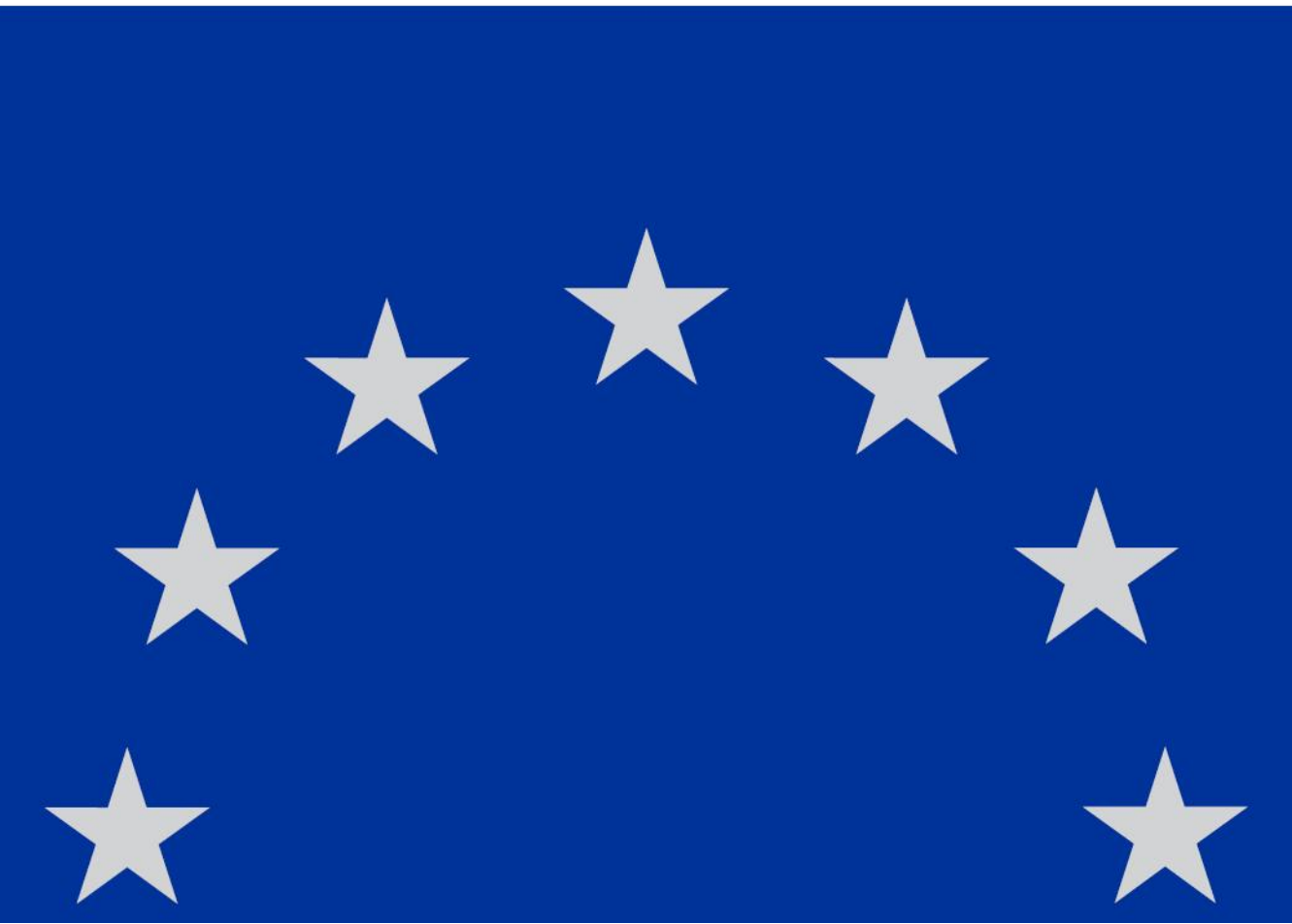
European Commission

Research and Innovation

Study on the R&I measures in the Recovery and Resilience Facility

Case study on Moderate Innovators



Study on the R&I measures in the Recovery and Resilience Facility - Case study on moderate innovators

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EUROPEAN COMMISSION

Study on the R&I measures in the Recovery and Resilience Facility

Case study on Moderate Innovators

2025 Directorate-General for Research and Innovation

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1. Introduction, methodology and limitations

This case study examines the use of RRF funding for research and innovation (R&I) in countries classified as moderate innovators. The term is a classification used in the European Innovation Scoreboard (EIS) ([1]): moderate innovators are countries whose innovation performance falls between 70 and 100% of the EU average, based on a comparative assessment of multiple indicators, including public and private R&D expenditure, patent activity, and the availability of a high-skilled and educated workforce. The following nine Member States are moderate innovators ([2]): Czechia, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Slovenia and Spain ([3]).

This case study provides an overview of RRF funding for research and innovation in the country group, alongside with an in-depth analysis for Italy, Lithuania, Portugal and Spain. The four countries were selected in agreement with DG RTD, with the rationale as follows. Spain, Italy and Portugal are the first, second and third EU Member States, respectively, in terms of number of R&I-related RRP measures ([4]). Spain and Italy are also the top two Member States in terms of cost associated to these measures, with Portugal ranking fifth out of 27 (after Germany and France). While Italy, Portugal and Spain were selected mainly due to their relevance in these indicators, Lithuania's selection stems mainly from the high number of R&I-related reforms included in its RRP (the highest in the EU).

The nine moderate innovators cover 43% of the total number of R&I-related measures under scope in this study (166 out of 387 measures) ([5]) and 68% of the total cost associated to these measures (EUR 37.8 billion out of EUR 55.5 billion) ([6]). The four countries selected for in-depth analysis cover 77% of the total number of R&I-related measures of moderate innovators (127 measures) and 93% of their cost (EUR 35.1 billion).

In moderate innovators, which cover the main bulk of the RRF support to R&I, the RRF represents the largest contributor to R&I – more than Cohesion Policy and Horizon Europe. This case study tests whether the unprecedented influx of resources for the R&I sector in these countries has led to transformative changes in the national R&I systems.

The objective of the case study is to highlight common trends as well as differences among moderate innovators, and the underlying reasons, addressing the following aspects.

- Allocations and types of measures dedicated to R&I, including the complementarity between reforms and investments, the coherence among different investments, and the alignment of these investments with the priorities of the renewed European Research Area (ERA) and the New European Innovation Agenda (NEIA).

