

# EU Funding for Research and Innovation Actions in Horizon 2020

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**Abstract:** *The countries from Central and Eastern Europe (CEE) joined the EU after 2004, thus becoming the “new” EU member states. For over thirteen years they participate as full members in European Union (EU) framework programmes for funding research and innovation, including the current Horizon 2020 (2014-2020). Although their participation in the EU programmes for research and innovation is considered not different from the “old” EU 15 member states, there are however differences in terms of number of successful projects winning European competitions and of EU funding attracted for R&D activities. During the last years, however, there became apparent differences within the group of the CEE member states, some of these countries becoming indeed research-intensive.*

*The present paper analyzes the participation of the EU CEE member states in Horizon 2020 from the perspective of EU and national funding for research, development and innovation activities, and European research projects won in Horizon 2020 competitions, with the aim of establishing which ones are the most active and successful in research and innovation nationally and at European level.*

**Keywords:** *EU budget, EU funding, Horizon 2020, CEE member states*

**JEL Classification:** *F02, F36, F68*

## 1. Introduction

Horizon 2020 is the European Union (EU) framework for research and innovation for 2014-2020, with 80 billion Euro available over the 7 years (Horizon 2020, 2017). The EU framework programme for research and innovation focuses on three main pillars, namely excellent science, industrial leadership and tackling societal challenges, and is complemented by the EU nuclear programme, Euratom. The goal of Horizon 2020 is to boost EU competitiveness for economic growth and jobs creation, thus contributing to the achievement of the Europe 2020 strategy (Europe 2020 Strategy, 2017). For this purpose, Horizon 2020 aims to produce world-class science, remove barriers to innovation and make it easier for the public and private sectors to work together in delivering innovation.

EU member states (EU MS) participate in Horizon 2020 through competitions of research and innovation projects, opened usually twice per year. The competitions for EU funding are fierce given the diminishing national budgets for research. Only the best European research projects, including the best research organizations and researchers within trans-national consortia, are selected for funding in Horizon 2020.

The funding for research and innovation projects in Horizon 2020 comes from the multiannual EU budget, formed through the national contributions of all EU 28 member states. The current EU financial framework, as well as the programming period for Horizon 2020, is 2014-2020.

The present paper analyzes the participation of the 13 Central and Eastern European (CEE) member states in Horizon 2020 from the perspective of EU and national funding for research, development (R&D) and innovation activities, and European research projects these countries won in Horizon 2020 competitions. The following research questions are analyzed: **What is the total level of funding for research and development (R&D) activities in the CEE member states (both national and EU allocated funding)? How competitive CEE countries are in winning research and innovation European projects and securing EU funding?**

## 2. Data and data collection

The quantitative research methodology used data collected from literature and document review and databases, which were then analyzed according to the research questions. The following sources were used for

the analyses: EU legislative documents (EUR-Lex (EU law, 2017)), documents and publications of the European Commission - Directorate General for Research and Innovation (DG R&I, 2017), CORDIS portal (CORDIS, 2017), EU Open Data Portal (EU-ODP, 2017), EUROSTAT databases (EUROSTAT, 2017), EU budget database (expenditure and revenue) (EU Budget, 2017).

The data were collected and interpreted for the CEE member states for the period of time 2014-June 2017 (the latest update of CORDIS is June 2017). For financial information, the latest data available (Eurostat and EU Budget) is 2015.

### 3. EU and national funding for research and development (R&D) activities

The data collected for EU and national funding for research and development and innovation activities over the period 2014-2015 allowed for the comparative analysis of the CEE countries from this perspective, answering the research question “**What is the total level of funding for research and development (R&D) activities in CEE member states (both national and EU allocated funding)?**” The research analysis developed in the paper provided information as to **what CEE countries are the most research-intensive over 2014-2015** from the perspective of total investment in R&D activities.

