

ACTIVITY AND SUCCESS RATE IN THE HE PROGRAMME

THE COMMITMENT OF THE RESEARCHERS FAR EXCEEDS THE CAPABILITIES OF THE HE PROGRAMME

The commitment of research teams and individuals to participate in international research far exceeds the financial possibilities of this FP. The greatest pressure to obtain funding to implement projects from the HE programme budget is for calls that are oriented towards the social sciences and humanities. Also at the forefront of the research community's interest are the parts of the HE programme that allow for funding projects focusing on a comprehensive, multidisciplinary approach to address civil security issues and excellent cutting-edge research projects under the European Research Council (ERC). The priority to support the mobility of researchers (MSCA) in the HE programme has also attracted a great deal of attention from researchers and research teams. The interest of the research community and private companies to use the funding to support high-risk breakthrough and disruptive innovations has also been enormous in the first third of the HE programme.

THE CZECH REPUBLIC'S ACTIVITY IN PREPARING PROJECT PROPOSALS FOR THE FP IS SLOWLY INCREASING

According to the number of Czech participation in project proposals and the share of submitted project proposals with Czech participation (from FP7 to the first third of the HE programme) in relation to all other EU countries, it can be stated that the position of the Czech Republic in the FP is gradually changing towards greater involvement of Czech research teams in the preparation of international projects and towards the desired greater participation in the FP. The Czech response to the FP challenges has to be compared with similarly large countries, or rather with countries with similar research capacity in terms of number of FTE researchers (Austria, Denmark, Hungary, Greece, Finland). Despite this shift, the Czech Republic is still very far from these countries, apart from Hungary.

In terms of the other countries, the interest in establishing a presence in FP has been growing continuously, especially in the smaller countries like Estonia and Slovenia, while it is visibly declining in the UK and Hungary. The apparent decline in the engagement of these two countries in FP may have a political background. For the UK, it may be related to the long-standing discussions on the form of the UK's remaining in the FP after Brexit, while for Hungary it may be a consequence of the desire of part of the Hungarian political spectrum to leave or reduce its relationship with the EU and related follow-up processes and activities.

THE EFFORT AND WILLINGNESS TO PARTICIPATE IN THE HE PROGRAMME IN PROJECTS WITH A PREDOMINANCE OF RESEARCH AND/OR INNOVATION ACTIVITIES, I.E. PROJECTS WITH HIGHER RESEARCH AND INNOVATION AMBITIONS, IS GREATER IN THE CZECH REPUBLIC THAN IN MOST OTHER NMS

Compared to other NMS (i.e. EU-13 countries), the Czech Republic has the second highest ratio of the number of project proposals with a predominance of research and/or innovation activities of consortium or of individual character (especially RIA/IA projects, ERC grants) to the number of project proposals focused on coordination, support, training, information, networking activities (especially CSA projects). In terms of overall success rate of project proposals in the HE programme, the Czech Republic ranks 15th among EU countries (up to 8th among NMS). However, unlike most NMS, the Czech Republic has a much higher success rate in project proposals that have higher research and innovation ambitions. Here, the Czech Republic is ranked 4th among NMS (i.e. EU-13 countries) and outperforms even a number of old EU member countries (EU-14 countries) - Sweden, Ireland, Greece, Spain, Luxembourg, Italy and Portugal.

THE OVERALL SUCCESS OF A COUNTRY IN THE HE PROGRAMME IS INFLUENCED BY THE NATURE OF THE PROJECT PROPOSALS IN THE PREPARATION OF WHICH THE COUNTRY'S RESEARCHERS AND RESEARCH TEAMS PARTICIPATE

The final success rate of project proposals for most NMS is positively influenced by the high proportion of successful project proposals that are not purely research and/or innovation in nature, but rather focus on coordination, support, training, information, networking activities. For most NMS, the higher the proportion of project proposals with lower research and innovation ambitions focused on coordination, support, outreach, training activities, the higher the overall success rate of that country in the HE programme. For the old EU Member States with higher innovation potential according to the EIS 2022, the values of their overall success rate in the HE programme are rather related to their higher innovation index and the nature of the project proposals does not matter so much. **The overall success rate of EU countries' project proposals in the HE programme is to some extent a reflection of their innovation performance or, on the contrary, their capacity and level of involvement in the preparation of project proposals that are not primarily focused on research and innovation activities, especially of the coordination and support type.** The overall success rate of a given country, without considering the nature of the project proposals in the preparation of which researchers and research teams from that country are involved, is not a good indicator for assessing the success of a country in the FP.

