



CONCEPTUAL THINKING ABOUT REGIONAL COMPETITIVENESS: COMPETITION, REGION TYPES, MODELING, AND MEASURING

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THINK GLOBALLY,
ACT LOCALLY,
PANIC INTERNALLY



Compete globally,
collaborate locally,
'competitive cooperation' internally,
develop independently

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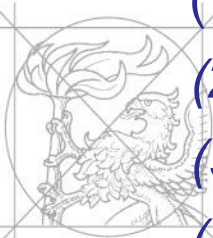
Starting points

Main subject areas on regional competitiveness (Barkley 2008):

- (1) definitions, conceptualizations and modeling of competitiveness;
- (2) measures of competitiveness, estimation of competitiveness indices (ratings, rankings, scores); and
- (3) benefits and shortcomings of following a strategy to enhance regional competitiveness.

Main questions of modeling and structure of my lecture:

- (1) *Is there competition among regions?*
- (2) *How can regional competitiveness be defined?*
- (3) *What indicators should be used to measure it?*
- (4) *Which factors are influencing it and how?*

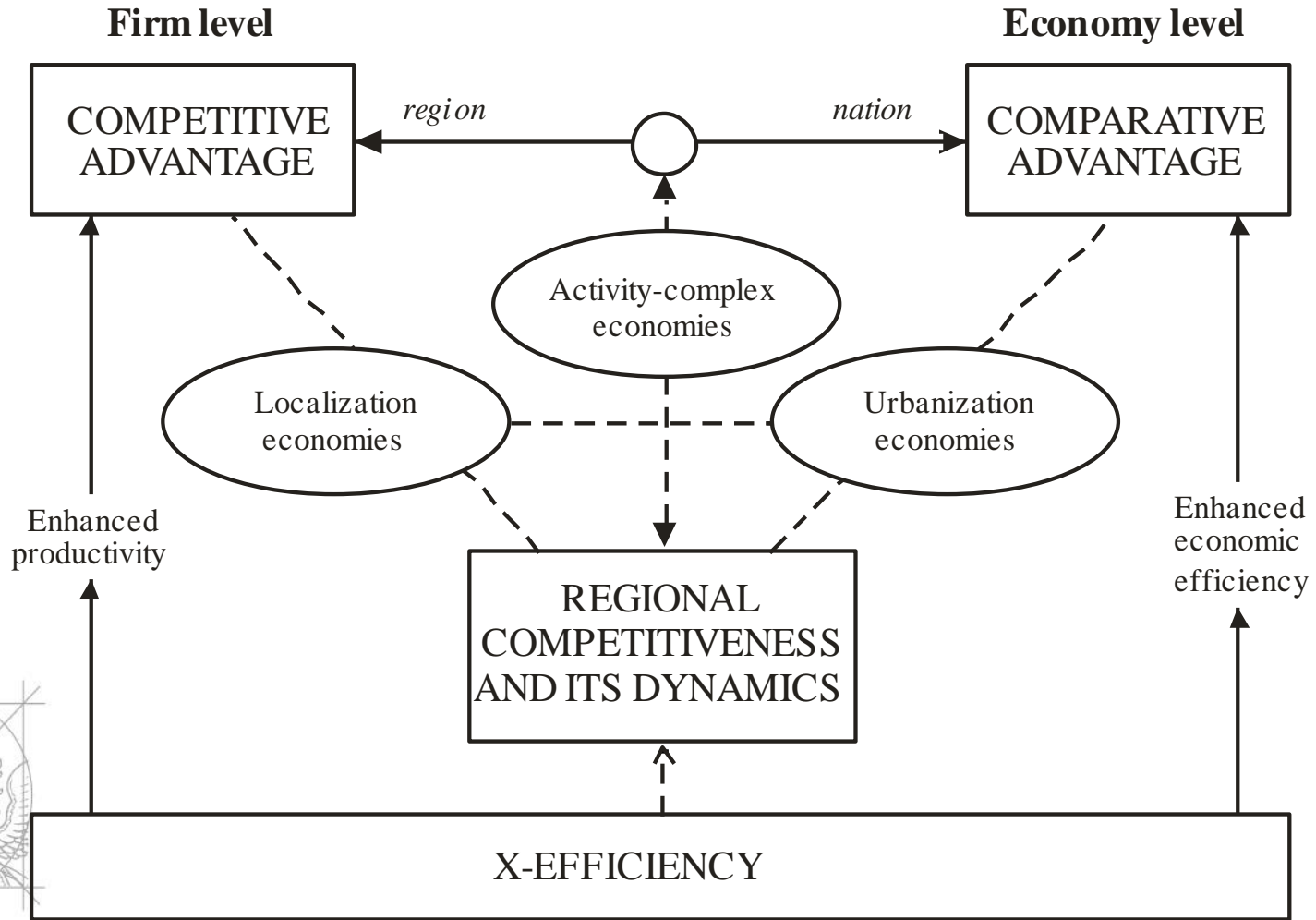


1. Is there competition among regions?

- Krugman (1994): there is no competition among countries, because in an international division of labor based on **comparative advantages** every nation may become a winner
- Porter (2008): 'territorial competition is existing, but it is based on **competitive advantages**'
- Malecki (2002): 'in the competition among the different regions within a country *scarcity* derives from two interrelated factors: investments made in the new market segments demanding special expertise and talented experts' and 'in short, **competition among cities is real** and has become 'fiercer''
- Capello (2007): '**Regions compete on absolute rather than comparative advantage**'



Budd and Hirmis (2004): integrated model for territorial competition



Main dilemmas of interregional competition

1. Region types (territorial units, aggregation levels)

- Normative regions (measuring) and/or functional (nodal) (improving) regions
- ESPON settlement hierarchy (5 city-tiers)
- Hall (1997) and others: mega cities, world cities, global cities, ...
- Parkinson (2013): capital cities, second-tier cities
- USA: metropolitan regions, nonmetropolitan regions (areas)
- McCann (2008): industrial clusters in interregional competition (by transaction costs)
 - **pure agglomeration** (urban): urbanization agglomeration economies (NEG)
 - **industrial complex** (local but not urban): localization agglomeration economies
 - **social networks** (local but not urban): localization agglomeration economies

2. Dimensions of interregional/territorial competition:

- **Direct competition:** between firms, inside same industry (transferable goods, services) → horizontal competition (between regions of same type)
- **Indirect competition:** between regions for attracting firms, institutions, talented experts, sources for public goods → vertical competition (between regions of all type)



