

**STI policies and framework
conditions for innovation
It takes (at least) two
to improve innovation performance**

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Outline

Motivation

Economic performance

Innovation performance

Potential reasons

Conclusions and policy implications

The broad picture

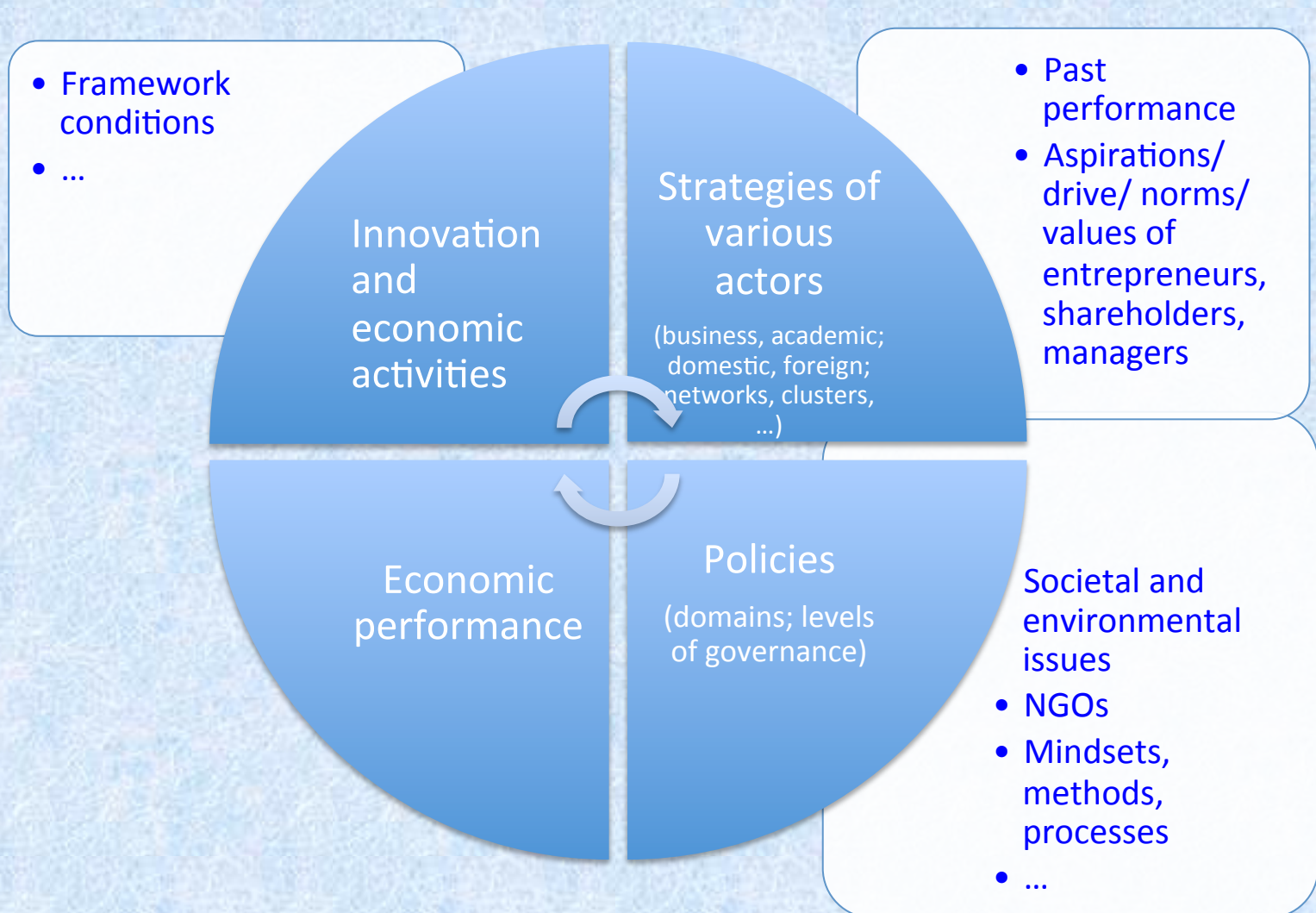
All the major elements of a potentially successful NIS are in place \leftrightarrow

Poor economic and innovation performance

Possible reasons:

- several 'nodes' of the NIS don't work satisfactorily, or still fledgling
- the intensity and quality of linkages and co-operation among them is insufficient

STI policies in context: Performance, policies, other factors



The puzzle: a more 'modest' research question

A broad set of apparently appropriate STI policy measures ↔

Poor economic and innovation performance

Hypothetical explanations:

- a) lack of co-ordination of STI policies
- b) inappropriate policy goals
- c) inadequate public funding
- d) inefficient allocation of available public funds
- e) lack of monitoring and evaluation
- f) unfavourable framework conditions for innovation

ECONOMIC PERFORMANCE

Economic performance, Hungary, 2002-2009

	2002	2004	2006	2007	2008	2009
GDP per capita in PPS (EU28=100)	60	62	62	61	63	64
Real GDP growth rate (%)	4.5	4.9	3.8	0.4	0.8	-6.6
Employment rate (20-64 years; %)	61.4	62.1	62.7	62.3	61.5	60.1
Labour productivity per person employed (EU28=100)	64.8	67.1	67.8	66.6	70.6	72.4
Labour productivity per hour worked (EU28=100)	54.4	56.7	57.1	56.1	59.4	60.5
Inflation rate (average annual)	5.2	6.8	4.0	7.9	6.0	4.0
General gov't balance (% of GDP)	-8.9	-6.4	-9.3	-5.1	-3.6	-4.6
General gov't debt (% of GDP)	55.0	58.5	64.7	65.6	71.6	78.0
Unemployment rate (%)	5.6	6.1	7.5	7.4	7.8	10.0

Economic performance, Hungary, 2010-2015

	2010	2011	2012	2013	2014	2015
GDP per capita in PPS (EU28=100)	65	65	65	66	68	68
Real GDP growth rate (%)	0.7	1.8	-1.7	1.9	3.7	2.9
Employment rate (20-64 years; %)	59.9	60.4	61.6	63.0	66.7	68.9
Labour productivity per person employed (EU28=100)	71.7	72.6	71.2	70.7	n.a.	n.a.
Labour productivity per hour worked (EU28=100)	60.4	60.6	62.0	61.6	n.a.	n.a.
Inflation rate (average annual)	4.7	3.9	5.7	1.7	0.0	0.1
General gov't balance (% of GDP)	-4.5	-5.5	-2.3	-2.6	-2.3	-2.0
General gov't debt (% of GDP)	80.6	80.8	78.3	76.8	76.2	75.3
Unemployment rate (%)	11.2	10.9	10.9	10.2	7.7	6.8

Hungary's ranking among the EU10

	2002	2015*	change
GDP per capita in PPS (EU28=100)	3	7	-4
Employment rate	7	6 ^a	1 [-3]
Labour productivity per hour worked (EU28=100)	4	5	-1
General gov't balance (% of GDP)	10	6	4
General gov't debt (% of GDP)	10	9	1
Unemployment rate (%)	1	4 ^b	-3

Source: author's compilation

* or latest year available

^a ranked 10 in 2007-2013, i.e. before introducing public works at a massive scale

^b even worse previously: 7-9 in 2007; 2008; 2012; 5-6 in 2009-2011; 2013

Policies and other efforts seem to matter

Global Competitiveness Index, 2006-2014

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Czech R	31	33	33	31	36	38	39	46	37
Estonia	26	27	32	35	33	33	34	32	29
Hungary	38	47	62	58	52	48	60	63	60
Ireland	22	22	22	25	29	29	27	28	25
Poland	45	51	53	46	39	41	41	42	43
Portugal	43	40	43	43	46	45	49	51	36
Slovakia	36	41	46	47	60	69	71	78	75
Slovenia	40	39	42	37	45	57	56	62	70

