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EU member states' ability to attract intellectual capital in times of crisis

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Abstract

Purpose – The purpose of this study is to assess how the recent financial and economic crisis has affected European Union (EU) member states' ability to attract intellectual capital. The issue was found to be relevant, as one of the key elements of competitiveness today is the ability to attract intellectual capital and the question how the recent financial and economic crisis has changed this ability of EU member states can be asked. The question is relevant in relation to the diversity of effects that the crisis had on EU member states, including, the different levels of real economy adjustment constraints.

Design/methodology/approach – The concept of competitiveness applied by the World Economic Forum (WEF) in constructing the Global Competitiveness Index (GCI) was used. Based on selected WEF GCI sub-indicators and the WEF's methodology, we a new index named "Ability to attract intellectual capital" was generated. EU member states' performance was compared along this indicator for the 2007-2008 (pre-crisis) and the 2013-2014 (post-crisis) periods. In this way, EU member states can be ranked before and after the crisis; their performance can be compared in the two periods, relatively to each other, and in relation to their performance along other relevant indices.

Findings – The findings show interesting results. First, many peripheral EU member states, deeply affected by the crisis, could considerably improve their relative positions between 2007 and 2013. Second, the Central and Eastern Europe (CEE) countries show a rather mixed picture, drawing up rather different individual development paths. Third, the advancements in some countries do not imply that overall convergence is proceeding in the EU. Nevertheless, some countries have not wasted the "good" crisis to take those steps of structural reform.

Research limitations/implications – Because we only look at two time periods (pre-and post-crisis), the authors are not able to describe the processes that were going on in the EU member states during the years of the crisis; the results can only show the difference between the two periods. Furthermore, there may be other methodological approaches to countries' abilities to attract intellectual capital that may bring results different from this study's results. For the countries who, according to our

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investigations, could improve these abilities, enhanced competitiveness is likely to occur in a few years' time.

Practical implications – For those countries aiming at improving their abilities to attract intellectual capital, or for EU policy design, this research may provide useful results. Moreover, not only this study's results but also the methodology can be used by others, for other purposes: to compare different years, different sets of countries included in the WEF GCI or even along different dimensions.

Social implications – This study's research findings, the authors believe, will help EU member states and the EU as a whole in getting to know their abilities to attract intellectual capital better. In the introductory part of this paper, the aim was also to collect arguments from the economic theory to explain why such abilities are crucial for future competitiveness of countries.

Originality/value – The methodology that was used is the adoption of WEF methodology, and the data are from the WEF GCI dataset. However, to the authors's knowledge, no other research work has applied this methodology on this set of WEF GCI sub-indicators, with such purposes as to compare EU member states' abilities to attract intellectual capital before and after the crisis.

Keywords European union, Competitive structure, Innovation and R&D

Paper type Research paper

Introduction

The importance of intellectual capital as a factor of competitiveness is growing, both at the level of firms and of countries. In our study, we examine the capacities of the 28 member states of the European Union (EU) in attracting intellectual capital. We were also interested to see how the crisis has affected these capacities. To understand what has recently happened in this field, we need to go back in time shortly and see what role the European integration itself has played in these processes.

The European Economic Community was established in 1957 with the declared objective "to ensure the economic and social progress of their countries by common action to eliminate the barriers which divide Europe"[1]. The newly created common market at that time was thought to be the main instrument to reach these objectives: economic development through the elimination of barriers to the movement of capital and labour (inputs of economic activities) and of goods and services (outputs of economic activities). The economic objectives driving forth European integration in the beginning were most probably fully appropriate then definitely a lot was to be done in eliminating the barriers in such a short time after World War II. Moreover, the free movement of the factors of production was indeed necessary to enable optimal resource allocation (Samuelson, 1948, 1962), and capital and labour could in fact be interpreted separately, at that level of technological development. The challenges came later. Of the challenges, we now highlight two: the subsequent enlargements and the growing economic complexity characterising economic development in the past decades. We chose these two, as we consider them being the major factors influencing the changing attitude to attracting intellectual capital, the factor which we now focus on in our study.

Enlargements, especially, the latest ones (2004, 2007 and 2013), are relevant because they have each time highlighted the growing internal differences for the EU (Farkas and Várnay, 2011; Harrold and Hahm, 2012), appearing as a challenge that should, in fact, be handled at the European level, according to our conviction. We are saying this because, as there are less developed and more developed countries sharing a common market with free movement of factors of production, there is a huge pressure on the less developed ones: they are threatened by losing the main drivers of their growth (either by

their factors "emigrating" to the more developed member states or by the newly created factors locating in more developed parts of the EU from the beginning already). Even if the Copenhagen criteria of accession included "the capacity to cope with competitive pressure and market forces within the Union" (EC, 1993), the challenge has remained after joining the EU, for most of the new member states. Then, the crisis has definitely put these abilities to cope with internal market forces in a new perspective (and, not neglectably, has highlighted the weak capacities of some old member states at the Eurozone periphery in coping with the very same internal competitive pressure, already as members of the monetary union)[2]. So, within the EU, under its current construct, member states definitely have to face the internal competitive pressures, obviously in the race for attracting intellectual capital as well.