COORDINATORS FROM THE NEW EU MEMBER STATES MAKE MORE MISTAKES IN THE PREPARATION OF PROJECT PROPOSALS IN THE HE PROGRAMME THAN COORDINATORS FROM THE OLD EU MEMBER STATES

The rate of ineligibility of project proposals submitted by coordinators is almost 1.5 times higher for NMS (EU-13 countries) than for OMS and the UK. **The rate of ineligibility (error rate) of project proposals coordinated by Czech coordinators is the third lowest among NMS.** This is not a bad result for the Czech Republic. However, it would be very desirable to „push“ the formal error rate of project proposals submitted by Czech coordinators below 2% and thus reach the values of this indicator achieved by Austria, Ireland, the Netherlands, France, Belgium, Denmark, or Finland.

THE SUCCESS RATE OF PROJECT PROPOSALS INVOLVING CZECH RESEARCHERS VARIES CONSIDERABLY ACROSS THE DIFFERENT PRIORITIES AND CLUSTERS OF THE HE PROGRAMME

The success rate of researchers and research teams from the Czech Republic in the preparation of individual ERC grants and research mobility grants – MSCA – is lower. In the long term, the researchers as well as private companies (SMEs especially) from the Czech Republic has not been more successful in penetrating grant schemes for innovators developing high-risk breakthrough and disruptive innovations. This may be related to the level of financial support from national programmes to support corporate research, development and innovation activities, which is many times higher, accessible and even more affordable than support from the FP. We also encounter a lower success rate of Czech applicants for participation in the HE programme in the cluster focused on the humanities Culture, Creativity and Inclusive Society. On the other hand, Czech institutions have a traditionally high success rate in preparing specific projects in support of research infrastructures. Czech organisations have been relatively successful in the priority aimed at reducing the persistent gap in research and innovation performance called „Widening participation and spreading excellence“. Czech research teams and institutions are also successful in the Digitalisation, Industry and Space cluster.

FOREIGN RESEARCH ENVIRONMENT FAVOURABLY INFLUENCES THE QUALITY OF ERC PROJECT PROPOSALS OF CZECH RESEARCHERS

ERC project proposals submitted by researchers of Czech nationality abroad have a higher success rate than project proposals intended by Czech researchers in Czech host institutions. Therefore, it is possible to continue the reasoning, as in the H2020 programme, that **the foreign research environment (usually in major Western European institutions) positively influences the quality of ERC project proposals of Czech researchers and the chances of their successful implementation.**

FOREIGN ERC GRANT APPLICANTS DO NOT LOSE INTEREST IN THE CZECH REPUBLIC, BUT ARE USUALLY NOT SUCCESSFUL

The Czech Republic has the second highest proportion of foreign ERC grant applicants compared to other NMS (EU-13 countries). However, it is also evident that foreign researchers who listed an institution from the Czech Republic as a host institution in their project proposal were not successful in the vast majority of cases and their project proposals did not receive financial support from the HE programme budget, as in the H2020 programme. We do not have a clear explanation for the high proportion of foreign ERC grant applicants in the Czech Republic. It can be assumed that some Czech host institutions (or some of their departments) attract the attention of foreign researchers more than in other V4 countries or other NMS. Another important factor for choosing the Czech Republic as a possible research location may be the general attractiveness of the Czech Republic for foreign researchers in terms of political, security and economic issues. Previous personal or professional ties of ERC grant applicants to the Czech Republic may also play an important role.

PARTICIPATION IN THE HE PROGRAMME

THE DISTRIBUTION OF PARTICIPATION IN THE HE PROGRAMME AND FINANCIAL CONTRIBUTION TO PARTICIPANTS REPLICATES THE PATTERN OF PREVIOUS FPS

Germany, France, Spain, the Netherlands and Italy have the highest participation and net EU contribution in the HE programme. These countries account for about half of all participation and net EU contribution in the HE programme. **The Czech Republic, with 730 participants, is ranked 16th (out of the 45 EU and HE Associated Countries compared). This is the second highest number of participants among the EU NMS, after Poland, with 880 participants and 15th place.** It may be a warning sign for the Czech Republic that a similar number of participants is reported by the much smaller Slovenia (603 participants and 17th place). As of the distribution of the net EU contribution to participants, Germany ranks first in the HE programme, followed by France, Spain, the Netherlands and Italy. **The Czech Republic is ranked 17th with a net EU contribution of €283 million, i.e. in similar positions to the H2020 (2014–2020) and FP7 (2007–2013) programmes.**