Source: World Economic Forum reports

Again, major differences across the EU10 countries
⇒ the global crisis is not a sufficient explanation

INNOVATION PERFORMANCE

Measurement of innovation

Measurement of innovation activities **vs.** performance

No proper, direct measure of innovation performance

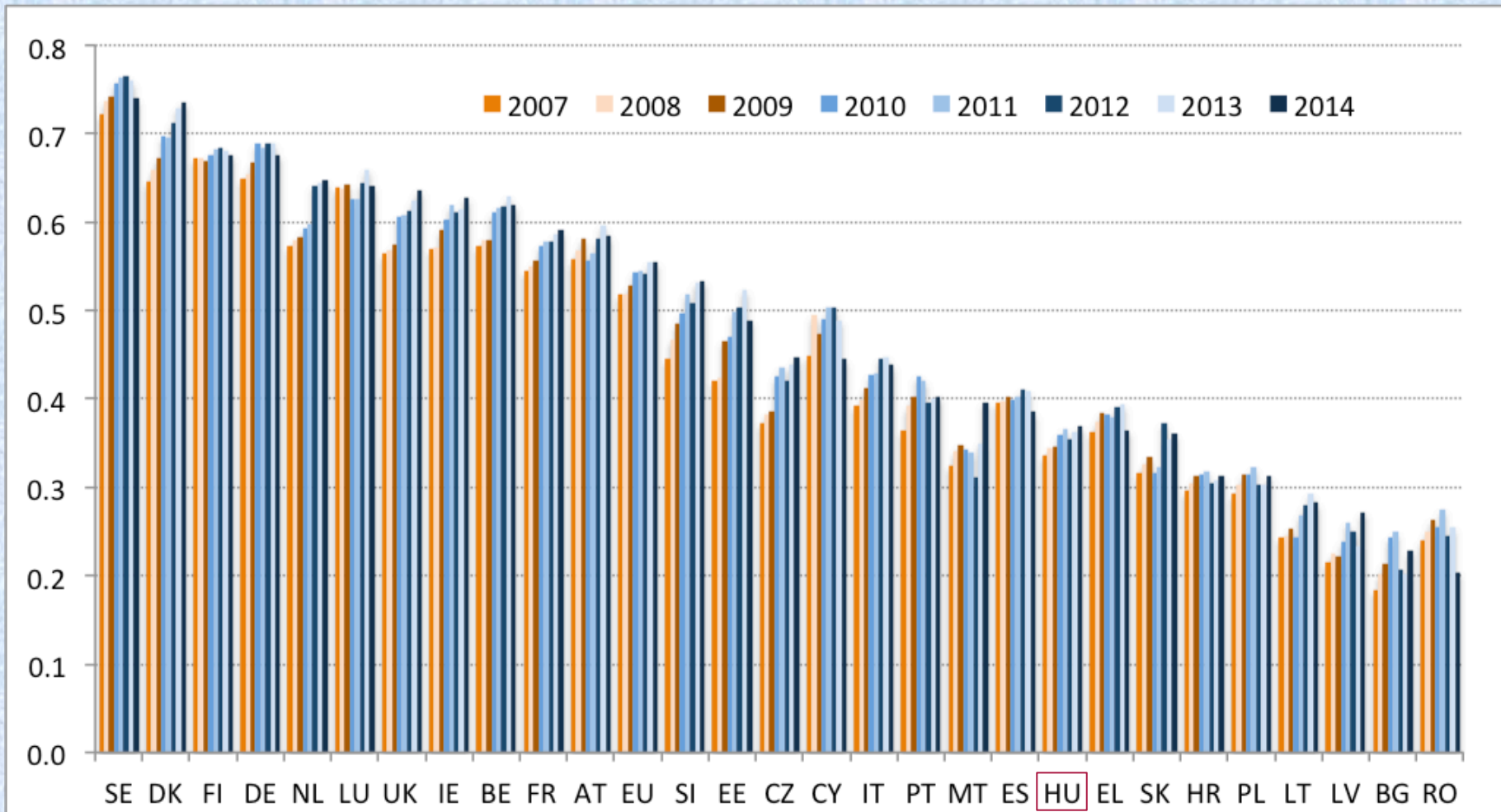
Innovation Union Scoreboard

- provides data for international comparison
- covers a relatively long period
- a strong bias towards R&D-based innovation
- focuses on inputs and activities
- pros and cons of using the Summary Innovation Index **vs.** individual indicators
- Hungary: a moderate innovator (see Annex)

Crude proxies

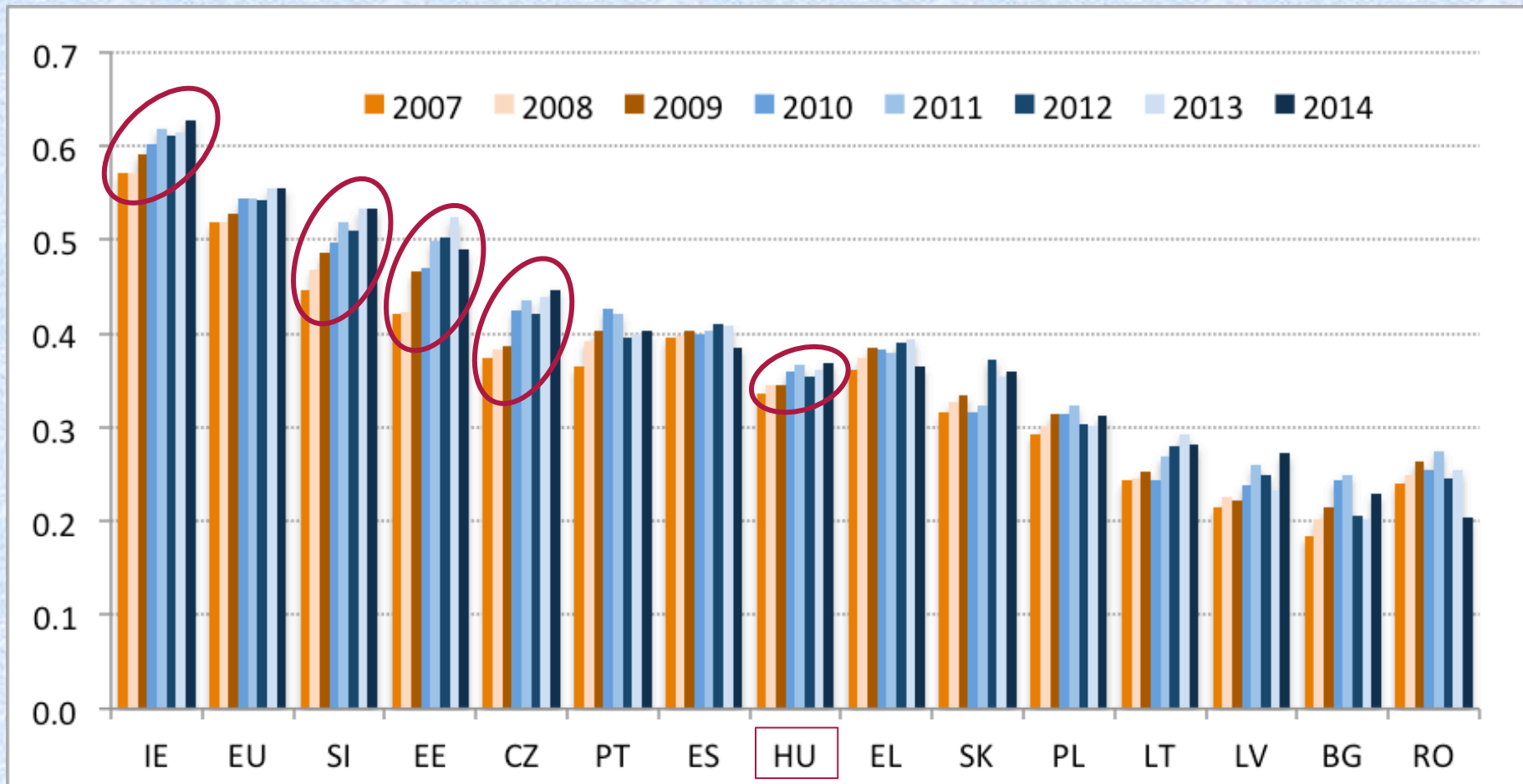
- the share of innovative enterprises
- turnover from innovation
- labour productivity