As regards complexity, the overall experience is that developed economies, since the second half of the twentieth century, have become more complex than ever, in many dimensions (e.g. in organisational or technological terms, in their relations and networks, in their operations and decisions, etc.), making it necessary to substantially reset our way of economic thinking as well (Elsner *et al.*, 2014). In relation to intellectual capital, we hereby point out one fundamental change: compared to the early times of European integration, capital and persons are no more so clearly distinguishable. They merge more and more: humans are the carriers of active, utilisable knowledge (Grant, 1996) and intangibles are ever more crucial assets of firms in the international arena (Denicolai *et al.*, 2014). Furthermore, the creation, the attraction and the accumulation of intellectual capital occur very differently from the way physical and financial capital behaves. Knowledge itself has become the most important but, at the same time, rather complicated (intangible and often tacit but dynamic) input of the twenty-first-century economy (Leydesforff, 2006). As the knowledge economy is growing in the EU (Brinkley and Lee, 2006) intellectual capital has become one of the main drivers of future growth (Aghion and Howitt, 2005), countries' ability to attract intellectual capital is of growing importance among the factors determining competitiveness. The race for collecting such resources is speeding up, competition is intensifying in this field as well and not keeping up with the pace is threatening prosperity.

The past years of the EU's economy has mostly been determined by the financial and economic crisis, opening up a new chapter for the Eurozone: the sovereign debt crisis. Several member states, during the most severe times of crisis, had to turn to the international organisations (the EU, the International Monetary Fund and the World Bank) for financial assistance. Since the outburst of the crisis in 2008, the following countries have received such assistance, provided under strictly monitored adjustment programmes: Ireland, Greece, Spain, Latvia, Hungary, Portugal, Romania and Cyprus. Most of these assistance programmes were over by the summer of 2014[3]. Outside the countries mentioned above, practically all member states applied certain sets of crisis management measures (Kovács and Halmosi, 2012). All in all, most EU member states' economies have been on highly constrained tracks these years, with little or no room for manoeuvre. In such difficult times, investment in intellectual properties and other intangible assets is not likely to be of high priority, as returns on such investments are typically long term (David, 1992). On the other hand, the necessary real economy adjustment enforced by the crisis may have induced prospective processes as well[4].

All in all, we were interested in how EU member states have performed during the crisis regarding their ability to attract intellectual capital. We were also curious to see if

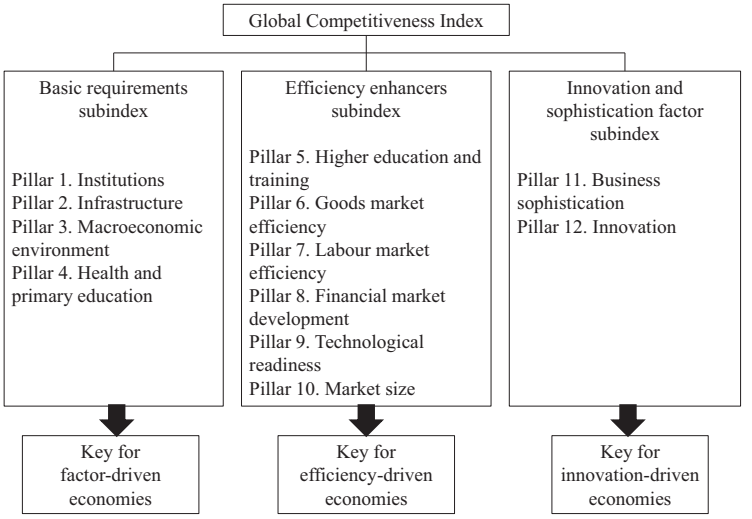
any country grouping can be applied or any patterns of change are traceable in this respect. We were not focusing on such investments themselves (e.g. their origin, their composition by ownership, their sectoral distribution, etc.) but the attractiveness of EU member states towards (potential) investors in intellectual capital.

Methodology

In our study, we talk about competitiveness in the sense that the World Economic Forum (WEF) is using the concept. Accordingly, competitiveness is "the set of institutions, policies and factors that determine the level of productivity of a country" (WEF, 2013a, 2013b, p. 4). According to the WEF's logic, productivity is the key factor of competitiveness, as it determines the output potential of an economy.