THE BASIS OF THE CZECH REPUBLIC'S PARTICIPATION IN THE HE PROGRAMME IS PARTICIPATION IN PROJECTS WITH A PREDOMINANCE OF RESEARCH AND INNOVATION ACTIVITIES

Two thirds of Czech research teams are involved in projects with a predominance of research and innovation activities, i.e. in projects of the RIA, IA, ERC, EIC, MSCA-PF type. These types of projects also account for almost $\frac{3}{4}$ (72%) of the financial support for the Czech Republic from the HE programme budget.

THE SHARE OF THE CZECH REPUBLIC'S PARTICIPATION IN THE MISSIONS FOLLOWS THE SHARE OF THE CZECH REPUBLIC'S PARTICIPATION IN THE WHOLE HE PROGRAMME

The Czech Republic recorded 44 participations in HE programme missions, which represents 1.6% of the total participation in missions of all countries. In the case of the whole HE programme, the Czech Republic achieved 730 participations, which represents 1.4% of the participation of all countries in this FP. The highest number of participation was achieved by participants from the Czech Republic in the „Cancer“ and „100 Climate-Neutral and Smart Cities“ missions – 12 participations each. 8 participations are related to the „Soil Deal for Europe“ mission and 6 participations each are related to the „Restore our Ocean and Waters by 2030“ and „Adaptation to Climate Change“ missions. In the projects addressed in the missions, institutions from the Czech Republic received a net EU contribution of €11.8 million. This amounts to about 4% of the total net EU contribution to the Czech Republic in the whole HE programme. This is in line with the European average of 4.5%.

THE CZECH REPUBLIC'S INVOLVEMENT IN THE EUROPEAN PARTNERSHIPS IS CRUCIAL FOR COUNTRY'S PARTICIPATION IN THE SECOND PILLAR AND THE WHOLE HE PROGRAMME.

The Czech Republic receives 42.6% of its financial support in Pillar 2 through its participation in the European Partnerships. This share is the second highest among EU countries in the HE programme so far. Similarly to the H2020 programme, the Czech Republic has been relatively successful in the HE programme in entering into joint venture projects (institutionalised partnerships under Article 187 TFEU – Joint Undertakings), which represent a form of public-private partnership to address strategic areas where research and innovation are essential for European competitiveness. The Czech Republic has thus been able to exploit the potential associated with the active approach and membership of Czech organisations in these partnerships. However, compared to previous years, the Czech Republic is also more involved in co-funded European partnerships (formerly ERA-NET Cofund). It turns out that the environment of European partnerships „fits“ some Czech institutions, companies and research teams in many aspects and for many reasons (e.g. smaller research consortia, more freedom to choose the focus of research within calls) better than the environment of the FP itself.

HIGHER EDUCATION INSTITUTIONS ARE AT THE FOREFRONT OF HE PARTICIPANTS IN THE CZECH REPUBLIC

Among the domestic participants in the HE programme, higher education institutions dominate with 40%, having received about 50% of the EU contribution from the HE budget allocated to the Czech Republic so far. Private enterprises and research institutions are roughly equally represented. Private enterprises accounted for a quarter of all Czech participation and net EU contribution to the Czech Republic. Research institutions accounted for a fifth of the national balance of participation and net EU contribution. Two thirds of the enterprises participating in the HE programme are concentrated in Prague. Among higher education institutions, the largest recipients of the HE funding are located in Brno, Prague, Olomouc, Ostrava and Pardubice.

THE SHARE OF PARTICIPATION OF HIGHER EDUCATION INSTITUTIONS AMONG OTHER FP PARTICIPANTS (FP7, H2020, HE) FROM THE CZECH REPUBLIC IS INCREASING OVER TIME

Despite the fluctuations in data between the monitored years (or between two-year periods) of the FP, we can state that the participation of Czech higher education institutions in the FP is increasing, both in terms of the number of participations, the claimed amount of

the EU contribution, the number of coordinated projects, and the representation of higher education institutions among other FP participants from the Czech Republic.