([1]) European Innovation Scoreboard, here.
([2]) Country selection based on the 2024 EU Innovation scoreboard. Ranking can shift year to year. In the 2025 scoreboard, published in July 2025, three Member States experienced changes in their performance group compared to 2024: Croatia moved from the Emerging Innovators group to the Moderate Innovators group; Cyprus moved from the Strong Innovators to the Moderate Innovators; Hungary moved from the Moderate Innovators to the Emerging Innovators.
([3]) For context, emerging innovators are countries whose innovation performance is below 70% of the EU average, while strong/leader innovators are countries whose innovation performance is above/well above the EU average.
([4]) A measure or sub-measure is defined as related to R&I (for the purposes of this study) if the European Commission assigned to it a R&I-related policy area (either as primary or secondary policy area, or both). R&I-related policy areas are three: Research, Development And Innovation; R&D&I In Green Activities; Digital-Related Measures In Research, Development And Innovation. Importantly, the set of R&I-related measures under scope in this study does not necessarily coincide with national-level documentation (for instance because some measures are not defined as R&I-relevant in the Commission's classification).
([5]) 41% of investments; 51% of reforms.
([6]) 67% of investments; 88% of reforms.

- The rationale behind RRF support for R&I, focusing on the distribution of allocations across policy areas, the types of support provided, and the extent to which investments are grounded in national policy frameworks.
- Implementation progress of R&I-related RRF measures, including an overview of targets and milestones achieved across the group of countries, selected examples of R&I outcomes, and a discussion on the long-term sustainability of the changes triggered by the RRF.
- Complementarities and synergies ([7]) with other major EU funding instruments, primarily Horizon Europe and Cohesion Policy.

The case study triangulates evidence from multiple sources: literature and document review, data from public sources and the FENIX database, semi-structured interviews, and two surveys. Further details can be found in Annex I. A focus group was also conducted to validate preliminary findings and enrich the analysis. While the analysis faces several limitations, the triangulation of sources has supported the development of a balanced and comprehensive narrative. Key limitations include the following ones.

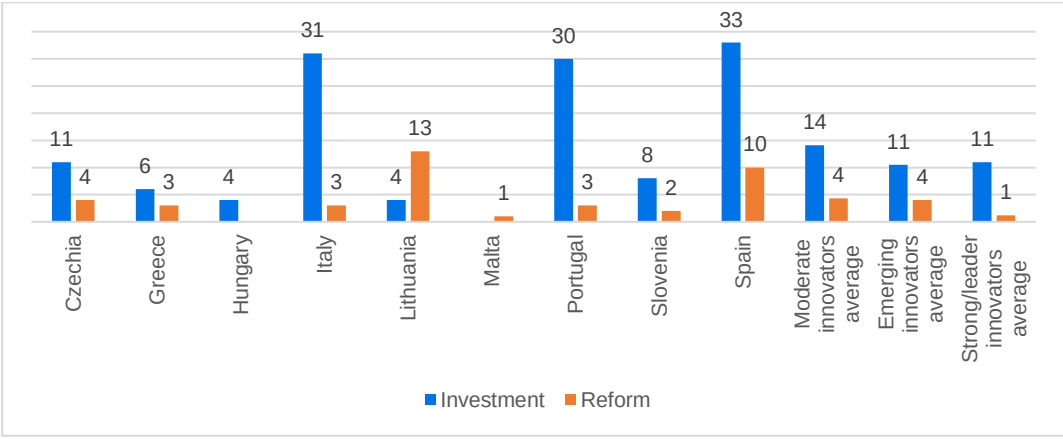
- The level of responsiveness varied across countries, affecting the depth of the analysis.
- The implementation of R&I measures under the RRF involved various bodies, depending on the specific policy area addressed. As a result, there is often no single point of contact within Member States. Ministries of Education, Science, or Innovation may only be partially involved in implementation, which can hinder a comprehensive understanding of the policy rationale, as well as of the implementation and monitoring frameworks.
- The absence of comprehensive beneficiary lists for RRF measures and sub-measures has limited the ability to analyse synergies and complementarities with other EU funding sources. As a result, the assessment relied mainly on anecdotal evidence gathered through desk research and interviews. For Italy, however, the availability of extensive datasets fed into an ad-hoc analysis, presented in Annex III.

([7]) Complementarity refers to the ways in which different EU funding instruments align — e.g. by addressing different needs or stages of the research and innovation cycle, targeting distinct types of beneficiaries, or supporting complementary objectives—so as to work together in a coherent way, maximise overall impact and avoid overlaps.
Throughout this evaluation, synergies refer to the strategic and planned use of the RRF alongside other sources of R&I funding. These synergies can take various forms: i) Co-funding – when a project receives financial support from more than one EU fund or instrument; ii) Upstream or downstream planned synergies – when different EU instruments provide a coordinated and seamless framework that supports all stages of the research and innovation process; iii) Supporting access to other programmes – this may include funding for training, technical assistance, or digital tools that enhance the capacity of public authorities to manage or apply for EU programmes, or that help SMEs and researchers submit competitive proposals to Horizon Europe, ERDF, or InvestEU; iv) Seal of Excellence – this involves the RRF supporting projects that have received the Seal of Excellence, a quality label awarded to high-ranking project proposals submitted under Horizon Europe. In this case study, the focus is on complementarities and synergies with Horizon Europe and Cohesion Policy, as neither the stakeholders consulted nor the documents reviewed for the three analysed countries reported any explicit links between the RRF and other EU programmes, such as InvestEU or the Innovation Fund.

2. Overview of measures

All but one moderate innovator countries have planned reforms to support their R&I systems. On average, countries in this group included 4.3 R&I reforms in their RRPs. This figure is close to that of emerging innovators (4) and higher than in strong and leader innovators (1). As far as investments are concerned, moderate innovators display the highest average number of investment measures or sub-measures ([8]). The figure is driven by Italy, Portugal and Spain, countries with 30 or more investments each.