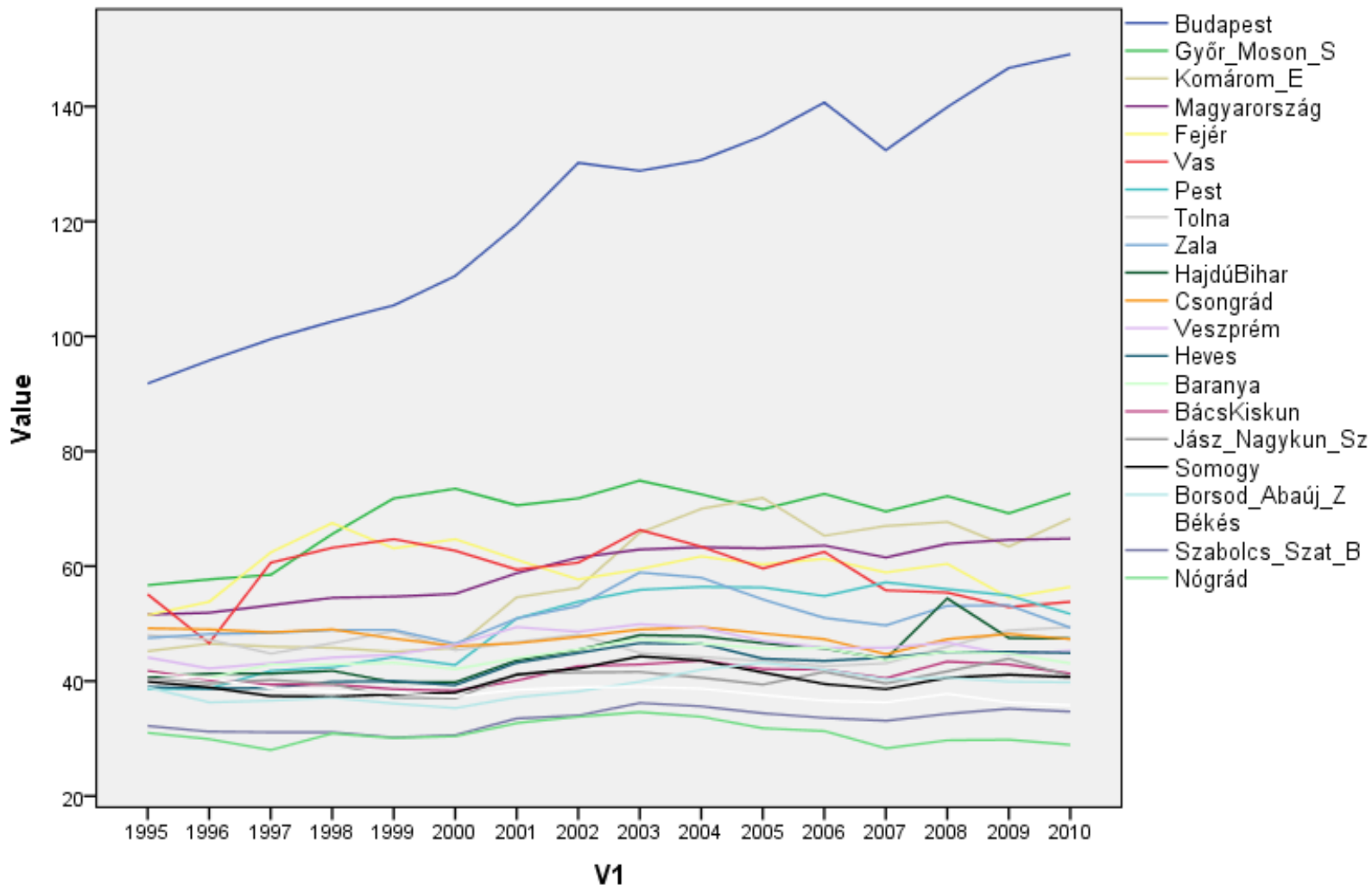
Hungarian territorial system



Level of territorial units	Number of territorial units
NUTS 2 = region	7
NUTS 3 = county	19 + Budapest (capital)
LAU 1 = microregion	176

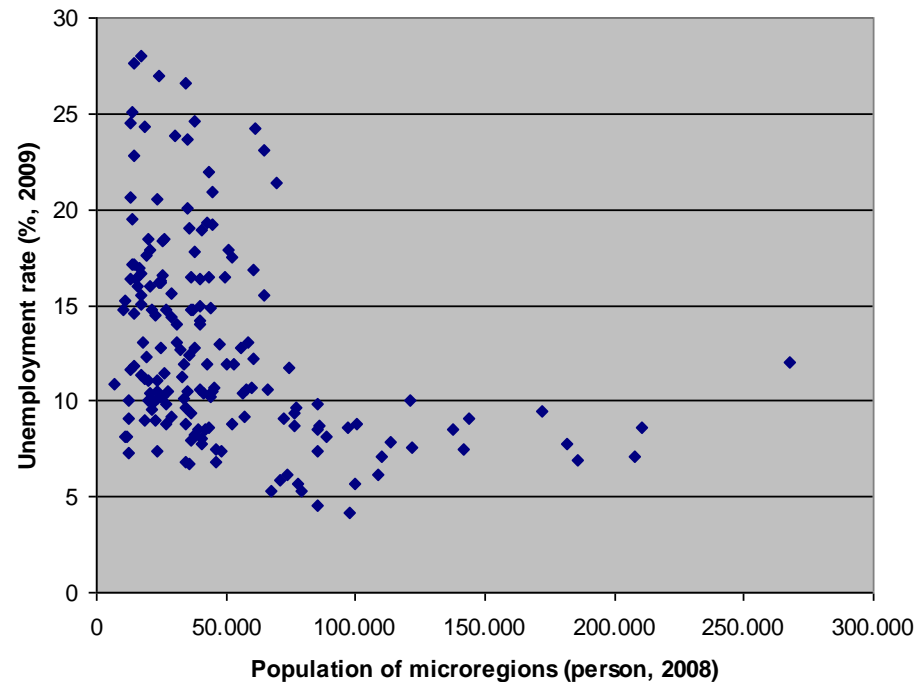
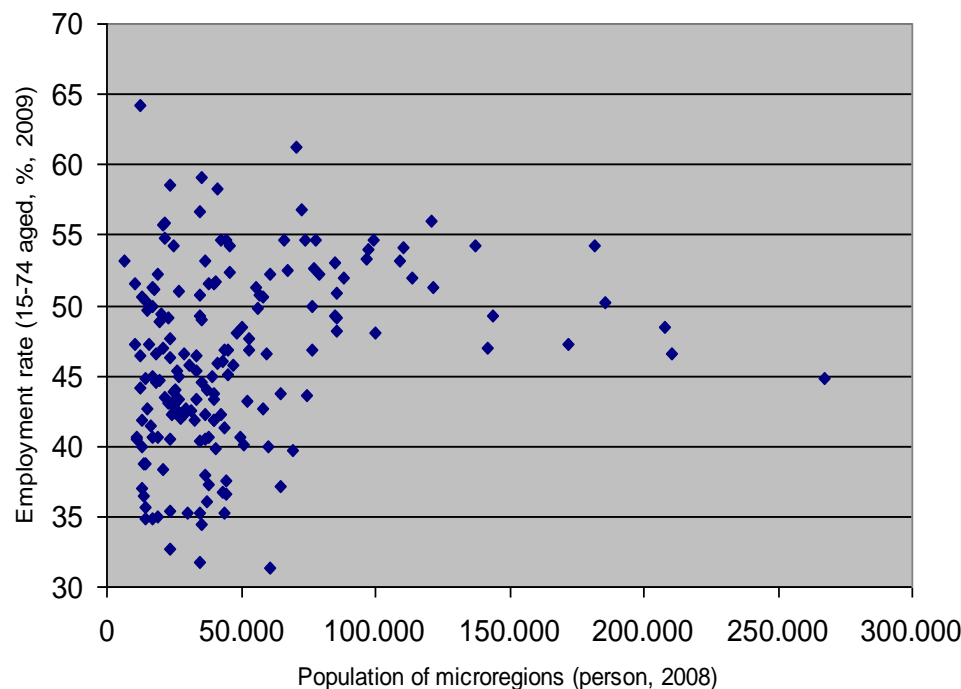


GDP/ capita of the Hungarian countries, NUTS3 (EU-27=100, PPS)



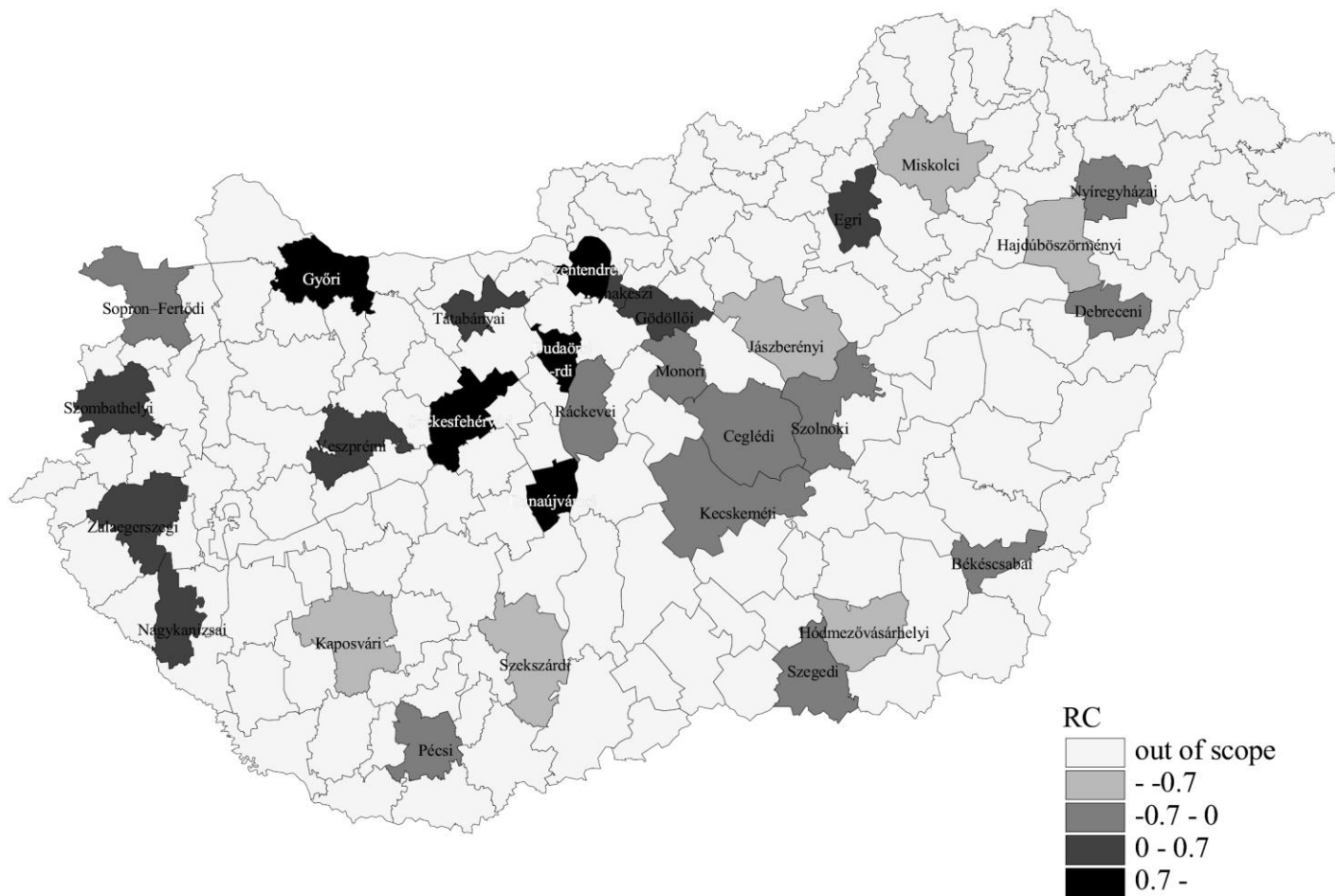
The types of 176 microregions (LAU1), according to agglomeration economies:

- *Budapest* (population of 2 million): **urbanization agglomeration economies** (Jacobs' externalities)
- *31 urban microregions* (OECD: at least 50.000 living in town, sum total 3.6 million): **localization agglomeration economies** (MAR externalities)
- *144 small (rural type) microregions* (sum total 4.4 million)



Types of 31 microregions by localization economies (clusters)

(Lengyel-Szakálné Kanó 2012)



Competitiveness types of 31 Hungarian urban microregions (LAU1) (approx nodal regions, travel-to-work districts)

- **Budapest and microregions around it** (about 3 million inhabitants): developing quickly → **urbanization agglomeration economies**
- **Manufacturing microregions**: outside-oriented, significant FDI and export, high (manual workers) employment, but weak RTD and human capital. These regions are located at the northwestern border and in the central region, and are well-integrated into the EU economy → **localization agglomeration economies** (cluster type: industrial complex)
- **University towns**: excellent human capital and state-financed RTD, but a low level of export capabilities in the business sector, low levels of productive capital, labor productivity and employment → **potential localization agglomeration economies** (cluster type: social networks)
- **Remaining urban microregions**: weak human capital, low levels of traded sectors, usually surrounded by rural settlements



(2) How can be regional competitiveness defined?

Storper (1997): place competitiveness is ‘the ability of an (urban) economy to attract and maintain firms with stable or rising market shares in an activity while maintaining or increasing standards of living for those who participate in it’

European Competitiveness Report (EC 2008, p. 15): “Competitiveness is understood to mean a sustained rise in the standards of living of a nation or region and as low a level of involuntary unemployment, as possible.”

Porter (2008): “competitiveness depends on the productivity with which a location uses its human, capital, and natural resources”

Dijkstra – Annoni - Kozovska (2011) *A New Regional Competitiveness Index (EU, by WEF methodology)*

But some critical reflections on regional competitiveness: Kitson, Martin and Tyler (2004), Bristow (2010)

Capello (2007) in the textbook of ‘Regional economics’: connection between territorial competitiveness and regional development, as well as regional growth (both for endogenous and exogenous)

Regional competitiveness: *economic growth driven by high labour productivity and high employment rate (and high household income)*



(3) What indicators should be used to measure it?

Huggins (2003) recommends three-level model for measuring competitiveness: inputs, output, and outcomes

- inputs are described by three indicators: business density (firms/capita), knowledge based business (per cent of all businesses), and economic participation (activity rates)
- output is estimated by productivity (GDP per capita)
- outcomes consist of two indicators: earnings (full time wages), and unemployment (ILO)

Kitson, Martin and Tyler (2004) measuring competitiveness: regional productivity, employment rate and standard of living

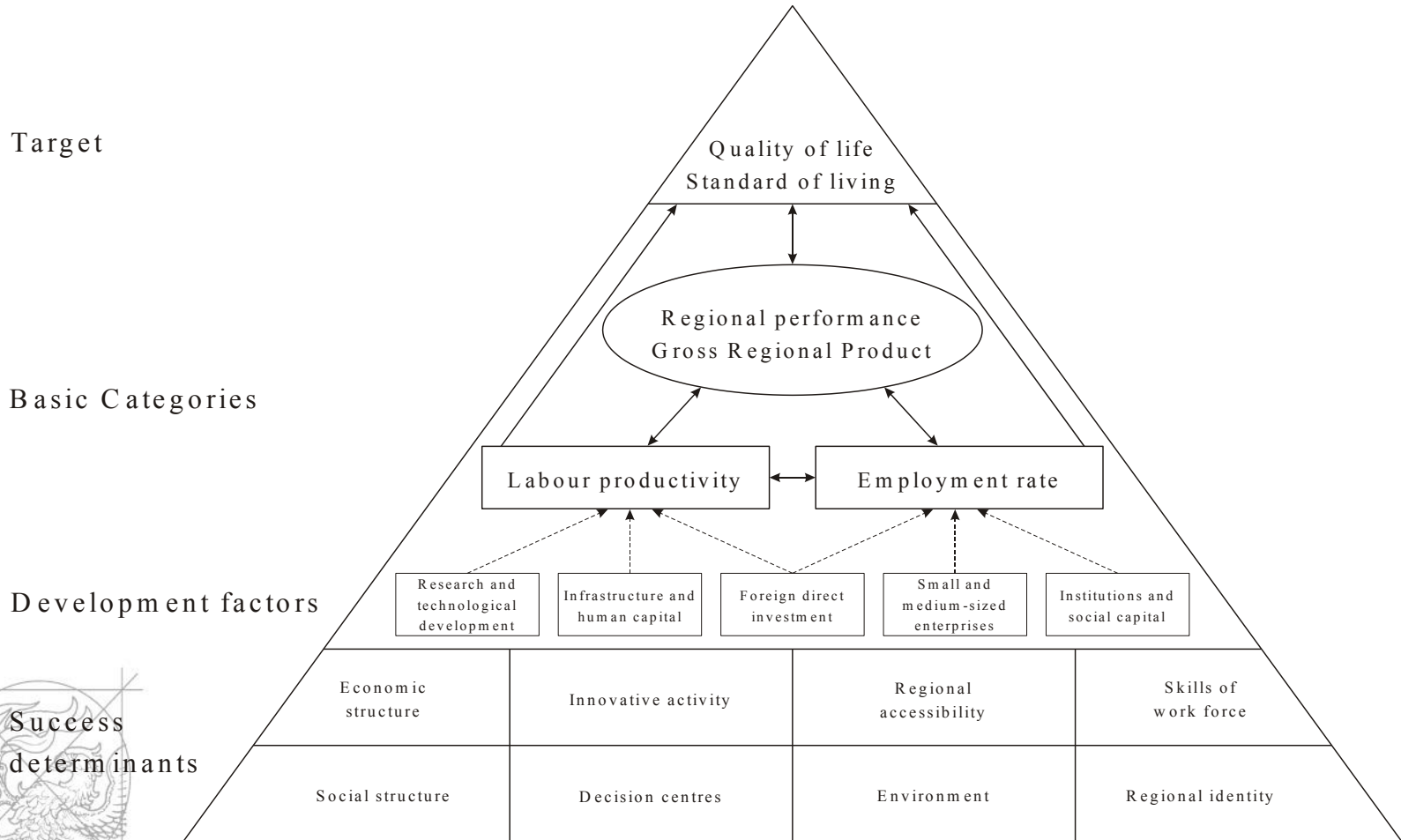
Stimson and Stought (2010): role of leadership and institutions as factors for endogenous development of non-metropolitan regions

Porter (2003): traded sector/agglomeration economies: export base theory and traded (innovative) clusters



Traditional pyramid model for regional competitiveness

(Lengyel 2000, 2004)