Summary Innovation Index, 2007-2014



Source: Innovation Union Scoreboard 2015

Summary Innovation Index, EU10 and C4 countries, 2007-2014



Source: Innovation Union Scoreboard 2015
 C4 countries: the 'classic' cohesion countries

The share of innovative enterprises in Hungary, 1999-2012 (%)

	1999-2001	2002-2004	2004-2006	2006-2008	2008-2010	2010-2012
Small enterprises (10-49 employees)	20.9	16.9	15.6	16.3	13.3	12.2
Medium-sized enterprises (50-249)	28.0	30.5	31.6	31.3	32.7	26.6
Large enterprises (250-)	44.4	52.4	55.5	59.2	60.0	53.9
Total	23.3	20.8	20.1	20.8	18.4	16.4

Source: Community Innovation Survey, various rounds
Enterprises with technological innovation activities

Dual structure of the economy:
domestic SMEs **vs.** foreign-owned large firms

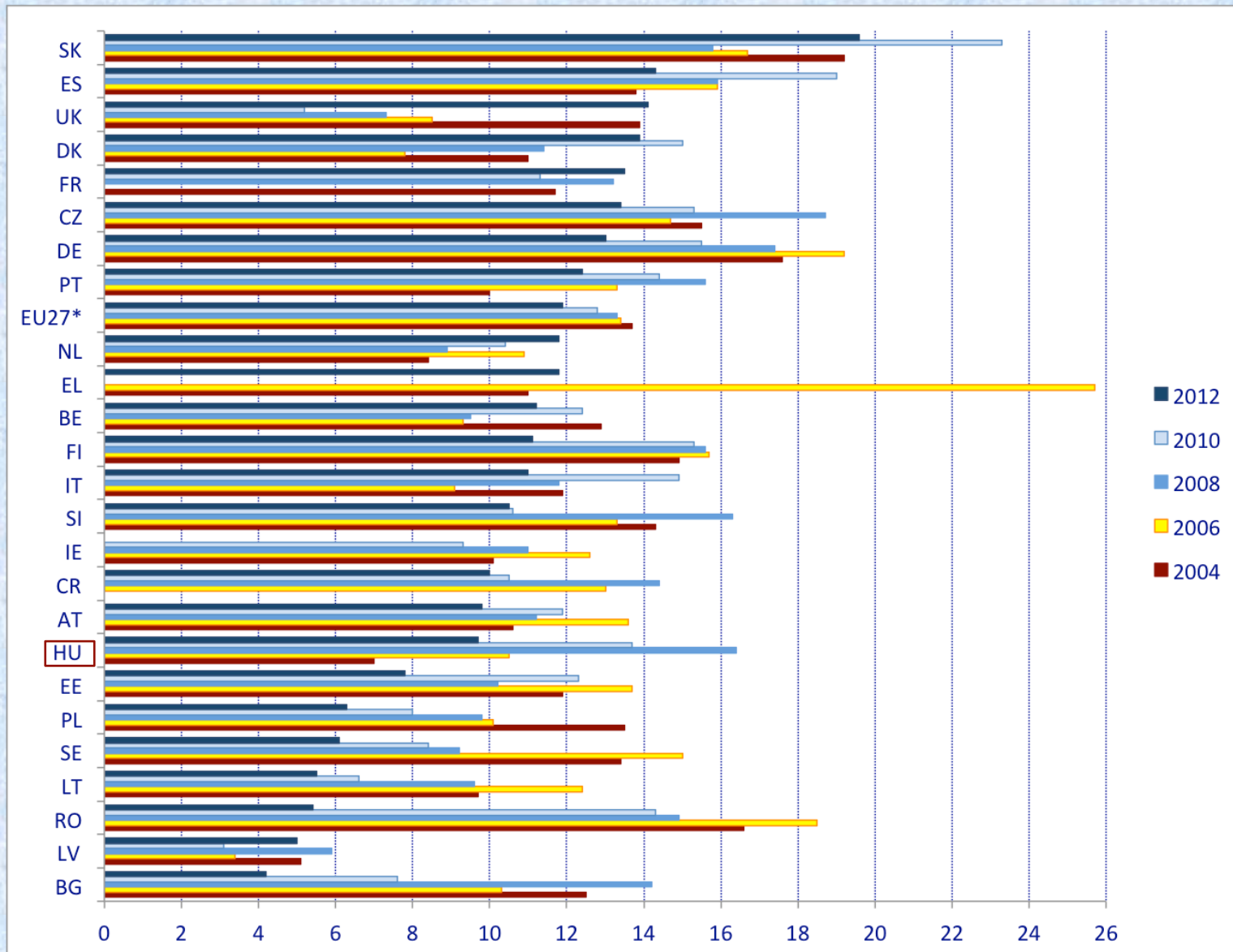
The share of innovative enterprises (%)

	1998- 2000	2002- 2004	2004- 2006	2006- 2008	2008- 2010	2010- 2012
Estonia	35.7	48.7	48.2	47.9	46.7	38.4
EU27*	n.a.	39.5	38.9	n.a.	39.0	36.0
Czech R.	30.3	38.3	35.0	39.3	34.8	35.6
Slovenia	21.1	26.9	35.1	34.4	34.7	32.7
Slovakia	19.5	22.9	24.9	21.7	28.1	19.7
Latvia	19.3	17.5	16.2	20.1	16.7	19.5
Lithuania	28.0	28.5	22.3	23.9	22.6	18.9
Bulgaria	11.4	16.1	20.2	23.9	17.7	16.9
Hungary	23.3	20.8	20.1	20.8	18.4	16.4
Poland	17.3	24.8	23.0	19.8	16.2	16.1
Romania	17.0	19.5	20.7	19.7	14.3	6.3