The structure of the EU budget for 2014-2020 is presented in Box 1. The main budget headings, i.e. Smart and inclusive growth, Sustainable growth, Security and citizenship, Global Europe, are in full accordance with the main sections of the Europe 2020 strategy, thus effectively contributing to achieving its objectives. The framework programme Horizon 2020 (including the Euratom) is to be found under the first heading („Smart and inclusive growth”), sub-heading „Competitiveness for growth and jobs”.

The EU budget is formed from national contribution of its MS<sup>1</sup>. There are three main types of sources:

- **Traditional own resources of the member states:** consist mainly of customs duties on imports from outside the EU and sugar levies. EU Member States keep 20 % of the amounts as collection costs.

- **Member states’ own resources based on value added tax (VAT):** a uniform rate of 0.3 % is levied on the harmonised VAT base of each member state.

- **Member states’ own resources based on GNI:** each member state transfers a standard percentage of its gross national income (GNI) to the EU. Although designed simply to cover the balance of total expenditure not covered by the other own resources, this system has become the largest source of revenue of the EU budget.

The total contribution of the CEE countries to the EU budget in 2014 and 2015 was 22 464 million Euro (EU Budget, 2017). The biggest contributors (as percentage of total CEE contribution to EU budget 2014-2015) were Poland (36.46%), Czech Republic (13.57%) and Romania (12.93%).

Hungary contributed with 9.21%, Slovakia with 6.32% and Bulgaria with 4.2%. All other CEE member states contributed with less than 4% (Author’s original calculations based on data collected and analyzed from (EU Budget, 2017). In general, the CEE countries’ contribution to the EU budget in 2014 and 2015 was around 0.95% of their GDP. The biggest contributors over the two years, with more than 1% of GDP<sup>2</sup>, are Bulgaria, Estonia, Lithuania, Slovenia (Author’s original calculation based on data collected from (EU Budget, 2017) and (EUROSTAT, 2017).

The countries that were allocated most of the total EU budget (on all headings) in 2014 and 2015 (as percentage of total EU payments to CEE member states) were Poland (35.23%), Romania (14.28%), Hungary (14.01%) and Czech Republic (13.1%). If to look at how much countries received from the EU budget in 2014 - 2015 compared to their contribution over the same period (considered as difference between EU budget payments and EU budget commitments, in million Euro) (EU Budget-Policy, 2017), the highest payments were

#### EU Budget 2014-2020 - Headings

1. Smart and inclusive growth
  - a) Competitiveness for growth and jobs
  - b) Economic, social and territorial cohesion
2. Sustainable growth
3. Security and citizenship
4. Global Europe
5. Administrative expenditure (for all EU institutions)
- Special instruments

#### Box 1. EU budget components 2014-2020

Source: (EU Budget, 2017)

<sup>1</sup> On 26 May 2014, the EU Council adopted a legislative package, including a new own resources decision, introducing some changes to the own resources system for the period 2014-20. The new own resources rules apply, following the entry into force of this decision on 1 October 2016, retroactively as of 1 January 2014 (EU Council Decision 335/2014, 2014)

<sup>2</sup> Eurostat, GDP at market prices (million Euro) (GDP-MEURO, 2017)

received by Poland followed by Hungary, Romania and Czech Republic (Author's original calculations based on data collected and analyzed from (EU Budget, 2017).

The EU budget allocates payments for Horizon 2020 (including Euratom) as one of the sub-heading inside heading 1a. Competitiveness for growth and jobs. The allocations for the CEE member states for Horizon 2020 in 2014-2015 are presented in Table 1, together with the national expenditure on research and development activities across all sectors of economy (GERD) over the same period of time.