The WEF publishes its report on countries' competitiveness each year. Countries are ranked according to the Global Competitiveness Index (GCI). The GCI is divided into 3 sub-indexes and 12 pillars (Figure 1). The 12 pillars are constructed by further sub-indexes (114 altogether). The sub-indexes are of two types: they are either "hard" indicators from certain databases (e.g. sub-index 2.08 Mobile telephone subscriptions/ 100 population) or "soft" indicators scoring on a 1-7 range based on ample global executive surveys carried out in partnership with numerous national and international organisations.

Based on its vast database, the WEF has constructed further indexes to assess countries' performance from several aspects. The Sustainable Competitiveness Index (SCI) adjusts the GCI to the requirements of social and environmental sustainability. Accordingly, "the new measure aims to assess the set of institutions, policies and factors that make a nation remain productive over the longer term while ensuring social and environmental sustainability"[5]. At the same time, the Human Capital Index (HCI) aims at "capturing and tracking the state of human capital development around the world"



Source: WEF (2013)

Figure 1.
The GCI Framework

(WEF 2013b, p. 3). The index is based on four pillars: health and wellness, education, wokforce and eployment and eabling evironment. Table I shows the EU member states' performance according to the different WEF indexes.

Specifically for the member states of the EU, in the framework of the WEF's Europe project[6], the Europe 2020 Competitiveness Index has been generated and the EU member states are ranked in respect of how they are meeting the objectives of the Europe 2020 strategy foreseeing smart, sustainable and inclusive growth for the EU along certain numerical objectives to be reached by 2020 (EC, 2010). Table II shows the EU member states' rank according to the WEF's Europe 2020 Competitiveness Index.

Evaluating the EU member states' performance according to the different indexes is outside of the scope of this study. Nevertheless, we have introduced the different assessment methods, as these are the ones currently available to compare the competitiveness of the EU member states, within the WEF methodological framework. Obviously, we have not found any index with a strong focus on the countries' ability to

	GCI		SCI		HCI	
Country	Rank	Score	Score	Compared to GCI	Rank	Score
Austria	16	5.15	5.98	+	13	0.977
Belgium	17	5.13	5.67	+	11	0.985
Bulgaria	57	4.31	4.25	0	56	−0.048
Croatia	75	4.13	4.24	0	46	0.099
Cyprus	58	4.30	4.42	0	31	0.452
The Czech Republic	46	4.43	4.77	+	33	0.387
Denmark	15	5.18	5.66	+	9	1.024
Estonia	32	4.65	4.93	+	27	0.571
Finland	3	5.54	6.40	++	2	1.406
France	23	5.05	5.56	+	21	0.746
Germany	4	5.51	6.23	++	6	1.109
Greece	91	3.93	3.94	0	55	−0.011
Hungary	63	4.25	4.37	0	54	0.000
Ireland	28	4.92	5.32	+	20	0.824
Italy	49	4.41	4.50	0	37	0.266
Latvia	52	4.40	4.80	+	38	0.248
Lithuania	48	4.41	4.76	+	34	0.360
Luxembourg	22	5.09	n.a.	n.a.	17	0.881
Malta	41	4.50	n.a.	n.a.	28	0.473
The Netherlands	8	5.42	6.13	+	4	1.161
Poland	42	4.46	4.50	0	49	0.087
Portugal	51	4.40	4.53	0	30	0.453
Romania	76	4.13	3.97	0	69	−0.176
Slovakia	78	4.10	4.33	+	n.a.	n.a.
Slovenia	62	4.25	4.64	+	32	0.445
Spain	35	4.57	4.71	0	29	0.465
Sweden	6	5.48	6.21	++	5	1.111
UK	10	5.37	5.85	+	8	1.042

Note: [a]n.a. = not available
Source: WEF (2013a, 2013b)

Table I.
EU member states' performance according to the different WEF indexes, 2013-2014[a]

Country	Rank	Score
Finland	1	5.70
Sweden	2	5.55
The Netherlands	3	5.41
Denmark	4	5.32
Germany	5	5.28
Austria	6	5.16
UK	7	5.13
Luxembourg	8	5.07
Belgium	9	4.93
France	10	4.81
Ireland	11	4.75
Estonia	12	4.74
Spain	13	4.47
Malta	14	4.44
Portugal	15	4.44
Slovenia	16	4.43
Lithuania	17	4.38
The Czech Republic	18	4.33
Latvia	19	4.32
Cyprus	20	4.22
Italy	21	4.05
Poland	22	3.97
Slovakia	23	3.91
Croatia	24	3.87
Hungary	25	3.83
Greece	26	3.79
Bulgaria	27	3.75
Romania	28	3.64

Source: WEF (2014, p. 13)

Table II. Europe 2020 index rankings (1-28) and scores [1-7 (best)] of EU member states, 2014

attract intellectual capital. Therefore, we took the courage and created a new index for that.

