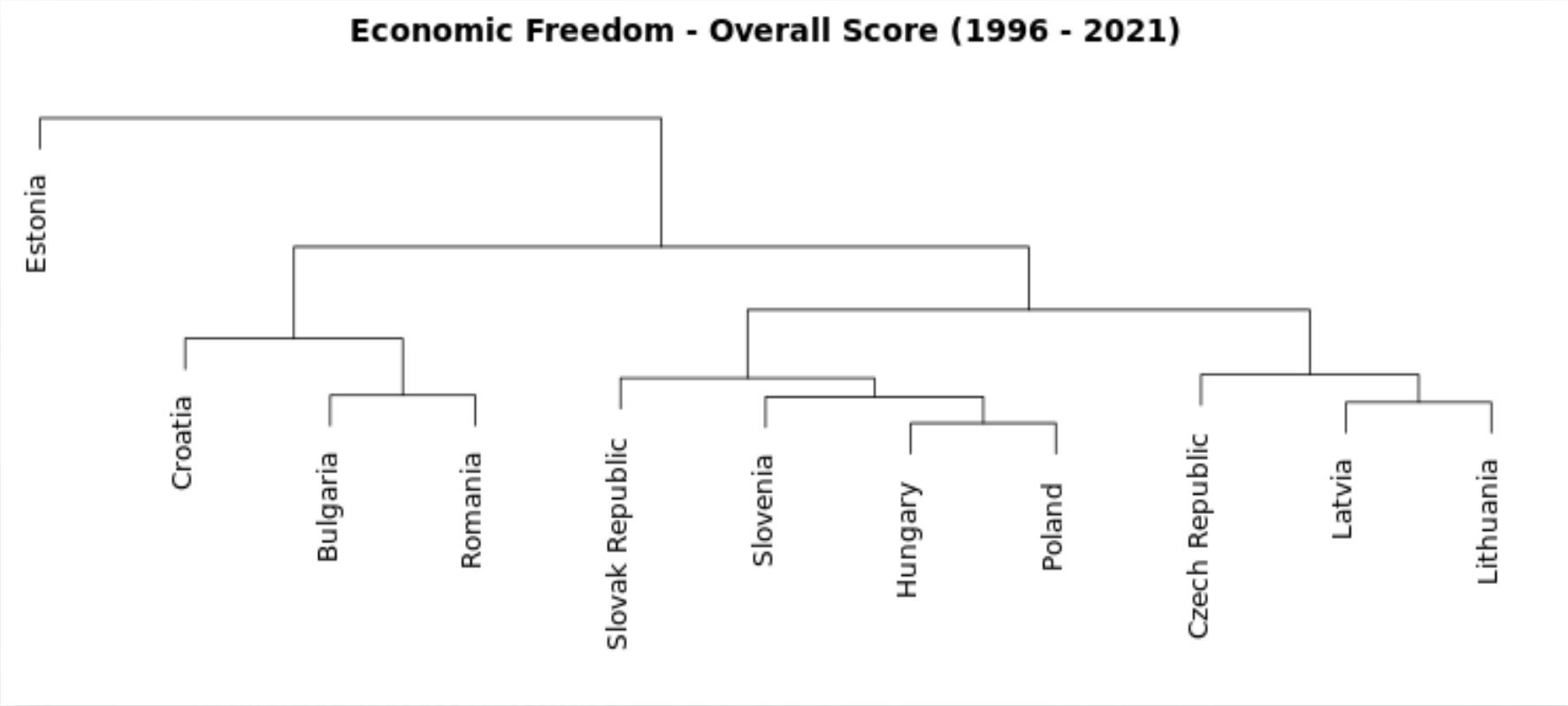
where  $i=1,2,\dots,N$ ;  $t=1,2,\dots,T$ ;  $X_{i,t}$  is a  $k \times 1$  vector of explanatory variables;  $\delta_{ij}$  is a coefficients vector;  $\lambda_{ij}$  are scalars and  $\mu_i$  represents a group-specific effect.