Source: Eurostat, various rounds of CIS

* EU28 in 2010-2012

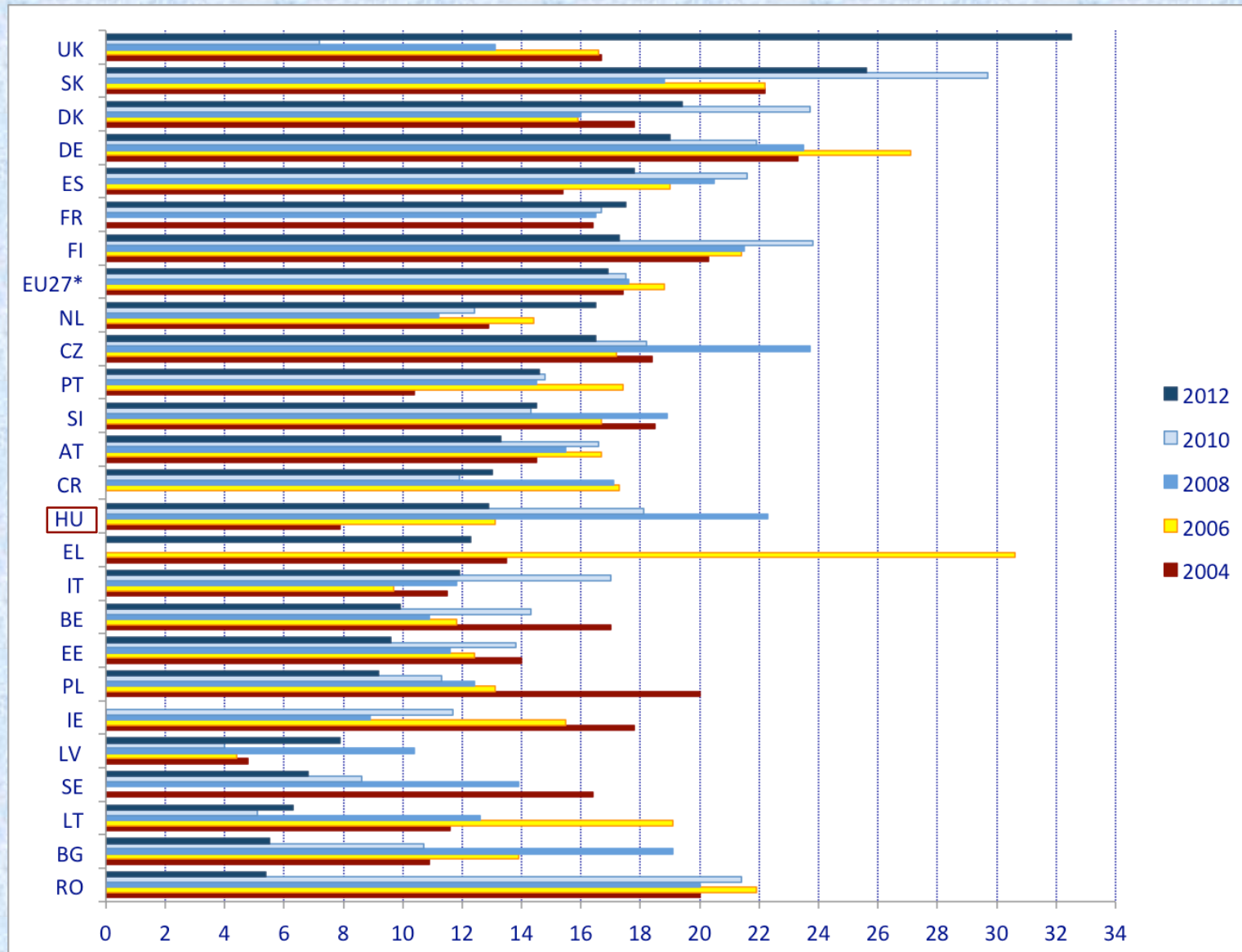
Turnover from innovation, selected EU countries, total, 2004-2012 (% of total turnover)



Source: CIS, Eurostat

* EU28 in 2012

Turnover from innovation, selected EU countries, industry, 2004-2012 (% of total turnover)



Source: CIS, Eurostat

* EU28 in 2012

Abrupt changes in 14 countries – improve CIS?

Labour productivity per hour worked in the EU10, 2002-2013 (EU28 = 100)

	2002	2006	2010	2011	2012	2013	Change
Latvia	33.4	38.4	51.8	54.0	56.3	57.0	22.8
Lithuania	45.4	51.1	59.7	64.2	65.5	66.5	21.1
Romania	26.6	35.5	44.1	44.0	44.5	45.1	18.5
Estonia	43.5	52.1	61.1	59.8	61.0	61.5	18.0
Slovakia	60.3	67.4	75.2	75.1	75.4	76.6	16.3
Poland	47.8	49.1	56.4	58.2	59.4	60.0	12.2
Slovenia	75.9	83.5	83.0	86.0	86.5	86.1	10.2
Bulgaria	34.7	36.78	41.0	43.2	44.5	43.3	8.6
Hungary	54.4	57.1	60.4	60.6	62.0	61.6	7.2
Czech R.	62.4	68.3	67.7	68.0	67.4	66.7	4.3

Source: Eurostat and own calculations

A puzzle: the share of innovative enterprises **vs.** improvement in labour productivity

A micro-macro issue and/or measurement of innovation?

**POTENTIAL REASONS FOR A
POOR INNOVATION PERFORMANCE**

Co-ordination of STI policies in two senses

STI policies & broader socio-economic policies:
no broad socio-economic strategy in Hungary \Rightarrow

- no co-ordination with STI policies
- cannot be established if STI policies contribute to achieving overarching socio-economic development goals

Among STI policy domains/ tools:

- apparently appropriate high-level bodies for efficient policy co-ordination used to exist \leftrightarrow actual operation
- the most recent one only exists on paper, never met

Policy goals

Major challenges are identified, and STI policies are in place to tackle these issues

Too many STI policy schemes

- overlaps, inefficiencies
- administrative burden on applicants (companies, PROs)
- demanding task to implement

The policy mix is insufficiently transparent and potentially inefficient (State Audit Office)

Ad hoc nature of policy-making

the policy mix is a collection of otherwise stand-alone, isolated initiatives and actions, rather than a result of conscious and co-ordinated (re-)targeting of policy strategies

Funding and Summary Innovation Index (1)

Five countries were behind Hungary in 2003-2010: Bulgaria, Latvia, Lithuania, Poland, and Romania

Portugal: ahead of Hungary since 2006

Slovakia: contradictions between the time series of SII presented in various editions

SK ahead of HU in 2008-2009 (EIS 2009)

SK behind HU in 2006-2010 (IUS 2010)

Funding: public R&D expenditures (% of GDP, 2001-2007)

Finland, Sweden	0.84-0.92
Austria, Denmark, France, Germany, The Netherlands	0.64-0.85
<i>UK, Italy, Spain, Czech Republic, Slovenia, Portugal</i>	0.5-0.6
Hungary	0.43-0.58
<i>Ireland, Greece</i>	0.26-0.43

Increased funding since 2004 (new national and EU funds)

∑ public funding doesn't have a major explanatory power

Funding and Summary Innovation Index (2)

Five countries were behind Hungary in 2011-2013: Bulgaria, Latvia, Lithuania, Poland, and Romania

Portugal: remained ahead of Hungary

Slovakia: behind Hungary in 2011 and 2013, ahead in 2012

Funding: public R&D expenditures (% of GDP, 2006-2009)

Austria, Finland, Sweden	0.79-0.99
Denmark, France, Germany, The Netherlands	0.67-0.88
<i>Belgium, UK, Italy, Spain, Czech Republic, Slovenia, Portugal (exc. 2009)</i>	0.5-0.66
Hungary	0.42-0.49
<i>Ireland, Greece</i>	0.28-0.5

Increased funding since 2004 (new national and EU funds)

∑ Public funding doesn't have a major explanatory power

Allocation of available funds

A significant room for improvement

- unrealistically short application deadlines in several cases
- unacceptably long appraisal periods
- neglecting the recommendations of independent experts
- difficult/ lack of access to appraisal reports on project proposals
- unduly lengthy admin procedures
contracts signed, disbursements of awarded funds
- low share of funds awarded to firms

Monitoring and evaluation

A new monitoring system has not been implemented according to the original plans (State Audit Office)

Policy evaluation of nationally funded schemes is mandatory ↔ 4 schemes have been evaluated

⇒ Policy learning is severely hampered

EU co-funded schemes: evaluation is a must, but reports tend to be somewhat superficial