Figure 1: Number of measures and sub-measures per Member State

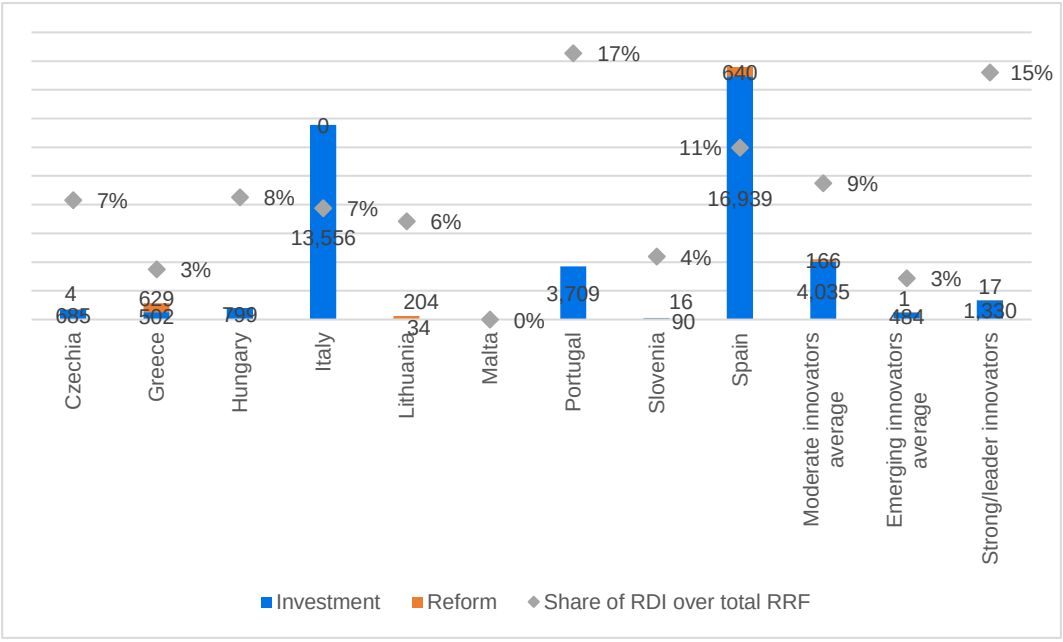


Source: Authors based on FENIX data.

Moderate innovators allocated on average 9% of their RRF envelopes to R&I: this is more than emerging innovators and less than strong and leader innovators (Figure 2). Among moderate innovators, only Portugal (17%) and Spain (11%) devote more than 10% of RRF funds to R&I. On the other hand, Greece, Malta and Slovenia devote less than 5%, closer to the emerging innovators average (3%). In general, the share of RRF funds devoted to R&I grows with the innovation level of the country groups. However, to contextualise RRF support for R&I within each country's context and gain a better understanding of the boost this policy instrument provided to national efforts in supporting R&I systems, it is important to compare RRF financing to R&I with that of the Member States.

([8]) The unit of all the analyses in this document are the measures and sub-measures resulting from the FENIX data excerpts provided by the Commission. In this document, for simplicity, the reference is sometimes made only to measures, leaving implicit the presence of sub-measures.

Figure 2: Total allocation (million EUR) in RDI investments and reforms and share (%) of RDI allocation over total RRP budget, by country belonging to the Moderate Innovators

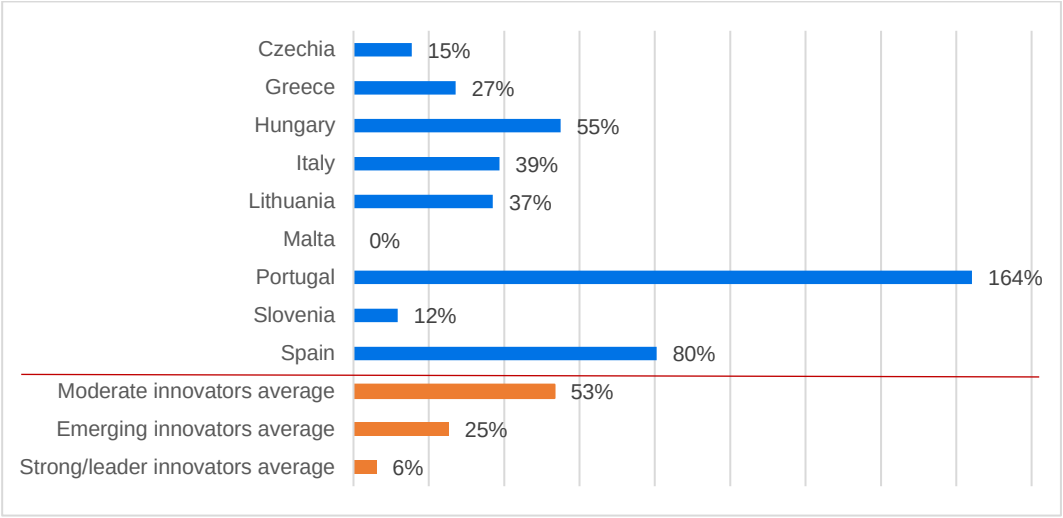


Source: Authors based on FENIX data.

Across moderate innovators, the share of R&I-related allocations from the RRF compared to Government Budget Allocation to Research and Development (GBARD) between 2021 and 2023 (53%) is considerably higher than that of emerging (25%) as well as strong and leader innovators (6%), as Figure 3 illustrates. This high average is driven by Portugal, where RRF R&I funds represent over 160% of 2021-2023 GBARD, and Spain (80%), where the RRF offered a particularly large number of resources for the enhancement of national R&I systems, compared to their national R&I budgets ([9]). Nevertheless, differences among moderate innovator countries are strong. In Czechia and Slovenia, RRF R&I-related funds correspond to slightly more than one tenth of 2021-2023 GBARD, and Malta does not have any RRF funds related to R&I.

([9]) Without Portugal and Spain, the moderate innovators' share of R&I-related allocations from the RRF compared to GBARD would drop from 53% to 35%.

Figure 3: Share of RRF RDI allocation over GBARD allocation between 2021 and 2023, by MS



Source: Authors based on FENIX data and Eurostat data.
Note: The total Government Budget Allocations on Research and Development (GBARD) have been cleaned from the allocations to defence and to transnational entities or organisations performing Research and Development. Note as well that the share compares the total RRP allocations on RDI (a multi-annual fund) to the sum of GBARD (an annual measure) between 2021 and 2023. Malta does not have RRP allocations for R&I.

In the four selected Member States, **RRP R&I measures are heterogeneous**, largely due to the high number of measures in Italy, Portugal and Spain (as the high number of measures correlates with diversity among measures). In general, RRP R&I measures in these countries can be summarised in three groups as follows:

- **Structural R&I-related measures** (reforms, but also investments);
- **Measures that are the deployment of R&I-intensive sectoral policies** (e.g. space);
- **Measures that cover R&I aspects of traditional sectors** (e.g. industrial policy, agriculture).

All four Member States offer examples of **measures aiming to structurally enhance the national R&I systems**. In Lithuania, structural reforms include the "Effective Implementation of Innovation Policy, Increased Demand for Innovation, Developed Start-Up Ecosystem, and Green Innovation Development" [C5-R.E1.2], and the "Establishment of the Innovation Agency Lithuania" [C5-E1.2.1], addressing a fragmented governance and consolidating multiple institutions. In Portugal, the reform on the "Promotion of R&I&D and Innovative Investment in Enterprises" [C05-R09], which updated the national innovation strategy, is central. Similarly, in Spain, two core reforms—the "Spanish Strategy for Science, Technology and Innovation 2021–2027" and the reform of the "Science, Technology and Innovation Law"—provide the strategic and legislative backbone for the country's R&I agenda. Additional reforms target the reorganisation of Public Research Organisations. Italy provides a partially different example, as it does not include overarching legislative reforms of the same level of ambition. In Italy's RRP, a set of three investment measures represents the core of the RRP's approach to R&I [M4C2I1.3, 1.4 and 1.5], collectively referred to by the Ministry of University and Research as "systemic actions". These are crucial structural investments aiming to establish extended partnerships, national leaders and sector-specific territorial innovation ecosystems (see individual country fiches for more details).