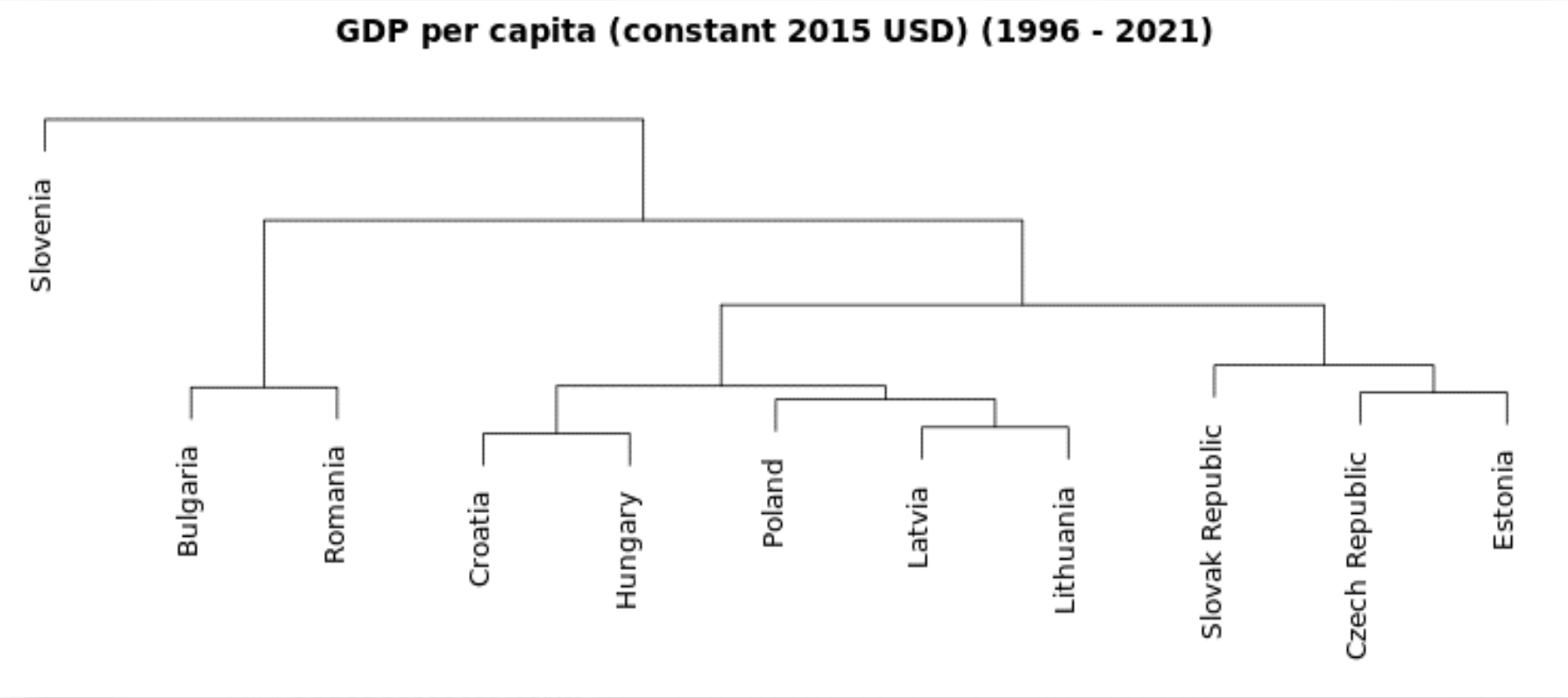
If the variables are  $I(1)$  and cointegrated - the error correction form:

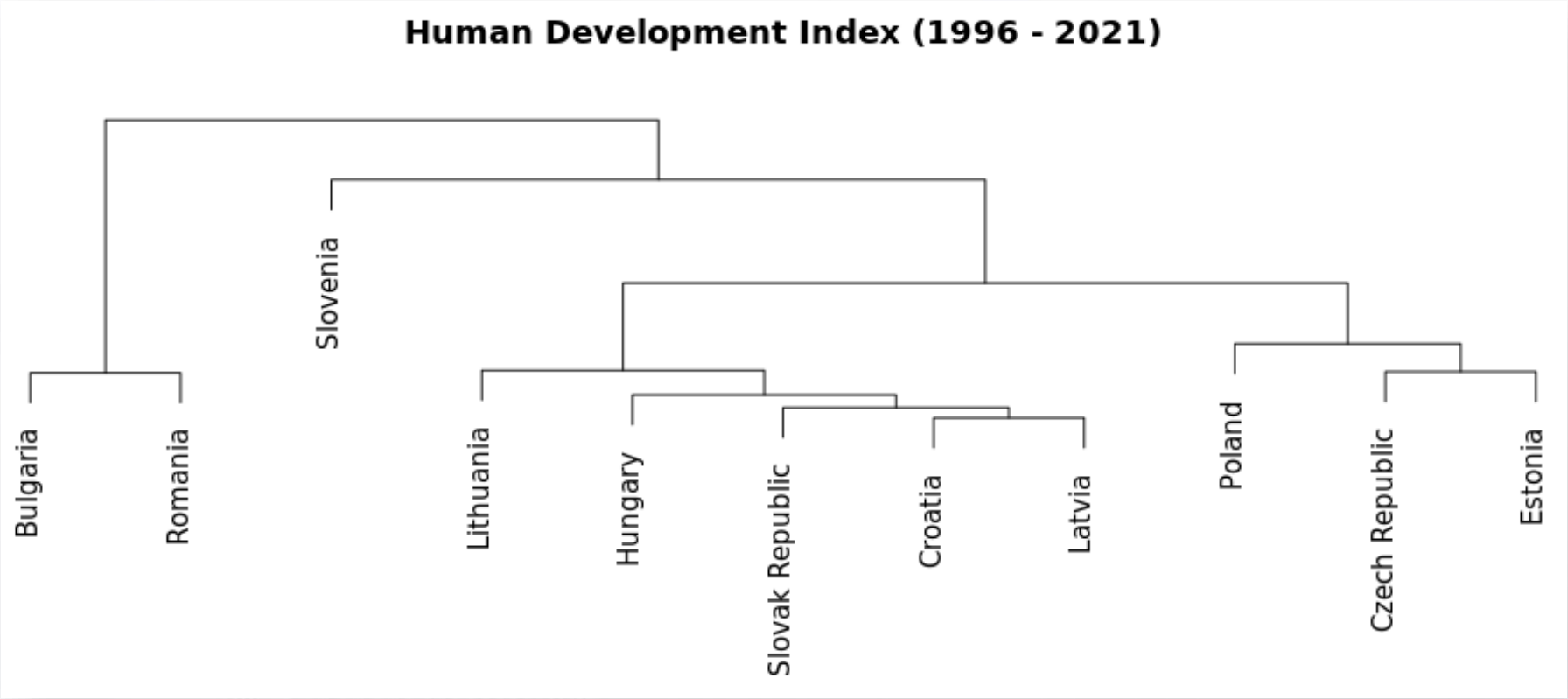
$$\Delta y_{it} = \varphi_i (y_{i,t-1} - \theta'_i X_{i,t}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,t-j} + \sum_{j=1}^{q-1} \delta'_{ij} \Delta X_{i,t-j} + \mu_i + e_{i,t} \quad (2)$$

Where:  $\varphi_i$  the error correction speed of the adjustment coefficient;  $\theta_i$  – a vector of the long-run coefficients.









Data summary: annual 1996-2021; data transformed to log – to avoid scale limitation