Sub-pyramids

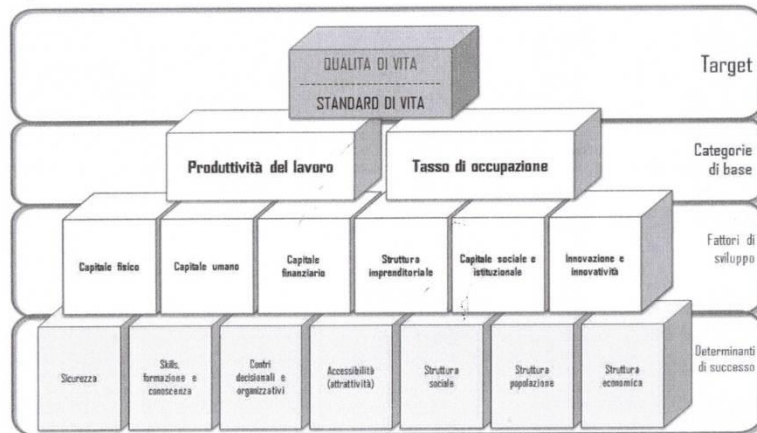
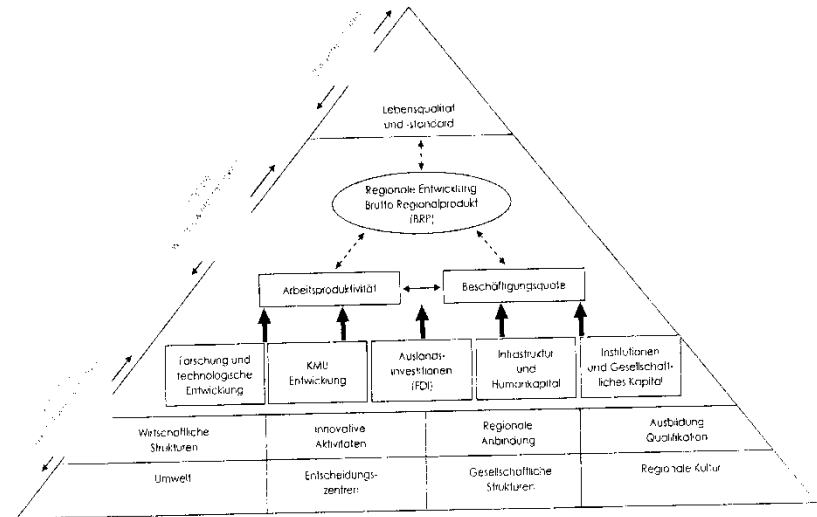
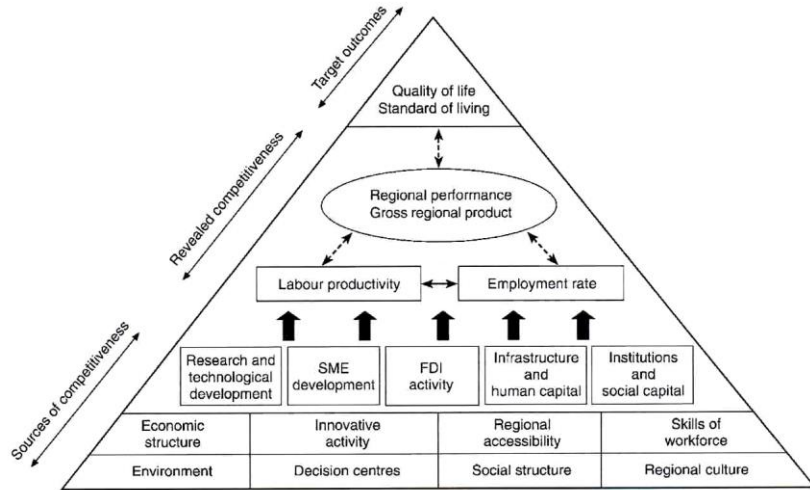
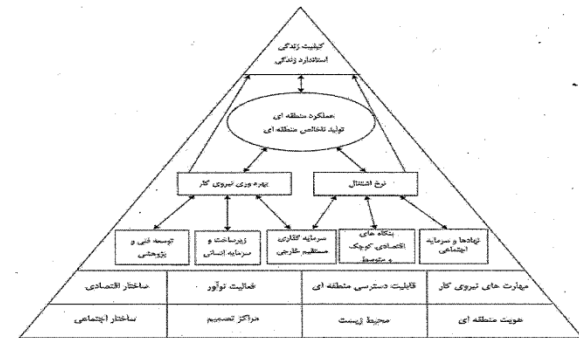


Figura 1: Modello piramidale della competitività economica regionale
Fonte: Elaborazione O-Pol per IRE (su Lengyel 2003), 2011

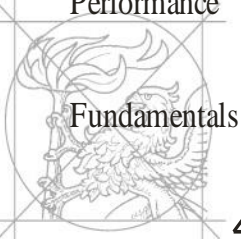
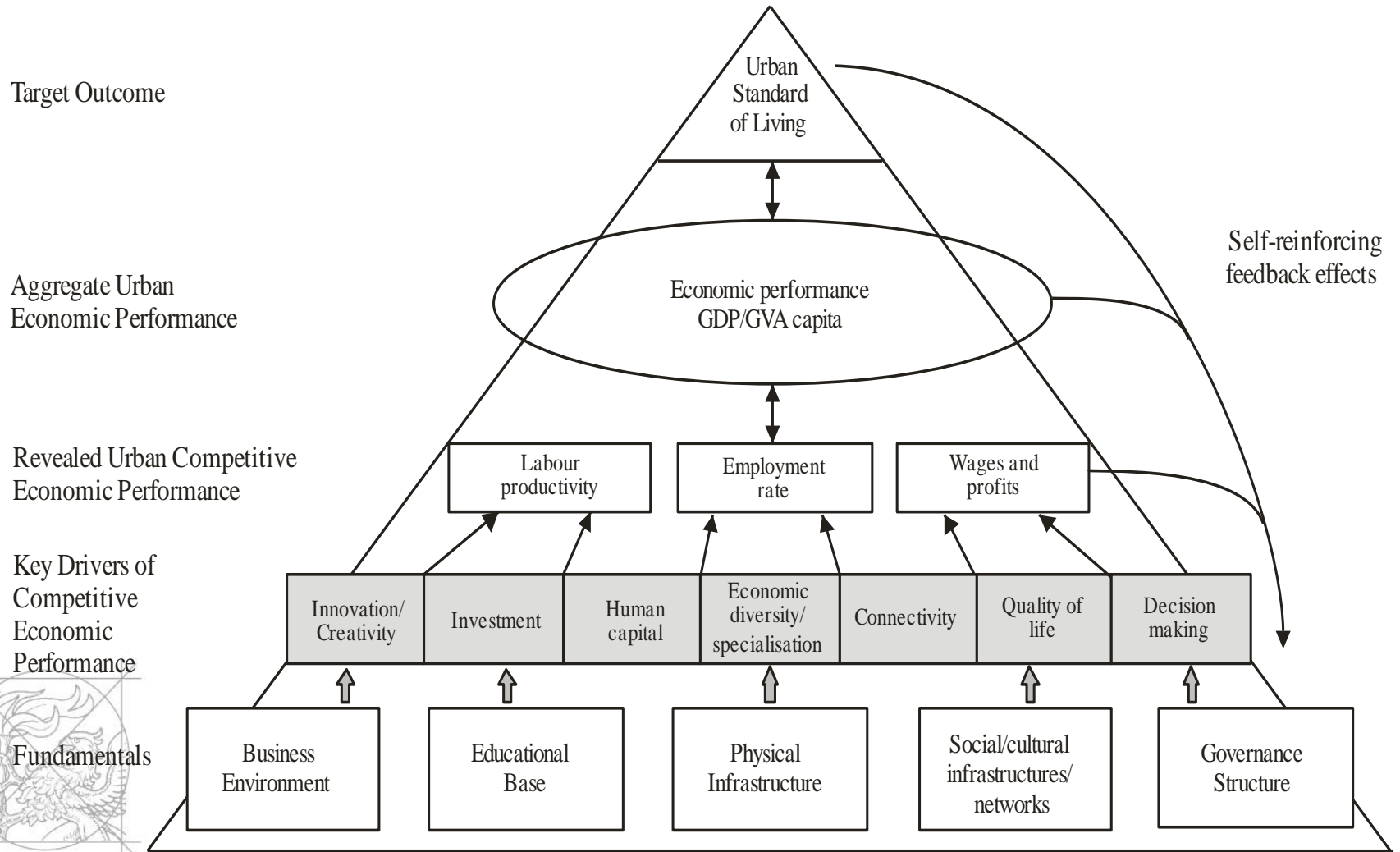
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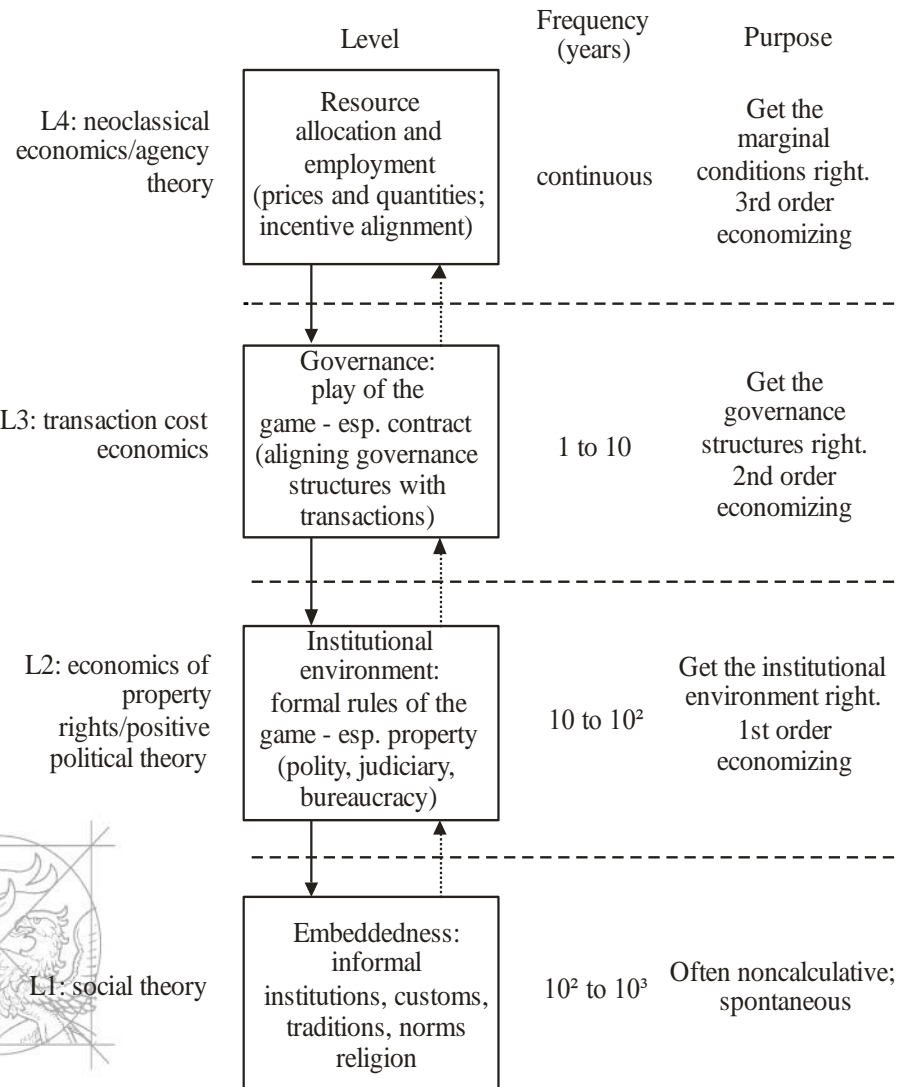
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Parkinson et al (2006): urban competitive performance