**Table 1. Comparison between the EU allocations for R&D in Horizon 2020 and national expenditure on R&D over 2014-2015 (million Euro)**

CEE member states <sup>3</sup>	EU allocations from the EU budget for Horizon 2020 and Euratom 2014-2015 (cumulative)	National expenditure on R&D (GERD) 2014-2015 (cumulative)
Bulgaria	16.5	773.1
Croatia	20.3	714.7
Cyprus	36.1	164.5
Czech Republic	94.2	6 340.9
Estonia	31.9	589.5
Hungary	237.2	2 939.8
Latvia	11.2	315.1
Lithuania	11.6	763.8
Malta	5.9	128.1
Poland	92.7	8 180.5
Romania	33.8	1 357.3
Slovakia	15.0	1 596.9
Slovenia	51.1	1 743.3

Source: Author's original calculation based on data collected from (EU Budget, 2017) and (GERD, 2017)

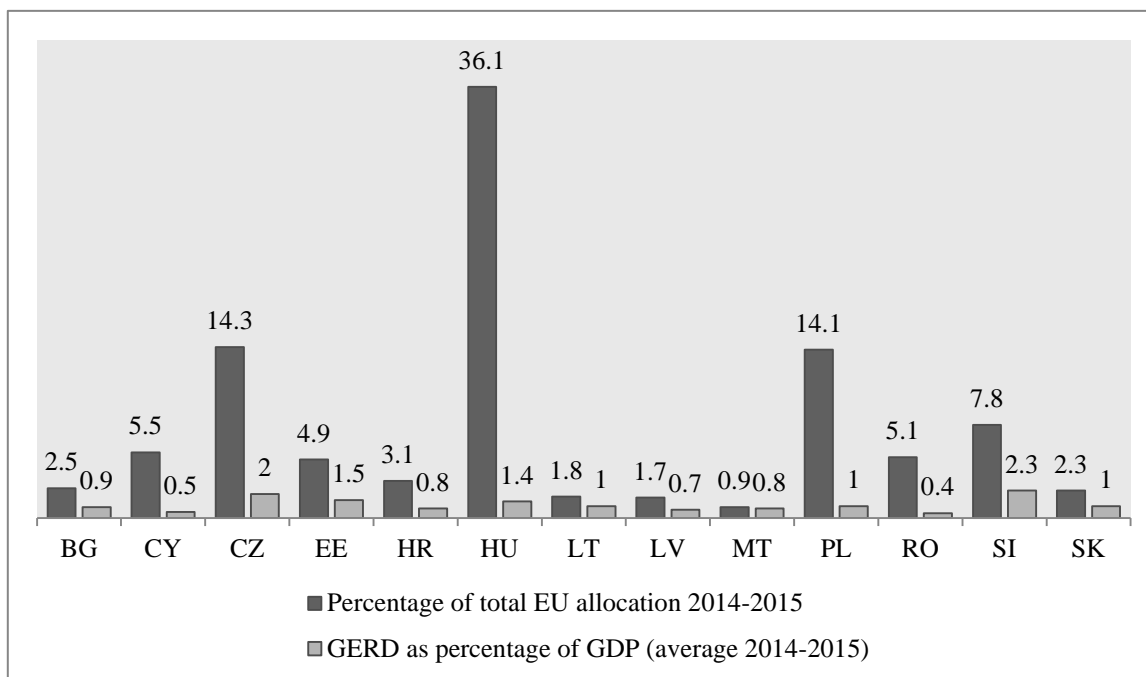
It should be noted that the highest EU allocation for research and innovation activities in Horizon 2020 (including Euratom) for 2014-2015 (cumulative) is for Hungary (36.1% of total EU allocations for CEE member states in 2014-2015 for R&D). Czech Republic and Poland have also allocated high budgets for R&D projects (about 14% each). The rest of the CEE countries have low allocations from the EU budget, most of them at 5% and below (Figure 1). At the same time, it is remarkable the national effort for R&D expenditure of Slovenia and Czech Republic (2.3% and 2% of GDP on average over 2014-2015) (Figure 1). Coupled with the high EU allocations for research and innovation activities in Horizon 2020 (incl. Euratom) they received in 2014 and 2015, the total expenditure for R&D of these two countries is very important (Figure 2).

Analyzing the data presented in Figures 1 and 2, it can be seen that the CEE member states most interested in advancing their research and innovation, considered as a long-term strategic instrument for economic growth, are Poland, Czech Republic and Slovenia. These three countries from Central and Eastern Europe invest a lot on R&D from their own national budgets and, on top of this, also receive significant allocations from the EU budget.

