



# Who wins Horizon 2020 grants: The role of regional and individual characteristics \*

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## Abstract

The study presents new evidence on the factors behind regional heterogeneity in receiving H2020 funding. In particular, we provide new evidence on the factors that influence regional success measured as: (i) share of successful applications for H2020 funding, and (ii) the amount of funding granted relative to other regions. Preliminary results indicate that such factors as regional technological capacity (measured as number of patents per region), productivity, the number of links with other EU regions and the availability of alternative research-funding schemes have a positive and significant effect on the region's success rate in getting H2020 funds. At the same time, the access to national research-funding schemes does not seem to have any significant effect on the performance of regions in terms of the amount of H2020 funds granted.

**JEL codes:** L25, O33, O38

**Keywords:** innovation, patents, EC Framework Programme, Horizon 2020

## Introduction

Strengthening territorial, economic and social cohesion has always been a cornerstone of the European Union policies. As a result, the last two decades of the EU country data exhibit a steadily decreasing pattern of internal disparities. The EU Cohesion policy

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has always been one of the main EU policy instruments aimed at correcting imbalances among the EU member states and regions, while delivering on the EU main political priorities. In the current cohesion policy debate the two main patterns seem to emerge. First, the emerging policy consensus indicates that research and innovation (R&I) are the key ingredients to achieve an inclusive and sustainable growth in the EU (Commission, 2011). Second, higher transparency and easier accountability call for the regions rather than countries to become key spatial targets of EU policies.

The two most important EU research and innovation (henceforth R&I) funding instruments are Horizon 2020 (succeeded by Horizon Europe) and European Regional Development Fund (henceforth ERDF). It should be noted, however, that significant differences exist between these two funding instruments. In particular, ERDF aimed at correcting imbalances across the EU regions allocates resources to Research and Development (R&D) and innovation only to a limited extent. On the other hand, H2020 funding and, in particular, its Marie Skłodowska-Curie (MSCA) and European Research Council (ERC) actions explicitly devoted to promote excellence in science and innovation and might not be contributing, if not having the opposite effect, on cohesion target.

Given the discussion above, the main goal of the current study is to present empirical evidence on the regional characteristics that significantly alter the capacity of certain regions to succeed in receiving funding under the H2020 framework. Moreover, in order to shed additional light on potential synergies among various EU funding mechanisms we take into account information about the Research and Innovation (R&I) subsidies received under the European Regional Development Fund (ERDF). Adding this information to our analysis allows us to explore whether receiving these funds improves: (i) regional ability to win H2020 grants; and (ii) regional performance, measured in terms of the amount of H2020 funds granted relative to other EU regions.

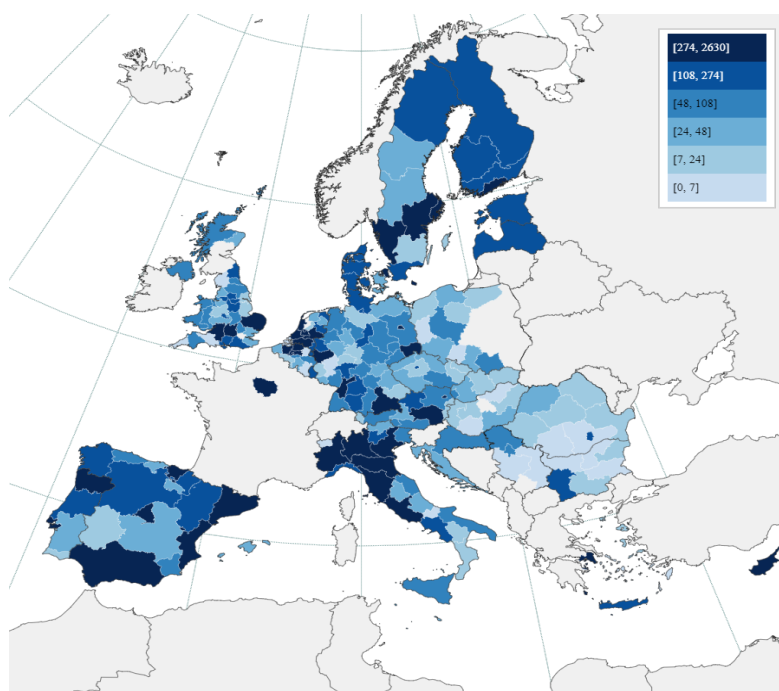
The second part of the paper will explore the impact of individual applicants' characteristics on the probability of winning H2020 funding. In particular, we plan to combine the information on H2020 applicants (distinguishing between successful and unsuccessful applications) with the additional firm-level balance sheet information extracted from the Orbis data-set, and with the information extracted from the ERDF database that includes all projects funded under the ERDF scheme.