While Lithuania and Spain have a high number of R&I reforms (13 and 10), which also have associated costs (EUR 204 million and EUR 640million respectively), Italy and Portugal have a lower number of reforms (3 each), all with no associated cost.

Structural R&I measures are complemented with sectoral ones, both in R&I-intensive sectors and more traditional ones. Italy's RRP financed the deployment of part of the country's space policy, as well as R&I aspects of its industrial policy, support to hydrogen, agriculture, and healthcare. Lithuania's RRP strengthen its R&I ecosystems, especially in the sectors of green innovation, ICT, and sustainable finance. Portugal integrated reforms and investments within and across sectors, for instance, through the Innovation Agenda for Agriculture 2030, strengthens agri-food research and partnerships. Other sectoral R&I measures relate to the blue economy, the green transition, and digitalisation. In Spain, the RRP includes several sector-specific reforms and investments that reinforce innovation across green energy, transport, AI, and industries such as health, aerospace, fisheries, and culture. Notable initiatives include support for hydrogen and renewable energy innovation, the national AI strategy, and public-private partnerships (PERTEs) in health and aerospace. The plan also targets SMEs and the digitalisation of various sectors.

In all four countries, **strengthening the science-business link (through both reforms and investments) emerges as a key objective of the RRPs**. In Italy, in particular, under Mission 4 of the RRP, Component 2 ([10]) ("From research to business") foresees an integrated set of measures. This component is central to the RRP's approach to research, which puts a special emphasis on strengthening the link between the R&I system and companies, traditionally limited by the fact that the Italian economic fabric is largely made of SMEs. Altogether, the measures under this component form a single strategy, foreseeing a systemic support for the Italian R&I system, as it targets different actors and technology readiness levels (TRLs) with a holistic vision. Similarly, Portugal's RRP supported partnerships between firms and research organisations (for instance in the agriculture sector) as well as the expansion of interface institutions to enhance science-business collaboration.

Moderate innovators show a diversified set of measures that tackle a variety of needs: in these countries, the sets of R&D measures target multiple actors (e.g. universities, research centres, businesses), multiple TRLs (from basic research to technology transfer) and multiple sectors, resulting in a composite mix of measures. As such, the RRF has provided Moderate innovators with the potential to operate transformative changes to national R&I policies and, at the same time, strengthen R&I elements of sectoral policies.

([10]) In the Italian RRP, each Mission is structured into Components, which in turn contain measures (reforms and/or investments).

3. Alignment to countries' R&I policies

This chapter examines the rationale behind RRF support for R&I, focusing on the distribution of allocations across policy areas, the types of support provided, and the extent to which these investments are grounded in national policy frameworks. To ensure comparability with the Horizon Europe framework (see Section 5), RRF measures were classified along a spectrum ranging from fundamental research to technology development and innovation support (see Section 2.1 in the main report). It is important to note that this alignment is not exact, as the RRF was not originally designed as a dedicated R&I funding instrument. Still, these categories provide insights on the types of RRF support for R&I in the various countries.

The distribution of RRF R&I funds per primary pillar shows that countries in the moderate innovator group chose to focus their R&I-related measures on smart, sustainable and inclusive growth and on the green transition. Compared to strong/leader innovators, moderate innovators show proportionally a lower focus on the digital transition pillar, but a larger focus on the smart, sustainable and inclusive growth pillar. It is worth noting that the pillar of smart, sustainable and inclusive growth is rather wide, and includes, for instance, measures targeted to strengthening RDI ecosystems (e.g., "National Coordination Group for Industrial Research" in Czechia), business-driven innovation (e.g., Italy's "Tax credit for R&D") and internationalisation (e.g., Horizon Europe participation and global partnerships). Compared to emerging innovators, the proportionally larger focus on the green transition in moderate innovators stands out.

The choice of instruments and the policy areas targeted were largely shaped by national policy priorities underpinning the RRPs, as well as the structure of existing national R&I programmes. Among moderate innovators, support for innovation mainly goes to "R&D projects", "Public private partnerships and science business collaboration" and "Grants for RDI in enterprises". However, as illustrated in the table below, the composition of RRF investments varies significantly across countries, and no clear pattern emerges ([11]).

([11]) Importantly, the figure only takes into consideration measures to which the European Commission assigned at least one RDI-related policy area. While in general the figure provides a good overview of R&I measures, it has some limitations. For instance, the figure shows that Italy has no allocation to Research infrastructure. However, the Italian RRP does have a measure on Research infrastructure (called "Fund for the realisation of an integrated system of research and innovation infrastructures", M4C2I3) which is worth EUR 1.6 billion, which is however not included in the study's scope of analysis.

Table 1: RRF RDI investments' distribution by type of support and country, million EUR

	Skills	R&D projects	Research infrastructure	Public-private partnerships and science-business cooperation	Strategic instruments	Grants for RDI in enterprises	Financial instruments and tax incentives
Czechia	0	244	222	59	0	160	0
Greece	0	140	180	163	0	18	0
Hungary	0	0	184	0	0	615	0
Italy	0	4,371	0	4,483	0	2,694	2,008
Lithuania	0	2	0	17	0	15	0
Portugal	215	260	145	3,060	9	21	0
Slovenia	13	0	5	73	0	0	0
Spain	304	1,739	556	2,660	617	11,063	0
Moderate innovators (average)	66	845	162	1,314	78	1,823	251
Strong/Leader innovators (average)	6	189	98	39	24	953	20
Emerging innovators (average)	65	167	132	43	43	29	5

Source: Authors based on FENIX data.

Note 1: The table covers only investments, not reforms (for this reason, in countries with RDI reforms associated to costs, for instance Lithuania, the total amounts do not correspond to their RRPs' total funding to RDI). To ensure comparability with the Horizon Europe framework, RRF investment measures were classified along a spectrum ranging from fundamental research to technology development and innovation support. It is important to note that this alignment is not exact, as the RRF was not originally designed as a dedicated R&I funding instrument.

Note 2: In each row, the colours illustrate the distribution by investment area of each Member State (or group of countries), on a scale from red (least RRP resources in this area) to dark green (most resources).