FPS (FP7, H2020, HE) HAVE A LONG HISTORY OF ENTERPRISES' PARTICIPATION, ESPECIALLY IN MANUFACTURING, INFORMATION AND COMMUNICATION ACTIVITIES AND PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

Out of the 21 sections of the CZ-NACE classification, enterprises with the main activities falling into these three sections – manufacturing, information and communication activities and professional, scientific and technical activities - have long been the most active in FPs (FP7, H2020, HE). These three sections include enterprises which accounted for around four-fifths of all enterprise participation in each of the three FPs under review. In terms of the amount of the net EU contribution claimed from the budget of each FP, it is worth noting the long-term declining representation of enterprises in manufacturing and the increasing representation of enterprises in information and communication activities. Among the Czech manufacturing enterprises participating in the FPs, the predominant ones in the long term are those focusing on the production of computers, electronic and optical instruments and equipment. In information and communication activities, these are enterprises in the field of information technology. In professional, scientific and technical activities, there is an increase in the representation of consulting and advisory firms.

DOMESTICALLY OWNED ENTERPRISES DOMINATE THE NUMBER OF PARTICIPATIONS IN THE FPS (FP7, H2020, HE) IN THE LONG TERM, HOWEVER, A HIGHER SHARE OF THE NET EU CONTRIBUTION TO THE PRIVATE SECTOR HAS SHIFTED TO FOREIGN-OWNED ENTERPRISES IN THE CZECH REPUBLIC IN THE HE PROGRAMME

As of ownership structure, the private sector's participation in FPs has been dominated by the domestically owned enterprises since the beginning of FP7 to the first third of the HE programme. In FP7 and the H2020 programme, domestically owned enterprises accounted for roughly two-thirds of all participation by Czech enterprises, and three-fifths of all participation by Czech enterprises in the HE programme. In FP7 and H2020, domestically owned enterprises have received a higher share of the net EU contribution from the FP budget for the private sector in the Czech Republic than foreign-owned enterprises. Conversely, in the HE programme, foreign-owned enterprises have a larger share of the net EU contribution.

IN THE FPS (FP7, H2020, HE), MICRO AND SMALL ENTERPRISES ACCOUNT FOR A DECISIVE SHARE OF THE TOTAL PARTICIPATION OF DOMESTICALLY OWNED ENTERPRISES, WHILE LARGE ENTERPRISES PREVAIL AMONG FOREIGN-OWNED ENTERPRISES

Micro and small enterprises (i.e. enterprises with up to 49 employees and an annual turnover of up to CZK 299.9 million) have long prevailed among the domestically owned enterprises participating in the three FPs under review in terms of the number of participations and the amount of the net EU contribution, while the participation of medium-sized enterprises (i.e. enterprises with 50-249 employees) has been decreasing. Among foreign-owned enterprises, large enterprises (i.e. enterprises with 250 or more employees and an annual turnover of over CZK 1.5 billion) predominate.

FPS (FP7, H2020, HE) ARE RATHER COMPLEMENTARY IN THE LONG-TERM SUPPORT OF DOMESTIC BUSINESS RESEARCH, DEVELOPMENT AND INNOVATION FROM A FINANCIAL POINT OF VIEW, BUT THEIR IMPORTANCE IS GROWING

If we compare the amount of support drawn from national programmes to support business research, development and innovation activities with the support for the private sector in the FPs, we find,

that the total amount of EU contribution claimed by domestic enterprises in FP7 was about 9 times lower than the financial support from national programmes, in the H2020 programme this support was about 4 times lower and in the HE programme is about 3 times lower.

PRAGUE, SOUTH MORAVIA AND CENTRAL BOHEMIA ARE AMONG THE BEST CENTRAL EUROPEAN REGIONS IN THE HE PROGRAMME

Prague, the South Moravian Region and the Central Bohemian Region have a very favourable position among the regions of the Czech Republic in the HE programme. In terms of net EU contribution from the HE programme, Prague and South Moravia ranked 9th and 24th respectively among 195 Central European regions. However, these three Czech regions are not on a par with the largest German metropolitan regions or Vienna. Prague, Brno and Olomouc are the dominant Czech Republic's locations in the HE programme in terms of the number of participations and the EU financial contribution received.