## H2020 Funding Schemes Characteristics

Horizon 2020 (replaced by Horizon Europe) is one of the main instruments of the EU Innovation Union flagship initiative that includes a number of R&I initiatives aimed to promote research and innovation activities across Europe. The H2020 includes different pillars and objectives that map into actions (funding calls). The allocation of funds is supervised by the specialised EC agencies. Finally, each funding scheme is different and this results in different allocation of funds across participants and territories that host them.

## Descriptive Statistics

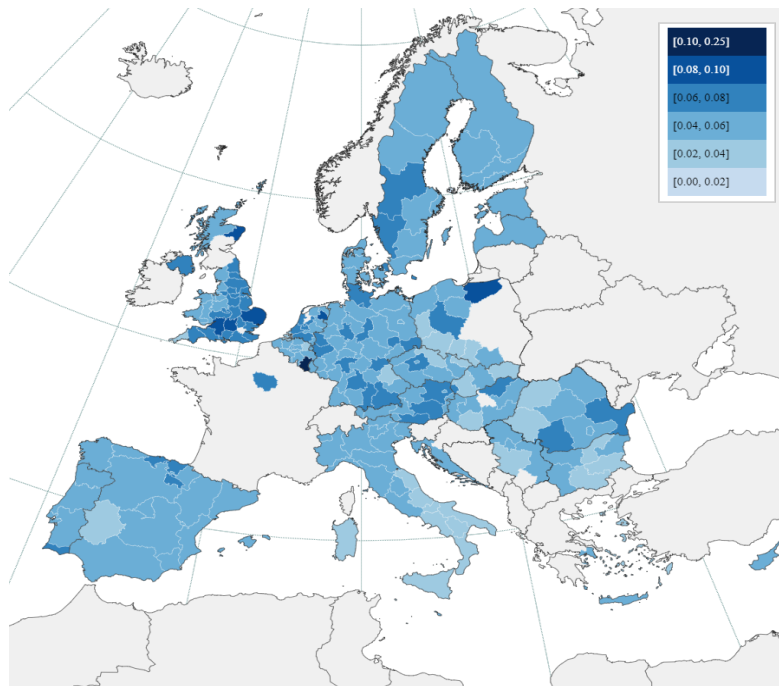
This section provides some descriptive statistics on the H2020 database, the main source of data for our study. Table 1 presents the information on the number of H2020 participants by H2020 pillar, organisation type, and funds granted. The *Excellent science* pillar, that



**Figure 1:** Regional distribution of H2020 funds  
2014-2020, Mln Euro

includes MSCA and ERC actions has the highest number of participants that belong to Higher Education Sector (HES) or research centers (REC): the share of HES participants

is almost 20%, while the share of RES is around 7%. The picture is different in the *Industrial Leadership* and *Societal Challenges* pillars (Table 1, panel 2), where the private companies (PRC) constitute the largest share of participants (around 12% and 17% respectively). Finally, across all pillars, HES organizations, research centres, and private companies seem to be getting the largest shares of H2020 funds.