The outliers in the framework of total expenditure on R&D (EU and national funding) for CEE countries are Estonia and Hungary. In 2014-2015, Estonia invested significant national budget on research and development (1.5% of GDP on average over 2014-2015) but its allocated share of EU budget for R&D is relatively low compared with other CEE member states (only 4.9%), thus the overall funding for research activities is not very high. On the other hand, Hungary invested similar percentage of GDP as Estonia (i.e. 1% on average in 2014-2015) but it received the highest EU allocation from all CEE countries (i.e. 36.1% over 2014-2015), thus effectively placing Hungary in the top research-intensive CEE countries (Hungary ranks third position after Poland and Czech Republic, whilst Estonia is at the 10<sup>th</sup> position out of a total 13).

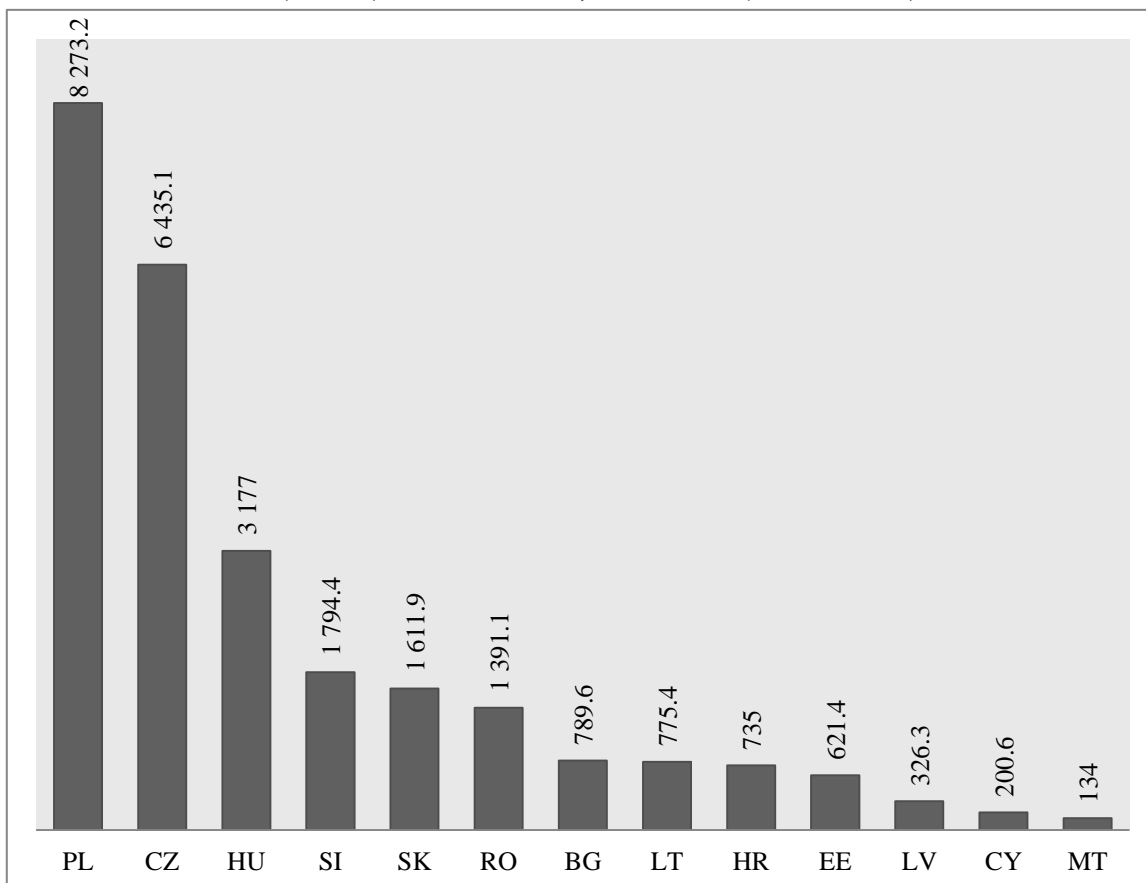
<sup>3</sup> The CEE member states are: Bulgaria (BG); Croatia (HR); Cyprus (CY); Czech Republic (CZ); Estonia (EE); Hungary (HU); Latvia (LV); Lithuania (LT); Malta (MT); Poland (PL); Romania (RO); Slovenia (SI); Slovakia (SK)