COMMUNITY PROGRAMMES, DESPITE THEIR DIFFERENT TARGETING, ARE NOT SO ATTRACTIVE IN THE CZECH REPUBLIC

When comparing the share of projects with Czech participation in the HE programme and other selected European programmes (Digital Europe, EU4Health, LIFE, European Defence Fund, Innovation Fund) against the total number of projects in these programmes in the period 2021+, it appears that Czech entities participate above average in European Defence Fund projects, where they participate in about one in six projects. This is followed by the LIFE and Digital Europe programmes, where Czech entities participate in every 14th and 15th project respectively. Czech entities also participate to a similar extent in the HE programme - Czech teams are part of every 16th project. Czech entities perform below average in the EU4Health and Innovation Fund programmes, where they are members of every 29th and 35th research consortium respectively.

PROJECT COORDINATION

PROJECT COORDINATION IS AN IMPORTANT ASPECT OF THE CZECH REPUBLIC'S PARTICIPATION IN THE HE PROGRAMME

Czech project coordinators represent a significant part of the overall participation of the Czech Republic in the HE programme – they account for about 16% of Czech participants in HE programme projects. The higher share of coordinators distinguishes the Czech Republic from the other NMS (except for Malta and Cyprus), where coordinators do not represent even 10% of the participants from these countries in this FP. The number of coordinators ranks the Czech Republic 14th among EU Member States and 1st among NMS. The higher share of coordinators in the total number of participants can to some extent be seen as the quality of the countries' participation in the FP. The Czech Republic has not only come close to the research and innovation strengths of the European countries in this indicator, but has even surpassed some of them. The Czech Republic is the only one of the so called „widening“ countries that managed to fit in among the research strong old member states of the EU by the intensity of coordination, i.e. the share of coordinators to all participants.

THE CZECH COORDINATORS CONTRIBUTE A SIGNIFICANT SHARE TO THE NATIONAL BALANCE OF THE HE BUDGET ALLOCATION

Czech coordinators of all project types contribute the fourth highest share of the national HE budget balance of all EU countries compared, approaching roughly half of the total contribution for the Czech Republic. Project coordination brings domestic higher education institutions and research institutions roughly half of their net EU contribution, and private companies one third.

THE SHARE OF COORDINATORS FROM THE CZECH REPUBLIC AMONG EU COUNTRIES IN THE FP IS GROWING

The share of Czech coordinators among EU countries in the HE programme has increased quite significantly compared to the situation in the H2020 programme. While in the H2020 programme the share of Czech coordinators in the EU was 0.8%, in the HE programme the share of coordinators is 1.5%.

THE STRUCTURE OF PROJECTS COORDINATED BY CZECH RESEARCHERS AND INSTITUTIONS IS SIMILAR TO THE STRUCTURE OF COORDINATED PROJECTS FOUND IN THE OLD EU MEMBER STATES

The Czech Republic is one of the two „widening“ countries in the EU where more than 75% of coordinated projects, whether individual or consortium, are mainly focused on research and innovation. Czech researchers and research institutions coordinate 76% of projects with a predominance of research and innovation activities (RIA/IA projects, ERC grants, MSCA - PF). On the contrary, in most NMS, coordinators who lead projects that have the character of coordination and support actions and project proposals focused on training, outreach, networking activities and research co-funding – i.e. project proposals with lower research and innovation ambitions – predominate.

The Czech Republic has the largest representation of coordinators in those parts of the HE programme that have the largest budget, i.e.

ERC, MSCA and the clusters of the second pillar of the HE programme (Global Challenges and European Industrial Competitiveness). Of the NMS, only Hungary and the Czech Republic have at least 2/3 of their funding dedicated to the coordination of HE Pillar 2 projects, ERC individual grants and MSCA projects. With this share, the Czech Republic is close to the old EU Member States.

Some Czech institutions have the potential to manage projects with a relatively large number of partners to a greater extent than is usual for most NMS. This may indicate not only the professional preparedness of Czech coordinators, but also the improving administrative and organisational background in their parent institutions.

CZECH INSTITUTIONS COORDINATE MORE CONSORTIUM RIA PROJECTS IN THE HE PROGRAMME

In the last H2020 programme, only 13 RIA projects (including the Euratom programme) were coordinated by Czech institutions. Only 4 RIA projects were managed by Czech higher education institutions. In the HE programme, the situation for Czech institutions, or higher education institutions respectively, is much better – Czech institutions are already coordinating 15 RIA projects, including 10 projects coordinated by Czech higher education institutions. The performance of Czech institutions or Czech higher education institutions in the first third of the HE programme as coordinators of RIA projects can be considered more successful than in the H2020 programme.