Modifying the pyramidal model

(Williamson (2000): levels of social analysis)



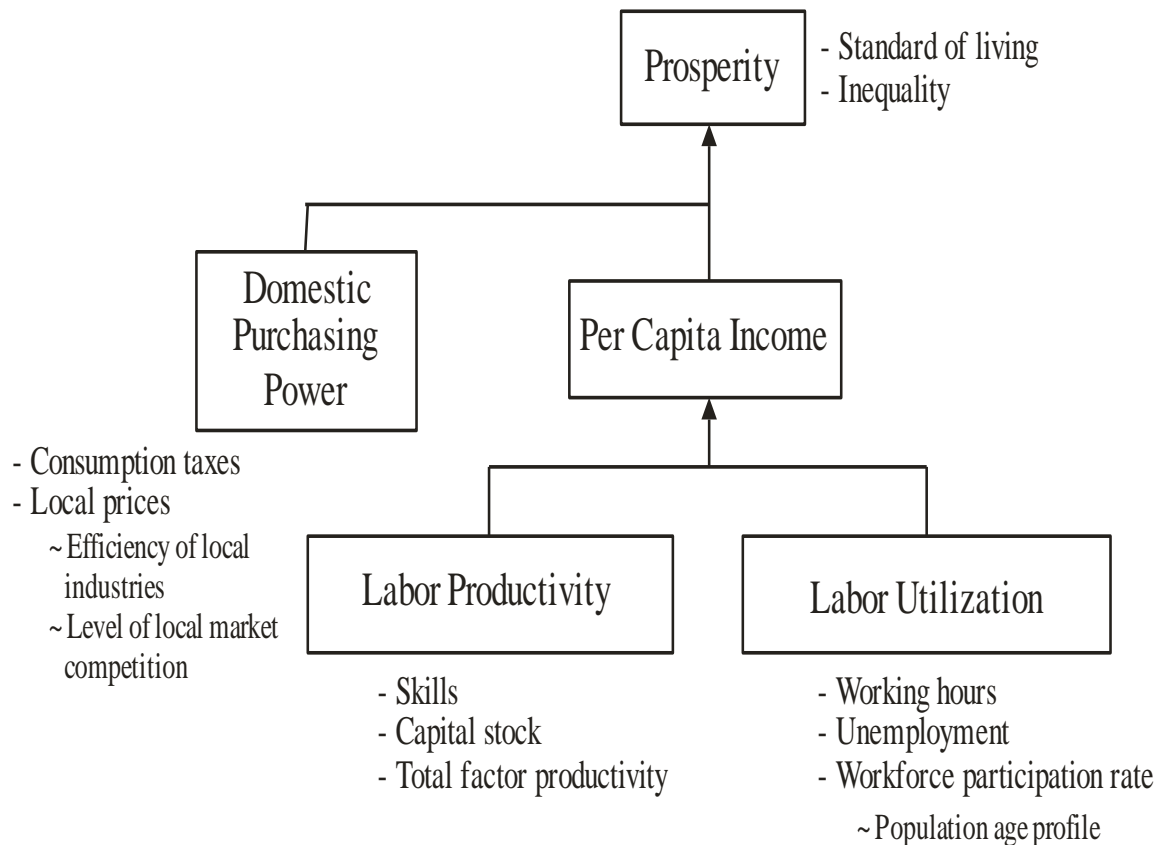
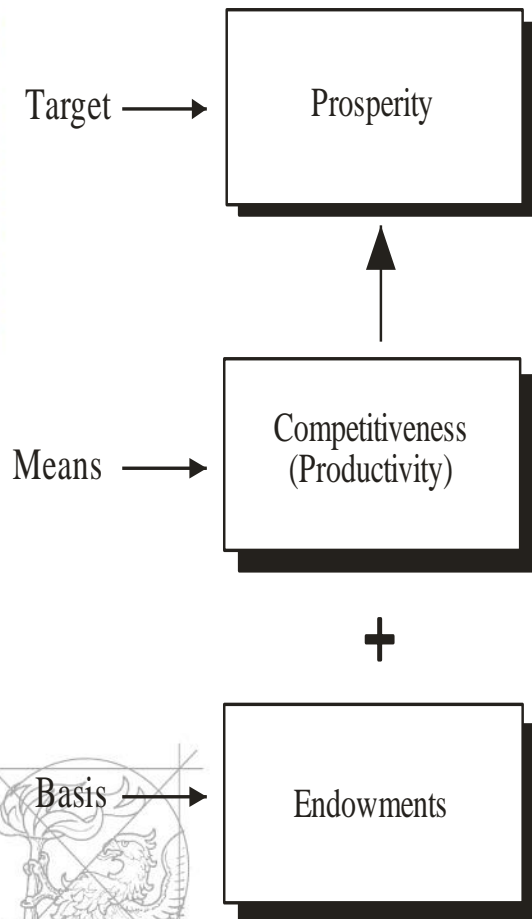
L4: Outputs: economic growth, revealed competitiveness (measuring competitiveness)

L3: Economic development drivers (improving competitiveness)

L2: Economic/social development fundamentals (influencing competitiveness)



Porter (2007): measuring regional competitiveness



Renewed pyramidal model for nodal regions

L4 level: Revealed competitiveness: employment rate, labor productivity, wages (disposable income of households) (GDP measuring is questionable)