As we were looking for methods measuring similar categories, we have found an fp7 project called INNODRIVE (Piekkola, 2011), and another one called COINVEST[7], and further works that were much more specific either in their scope or in their geographical coverage (Clayton *et al.*, 2009; Delbecque and Nayman, 2010; Edquist, 2011). However, these methods were all aiming at measuring intangible assets or intellectual capital itself and not actors' ability to attract such capital. As for us, we were particularly interested in countries' such abilities so these works did not give the answer to our question.

To show the EU member states' ability to attract intellectual capital, we courageously generated a new index based on the WEF data and the WEF's methodology applied for the other similar "secondary" indexes (SCI, HCI and Europe 2020 Competitiveness Index). To generate this new index, we selected 12 sub-indicators (Table III) of the WEF's GCI (WEF, 2013a, 2013b). We chose these very sub-indicators as we consider them most relevant in relation to the ability to attract intellectual capital.

No. in GCI	Name of sub-indicator in GCI	Scale
1.02	Intellectual property protection	1-7 (best)
1.21	Strength of investor protection	0-10 (best)
12.03	Company spending on R&D	1-7 (best)
12.04	University-industry collaboration in R&D	1-7 (best)
12.06	Availability of scientists and engineers	1-7 (best)
4.09	Quality of primary education	1-7 (best)
4.10	Primary education enrolment	Net %
5.01	Secondary education enrolment	Gross
5.02	Tertiary education enrolment	Gross %
5.03	Quality of the educational system	1-7 (best)
5.07	Availability of research and training services	1-7 (best)
9.01	Availability of latest technologies	1-7 (best)

Source: WEF (2013a)

Table III.
GCI sub-indicators of ability to attract intellectual capital

Our choice was intuitive and, obviously, somewhat arbitrary. The selected indicators are revealing the answers provided in the WEF's Executive Opinion Survey and are, as such, merely soft data. Therefore, our methodology certainly has its limitations. Accordingly, we hereby indicate that one possible way to develop this research further can be the testing and respective modification and/or refinement of the generated index.

In our calculations, we used the data for the 28 member states of the EU from 2 WEF Global Competitiveness Reports, namely, the 2007-2008 and the 2013-2014 editions (WEF, 2007, 2013a, 2013b)[8]. We chose these two editions because the 2007-2008 report can be regarded as the last one preceding the crisis, while the 2013-2014 report, published in December 2013, provides the latest data, on one hand, and can be regarded as showing a post-crisis picture of competitiveness (EC, 2014). As we compare pre-crisis performance with post-crisis performance only, our methodology is not applicable for showing processes during the crisis and the differences across countries in this respect. Nevertheless, even if the crisis took manifold manifestations ranging from financial crisis to internal structural crisis or lack of fiscal discipline and credibility, our approach is that attracting intellectual capital is a good remedy, whatever the exact nature of the crisis.

Our aim was to generate the new indicator from the 12 applied sub-indicators. We named the new index "Ability to attract intellectual capital". To receive the values for the new indicator, we applied the formula that the WEF itself uses in calculating its secondary indexes:

$$(\text{country score} - \text{sample minimum}) / (\text{sample maximum} - \text{sample minimum})$$

As a consequence, deriving from the very nature of the formula, for all the 12 sub-indicators, the best-performing country got the value 1 and the worst-performing one got the value 0.

As a next step, we calculated the (unweighted) averages of these values for all countries for both the time periods (2007-2008 and 2013-2014)[9].

Discussion

As a result of our calculations, we could set up the EU member states' rank in their ability to attract intellectual capital, for the two periods. Results of our calculations are shown in Tables IV and V. The order is not particularly surprising after the GCI, SCI, HCI and Europe 2020 Competitiveness Index ranks. With a few exceptions, the Nordic countries are the best performers on this dimension as well, while the new member states are tendentiously weaker in their ability to attract intellectual capital. It is also not too surprising that, in 2007-2008, Estonia was the best performing new member states (Rank 11), followed by The Czech Republic (12) and Slovenia (14). As usual, in such comparisons, Croatia (26), Romania (27) and Bulgaria (28) were the last on the 2007-2008 rank. As for the 2013-2014 results, the top and bottom parts of the list have not changed much. Nevertheless, Estonia's relative position has worsened (Rank 15 on the 2013-2014 list) and The Czech Republic (20) has also suffered a fallback.