Several bn € have been allocated without clearly defined goals, rationales for state intervention, and efficient co-ordination of sectoral strategies. The impact of state intervention cannot be established due to the lack of clearly defined targets (and indicators), as well as systematic evaluation. (State Audit Office)

Framework conditions for innovation

Economic structure: *dual economy*

Macroeconomic situation and dynamics: *unfavourable*

Entrepreneurial culture: *weak*

Conditions for doing business: *unfavourable*

Standards and regulation: *mixed*

- type and intensity of competition
- public procurement

Publicly financed R&D organisations

- *academia-industry co-operation is stronger in more successful economies*
- mismatch in the incentive structures
publication **vs.** commercialisation
- insufficient understanding of industry's needs

Conclusions

Framework conditions for innovations seem to play a decisive role

Innovation is not a major policy issue

- short-term macroeconomic tensions
- social costs of the transition process
- other 'burning' political issues
- RTDI is perceived as burden on the budget, rather than part of the solution (contributing to socio-economic development)

No excuse for overlooking the efficacy and efficiency of the current STI policy-making practices

Policy recommendations

No 'panacea' or a 'quick fix' to improve RTDI performance by introducing 2-3 new STI policy measures

Substantial efforts are needed, based on a comprehensive approach

Conscious co-ordination of major economic and STI policies, guided by an overarching socio-economic development strategy

Foresight to underpin these strategies, orchestrate the main objectives

Policy recommendations (2)

Policy design and implementation: use up-to-date decision-preparatory methods

- thorough analyses of innovation performance, combining census, R&D and innovation data
- evaluation of individual policy measures, and the policy mix as a whole
- monitoring of supported projects
- participatory, prospective analyses
 - technology foresight
 - technology assessment

A general dilemma

“Keep it simple, focus!” – to have impacts
Orchestration is a daunting task, indeed

- limited policy-making and implementation capabilities
- compartmentalised decision-making structure
- vested interests of strong players
- central planning disguised?!?

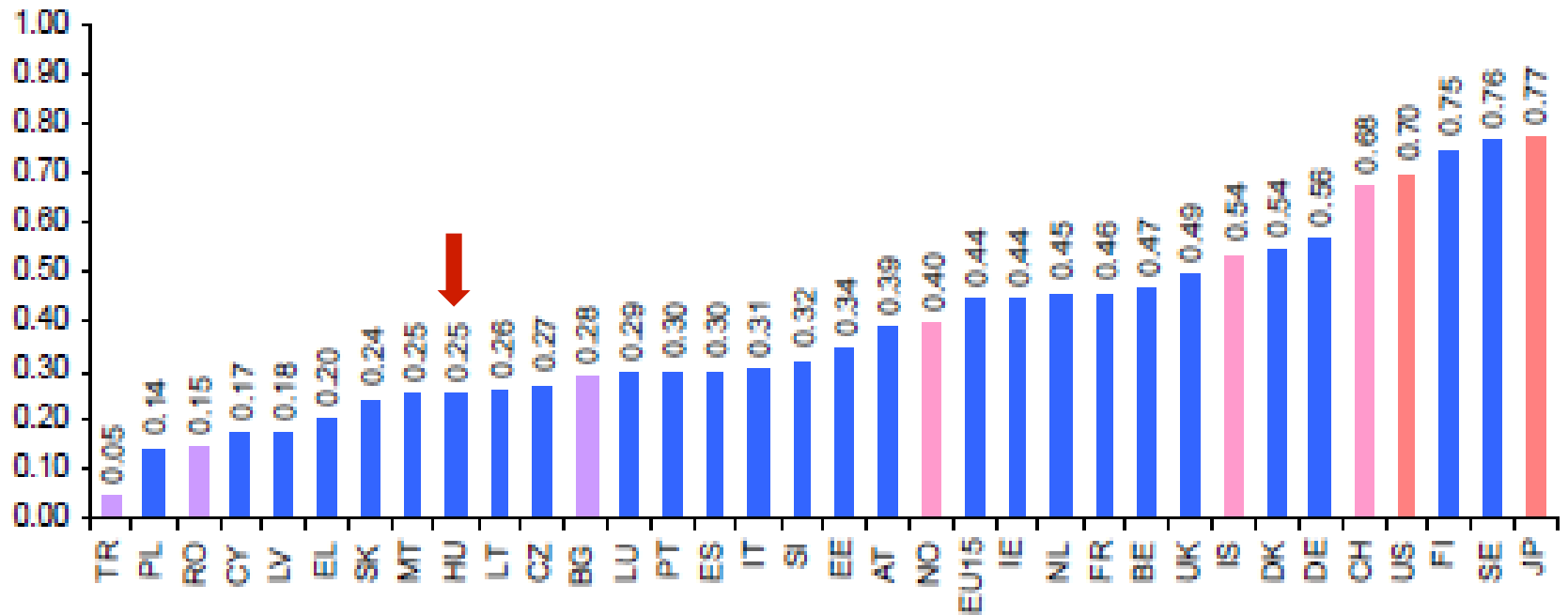
Yet, lack of orchestration (unfavourable framework conditions) is likely to backfire: funds spent on STI policy tools are called into question

Thank you!

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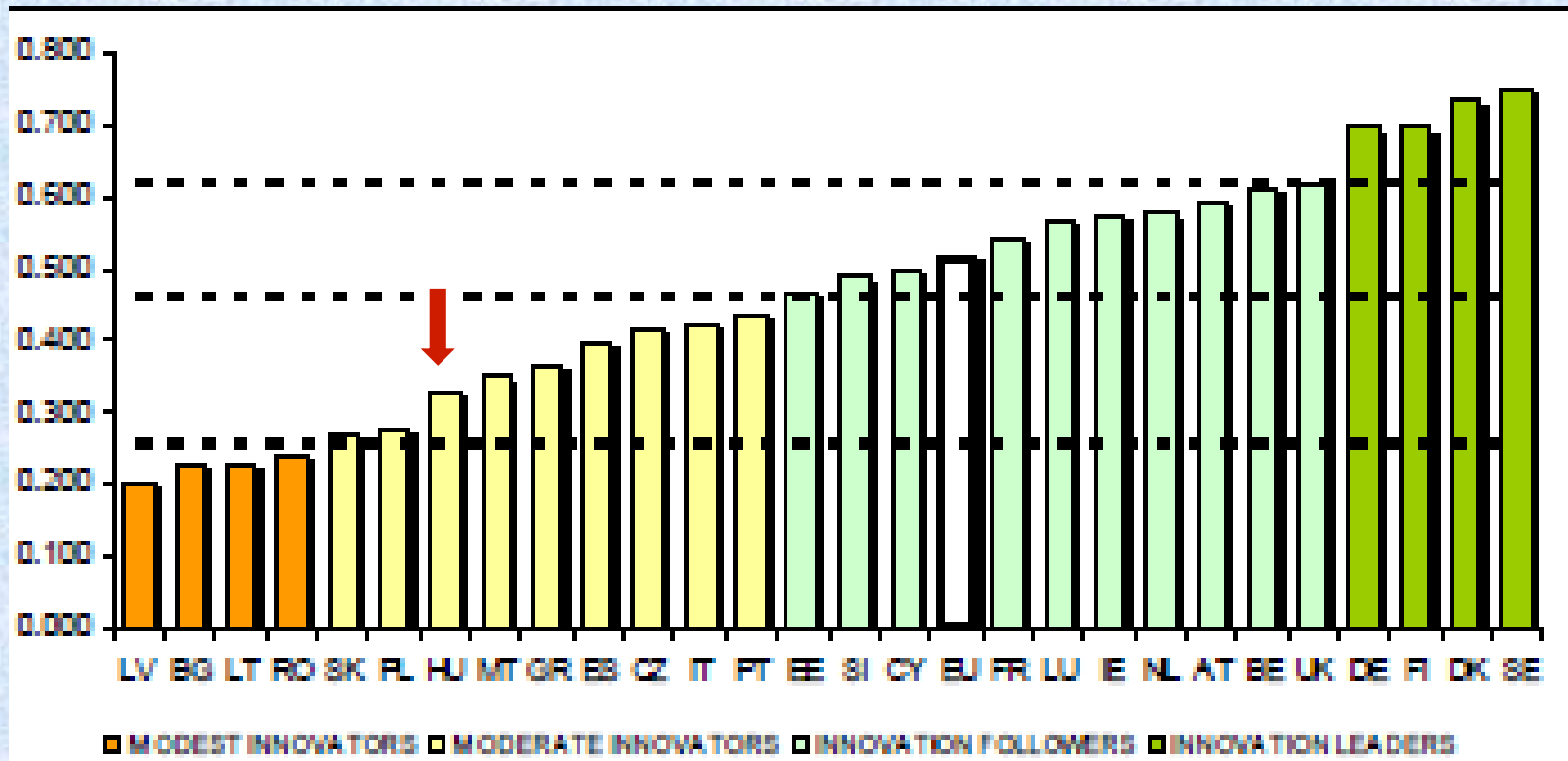
ANNEX