L3 level: Drivers of competitiveness

Traditional regional economic growth:

$$Y = f(L, K, T)$$

Where: - L labour: human capital

- K capital: productive capital and FDI

- T technology: research and technological development

+ **Endogenous regional economic development** (Stimson and Stought 2009):

$$Y = f(L, K, T, C, L_s)$$

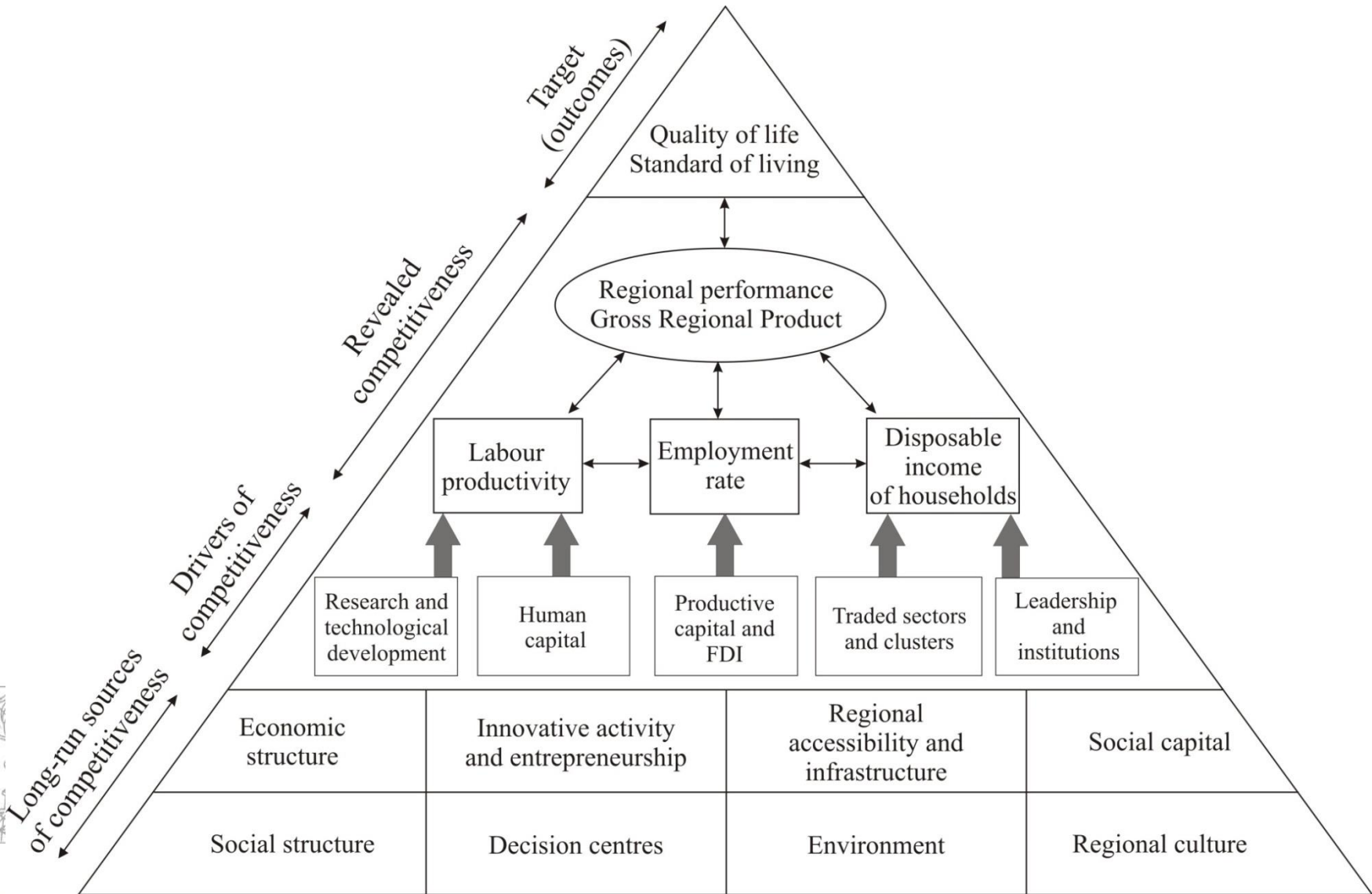
Where: - **C: Traded sectors and clusters (agglomeration economies)**

- **Ls: Leadership and institutions**

→ renewed model of regional competitiveness with endogenous regional drivers of competitiveness



Renewed pyramidal model for nodal regions



Regional Competitiveness Function (RCF)

$$RC (EMP, LPR, DIH) = f (RTD, HUM_CAP, CAP_FDI, TS_CLUST, LED-INST)$$

Where dependant variables: RC - revealed competitiveness indicators

- EMP – employment rate
- LPR – labour productivity
- DIH – disposable income of households

Where explanatory variables:

- RTD – research and technological development
- HUM_CAP – human capital
- CAP_FDI – productive capital and FDI
- TS_CLUST – traded sectors and clusters
- LED-INST – leadership and institutions

→ regional competitiveness function is mixed construction:

- exogenous and/or endogenous?



Empirical study for competitiveness of Central Europe regions

(Lengyel 2012, Lengyel-Rechnitzer 2013)

We study the competitiveness of 93 NUTS2 regions of Central Europe:

- Austria: 9 regions, Czech Republic: 8 regions, Germany: 39 regions, Hungary: 7 regions, Poland: 16 regions, Romania: 8 regions, Slovakia: 4 regions, Slovenia: 2 regions

Principal component analysis (3 dependant variables): **RC is principal component**

- RC contains 92,8 % of the 3 indicators information
- commonalities:
 - Labprod07: 0,938
 - Empr1509: 0,883
 - Dispinc07: 0,961



Indicators of empirical study

Revealed competitiveness (RC): 3 indicators

Competitiveness factors: 21 indicators

RTD - research and technological development: 5 indicators

HC - human capital: 5 indicators

PC_FDI - productive capital and FDI: 1 indicator

TSC – traded sectors and clusters: 2 indicators

SCI - social capital and institutions: 8 indicators

Code	Denomination	Source
<i>Revealed competitiveness</i>		
labprod07	Labour productivity in industry and services (GVA per employee, in the average of EU27), 2007, %	CR5
empr1509	Employment rate of the age group 15-64, 2007, %	Eurostat
dispinc07	Disposable income of private households (Purchasing power standard based on final consumption per inhabitant), 2007	Eurostat



Research and Technological Development

gerd07	Total intramural R&D expenditure (GERD), percentage of GDP, 2007, %	Eurostat
emphigh08	Employment in high-technology sectors within the number of total employed, 2008, %	CR5
fp707	7th Framework Program, average funding per head (EU27= 100), %	CR5
pat1607	Patent applications to the European Patent Office (EPO), average 2006-2007, per inhabitant	CR5
lisbind08	Lisbon Index (0–100), 2008	CR5

Human Capital

adedu08	Population aged 25-64 with tertiary education (ISCED 5-6), 2008, %	CR5
tertedu34	Population aged 30-34 with a tertiary education (ISCED 5-6), 2008, %	CR5
age25-64	The proportion of people aged 25–64 in the total population, 2004, %	CR4
weekly10	The number of average weekly hours worked (in full-time job), 2010, hour	Eurostat
mwork78	That proportion of people from the active age population who moved into the region from outside in the past two years (from within the EU, 2007–2008, %	CR5



Productive Capital and FDI

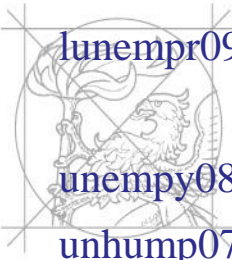
gfcf07	Gross fixed capital formation per inhabitant (all NACE activities), 2007, Euro	Eurostat
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Traded Sectors and Clusters