As we, at this point, had scores and ranks for the years before and after the crisis, we asked ourselves the question how countries' relative positions have changed during the

Country	Rank	Calculated score
Finland	1	0.92722189
Denmark	2	0.85618390
Sweden	3	0.83824193
Belgium	4	0.77735929
The Netherlands	5	0.76184695
UK	6	0.70409014
Ireland	7	0.70086377
France	8	0.69851513
Germany	9	0.69716713
Austria	10	0.69090263
Estonia	11	0.50524296
The Czech Republic	12	0.48831488
Spain	13	0.47309351
Slovenia	14	0.45839338
Portugal	15	0.42928647
Luxembourg	16	0.41246411
Cyprus	17	0.39966273
Italy	18	0.37087717
Slovakia	19	0.35878748
Lithuania	20	0.35379233
Greece	21	0.33741151
Hungary	22	0.33403565
Poland	23	0.32178968
Malta	24	0.31770781
Latvia	25	0.27137550
Croatia	26	0.25964775
Romania	27	0.20864242
Bulgaria	28	0.15324393

Source: Own calculations based on WEF (2007, 2013a)

Table IV.
EU member states' ability to attract intellectual capital, 2007-2008

Country	Rank	Calculated score
Finland	1	0.92880984
The Netherlands	2	0.76252548
Sweden	3	0.75264765
Belgium	4	0.75035527
Germany	5	0.71115589
Ireland	6	0.71089993
UK	7	0.69814312
Austria	8	0.65386127
Denmark	9	0.63693548
France	10	0.62636674
Portugal	11	0.55921717
Luxembourg	12	0.54496529
Spain	13	0.53004912
Malta	14	0.48991537
Estonia	15	0.47861230
Cyprus	16	0.46772873
Slovenia	17	0.41711864
Lithuania	18	0.40617599
Italy	19	0.36564653
The Czech Republic	20	0.34652690
Greece	21	0.33591134
Latvia	22	0.30657753
Hungary	23	0.29716678
Poland	24	0.27833903
Slovakia	25	0.24969203
Croatia	26	0.22715729
Bulgaria	27	0.16672802
Romania	28	0.11354830

Source: Own calculations based on WEF (2007, 2013a)

Table V.
EU member states' ability to attract intellectual capital, 2013-2014

crisis (Table VI). In the column showing the changes, we find some rather large numbers, both negative (worsening) and positive (improving). Malta has improved the most (+10 positions) and The Czech Republic fell the most (−8), with Slovakia performing a similarly large fallback (−6). Germany and Luxembourg (+4) and Latvia and The Netherlands (+3) were the other countries with remarkable improvement in their relative positions.

Nevertheless, as the relative positions did not tell us enough, we were also interested in how the values of the sub-indicators and of the main indicator of attracting intellectual capital have changed during the years of the crisis (Table VII shows the latter). The change in value of indicator also shows a spectacular improvement in the case of Malta (+54.203 per cent). However, in this way, some considerable fallbacks could also be revealed (Romania −45.578 per cent, Slovakia −30.407 per cent, The Czech Republic −29.036 per cent and Denmark −25.608 per cent), while improvements are also more obvious (outside Malta, we note the improvement of Luxembourg +32.124 per cent, Portugal +30.267 per cent and Cyprus +17.031 per cent). Interestingly, Portugal

Country	2013-2014	2007-2008	Change in position
Austria	8	10	+2
Belgium	4	4	0
Bulgaria	27	28	+1
Croatia	26	26	0
Cyprus	16	17	+1
The Czech Republic	20	12	−8
Denmark	9	2	−7
Estonia	15	11	−4
Finland	1	1	0
France	10	8	−2
Germany	5	9	+4
Greece	21	21	0
Hungary	23	22	−1
Ireland	6	7	+1
Italy	19	18	−1
Latvia	22	25	+3
Lithuania	18	20	+2
Luxembourg	12	16	+4
Malta	14	24	+10
The Netherlands	2	5	+3
Poland	24	23	−1
Portugal	11	15	4
Romania	28	27	−1
Slovakia	25	19	−6
Slovenia	17	14	−3
Spain	13	13	0
Sweden	3	3	0
UK	7	6	−1

Source: Own calculations based on WEF (2007, 2013a)

Table VI.
EU member states' ability to attract intellectual capital, rank

and Cyprus were among the EU member states in need of external financial assistance during the crisis.

We were also interested in how EU member states' ability to attract intellectual capital relates to the countries' national gross domestic product (GDP). We were interested in the relation, as competitiveness, at the end of the day, would manifest in higher output levels. Accordingly, we collected the GDP at constant prices' (2005 market prices) data for the 28 member states of the EU, for the two years: 2007 and 2013. The source of these data is the EU's AMECO database (AMECO 2014). We also calculated the change in countries' GDP between 2007 and 2013 (Table VIII). These data are more or less well known: Greece suffered the largest setback in its GDP in the course of the crisis (−23.664 per cent), while other countries could grow during these years (e.g. Poland +20.144 per cent, Slovakia +11.095 per cent, Malta +9.992 per cent and Sweden +6.086 per cent). Adding Croatia or Italy to the picture (−10.036 per cent and −8.538 per cent, respectively), our argument above regarding the need for finding EU-level solutions to the internal disparities seems justified.