Variable name	Data Category	Data Source	Im, Pessaran, Shin	Stationarity Bai&Ng PANIC	Pesaran CIPS
Economic Freedom – Overall score	Economic Freedom	The Heritage Foundation	I(1)	I(1)	I(0)
Business freedom	Economic Freedom	The Heritage Foundation	I(1)	I(1)	I(1)
Financial freedom	Economic Freedom	The Heritage Foundation	I(1)	I(0)	I(0)
Government Integrity	Economic Freedom	The Heritage Foundation	I(1)	I(0)	I(0)
Government spendings	Economic Freedom	The Heritage Foundation	I(0)	I(0)	I(1)
Investment freedom	Economic Freedom	The Heritage Foundation	I(0)	I(1)	NA
Monetary freedom	Economic Freedom	The Heritage Foundation	I(0)	I(1)	I(1)
Property rights	Economic Freedom	The Heritage Foundation	I(1)	I(1)	I(1)
Tax burden	Economic Freedom	The Heritage Foundation	I(0)	I(1)	I(0)
Trade freedom	Economic Freedom	The Heritage Foundation	I(0)	I(1)	I(1)
GDPpc (USD)	Economic growth	The World Bank	I(1)	I(1)	I(1)
Gross capital formation	Economic growth	The World Bank	I(0)	I(1)	I(1)
FDI	Economic growth	The World Bank	I(0)	I(0)	I(1)
Government spendings for education	Economic growth	The World Bank	I(0)	I(1)	I(1)
Imports	Economic growth	The World Bank	I(1)	I(1)	I(1)
Exports	Economic growth	The World Bank	I(1)	I(1)	I(1)
Inflation	Economic growth	The World Bank	I(0)	I(0)	I(1)
Population	Economic growth	The World Bank	I(1)	I(0)	I(1)
Net migration	Economic growth	The World Bank	I(0)	I(1)	I(1)
Employment to population	Economic growth	The World Bank	I(1)	I(1)	I(1)
Unemployment rate	Economic growth	The World Bank	I(0)	I(1)	I(0)
HDI	Economic growth	The World Bank	I(0)	I(0)	I(1)
R&D	Economic growth	The World Bank	I(1)	I(1)	I(1)
School enrollment (2 <sup>nd</sup> )	Economic growth	The World Bank	I(1)	I(1)	I(1)
School enrollment (3 <sup>rd</sup> )	Economic growth	The World Bank	I(0)	I(0)	I(1)

# Cointegration analysis

## Cointegration test results (Westerlund, 2007 cross dependence)

Variable name	EF	EF – Emp	EF – GCapital	EF – Imp	EF – Exp	EF – Edu_spend	EF – School3	EF – School2	EF – R&D	EF – FDI	EF – Mig	EF – Unemp
<b>GDP pc</b>												
G <sub>t</sub>	0.208	<b>0.043</b>	0.908	<b>0.028</b>	0.198	0.944	<b>0.001</b>	0.357	0.264	0.071	0.229	0.178
G <sub>a</sub>	0.578	0.914	0.987	0.697	0.979	0.972	0.986	0.925	0.657	0.818	0.764	0.989
P <sub>t</sub>	0.052	0.129	0.417	<b>0.035</b>	0.701	0.691	<b>0.017</b>	0.437	0.259	<b>0.046</b>	0.063	0.078
P <sub>a</sub>	<b>0.016</b>	0.377	0.730	<b>0.028</b>	0.961	0.660	0.875	0.412	0.146	0.201	0.194	0.389
<b>HDI</b>												
G <sub>t</sub>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.018</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.057	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
G <sub>a</sub>	<b>0.033</b>	<b>0.003</b>	0.784	0.225	0.189	0.441	0.140	0.403	0.887	0.535	0.764	0.737
P <sub>t</sub>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>0.000</b>	<b>0.003</b>	<b>0.001</b>	<b>0.032</b>	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>
P <sub>a</sub>	<b>0.000</b>	<b>0.000</b>	0.081	0.002	0.000	0.134	0.060	0.015	0.224	0.040	0.230	0.072

Note: Significant results are bolded

## Cointegration analysis

- Cointegration test results (Westerlund, 2007 cross dependence) – summary table

Variable name	V2	V3	V4	V5	V6	V7	V8	V9	V10
GDP pc									
$G_t$	0.997	0.851	0.607	0.957	0.379	<b>0.001</b>	0.998	0.989	0.230
$G_a$	0.994	0.989	0.930	0.992	0.833	0.375	0.996	0.994	0.954
$P_t$	0.873	0.228	0.402	0.809	0.093	0.052	0.713	0.854	0.111
$P_a$	0.854	0.490	0.647	0.879	0.746	0.238	0.654	0.877	0.421
HDI									
$G_t$	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.112	<b>0.000</b>	<b>0.000</b>
$G_a$	<b>0.013</b>	<b>0.042</b>	<b>0.050</b>	<b>0.047</b>	0.608	<b>0.005</b>	0.448	0.578	0.587
$P_t$	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.052	<b>0.000</b>	<b>0.000</b>
$P_a$	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.050</b>	<b>0.001</b>	0.070	0.120	0.075