Summary Innovation Index, 2004



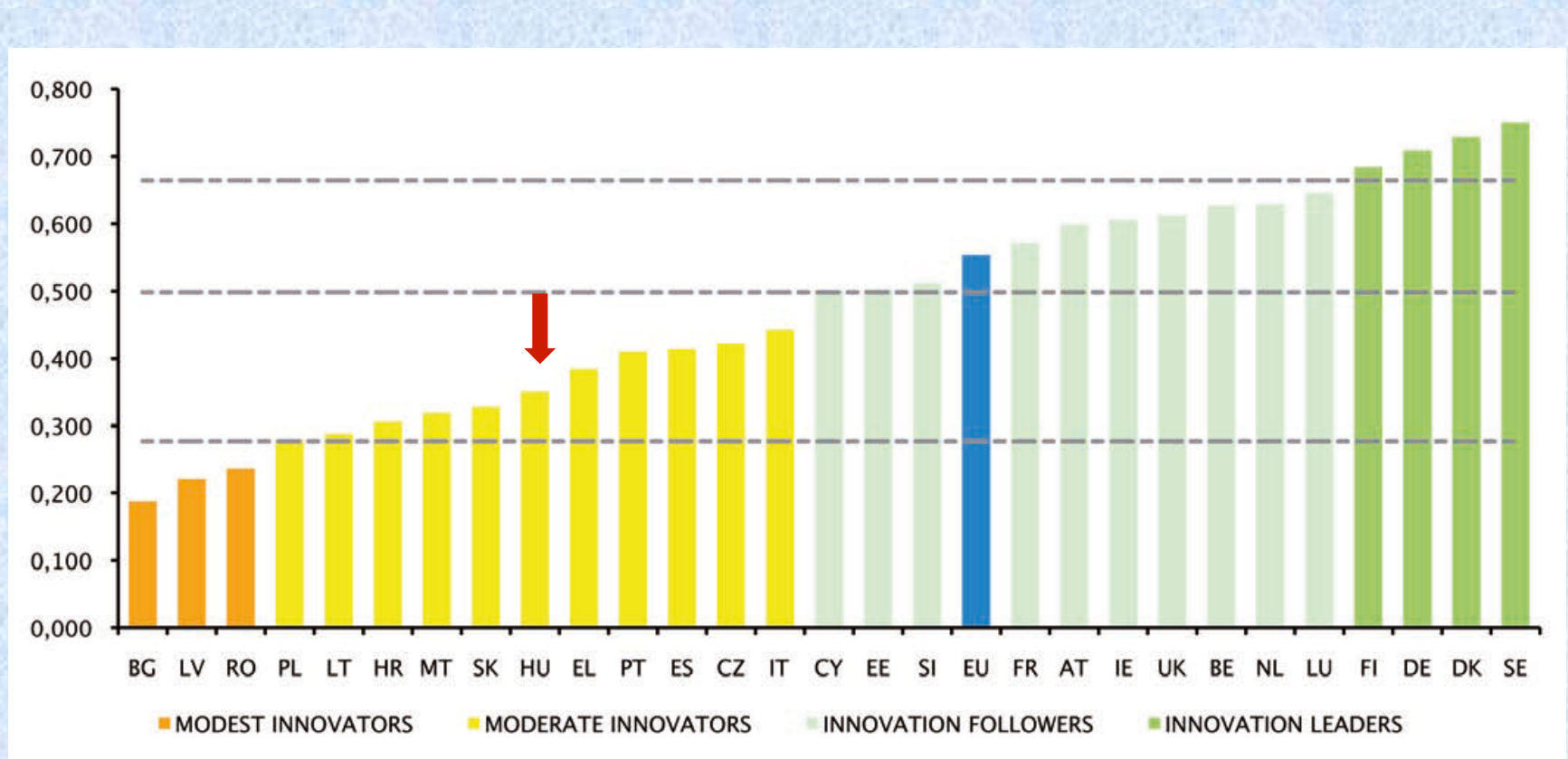
Source: The European Innovation Scoreboard 2004

Summary Innovation Index, 2010



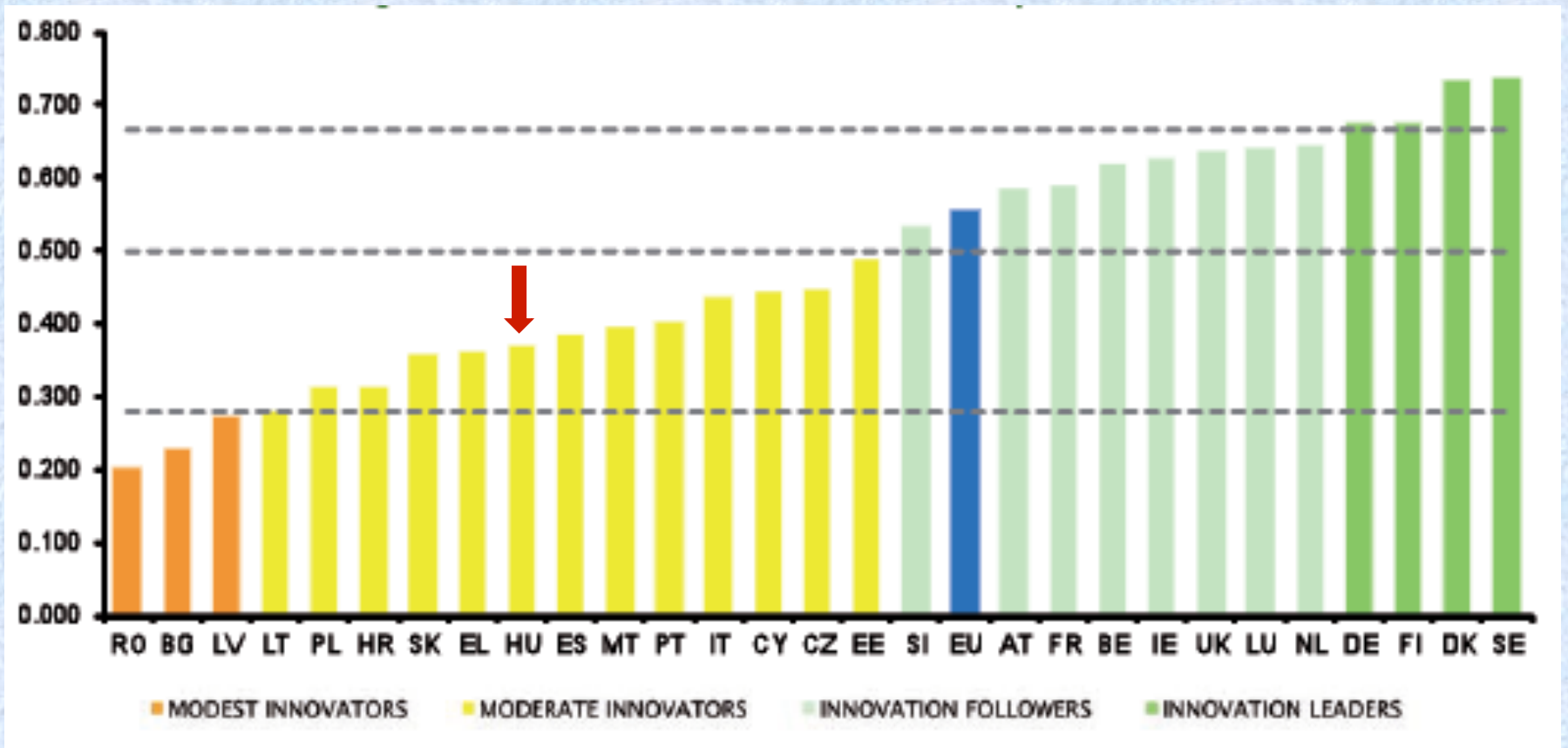
Source: Innovation Union Scoreboard 2010

