

## IN SEARCH FOR THE BEST MATCH. COMPLEMENTARITIES BETWEEN R&I FUNDS ACROSS EU REGIONS

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- For the period 2021-2027, the three main instruments through which the EU supports Research and Innovation (R&I) in its regions are: cohesion policy, Horizon Europe, and the Recovery and Resilience Facility (RRF).
- In the 2014-2020 period, cohesion policy and Horizon 2020 together have made a decisive contribution to R&D expenditure in most regions of Eastern Europe (often in the order of 20% or more), as well as in many Mediterranean regions. This shows that the R&I investment of these regions remain heavily dependent on EU funds, especially cohesion policy funds.
- R&I cohesion policy and Horizon 2020 funds show very different levels of regional concentration along North-South and East-West lines reflecting their diverse allocation criteria.
- In the 2014-2020 period, Horizon 2020 funding have been much more territorially concentrated than R&I cohesion policy funding, with the bulk going to a small number of areas leading in R&I, which may increase the risk of regional disparities.
- More developed regions in Eastern Europe and some part of the Mediterranean area struggled to attract adequate shares of Horizon 2020 funds and continue to rely significantly on R&I cohesion policy funds.
- The funding concentration of the RRF (at national level) shows a less clear-cut trend than the other two funding streams as it provides substantial resources to R&I in a number of countries with both low and high innovation capacity. This is due to its specific allocation methodology.

### 1. CONTEXT

Innovation has been recognized as a key driver of long-term growth since the pioneering work of Schumpeter and Solow in the 1940s and 1950s. The capacity to innovate or absorb innovation is not only seen as an important factor in regional development. It is also crucial to help regions to manage the green and digital transition. Public support for innovation is important because private firms would otherwise tend to invest sub-optimally in innovation activities (Arrow, 1962). Market failures that justify public intervention include knowledge spillovers, inefficient financial markets, skills shortages, and asymmetric information.

The EU manages several funding instruments to support investment in Research and Innovation (R&I). The main ones are: cohesion policy, whose main objective is promoting regional convergence and competitiveness; EU Framework Programmes (Horizon 2020 in 2014-2020 and Horizon Europe in 2021-2027), which aim to strengthen scientific excellence; the Recovery and Resilience Facility (RRF), that is, the EU's post-Covid recovery programme.

#### *The policy impact of this research*

The analysis included in this Policy Insight is featured in the 2024 Science, Research and Innovation Performance of the EU (SRIP) report (European Commission, 2024).

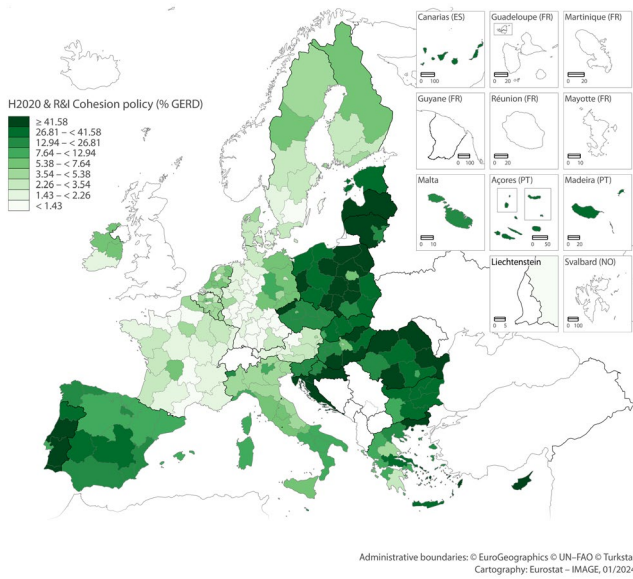
This policy brief presents an analysis of the regional concentration of these EU instruments and how they compare in the context of Europe's highly heterogeneous spatial situations. It identifies specific patterns in order to develop a better understanding of the complementarities between these funds.

Coordination between different R&I funds is important to maximize their impact. R&I capacities are very unevenly distributed across EU regions due to differences in production structures, technological capabilities, human capital endowments, geographical conditions, among other factors. The different objectives and allocation criteria of the main EU funds for R&I should lead to a balanced concentration across EU regions so as to promote scientific excellence and convergence at the same time.

The importance of the EU public support to R&I, especially for some territories, can be fully understood by looking at its contribution to the regional gross expenditure in research and development (GERD).