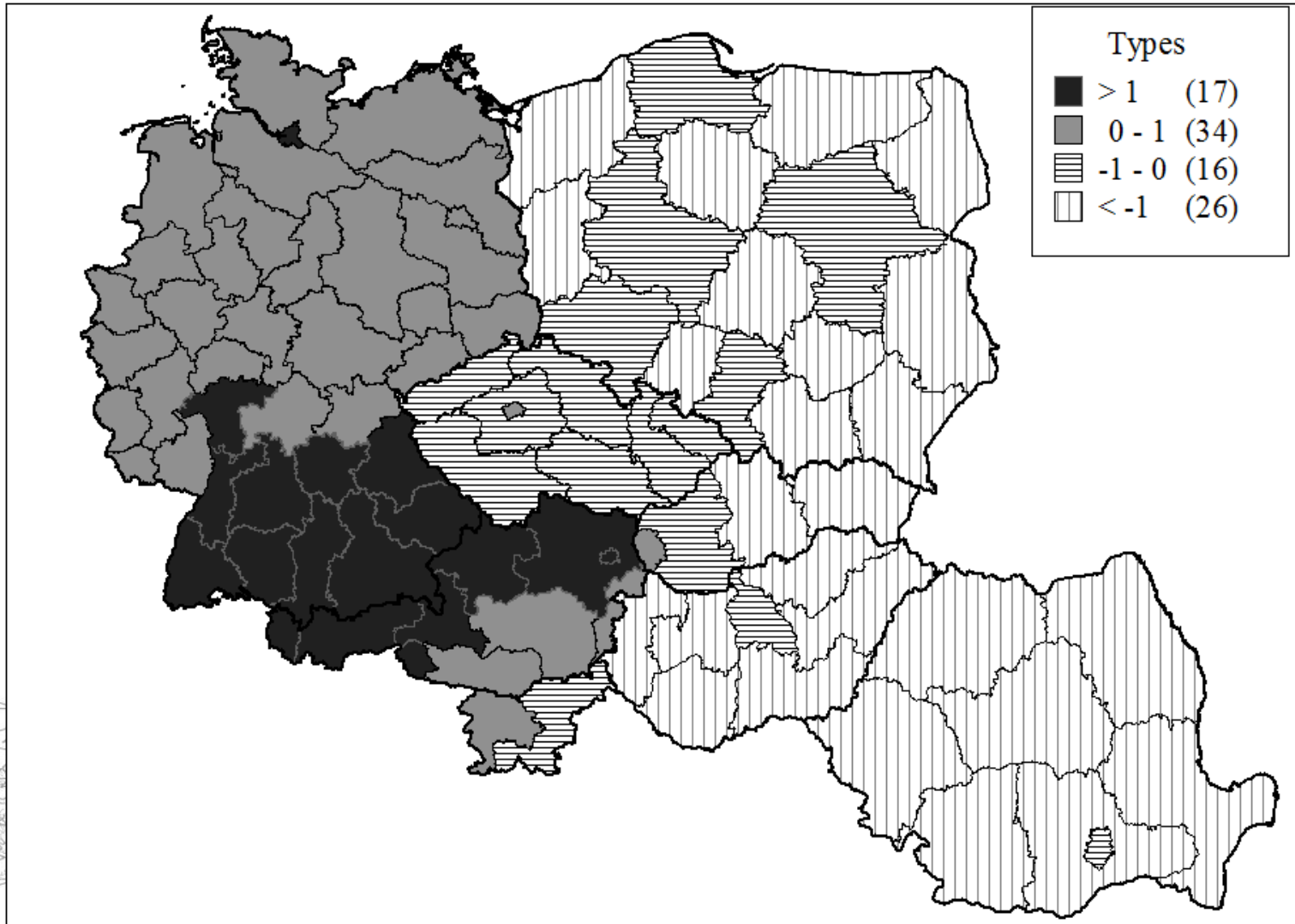
indust05	Employment in industry (% of total employment), 2005, %	CR4
serv05	Employment in services (% of total employment), 2005, %	CR4

Social Capital and Institutes

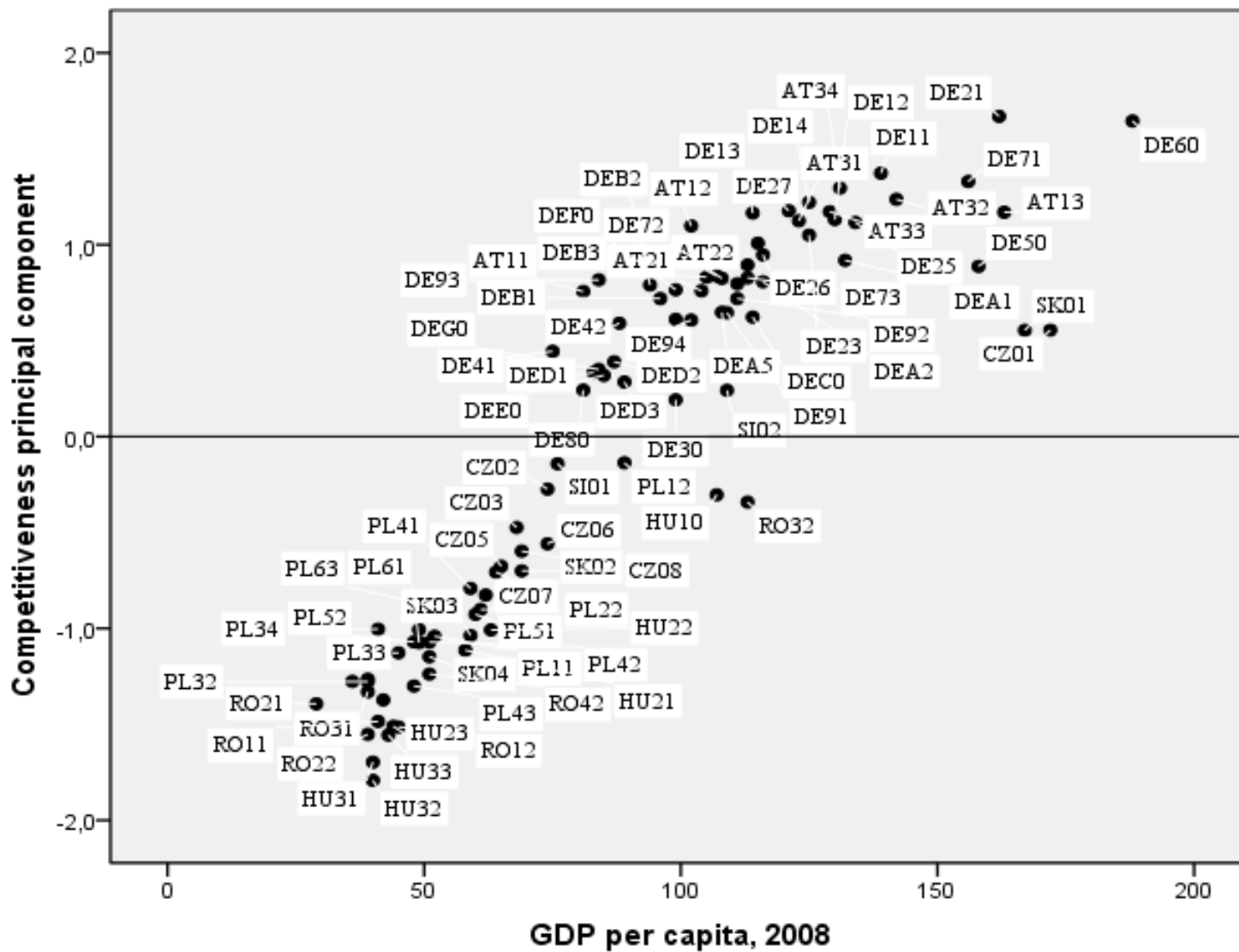
adedutr08	Participation of adults aged 25-64 in education and training, 2008, %	CR5
eudev07	EU Human Development Index (0–100), 2007, %	CR5
povrisk08	The proportion of the population subjected to poverty even after receiving social benefits, 2008, %	CR5
unempr09	Unemployment rate, 2009, %	Eurostat
lowedu08	Population aged 25-64 with low education, (ISCED 1-2), 2008, %	CR5
lunempr09	Share of long-term unemployment (12 months and more), percentage of total unemployment, 2009, %	Eurostat
unempy08	Youth unemployment rate, 2008, %	CR5
unhump07	UN Human Poverty Index (between 0–100), 2007	CR5



Types of regions by competitiveness principal component (RC)



Connection between competitiveness principal component and GDP per capita



Relationship between RC and the drivers (factors created from 21 indicators of the drivers of competitiveness)

Factor analysis was performed for 21 indicators:

Factor1: F1		Factor2: F2		Factor3: F3		Factor4: F4		Factor5: F5	
Fw= 18,873		Fw=17,901		Fw=17,224		Fw=15,265		Fw=12,306	
eudev07	0,701	fp707	0,866	povrisk08	-0,733	lunempr09	0,965	tertedu34	0,741
mwork78	0,684	gerd07	0,820	lowedu08	-0,869	unempr09	0,955	adedu08	0,684
pat1607	0,614	emphigh08	0,642	unhump07	-0,915	unempy08	0,688	indust05	-0,881
age25-64	-0,819	lisbind08	0,602	-	-	-	-	-	-
weeklyh10	-0,906	gfcf07	0,544	-	-	-	-	-	-

Sum factor weights= 81,569 (81,6% of information)