The in-depth analysis of the four selected countries shows a high alignment with relevant national strategies. In Italy, the RRP was preceded by the National Research Programme, a strategic document the government issued in 2020, covering the 2021-27 timeframe and strongly inspired by EU-level priorities, especially by Horizon Europe. The RRP worked as an enabler of the National Research Programme's vision, providing resources to address priorities the latter identified ([12]). The National Research Programme committed to new ways of encouraging a strong relationship between universities and businesses: the RRP made this possible, becoming an additional crucial source of financing for the Italian R&I system. In Lithuania, although core strategic R&I documents, such as the Lithuania 2050 Strategy, the National Progress Programme 2021–2030, or the Smart Specialisation Strategy, do not explicitly reference the RRF, the R&I measures funded under the RRF are well-aligned with national priorities. Lithuania's RRF measures are also aligned with national programmes, notably the Horizon Europe Acceleration Programme funded by the Research Council of Lithuania, which assists in proposal preparation and complements RRF's capacity-building activities [C5.E.1.3]. Looking ahead, RRF-supported reforms are expected to have lasting effects, with the newly established Innovation Agency and science officer roles continuing beyond 2026 through national funding, while Lithuania plans to increasingly leverage EU structural funds to sustain and expand its R&I activities. In Portugal, the alignment between the RRF and the Portugal 2030 strategy allowed for the creation of a coherent national R&I policy. Stakeholders acknowledged that the RRF addressed previous limitations in funding scope, scale, and flexibility, enabling more ambitious and effective investments in R&I. This alignment also ensured the integration of national strategic goals, such as digitalisation and sustainability, with broader EU priorities, making the RRF a catalyst for structural change. Additionally, the RRF facilitated synergies between national and sectoral strategies—such as ENEI 2030 and the National Ocean Strategy—ensuring that R&I measures were not only well-funded but also strategically directed. Stakeholders noted that without the RRF's support, many of the R&I measures currently driving Portugal's R&I progress would not have been possible. In Spain, the RRF has played a pivotal role in reinforcing R&I's national priorities, aligning with several national strategies and enabling their implementation. Examples include the Digital Spain strategy ('España Digital 2026'), the Plan for Science and Innovation ('Plan de Choque por la Ciencia y la Innovación'), and the Plan to attract and retain scientific and innovative talent ('Plan de atracción y retención de talento científico e innovador'). The RRF has become a cornerstone of Spain's R&I landscape, though the sustainability of these initiatives post-RRF remains a critical question for the future.

R&I-related structural measures were mostly of transformative nature (for instance in Lithuania and Spain), but other measures represented the continuation of existing policies. In general, while strong and leader innovators did not disrupt their R&I systems through the RRPs but tended to act in a "top-up" logic, moderate innovators show a mix of disruptive and "top-up" measures. **R&I-related measures in fact have a mix of relationships with the pre-existing policy setting: some measures represent new policy initiatives, while others represent the continuation of already existing initiatives.** In Italy, for example, the 34 R&I measures under scope have a heterogeneous relationship with a pre-existing context. Under both Missions with the highest R&I-related associated cost (Missions 4 and 1), there are new measures as well as continuity ones: Under Mission 4 (Education and Research), the above-mentioned "systemic actions" (at the core of the RRP's vision on R&I) are new measures ([13]). However, there are also measures that continue or reinforce pre-existing actions: this is the case of research projects of significant national interest or support for young researchers. The reform of PhDs and the reform of R&D support measures to promote mobility were reforms already in the pipeline (and immediately fulfilled in 2021). Under Mission 1 (Digitalisation,

([12]) See National Research Programme, pages 20-35.

([13]) Even though these initiatives were mentioned in the previous National Research Programme (a strategic document), it was only with the RRP that they could be implemented. Consensus exists among interviewees about the "new" nature of these measures compared to the previous R&I context, and about their centrality in the RRP's R&I strategy.

innovation and competitiveness) the R&I tax credit is part of a broad measure (Transition 4.0) which precedes the RRF and is funded through national funds as well. As such, it does not represent a new measure. Furthermore, the RRP's investment in the industrial property system also represents the continuation of actions that were already previously in place and that had proved successful. Crucially, however, this investment was combined in the RRP with a new reform which introduced key modifications in the industrial property code.

Italy and Spain also put in place complementary plans to seize on their RRPs' mobilisation of resources. In 2021, Italy se set up a National Plan for Complementary Investments to the RRP: the government thereby integrates and enhances the contents of the RRP, allocating an additional 30.6 billion of national resources (covering all sectors, not just R&I), available in addition to the grants and loans provided under the RRF. For instance, the Complementary Plan allocated EUR 5 billion to Transition 4.0 and EUR 800 million to Satellite technology and space economy, thereby co-funding measures foreseen under Mission 1. Another example is the intervention called "Research initiatives for technologies and innovative pathways in healthcare", worth EUR 500 million, under the responsibility of the Ministry of University and Research. The Complementary Plan also originally included the "Innovation Agreements" measure [M4C2I2.2bis], which replaced the measure "Partnerships for research and innovation – Horizon Europe" [M4C2I2.2] in the RRP in 2024. The latter measure was moved to the Complementary Plan, which does not have the same timeline requirements as the RRF (see more on this below). In Spain's RRP, a standout feature is the emphasis on regional cohesion, as seen in the development of complementary R&D plans with Autonomous Communities. The Horizon Europe Incentive Plan further complements the RRP by promoting internationalization, enhancing Spanish participation in EU programmes, and shows a high level of alignment with the Spanish plan.

4. Implementation progress and achievements

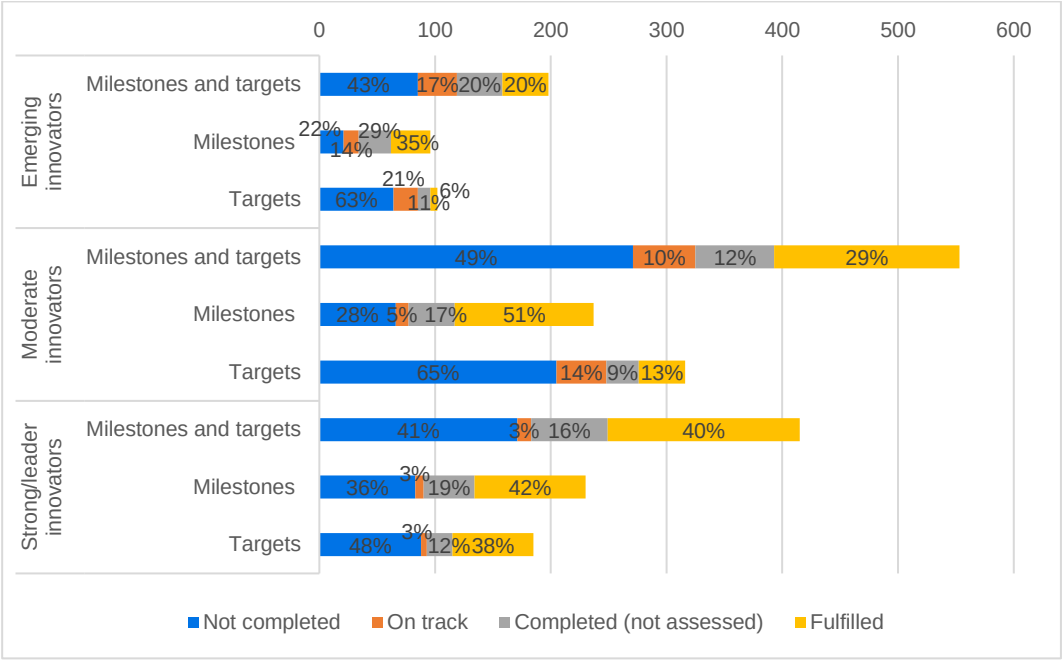
This chapter presents an update on the implementation progress of the selected RRF measures. It includes an overview of the targets and milestones achieved across the group of countries, along with a discussion of selected examples of research and innovation (R&I) outcomes in Italy, Lithuania, Portugal and Spain.