Summary Innovation Index, 2013



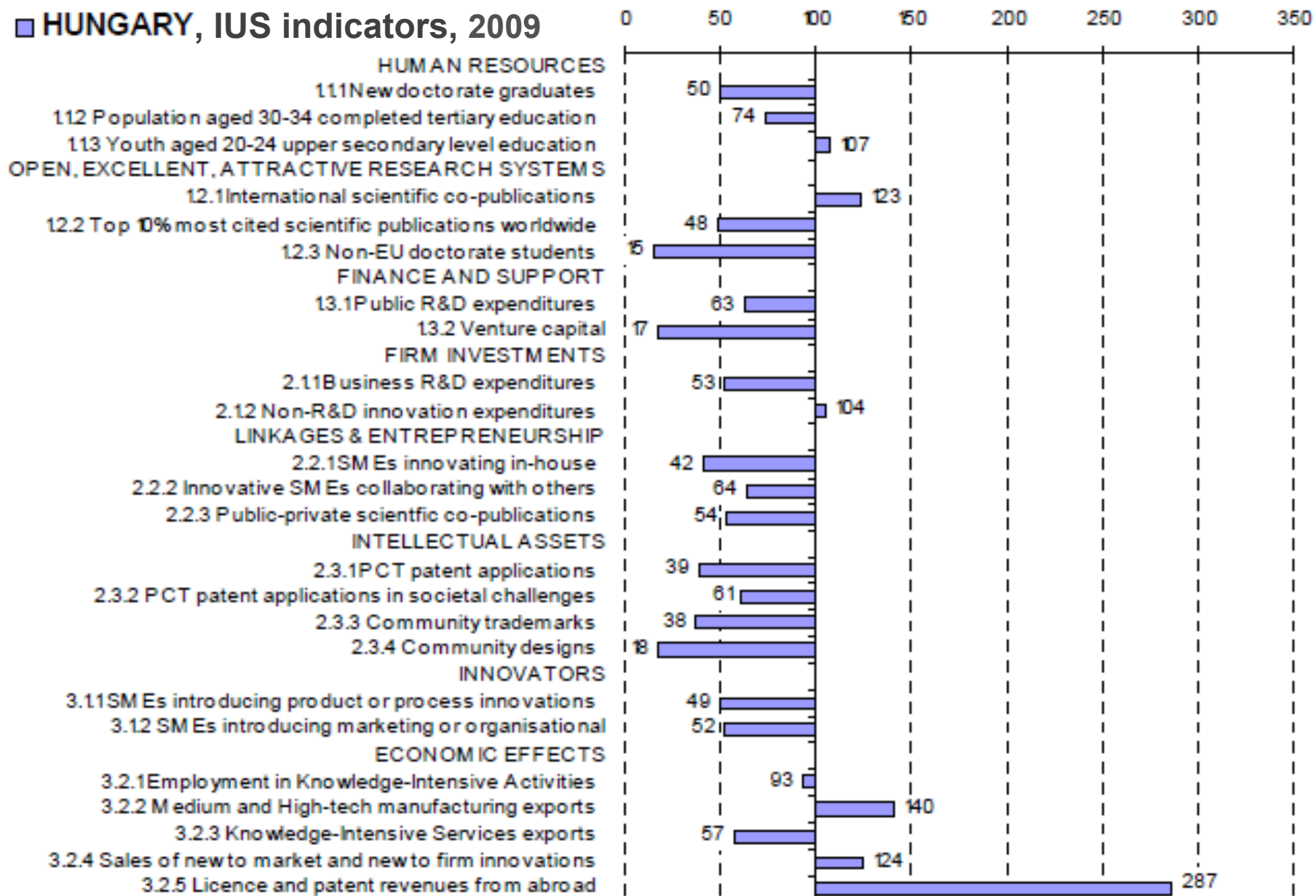
Source: Innovation Union Scoreboard 2014

Summary Innovation Index, 2014



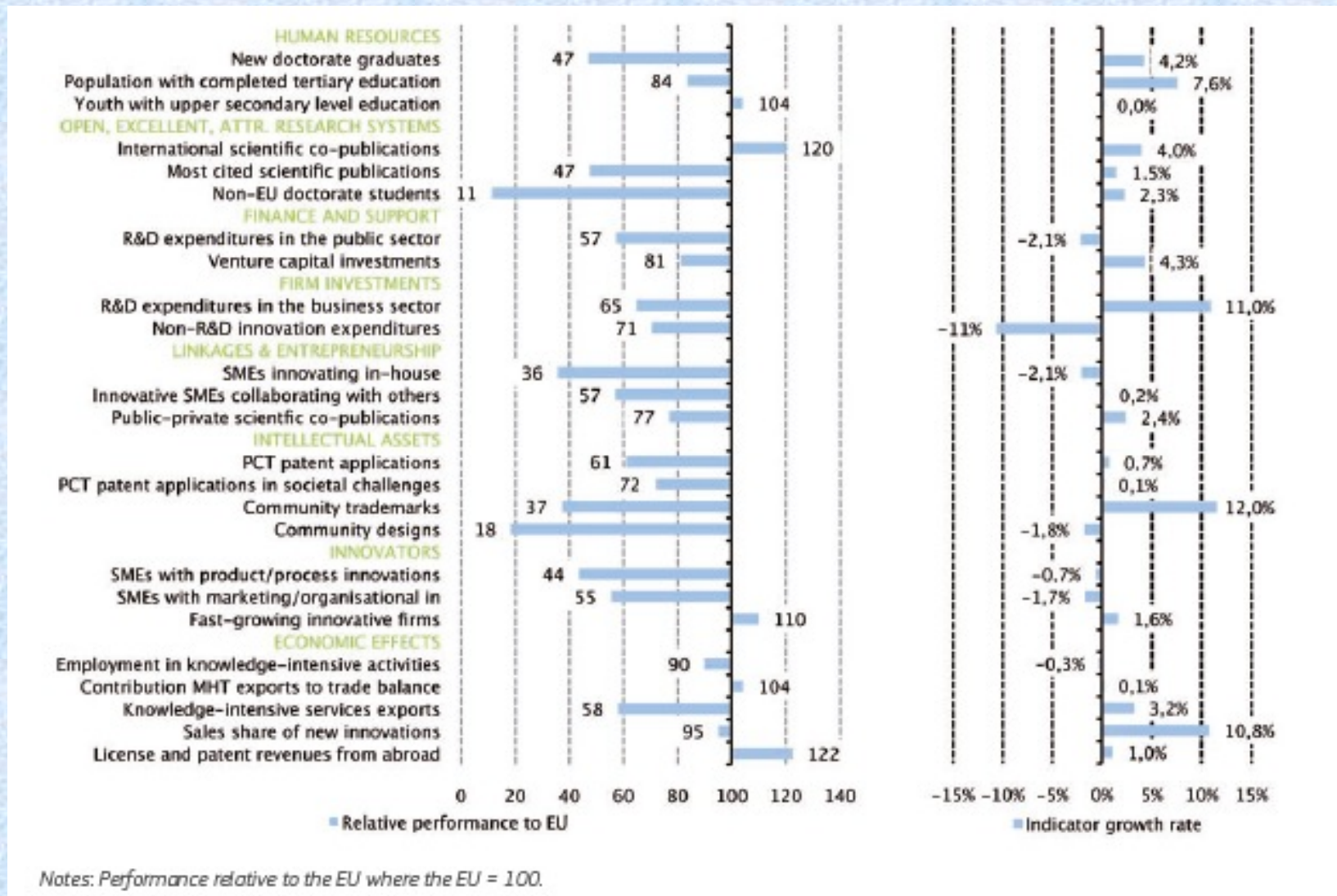
Source: Innovation Union Scoreboard 2015