The multivariate linear regression model:

$$RC_i = + 0,691 F1_i + 0,439 F2_i + 0,322 F3_i - 0,334 F4_i + 0,22 F5_i + e_i$$

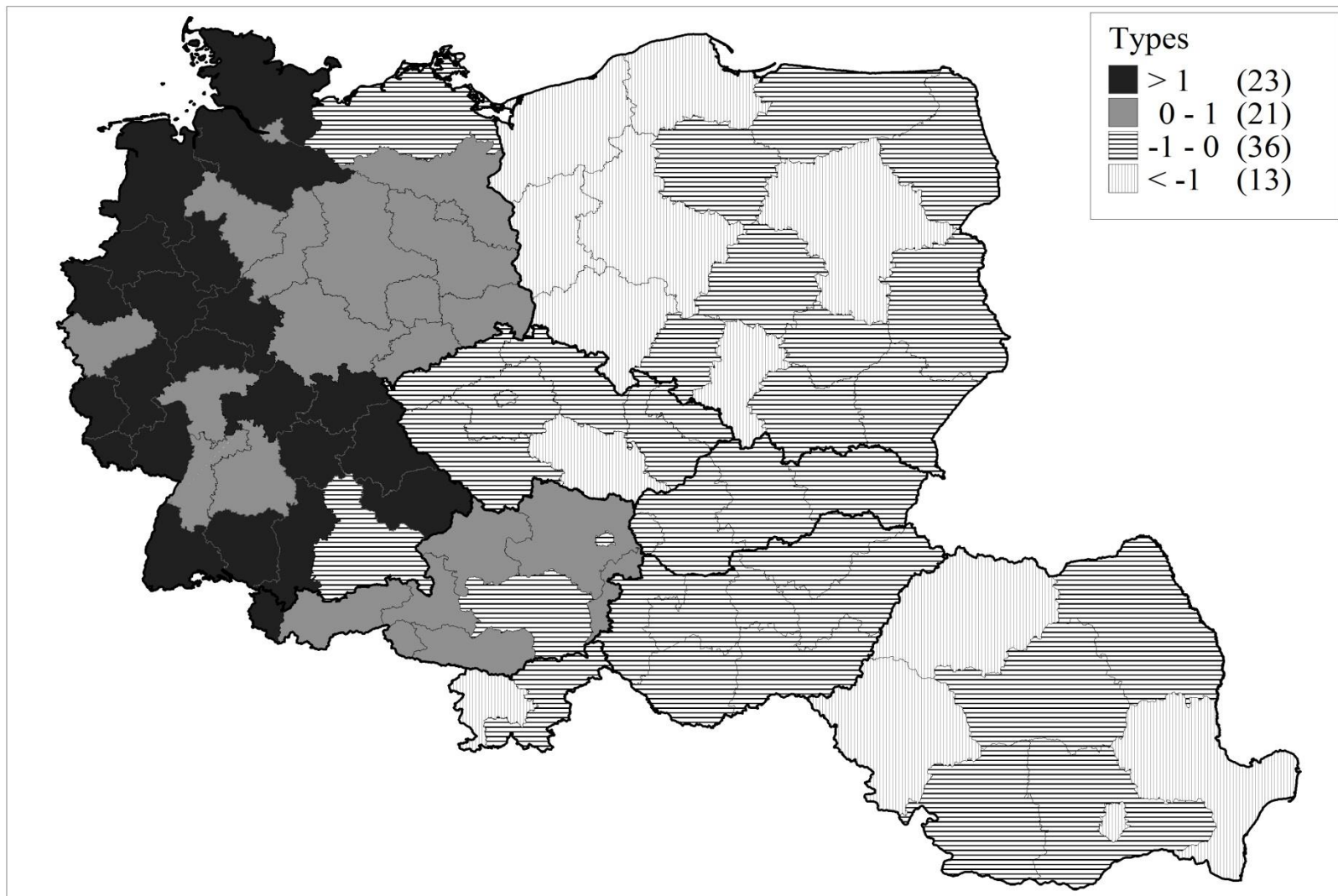
- $R^2 = 0,935$ (93,5%)

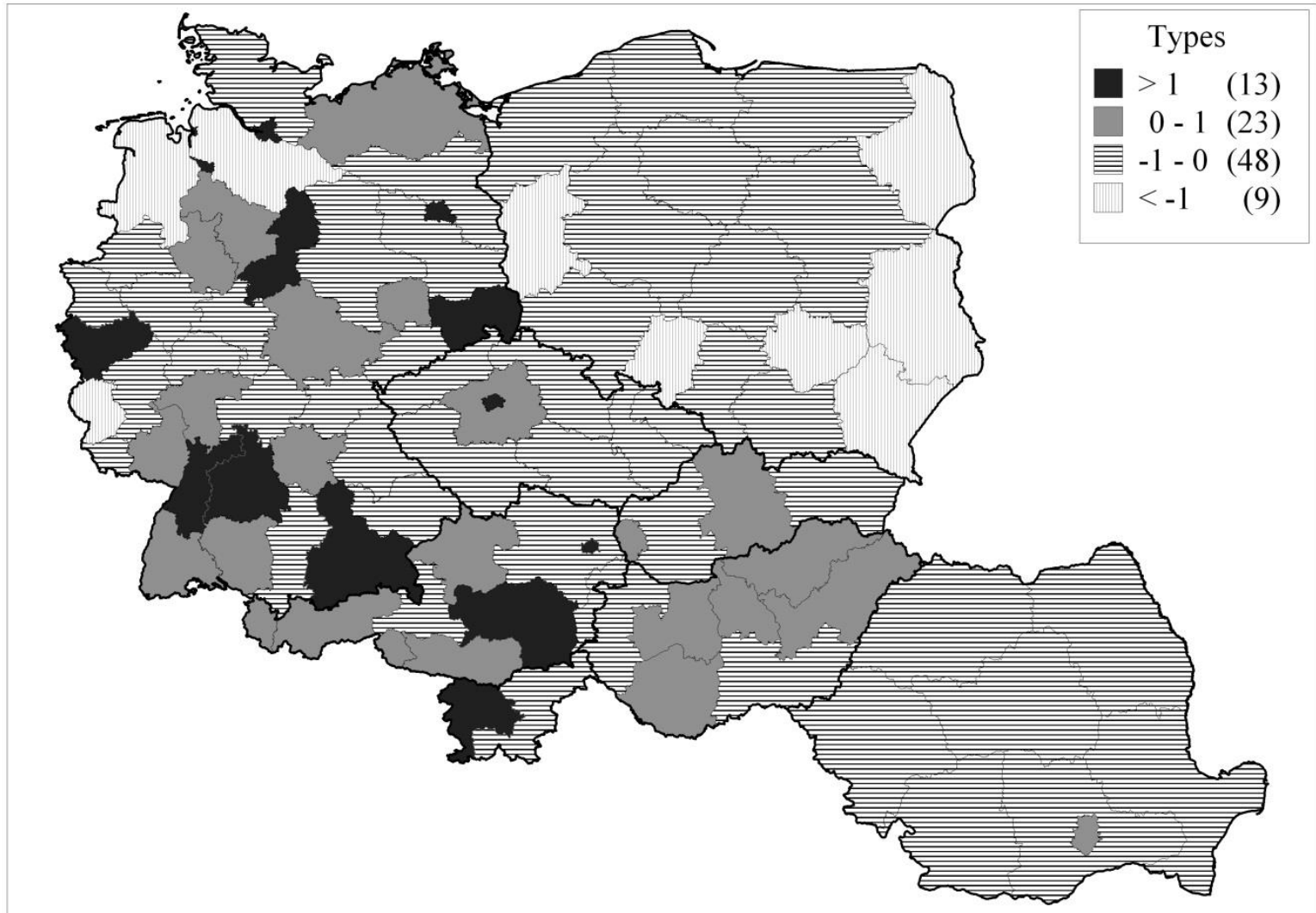
- there is no multicollinearity (because of factor analysis)

- there is no homoscedasticity to be observed



Factor 1 (human capital, workforce attraction, patents): +0,691



Factor 2 (R&D, high-tech empl., gross fixed capital formation): +0,439

Summary

(at half time of research)

Theoretical and methodological remarks:

- Renewed pyramidal model (with endogenous regional development elements)
- Regional competitiveness principal component: RC (3 dependant variables)
- Regional competitiveness function (testing will be continued: path analysis by region types)
- Functional urban regions, or NUTS3 regions instead of NUTS2 region (we are looking for partners from post-socialist countries to continue this investigation!!)

Some empirical conclusions:

- Influence of history: four clusters of regions (+ Romania)
 - West (West Germany, Austria and Slovenia)
 - East Germany regions
 - Capital regions of post-socialist countries
 - Other post-socialist regions
- Geographical proximity: west-east slope
- Emergence of capital towns: centralised society and economy
- Human capital is better than revealed competitiveness in East-Central Europe



Thank you for your attention!

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