During the programming period 2014-2020, Horizon 2020 and R&I cohesion policy funding collectively contributed for more than 20% (in some cases more than 40%) of the GERD in almost all regions of Eastern Europe and Portugal (Figure 1). This pattern is also observed in some regions of Spain and Greece. Unsurprisingly, the share is below 8% in all regions of Northern Europe, although many of them are large beneficiaries of Horizon 2020. These stark differences are also due to very uneven levels of both business and public expenditures in R&D, which are notably very modest in Central and Eastern European countries.

**Figure 1.** Contribution of Horizon 2020 and R&I cohesion policy (2014-2020) to total R&D expenditure (GERD)



Source: Own estimation based on Marques Santos et al. (2023) and Eurostat. Note: Total R&D expenditure refers to the average between 2014 and 2020.

**2. COMPLEMENTARITIES BETWEEN COHESION POLICY AND HORIZON IN 2014-2020**

Cohesion policy funds are allocated – and earmarked – according to geographical criteria (essentially the regional GDP per capita) that favour the least developed regions. Conversely, Horizon 2020 funds are distributed on a purely competitive basis, that is, based on excellence criteria, through pan-European schemes: regions with a higher innovation performance are more likely to benefit from these funds. This leads to marked differences in the concentration of the two funding streams at regional level.

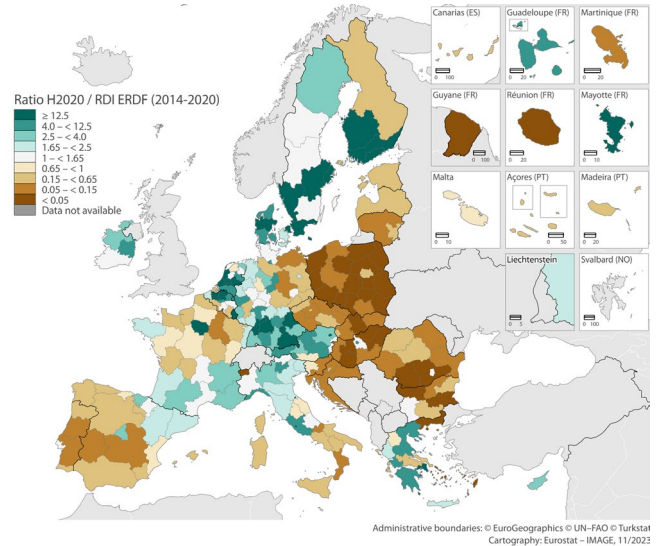
Figure 2 shows a tale of two “Europes”. Regions with a higher concentration of Horizon 2020 funds vis-à-vis their share of R&I cohesion policy funds are in large part metropolitan areas, industrial regions located along the so-called “blue banana”, and Nordic regions. A number of well-off regions from Southern Europe are also part of this group.

By contrast, the share of R&I cohesion policy funds is higher than that of Horizon 2020, often by several times, throughout Eastern European regions, with the sole exception of Budapest. In other words, even transition and more developed regions in Central and Eastern European countries attract lower amounts of Horizon 2020 than their R&I cohesion policy allocations. This further highlights the importance of cohesion policy funding in supporting regional R&I activities in the newer Member States, especially as they tend to have a below average GERD. In many of their regions, the share of Horizon 2020 remains very modest, and in some cases even close to zero.

A third group of Mediterranean countries, such as Italy, France, Greece and, to a lesser extent, Spain, are split

between richer areas attracting more Horizon 2020 funds (e.g. Ile de France, Lazio, Madrid, Catalonia, Attica) and regions more dependent on R&I support from cohesion policy funds (e.g. Italy’s Mezzogiorno, France’s North and Grand East regions).

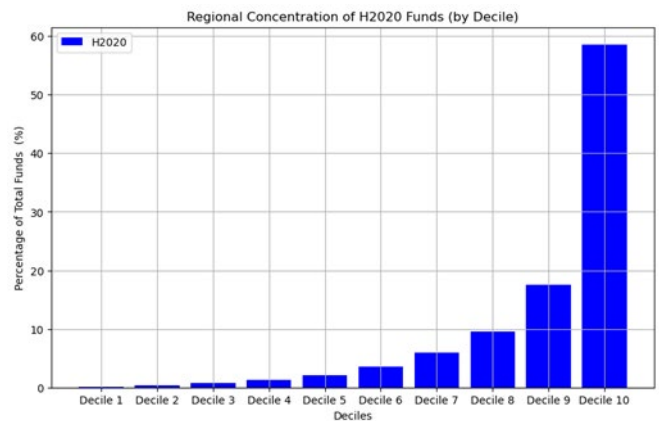
**Figure 2.** Regional distribution of R&I-Cohesion policy and Horizon 2020 funds by Nuts 2-level: 2014-2020



Source: Own elaboration based on Marques Santos et al. (2023).