Country	Change in value (%)
Austria	−5.361
Belgium	−3.474
Bulgaria	+8.799
Croatia	−12.513
Cyprus	+17.031
The Czech Republic	−29.036
Denmark	−25.608
Estonia	−5271
Finland	+0.171
France	−10.329
Germany	+2.007
Greece	−0.445
Hungary	−11.037
Ireland	+1.432
Italy	−1.410
Latvia	+12.972
Lithuania	+14.806
Luxembourg	+32.124
Malta	+54.203
The Netherlands	+0.089
Poland	−13.503
Portugal	+30.267
Romania	−45.578
Slovakia	−30.407
Slovenia	−9.004
Spain	+12.039
Sweden	−10.211
UK	−0.845

Source: Own calculations based on WEF (2007, 2013a)

Table VII.
EU member states' ability to attract intellectual capital, change in value, %, 2013-2014/2007-2008

Last but far not least, we were eager to see in one figure how the crisis has affected EU member states' GDP and their ability to attract intellectual capital. Figure 2 is a visualisation of that. We ran cluster analyses on our data, but we have not come to any logically interpretable results. However, the EU member states "occupy" quite a large territory of the diagram, implying that there are considerable differences among them along these dimensions.

Malta's outstanding performance should be subject to further, deeper analysis. The other countries in the upper right quadrant (Luxembourg, Lithuania, Bulgaria and Germany) are the ones that could improve their abilities to attract intellectual capital and grow at the same time.

Poland's situation is exceptional: it was able to grow considerably between 2007 and 2013, despite a significant fallback in its ability to attract intellectual capital. Slovakia, Romania and The Czech Republic could also grow during the reference period, with even larger fall-backs in the other examined dimension. These results imply that, for these Central and Eastern Europe (CEE) countries, there must have been other drivers of growth in the reference period. However, at the same time,

Country	2007	2013	Change (%, 2013/2007)
Austria	263.6655	272.614	+3.394
Belgium	320.5082	327.9713	+2.329
Bulgaria	51.56889	53.69126	+4.116
Croatia	293.9697	264.4663	−10.036
Cyprus	14.66631	14.00489	−4.510
The Czech Republic	3526.071	3551.436	+0.719
Denmark	1623.01	1557.171	−4.057
Estonia	13.23315	12.83111	−3.038
Finland	173.1422	164.7951	−4.821
France	1800.663	1812.687	+0.668
Germany	2382.11	2482.43	+4.211
Greece	210.8845	160.9812	−23.664
Hungary	22900.86	21984.68	−4.001
Ireland	180.4066	166.7234	−7.585
Italy	1492.671	1365.227	−8.538
Latvia	15.63304	14.24174	−8.900
Lithuania	85.70233	86.60628	+1.055
Luxembourg	33.8562	34.0007	+0.427
Malta	5.271486	5.798202	+9.992
The Netherlands	551.6451	543.033	−1.561
Poland	1115.412	1340.106	+20.144
Portugal	160.2048	149.4344	−6.723
Romania	331.4004	349.9791	+5.606
Slovakia	59.03658	65.58643	+11.095
Slovenia	32.51847	30.41702	−6.462
Spain	979.2887	921.7387	−5.877
Sweden	2984.108	3165.734	+6.086
UK	1356.88	1338.042	−1.388

Sources: AMECO (2014), and own calculations

Table VIII. EU member states' GDP at constant prices (2005 market prices), 2007, 2013, and change (%, 2013/2007)

other CEE countries performed rather differently. Estonia, Hungary, Slovenia and Croatia are found in the lower left quadrant which means that their economies contracted and their abilities to attract intellectual capital worsened between 2007 and 2013. Overall, it does not seem like the new member states can be grouped in any appropriate way. Instead, they all seem to be following their own paths.

It is not less exciting that some member states in the upper left quadrant of Figure 2 who had suffered greatly from the crisis (Portugal, Cyprus, Latvia, Spain) could improve their relative positions in attracting intellectual capital, despite the measurable loss in their GDP. This implies that the adjustment made in the respective economies may well have been judged positively in the eyes of investors, even if economic recovery in most of these countries is yet to come (Végh 2014). It is similarly positive that Greece could at least keep its ability to attract intellectual capital, despite the exceptional fallback of its GDP during the crisis. Many of the developed EU member states (e.g. The Netherlands, UK, Belgium and Austria) are close to the pole which can be considered as a manifestation of the relative stability in their positions (at fairly low growth rates, though).