**Figure 1. Comparison between the EU allocations for R&D in Horizon 2020 (as percentage of total EU allocation for CEE member states in 2014-2015, cumulative) and national expenditure on R&D over 2014-2015 (GERD as percentage of GDP)**



Source: Author's original calculation based on data collected from (EU Budget, 2017) and (EUROSTAT, 2017)

**Figure 2. Total expenditure on R&D from EU allocations in Horizon 2020 and from national budget (GERD) over 2014-2015, cumulative (million Euro)**



Source: Author's original calculation based on data collected from (EU Budget, 2017) and (EUROSTAT, 2017)

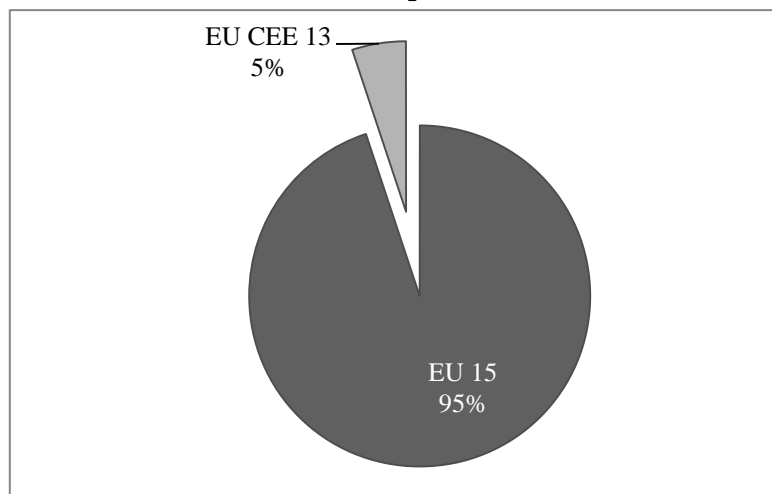
Over the period 2014-2015, Romania had the lowest national budget allocated for R&D from all CEE member states (0.4% average) and, with modest EU allocation for Horizon 2020 activities (i.e. 5.1%), it holds the middle position (6<sup>th</sup> place) among the CEE countries in terms of funding for research and innovation.

#### 4. The EU funding attracted through successful research and innovation European projects 2014 - June 2017<sup>4</sup>

The analyses of the data collected from the CORDIS database and the EU Open Data Portal regarding the research and innovation European projects that were successful in Horizon 2020 over 2014 - June 2017 allowed for the assessment of the CEE member states' performance, thus answering to the research question **“How competitive CEE countries are in winning research and innovation European projects and securing EU funding?”**. At the same time, the analysis provided information as **to which CEE countries are the most successful in the Horizon 2020 competitions** for research and innovation projects.

As mentioned in the previous section, the EU funding allocated for research and innovation activities in the programme Horizon 2020 (including Euratom) is distributed through competitions of European (mostly trans-national) projects. Winning such European projects, thus securing the EU funding, is very difficult for many reasons<sup>5</sup>, especially for the “new” member states from Central and Eastern Europe. That is why, the overall performance of CEE member states in the Horizon 2020 competitions for research and innovation projects over the period 2014 - June 2017 is significantly lower than for the “old” ones. For the period 2014-June 2017, the CEE countries managed to secure 1.1 billion Euro from successful research and innovation projects in Horizon 2020, which represents however only 5.1% of the total EU funding attracted by the 28 EU member states (Figure 3).