Note: Significant results are bolded V1 - Economic Freedom Overall score, V2 - Property rights, V3 - Government Integrity, V4 - Tax burden, V5 - Government spendings, V6 - Business freedom, V7 - Monetary freedom, V8 - Trade freedom, V9 - Investment freedom, V10 - Financial freedom

$$GDPpc_{it} = deterministic + \beta_{1i}EF_{it} + \beta_{2i}X_{it} + u_{it}$$

Estimated panel ARDL models

$$HDI_{it} = deterministic + \beta_{1i}EF_{it} + \beta_{2i}X_{it} + u_{it}$$

Endogenous variable	$\Delta GDP_{pc}$		$\Delta HDI$	
Variable	Model 1	Model 2	Model 3	Model 4
<b>Long-run (pooled) eq</b>				
EF	7.0174 [0.000]	1.3772 [0.034]	0.8503 [0.000]	0.5093 [0.003]
Imp		0.8227 [0.000]		0.0643 [0.000]
EURO2004	0.1501 [0.009]			
C		18.890 [0.000]		
<b>Short-run (mean-group) eq</b>				
COINTEQ	-0.0828 [0.029]	-0.1543 [0.000]	-0.1034 [0.000]	-0.1136 [0.000]
Pop		-0.1452 [0.000]		
Unemp		-0.0031 [0.000]		
$\Delta EMP$		0.2879 [0.000]		0.0355 [0.000]
$\Delta GCapital$		0.1171 [0.006]		
$\Delta SCHOOL2$				0.0577 [0.001]
C	-0.0493 [0.331]		-0.1402 [0.000]	-0.1290 [0.000]
BIC	0.5213	1.2215	0.1900	1.0062

## Granger causality test results

Granger causality: Dumitrescu-Hurlin									
Economic Freedom Overall score	Property rights	Government Integrity	Tax burden	Government spendings	Business Freedom	Monetary freedom	Trade freedom	Investment Freedom	Financial freedom
<b>GDPpc-&gt;EF</b>									
yes	no	yes	yes	no	no	yes	yes	yes	no
<b>EF-&gt;GDPpc</b>									
no	no	no	no	no	yes	no	no	no	no
<b>HDI -&gt;EF</b>									
yes	no	yes	yes	no	yes	yes	yes	yes	no
<b>EF-&gt; HDI</b>									
no	yes	no	no	no	no	no	no	no	no



1. The paper aimed to find out the relationships between economic freedom (EF) and economic growth (GDPpc) as well as economic development (HDI) in Central and Eastern economies from 1996 to 2021.
2. We found similar groups of countries and the most influential variables. Concerning economic freedom - overall indicator, we confirmed that in the examined period, the following groups could be distinguished: Estonia (the leader), Czech Republic, Latvia and Lithuania (2<sup>nd</sup>), Hungary, Poland, Slovakia, and Slovenia (3<sup>rd</sup>), and Bulgaria, Croatia and Romania (4<sup>th</sup>).
3. The most influential part of economic freedom across countries is related to monetary freedom, property rights, and financial freedom.

Table of links

4. By applying the panel ARDL model, we confirmed that:

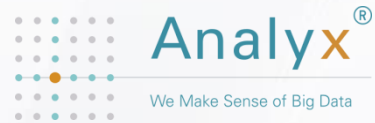
- a long-run relationship exists between economic freedom and GDP per capita and the Human Development Index, i.e. economic growth and development, respectively.
- Factors such as gross capital formation and the employment-to-population ratio strengthened GDP per capita growth, while the unemployment rate and population growth weakened it. For HDI, the employment-to-population ratio, secondary school enrollment, and educational reforms played a supportive role.
- The short-run adjustment coefficients are negative and statistically significant for the entire panel and individual countries.

5. Cointegration analysis revealed that during and after the transformation period, the forces related to introducing a new institutional order and improving living standards, including GDP, education, and health, acted simultaneously, forming the present state of the arts of CEE countries.

6. Granger causality between GDP pc, HDI, and economic freedom overall indicator and its components demonstrated that in the short run, GDP pc and HDI preceded economic freedom apart from business freedom, which was the cause for GDP pc., and property rights, which preceded HDI.

1. To examine the role of institutions, such as the rule of law, property rights protection, and government transparency, in shaping the relationship between economic freedom and economic growth in CEE countries (individual country level).
2. To determine if economic freedom and its components have a similar impact on different sectors of the CEE economies, i.e. industry, building and construction, farming, trade, etc. (sectoral analysis)
3. To examine the causes of convergence/divergence processes in CEEC and its historical sources

Thank you



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