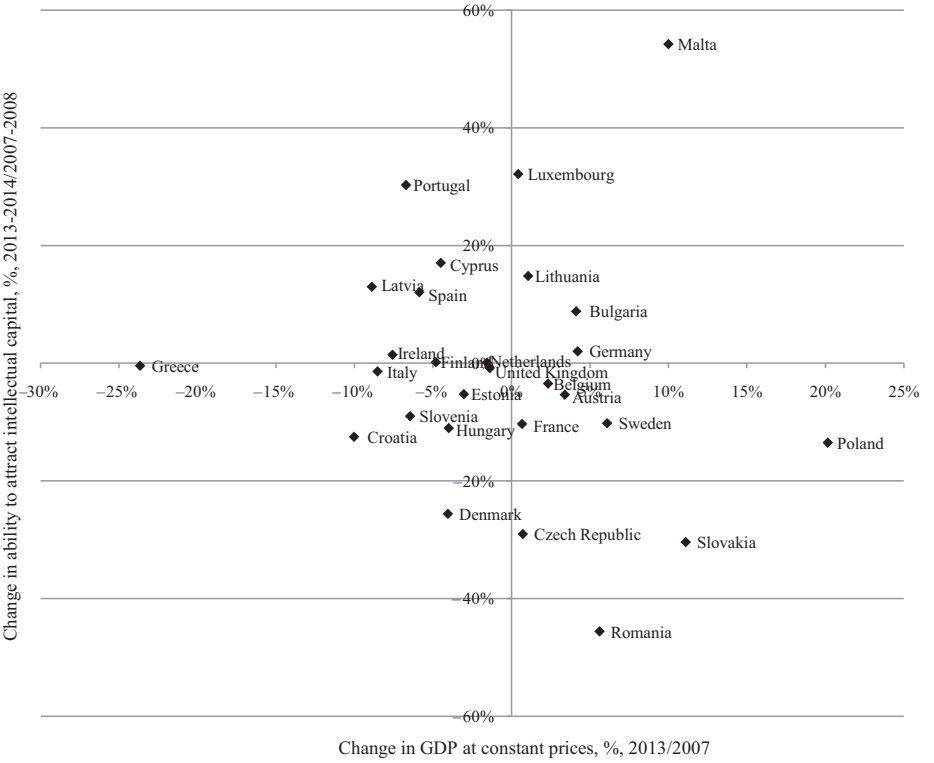


Figure 2.
The effect of the crisis on EU member states' GDP and their ability to attract intellectual capital

Sources: Own calculations based on WEF (2013, 2007); AMECO (2014)

Conclusions

Our finding that the CEE countries of the EU are following rather different paths is in line with Farkas's (2014) results based on fully different factors. Similarly, the European Bank for Reconstruction and Development (2013) or the European Science Foundation (2012) have come to such conclusions in assessing these economies on other grounds. On the other hand, some countries of the periphery of the EU that had suffered deeply from the crisis in its worst years (Portugal, Cyprus, Latvia, Spain, Lithuania and Bulgaria) could improve their abilities to attract intellectual capital, which anticipates positive trends in their future outputs and competitiveness.

The results of our research certainly do not imply that convergence is proceeding in the EU or that the less developed EU member states have all been successful in coping with the pressure deriving from internal market forces since the time preceding the global financial and economic crisis. Nevertheless, some countries have not wasted the "good" crisis and took those painful steps of structural reform, which manifests in their improved positions in attracting intellectual capital. For them, the future prospects of improved competitiveness are likely to come true.

Notes

1. The Treaty establishing the European Economic Community. Date of signature: 25 March 1957, entry into force: 1 January 1958, was not published in the Official Journal.
2. These issues are discussed in detail by Pelle (2013).
3. Updated information available at http://ec.europa.eu/economy_finance/assistance_eu_ms/index_en.htm
4. In line with the philosophy of "never let a serious crisis go to waste". Quote from Rahm Emanuel, US White House chief of staff. http://perc.org/blog/rahms-rule-never-let-serious-crisis-go-waste
5. www.weforum.org/content/pages/sustainable-competitiveness/
6. www.weforum.org/content/global-agenda-council-europe-2012-2014
7. www.coinvest.org.uk
8. We included Croatia in our calculations for both time periods.
9. Another possibility for refinement of our index is to apply a weighted average.

References

Aghion, P. and Howitt, P. (2005), "Appropriate growth policy: a unifying framework", paper presented at The 2005 Joseph Schumpeter lecture, to be delivered to the 20th Annual Congress of the European Economic Association, Amsterdam, 25 August, available at: www.oecd.org/eco/growth/35912476.pdf (accessed 5 May 2014).