**Figure 3. EU funding attracted by the CEE MS through successful research and innovation European projects in 2014-June 2017 as percentage of the total EU funding attracted by the EU 15 MS over the same period**



Source: Author's original calculation based on data collected from (CORDIS, 2017) and (EU-ODP, 2017)

The most active and successful CEE countries in Horizon 2020 in 2014-June 2017 were Poland (894 participations in successful research and innovation European projects<sup>6</sup>), Czech Republic (564 participations), Hungary and Romania (with similar number of successful participations, i.e. 518 and 516) and Slovenia (481 participations) (Figure 4). In terms of unique successful European projects in Horizon 2020 over 2014 - June

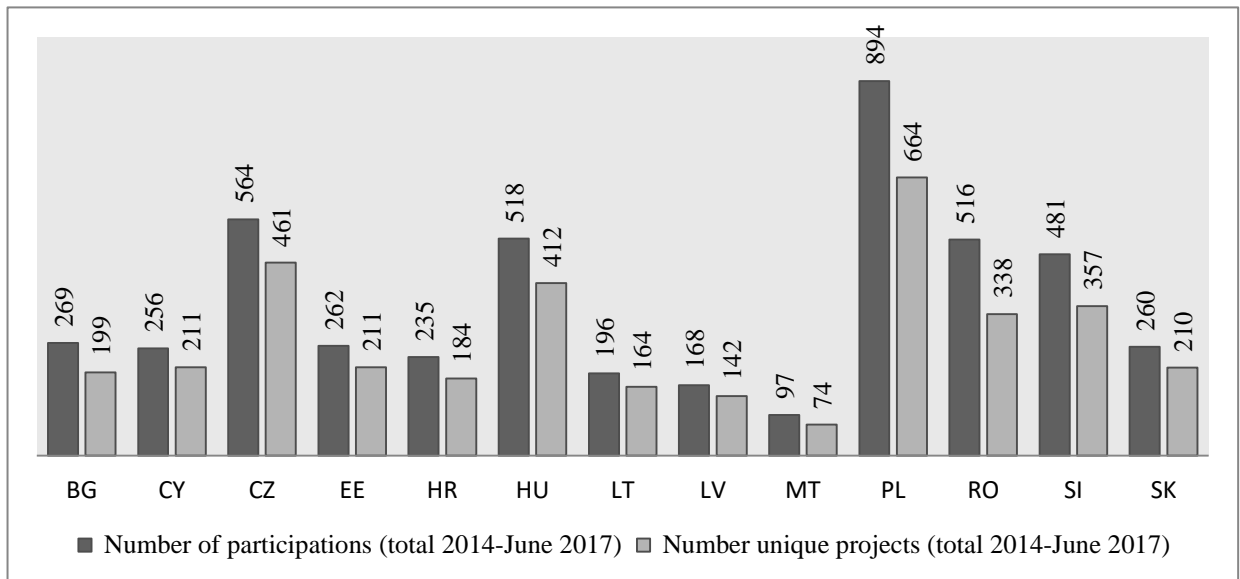
<sup>4</sup> June 2017 is the latest update of the European projects database EU Open Data Portal

<sup>5</sup> Among these reasons we can cite insufficient visibility and recognition of research / researchers from CEE (e.g. not enough ISI or other high level papers); insufficient and/or inadequate research infrastructure; insufficient experience (i.e. credibility) in managing European grants.

<sup>6</sup> “Participation” means involvement in more than unique projects, for example a country can have 10 unique projects but have 15 participations in those 10 projects.

2017, the same countries are in top positions: Poland, Czech Republic, Hungary, Slovenia and Romania (Figure 4).