Overall, the comparative map in Figure 2 suggests that a small number of regions account for the lion’s share of Horizon 2020 funding. This effect can be observed in Figure 3 which illustrates the regional distribution of H2020 by decile. The top 10% regions in terms of Horizon 2020 resources attract nearly 60% of the total funds, far more than the second highest decile. There is a risk that this high concentration exacerbates existing innovation and economic divides between European regions.

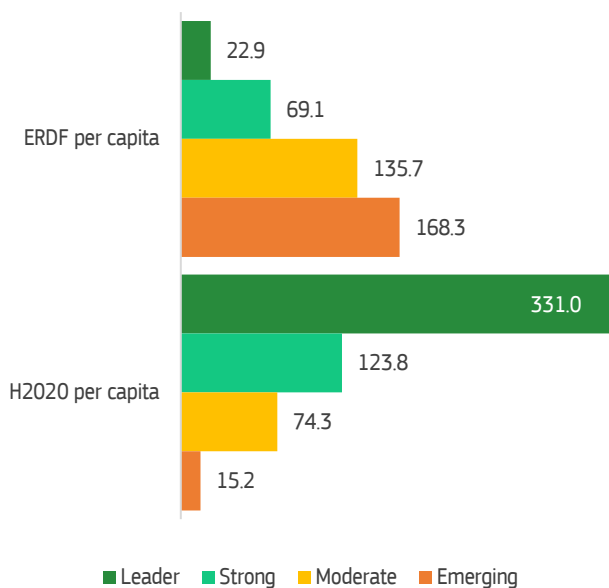
**Figure 3.** Regional distribution of Horizon 2020 funds by decile



Source: Own elaboration based on Marques Santos et al. (2023)

In a similar vein, [Figure 4](#), shows that the per capita concentration of Horizon 2020 resources is significantly higher in the 27 regions with the highest innovation performance (so-called leader innovators according to the Regional Innovation Scoreboard or RIS). Even regions that are not innovation leaders but still have a strong innovation performance (strong innovators in the RIS) have a much lower per capita concentration of Horizon 2020 funds in comparison.

**Figure 4.** Intensity of R&I funds in 2014-2020 programming period by funds and Regional Innovation Scoreboard 2023 profile



Source: Own elaboration based on Marques Santos et al. (2023), Eurostat and Regional Innovation Scoreboard data.

At the other side of the spectrum, regions with a low innovation performance are by far the biggest beneficiaries of cohesion policy funds for R&I. However, in these regions (RIS' moderate and emerging innovators) the per capita intensity of cohesion policy funds allocated to R&I is only about half of the per capita intensity of Horizon 2020 in leader innovators, despite the fact that these latter areas are on average more densely populated. This confirms that Horizon 2020 funds are more geographically concentrated than cohesion policy ones, in what has been defined as a "closed-club" effect (Balland et al. 2019).

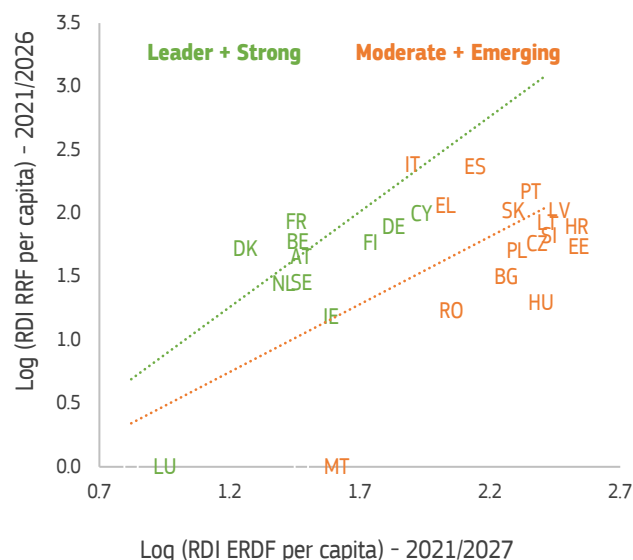
### 3. POTENTIAL COMPLEMENTARITIES BETWEEN COHESION POLICY AND NEXT GENERATION EU IN 2021-2027