AMECO (2014), "Gross domestic product at market prices", available at: http://ec.europa.eu/economy_finance/ameco/user/serie/ResultSerie.cfm (accessed 5 May 2014).

Brinkley, I. and Lee, N. (2006), "The knowledge economy in Europe: a report prepared for the 2007 EU Spring Council", The Work Foundation, London.

Clayton, T., Dal Borgo, M. and Haskel, J. (2009), "An innovation index based on knowledge capital investment: definition and results for the UK marker sector", IZA Discussion Papers No. 4021, IZA.

David, P.A. (1992), "The evolution of intellectual property institutions and the panda's thumb", in Wallerstein, M.B., Mogee, M.E. and Schoen, R.A. (Eds), *The Global Dimensions of Intellectual Property Rights in Science and Technology*, National Academy Press, Washington, DC, pp. 19-62.

Delbecque, V. and Nayman, L. (2010), "Measuring Intangible capital: an application to the French data", available at: www.kites.unibocconi.it/wps/allegatiCTP/Delbecque%20Measuring_intangible_capital_1.pdf (accessed 10 July 2014).

Denicolai, S., Zucchella, A. and Strange, R. (2014), "Knowledge assets and firm international performance", *International Business Review*, Vol. 23 No. 1, pp. 55-62.

Edquist, H. (2011), "Intangible investment and the Swedish manufacturing and service sector paradox", IFN Working Paper No. 863, Research Institute of Industrial Economics, Stockholm.

Elsner, W., Heinrich, T. and Schwardt, H. (2014), *The Microeconomics of Complex Economies: Evolutionary, Institutional, Neoclassical, and Complexity Perspectives*, Elsevier, San Diego, CA.

European Bank for Reconstruction and Development (2013), "Stuck in transition? Transition report 2013", European Bank for Reconstruction and Development, London.

European Commission (EC) (2010), *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*, European Commission, Brussels.

European Commission (EC) (2014), "European economic forecast", *European Economy, 2/2014*, European Commission.

European Council (EC) (1993), "Presidency conclusions: Copenhagen European council", available at: www.europarl.europa.eu/enlargement/ec/pdf/cop_en.pdf (accessed 3 March 2011).

European Science Foundation (2012), *Central and Eastern Europe Beyond Transition: Convergence and Divergence in Europe*, European Science Foundation, Strasbourg.

Farkas, B. (2014), "Competitiveness of the Central and Eastern European economies: changing prospects after the global crisis", paper presented at EACES Biennial Conference, Budapest, 4-6 September.

Farkas, B. and Várnay, E. (2011), *Bevezetés az Európai Unió tanulmányozásába*, JATEPress, Szeged.

Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17 No. S2, pp. 109-122.

Harrold, P. and Hahm, H.J. (2012), "Croatia and the European Union: an opportunity, not a guarantee", available at: www.worldbank.org/en/news/opinion/2012/07/30/croatia-and-the-european-union-an-opportunity-not-a-guarantee (accessed 13 March 2014).

Kovács, A. and Halmosi, P. (2012), "Azonosságok és különbségek az európai válságkezelésben", *Pénzügyi Szemle*, Vol. 57 No. 2, pp. 9-26.

Leydesforff, L. (2006), *The Knowledge-Based Economy*, Universal Publishers, Boca Raton, FL.

Pelle, A. (2013), "The European social market model in crisis: at a crossroads or at the end of the road?", *Social Sciences*, Vol. 2 No. 3, pp. 131-146.

Piekkola, H. (Ed.) (2011), "Intangible capital: driver of growth in Europe", *Proceedings of the University of Vaasa No. 167*, available at: www.innodrive.org/attachments/File/Intangible_Capital_Driver_of_Growth_in_Europe_Piekkola%28ed%29.pdf (accessed 5 May 2014).

Samuelson, P.A. (1948), "International trade and the equalisation of factor prices", *The Economic Journal*, Vol. 58 No. 230, pp. 163-184.

Samuelson, P.A. (1962), "Economists and the history of ideas", *The American Economic Review*, Vol. 52, pp. 1-18.

Végh, M.Z. (2014), "Has austerity succeeded in ameliorating the economic climate? The cases of Ireland, Cyprus and Greece", *Social Sciences*, Vol. 3 No. 2, pp. 288-307.

World Economic Forum (WEF) (2007), *The Global Competitiveness Report 2007*, World Economic Forum, Geneva.

World Economic Forum (WEF) (2013a), *The Global Competitiveness Report 2013*, World Economic Forum, Geneva.

World Economic Forum (WEF) (2013b), *The Human Capital Report*, World Economic Forum, Geneva.

World Economic Forum (WEF) (2014), *The Europe 2020 Competitiveness Report: Building a More Competitive Europe*, World Economic Forum, Geneva.

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