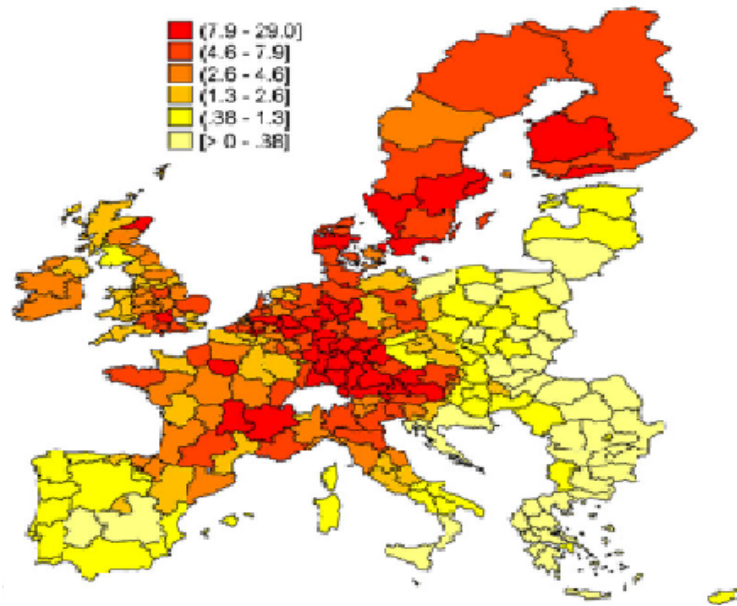
**Figure 2:** Share of successful H2020 applications by region

Looking at the regional characteristics of the data, one notes that there might be some clustering of regions in the distribution of the H2020 funding (Figure 1). However, the regional indicator of success rate in winning H2020 grants (Figure 2), does not show such significant disparities in the distribution of grants across regions. Hence, the clustering observed in Figure 1 is most likely explained by the fact that different regions specialise in different types of H2020 calls that, consequently, have varying levels of financing. For example, MSCA calls usually provide relatively modest individual scholarships, while the Industrial leadership pillar actions specialise in providing grants of larger scale.

On the other hand, distribution of patenting activity across the EU regions (Figure, 3) reveals significant clustering patterns in the EU technological landscape. As stated by Archibugi *et al.* (2021), these patterns reflect the structural dualism within the broad EU area (i.e. a strong innovative core and lagging periphery).

**Table 1:** Participants and costs by organization type and pillar

Organization type	N participants	Share	Cost, mln Euro	Cost share
Excellent Science, EU.1.				
HES	32,519	18.64%	16,188	24.39%
OTH	1,326	0.76%	311	0.47%
PRC	8,928	5.12%	1,413	2.13%
PUB	1,065	0.61%	286	0.43%
REC	12,846	7.36%	6,472	9.75%
Industrial Leadership, EU.2.				
HES	6,844	3.92%	2,640	3.98%
OTH	2,568	1.47%	552	0.83%
PRC	20,792	11.92%	7,084	10.67%
PUB	1,696	0.97%	264	0.40%
REC	6,926	3.97%	3,295	4.96%
Societal Challenges, EU.3.				
HES	17,004	9.75%	6,804	10.25%
OTH	6,359	3.64%	1,410	2.12%
PRC	29,002	16.62%	10,200	15.37%
PUB	6,676	3.83%	1,570	2.36%
REC	15,705	9.00%	6,366	9.59%
Spreading excellence and widening participation, EU.4.				
HES	906	0.52%	443	0.67%
OTH	40	0.02%	292	0.44%
PRC	73	0.04%	11	0.02%
PUB	85	0.05%	8	0.01%
REC	503	0.29%	262	0.39%
Science with and for Society, EU.5.				
HES	1,183	0.68%	260	0.39%
OTH	411	0.24%	64	0.10%
PRC	293	0.17%	50	0.08%
PUB	206	0.12%	22	0.03%
REC	508	0.29%	100	0.15%
Total	174,464	100%	66,367	100%