4.1. Implementation progress

Moderate innovators selected 237 milestones and 316 targets ([14]) to track the progress of their 166 measures (on average, 3.3 milestones or targets per measure). **Cumulatively, moderate innovators have a higher share of achieved milestones or targets compared to emerging, and lower compared to strong/leader innovators. At the same time, their share of not-completed M&Ts is the highest.** The Figure below displays the progress of the milestones and targets per innovation category. Overall, 42% of milestones and targets have been either completed or fulfilled, with milestones proceeding considerably faster than targets.

([14]) Milestones are qualitative achievements that reflect the final point or the intermediate progress towards the goal of a measure. They are often procedural or administrative in nature and are measured in a qualitative way. Milestones are mainly tracking the contract awards and funding decisions (e.g., "Notifications awarding projects […]."), the publication of calls or proposals (e.g., "Launch of calls to support excellent researchers"), the project initiation or progress reports (e.g., "Studies on Carbon Geological Storage") and the policy or strategy adoption (e.g., "Entry into force of the amendments to the Higher Education Act"). Targets instead are always quantitative and measure the outcomes that represent the end goal of a measure. The most recurrent themes in targets are the project completion or output delivery (e.g., "Number of excellent researchers supported").

Figure 4: Milestones and targets by progress status and innovation group



Source: Authors based on FENIX data (last update March 2025)

All moderate innovators country except one (Hungary) have fulfilled at least one milestone or target. Among the nine countries classified as moderate innovators, Spain has the highest rate of fulfilled milestones and targets, followed by Slovenia.

Common bottlenecks emerge from the analysis of the four selected Member States:

- **Uncertainties related to the new delivery method of the RRF represented bottlenecks in the initial implementation phase.** In Lithuania, the implementation of R&I measures faced early bottlenecks due to the unprecedented nature of RRF milestones and targets compared to other EU programmes. Demands related to milestones and targets exposed gaps in existing monitoring systems and strained administrative capacities, especially in infrastructure-heavy projects like competence centres, where procurement delays and construction approvals also proved challenging in view of complying with milestones' and targets' schedule. In response, Lithuanian authorities enhanced monitoring frameworks, adjusted project scopes, and streamlined administrative procedures to maintain compliance and delivery timelines. Initial coordination issues among institutions in 2021 and 2022 further highlighted the need for stronger interinstitutional collaboration, which improved over time through adaptive learning and sustained dialogue. Similarly, in Portugal, the RRF's administrative complexity posed a significant challenge, as the necessity to adhere to the stipulated milestones and targets represented a novel undertaking for the authorities, more accustomed to Cohesion policy procedures. The process of discerning the requisite evidence to be furnished to EU institutions was notably time-consuming and costly, a circumstance that is not customary for the routine operations of these institutions. In addition, implementing IT platforms to monitor the progress of R&I measures has proven challenging and remains an area requiring attention. Similar considerations about the "new" nature of the RRF representing an early bottleneck were also expressed by stakeholders from Italy and Spain consulted.
- A **shared bottleneck is the emphasis on cost control**, which has increased over time, adding complexity. Consensus was found among stakeholders on the fact that the

simplification originally expected to be generated by the performance-based system did not fully materialise.

- **Another key challenge is applying the "Do No Significant Harm" (DNSH) principle**. In Italy, according to interview feedback, the DNSH principle led to disproportionate administrative burdens, especially for low-risk measures like patent platforms Interviewed stakeholders from Spain expressed similar considerations, highlighting the additional verification measures that became necessary, adding bureaucratic burdens that slowed down programme implementation.

Stakeholder consultation also pointed to further bottlenecks. In Italy, additional barriers mentioned by interviewees include tight revision timelines and evolving guidance from the EU level, which strained administrative capacity. In addition, market unpreparedness—particularly in the hydrogen sector—slowed implementation. On a different note, the influx of RRP funds burdened university grant offices, indirectly reducing participation in Horizon Europe. In Portugal, the lack of workers with advanced skill levels to implement R&I projects has been a significant hindrance, as it has led to delays in the process. In Spain, the principal difficulty encountered by stakeholders consulted was adherence to project deadlines. In this regard, the lengthy R&I cycle, which requires a minimum of five years from programming to execution and final reporting, can represent a challenge for some projects, which may require extensions beyond the initial execution period to ensure proper implementation and justified reporting. Moreover, the rigidity of predefined deadlines can hinder the program's ability to accommodate unforeseen delays, reducing the project's overall effectiveness, which is a particularly relevant element for R&I.

4.2. Achievements beyond milestones and targets

This section offers insights into the results achieved by the RRF, extending beyond milestones and targets that primarily address operational objectives related to fund absorption rather than R&I outcomes. The analysis is based on evidence from Italy, Lithuania, Portugal and Spain, gathered through desk research, interviews and a focus group with RRF coordinating bodies, ministries and implementing agencies in these countries.

Some common elements emerged from the analysis of the four selected countries and consultation with stakeholders.

- **Compared to other funds, the RRF stands out for its support for reforms.** Beyond individual milestones and targets, the RRF's ability to support the swift approval or implementation of reforms has been widely noted as the RRF's added value. In this regard, in Lithuania, RRF-supported institutional initiatives progressed well with the establishment of Innovation Agency Lithuania in early 2022 and the reorganisation of the Research Council of Lithuania, which both consolidated fragmented innovation support services respectively in business and research. As another example, efforts to stimulate demand-driven innovation are also advancing, with the goal of supporting 155 projects through strategic public procurement by early 2026. In Portugal, the reform on the Promotion of R&I&D and Innovative Investment in Enterprises updated the national innovation strategy and enhanced the framework for public-private partnerships. Among other things, it also enabled the development of large-scale collaborative research agendas, notably the Mobilising Agendas for Business Innovation, and early indications suggest that these agendas have started promoting a stronger culture of collaboration across sectors.
- **The RRF strengthened capacity in universities and research bodies.** In Italy, EU grant offices of universities and research institutes enhanced their capacity thanks to the RRP, as well as their linkages with businesses. However, structural challenges remain in integrating research into Italy's SME-dominated economy. In Lithuania, the measure "Quality higher education and strong higher education institutions" (C5-E1.1) introduced a new funding

structure for higher education and defined the missions of universities and colleges, increasing their R&D funding component.