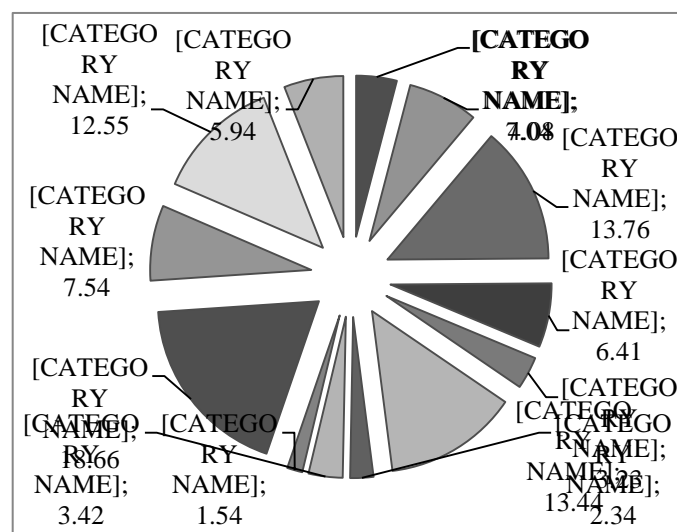
**Figure 4. Performance of CEE MS in attracting EU funding through successful research and innovation European projects in Horizon 2020 (incl. Euratom) in 2014 - June 2017**



Source: Author's original calculation based on data collected from (CORDIS, 2017) and (EU-ODP, 2017)

The EU funding attracted through the successful participation in Horizon 2020 competitions in 2014 - June 2017 was evidently the highest for the same CEE member states, i.e. Poland (18.66% of total EU funding attracted by CEE MS in Horizon 2020 in 2014-June 2017), Czech Republic and Hungary (with 13.76% and 13.44%, respectively) and Slovenia (12.55%). Although with a high number of successful European research projects, Romania and Slovakia attracted only 7.5% and 6% of the total EU funding attracted by CEE countries in Horizon 2020 in 2014-June 2017 (Figure 5).

**Figure 5. EU funding attracted by the CEE MS through successful research and innovation European projects in 2014-June 2017 as percentage of the total EU funding attracted by all CEE MS over the same period**



Source: Author's original calculation based on data collected from (CORDIS, 2017) and (EU-ODP, 2017)

Possible explanations for this fact are lower amounts for the EU funding requested/received by Romania and Slovakia in the European research projects they participate in and/or their participation in

European funding instruments (projects) that do not receive significant EU grants (for example, Coordination and Support Actions<sup>7</sup>).

## 5. Conclusions

The research carried out in the paper analyzed the performance of the CEE member states in research and development activities over the period 2014 - 2015 (and in some cases until June 2017) from the perspective of the national and EU funding allocated and attracted through European projects that were successful in Horizon 2020.

The following conclusions can be drawn:

- The CEE countries with high national budgets for R&D (GERD, as percentage of the GDP, averaged over 2014 and 2015) were Slovenia (2.3%), Czech Republic (2%), Estonia (1.5%) and Hungary (1.4%). Lithuania, Poland and Slovakia each allocated 1% of their GDP to research and innovation activities. With 0.4%, Romania had the lowest national budget for R&D of all CEE countries (and European Union).
- The CEE countries that had the highest allocation of funding for R&D from the EU budget in Horizon 2020 were Hungary (36.1% of total EU budgetary allocations for CEE MS in 2014-2015 for R&D), Czech Republic (14.3%), Poland (14.1%) and Slovenia (7.8%).
- The most successful CEE countries in terms of total number of unique research and innovation European projects over 2014 - June 2017 in Horizon 2020 are Poland, Czech Republic, Hungary, Slovenia and Romania.
- The CEE member states that were most interested in advancing their research and innovation, seen as a long-term strategic instrument for economic growth, are **Poland, Czech Republic, Hungary and Slovenia**. These countries invest a lot on R&D from their own national budgets and, on top of this, receive also significant allocations from the EU budget. These countries can already be considered as research-intensive from the perspectives of both total funding allocated to R&D (national and from the EU budget) and the number of successful European research projects.

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<sup>7</sup> The main types of projects (funding instruments) in Horizon 2020 are Research and Innovation Action; Innovation Action; Coordinated and Support Action; ERA-NET; European Research Council - ERC; Marie Skłodowska-Curie Actions (General Annexes, 2017)

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