■ HUNGARY, IUS indicators, 2009



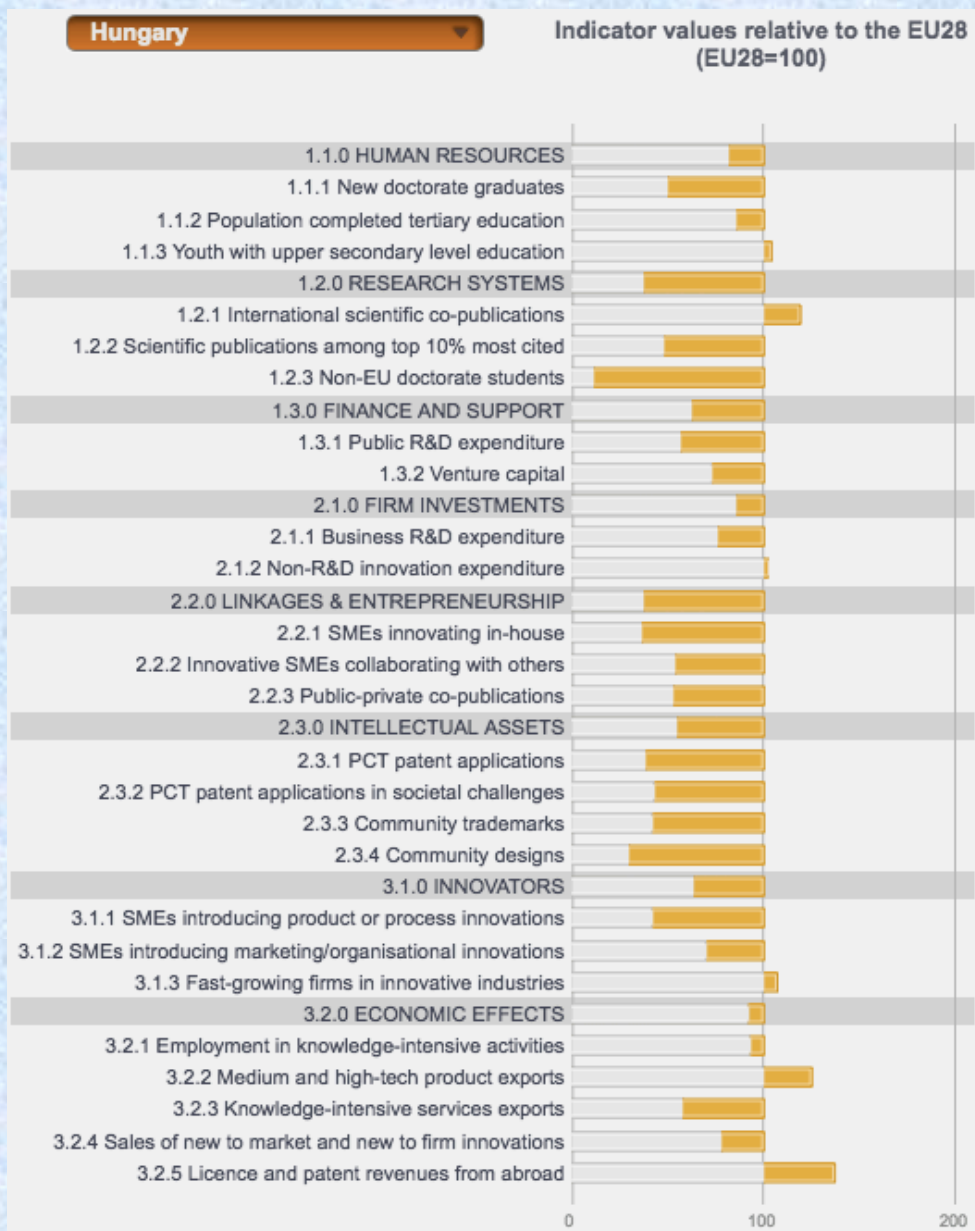
Source: Innovation Union Scoreboard, 2010, EU27=100

Hungary: IUS indicators, 2013 (EU = 100)



Notes: Performance relative to the EU where the EU = 100.

Source: Innovation Union Scoreboard 2014



Hungary: IUS indicators, 2014 (EU = 100)

Source: Innovation Union Scoreboard 2015

The share of innovative enterprises in selected countries, 2010-2012 (%)

	Estonia	Czech R.	Slovenia	Slovakia	Hungary	Poland
Small enterprises (10-49 employees)	33.1	29.8	26.0	15.9	12.2	10.7
Medium-sized enterprises (50-249)	55.8	49.3	49.5	25.4	26.6	28.4
Large enterprises (250-)	72.8	71.7	79.9	43.4	53.9	55.9
<i>Total</i>	<i>38.4</i>	<i>35.6</i>	<i>32.7</i>	<i>19.7</i>	<i>16.4</i>	<i>16.1</i>

Source: Community Innovation Survey
Enterprises with technological innovation activities

Extreme cases: Dates of publication of calls for proposals and deadline for submission

Measure	Call published	Deadline for submission
Péter Pázmány Programme, HU_87	23 May 2005	15 June 2005
Ányos Jedlik Programme, HU_24	20 Apr 2005	20 May 2005
Large international R&D projects, HU_94	26 Jan 2005	22 March 2005
Information infrastructure for R&D, HU_90	10 Jan 2005	7 March 2005
Miksa DÉRI Programme, HU_88	17 Dec 2004	31 Dec 2005
Innovative Education Support Systems, HU_89	25 Nov 2004	15 Feb 2005
Mobile Communications R&D and Innovation Centre, HU_92	25 Nov 2004	3 Dec 2004
Co-operative Research Centres (KKK II), HU_91	23 Nov 2004	31 Jan 2005
Regional Knowledge Centres, HU_87	11 Oct 2004	4 Nov 2004
Regional Innovation Agencies, HU_93	5 Oct 2004	2 Nov 2004
Regional info and consultancy services on EU FP6, HU_6	16 Sept 2004	15 Oct 2004