- **After a challenging initial familiarisation with the RRF's delivery mechanism, an important future legacy could lie in increased administrative capacity**. In Italy, in particular, the experience of Ministerial RRP Mission Units, which have enhanced coordination within and across ministries, was highlighted by multiple interviewed stakeholders as a positive step. In principle, their experience could be renewed to cover the whole set of EU funds in the future.
- **Evidence on outcomes and broader impact on R&I system remains limited as these effects are largely not visible yet, but data from Spain suggest positive developments**. Focus group participants strongly emphasised that it is "too early" to conduct a truly robust analysis of RRF outcomes and impacts. It was mentioned that key indicators, such as published papers in peer-reviewed journals and citations require a significant amount of time (years) to accumulate, and projects are still actively in implementation. Yet, in Spain, where the RRF has contributed 43.8% of the public R&I budget between 2021 and 2023 ([15]), key performance indicators appear to reflect its impact: R&D investment rose from 1.24% in 2019 to 1.49% of GDP in 2023, and the number of researchers and R&D staff significantly increased. Research excellence also improved, with more ERC grants and high-impact publications ([16]). Progress is evident in knowledge transfer metrics, such as patent licensing and business R&D expenditure, both of which saw measurable gains. Licensed patents per million inhabitants increased from 26.13 in 2019 to 28.70 in 2022, and business R&D investment rose from EUR 8.74 billion to EUR 10.9 billion. These trends affirm the effect of RRF funding, as well as national efforts.
- **There is a lack of evidence on the impact of most measures, as they were not designed with an embedded assessment framework for R&I impact evaluation**. Such a framework would typically track indicators such as scientific publications, patents, intellectual property rights, technology readiness level progression, and knowledge exploitation through commercial and societal uptake. On a more general note, during the focus group it was noted that since in the R&I domain it is difficult to have fast results from public investment, most of the milestones and targets in this area necessarily have to do with the physical outputs (e.g. the amount invested, or some characteristics of the different kind of projects). Of course, it is very difficult to imagine having result indicators in the lifespan of RRF, but this could have led to a stronger focus on evaluation. In a strategic area such as research, which is also a difficult area to analyse in terms of success and failure, there could have been more focus on ex-post evaluation of these policies. This is especially, though not exclusively, true for the legislative reforms. Ex-post evaluation, in fact, is necessary to understand whether policies should be readjusted in the future, and the fact that the RRF does not have a country-level requirement on this may represent a lost occasion.
- **Despite this, there is clear evidence of progress in the implementation of measures**. For example, in Portugal, 50 out of 53 Mobilising Agendas (30 business-focused, 20 green) have been contracted, involving 1,247 entities and representing EUR 7.8 billion in total investment, with EUR 2.8 billion in public funding. The Interface Institutions network, another core component of the RRP, has also expanded through legislative reform and financial support, enhancing the knowledge and technology transfer system. Over 8,800 companies have benefited from these institutions' activities, and more than 3,600 researchers (38% female) are employed in Technology and Innovation Centres (CTIs) and Collaborative Laboratories (CoLAB) facilities. As another example, Spain's RRP sectoral investments have made strong headway. In health, the PERTE for Cutting-Edge Health has executed 82% of its budget, supporting landmark projects such as SPAIN NEUROTECH and MARSI-

([15]) Seguimiento y evaluación de la EECTI 2021-2027, here.
([16]) Ibid.

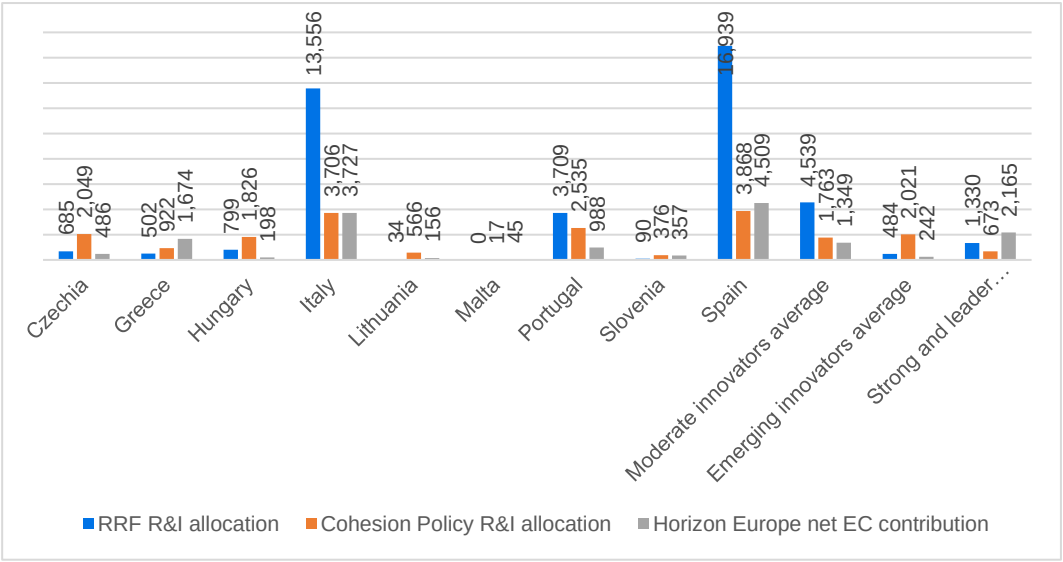
Bionics. In green energy, Spain has advanced hydrogen and offshore wind development, supported by regulatory frameworks and over 50 major projects. Digital transformation has reached the cultural sector, with museums modernized through RRF investments. In AI, a new national strategy focuses on innovation and responsible development. Lastly, knowledge transfer initiatives such as BlueSolar's thermos-photovoltaic plant showcase how RRF funding is enabling SMEs to lead in clean energy innovation.

- **All countries committed to the long-term policy goals supported by the RRF and intend to continue investing to ensure the sustainable impact of RRF's investments and reforms beyond 2026**. For instance, Italy has officially committed to increasing public expenditure for R&I: this is expected to contribute to ensuring a lasting impact of RRP investments over time. Despite this, some concerns about sustainability beyond 2026 remain: RRP measures have created valuable infrastructure and human capital, but long-term funding is relatively uncertain. For some RRP measures (e.g., the systemic actions at the core of the RRP's R&I approach), however, concrete steps have already been taken by the government to ensure continued funding.