An additional dimension to consider is the complementarity between R&I funding under the Recovery and Resilience Facility (the main pillar of NextGenerationEU) and cohesion

policy. A comparison between the two funding streams (for the period 2021-2027) can only be made at national level due to the lack of data on the territorial concentration of RRF resources. It should be also noted that the time span of the two funding streams differ as cohesion policy runs from 2021 to 2027 (with the possibility to spend until 2029) whereas the RRF from 2021 to 2026. Bearing this in mind, the differences in terms of concentration between the two instruments are less pronounced than between cohesion policy and Horizon 2020.

As shown in [Figure 5](#), a number of countries with weaker or somewhat weaker innovation performance enjoy higher intensities of both RRF and cohesion policy funds allocated to R&I (EL, PT, LV, HR, EE, CZ, PL). However, per capita allocations of R&I RRF funds are also significant in some strong innovator countries (BE, FR, DE, DK), while they are lower in some less developed (less innovative) countries (RO, HU, BG).

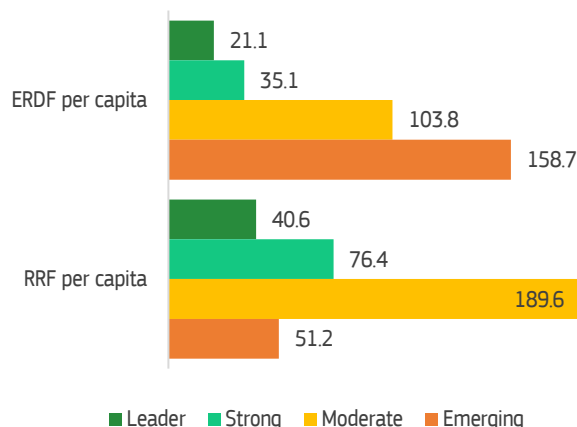
**Figure 5.** Relationship between R&I RRF and ERDF allocation for 2021-2027 (ERDF)-2026 (RRF)



Source: Own elaboration based on Cohesion Open Data Platform, FENIX, Eurostat and European Innovation Scoreboard data.

Overall, the differences in per capita intensity between EU countries are much greater for R&I cohesion policy than for the RRF ([Figure 6](#)). This may be partially due to differences in the allocation methodology. While the GDP per capita (mostly at regional level) is by far the most important criterion for determining cohesion policy allocations, the RRF allocation key takes more into account the size of the country, in addition to the impact of Covid-19 on national GDP.

Figure 6. Intensity of R&I EU planned amount for 2021-2027 (ERDF) and 2021-2026 (RRF) by fund and European Innovation Scoreboard 2023 profile



Source: Own elaboration based on Cohesion Open Data Platform, FENIX, Eurostat and European Innovation Scoreboard data. Note: Leader: BE, DK, FI, NL and SE; Strong: AT, CY, DE, FR, IE and LU; Moderate: CZ, EE, EL, ES, HU, IT, LT, MT, PT and SI; Emerging: BG, HR, LV, PL, RO and SK.

## 4. CONCLUSION

A number of conclusions can be drawn from the analysis of complementarities between the three instruments. First, cohesion policy funds play a crucial role in supporting R&I activities in Central and Eastern Europe and a number of Mediterranean regions. This highlights the need to maintain an adequate volume of cohesion policy investment in these areas in the future in order to improve their innovation capacity and, thus, their long-term growth prospects. While from an efficiency perspective the spatial concentration of R&I activities can be an important factor for Europe competitiveness, the current innovation gap carries the risk of missing research and innovation potential in lagging areas and increase their vulnerability. All of which have negative consequences for the EU as a whole.

Second, in the programming period 2014-2020, Horizon 2020 funds show a very high level of territorial concentration, which may further reinforce existing agglomeration dynamics and increase regional disparities.

The level of participation of less developed and peripheral regions in the Framework Programme may be, however, quite different, all the more looking at specific thematic areas (Peñalosa and Castaldi, 2024).

Third, the funding concentration of the RRF (at national level) shows a less clear-cut concentration trend than the other two funding streams as it provides substantial resources to R&I in a number of countries with both low and high innovation capacity. Nevertheless, the current lack of data on the territorial concentration of RRF funds suggests additional caution in drawing conclusions from the comparison with the other two instruments.

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