**Figure 3:** Patents per 1,000 inhabitants, 2013—16  
 Source: Archibugi *et al.* (2021)

In addition to the statistics presented above, we are planning to complement analysis with the data on regional productivity and other regional characteristics that might have a significant impact on region's ability to get H2020 funds and its performance in terms of the amount of H2020 funding granted. Finally, second part of our study will explore the impact of individual characteristics on the probability of applying and signing an H2020 contract. To this end, we plan to combine the information on H2020 applicants and participants, contained in H2020 database with the additional firm-level balance sheet information extracted from Orbis data-set, and with the information extracted from the ERDF data-set that includes the R&I subsidies received by firms under the ERDF framework. Finally, we plan to add the individual information on participation in the 7<sup>th</sup> Framework Programme for Research (FP7) to explore whether participation and/or success in FP7 increases the probability of taking part and/or winning H2020 in line with Enger and Castellacci (2016).

## Methodology

The first part of this study explores the impact of regional characteristics on the success in getting H2020 funding. Taking into account potential issue of spatial auto-correlation, we have computed Moran I index. The index is close to 0. Computing inference with 9,999 random permutations, we get a p-value of 0.4348, indicating that we cannot reject the null hypothesis of spatial randomness. Hence, in the first part of our analysis we employ a standard multivariate regression framework of the following preliminary specification:

$$Pass_i = ERDF_i + Controls_i + \mu_c + u_i \quad (1)$$

Where  $Pass_i$  stands for the regional success rate in getting H2020 funding.  $ERDF_i$  is a dummy variable that equals one, if an organization has managed to obtain funding under the ERDF framework by the time of its H2020 application, and zero otherwise.  $Controls_i$  is a set of regional characteristics that might affect regional ability to get H2020 funds. Finally, we control for country-specific fixed effects ( $\mu_c$ ) and cluster the standard errors at the country level.

The second part of the study aims to present empirical evidence on the main individual antecedents of winning a grant under the H2020 framework. Due to the richness of the data, we are able to control for selection bias by relying on the control group of entities with similar characteristics that either never applied (by combining our data with Orbis database) or applied but did not win (H2020 unsuccessful applicants database). Additionally, we employ micro-level information on financing received under the ERDF funding scheme to explore whether receiving these funds might affect individual probability of applying and/or signing H2020 contract.

Finally, we enrich our analysis with the micro-level information on participation in the FP7 funding cycle to explore whether previous participation and/or success affects the probability of applying/winning in next funding programme (H2020).

The empirical approach for the second part of our study will be based on a two-stage estimation procedure. In particular, the first step estimates the probability of applying for an H2020 grant. This step will have to be carried out using the whole population of European firms eligible for H2020 funds. The second stage focuses on the sub-sample of organisations that chose to apply for the H2020 grants and estimates the probability that an organisation will win one or more H2020-funded projects. To control for potential issues of sample-selection, two stages of the model will be estimated jointly by means of Heckman sample selection model (Heckman, 1979).

## Preliminary Results

Preliminary results for the regional analysis indicate that such factors as regional innovative capacity (measured as number of patents per region), productivity, the number of links with other EU regions and the availability of alternative research-funding schemes have a positive and significant effect on the region's success rate in getting H2020 funding. At the same time, the access to national research-funding schemes does not seem to have any significant effect on the performance of the regions in terms of the amount of H2020 funds granted.

The results on the impact of individual characteristics on the probability of applying/winning an H2020 grant have yet to be delivered. However, in line with previous studies, we expect that individual propensity to apply for H2020 funds is enhanced by the prior participation in EU FPs and by the availability of other national/international funding schemes. Finally, the individual probability of winning an H2020 grant is also strengthened by the prior participation in EU FPs, as well as by an organization's research potential (number of patents, trademarks, publications). Given the richness of our data, we aim to explore the role of additional factors, such as the availability of the ERDF funding and other firm-level characteristics.



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