5. Complementarities and synergies with other EU Programmes

For R&I actors in moderate countries, RRF R&I allocations represent the most significant source of funding compared to Cohesion Policy and Horizon Europe. The overall figure is driven by Spain, Italy and Portugal, where the prominence of the RRF funds in RDI spending is more accentuated. In smaller countries (Czechia, Hungary, Lithuania, Slovenia), the main source of funding in this area is the Cohesion Policy RDI allocations. Finally, in Greece, the main source of RDI funding is Horizon Europe.

Figure 5: Comparison of funding allocation across Cohesion Policy, RRF investments, and Horizon Europe, million EUR ([17])



Source: Authors based on FENIX data, Horizon Europe country profiles and Cohesion Open Data platform.

Based on the analysis of the titles and descriptions of the measures and sub-measures, as well as their associated M&T, **only 6 out of the 166 measures and sub-measures introduced by countries in the moderate innovator group make explicit reference to Horizon Europe or its components, and only 3 refer to a co-funding strategy with Cohesion Policy funds.**

([17]) The data on Cohesion Policy support to R&I presented in the country fiches differ from those in the case studies due to differences in approach. In the country fiches, Cohesion Policy support to R&I refers to the total amounts planned under Specific Objective 1.1 ("Enhancing research and innovation"). In the case studies, however, focusing solely on the overall SO1.1 allocation would have prevented an analysis by investment area (instrumental to establish correspondences with Horizon Europe and RRF support for the coherence analysis). For this reason, Cohesion Policy support to R&I in the case studies is calculated as the sum of the amounts for each investment area. Annex IX in the main report sets out the definition of each area.

Table 2: Number of R&I measures and sub-measures making explicit reference to Horizon Europe (or its components) and Cohesion Policy funds.

Support to/for…	N. of cases per moderate innovator countries	Total No. of cases in FENIX
Co-funding European Partnerships in HE	1 Greece	1
Seal of Excellence	1 Greece; 1 Lithuania	12
Access to programmes, Incl. Horizon Europe	1 Lithuania; 1 Slovenia; 1 Spain	3
Alignment of national R&I organizations with EU missions		0
Synergy with Cohesion policy	2 Czechia; 1 Spain	3

Source: Authors based on FENIX data.

The following sections provide insights into the synergies and overlaps between the RRF, Cohesion Policy, and Horizon Europe funding in the four case study countries based on further research beyond the titles and descriptions of the measures and M&T. Annex III provides additional evidence on Italy, comparing the RRF with Cohesion Policy and Horizon Europe thanks to the availability of detailed open data at the national level.

5.1. Cohesion policy

The four countries show a high degree of alignment between RRF and Cohesion Policy investments in the R&I sector. In Portugal, even though Cohesion policy funds are administered by a distinct entity from those of the RRP, there is ongoing dialogue with the coordinating body of the RRF to formulate a strategy and delineate measures that have potential for complementarities. In Spain, funds from the Cohesion policy, and particularly the ERDF, complement, reinforce and consolidate the broad investment programme launched with the RRP. Among the main priorities of the ERDF programmes, there are synergies with components 13, 15, 16 and 17 of the RRP, related to the R&I ecosystem. Thus, for example, in the field of research, the multiregional ERDF programme is expected to put forward complementary efforts aligned with the RRP in areas relevant to the smart specialisation of Spain and its regions. Italy offers an example of RRF-Cohesion Policy complementarity based on demarcation between different themes. The actions envisaged by the National Research and Competitiveness Programme (PN RIC) 2021-2027, financed by Cohesion Policy funds, have been formulated with a clear demarcation from the measures of the RRP, precisely to avoid overlaps and duplications. The RRP, in fact, focuses especially on strategic investments and structural reforms, while Cohesion Policy funds (and Horizon Europe) support specific projects and basic and applied research activities. At the same time, interview feedback suggests that, while the implementation of Cohesion Policy programmes suffered from the parallel implementation and prioritisation of the Italian RRP (as proved by the low fund absorption of these programmes), a sort of temporal complementarity will de-facto come about as well, since Cohesion Policy

programmes can be expected to "inherit" projects that will have difficulties respecting the RRF's timing and thereby give them continuation in funding. This is for instance the case in Lithuania, where projects supported by Cohesion Policy (for example, EUR 105 million to SME-led R&I initiatives, EUR 75 million to circular economy projects, and EUR 14,6 million in micro-enterprise R&I in the Capital region) not only align with RRF-supported goals in sustainability and digitalisation but are also expected to generate thousands of new R&I jobs by 2029, significantly expanding Lithuania's applied innovation base. By co-funding key measures such as digital innovation development (C3.C.1.4) and knowledge centres (C2.B.3.1), Cohesion Policy extends the reach of RRF initiatives., where projects supported by Cohesion Policy (for instance, EUR 105 million to SME-led R&I initiatives, EUR 75 million to circular economy projects, and EUR 14,6 million in micro-enterprise R&I in the Capital region) not only align with RRF-supported goals in sustainability and digitalisation but are also expected to generate thousands of new R&I jobs by 2029, significantly expanding Lithuania's applied innovation base. By co-funding key measures such as digital innovation development (C3.C.1.4) and knowledge centres (C2.B.3.1), Cohesion Policy extends the reach of RRF initiatives.

Complementarities between Cohesion Policy and the RRF also emerge in terms of sub-national territorial dimension. In Spain, an example of RRP-Cohesion Policy complementarities emerges through looking at the RRP "Strategic Project for Vanguard Health". Within this measure, the call for the creation of new clinical research units across the whole national territory has been a major step in gaining territorial convergence, given that the majority of the units are centred in Madrid and Barcelona. The objective is to create research units and to strengthen those that already exist. In this sense, the RRP has included measures to promote territorial cohesion and R&D to prevent the widening of gaps. According to stakeholders consulted, the advances made by the RRF on the matter have paved the way for using ERDF funds in order to further support R&I in the Autonomous Communities. In Italy, coherence between the RRP and Cohesion Policy is also facilitated by a reference to regional Smart Specialisation Strategies (S3) within the measure "Innovation ecosystems" [M4C2I1.5], about territorial leaders of research and innovation (networks of state and non-state universities, public research bodies, territorial public bodies, other highly qualified and internationally recognized public and private entities). This measure, as mentioned, funded large projects on high TRLs, spanning from EUR 80 to 110 million, covering topics relevant to the regional context in line with the regional S3 (e.g., space, sea protection, humanities). Coherence with the regional S3 has been an assessment criterion in this measure's call for projects ([18]). Concerning the sub-national dimension, the 2021-2027 Cohesion Policy allocates more R&I-related funds to less developed Italian regions than the RRF in percentage terms (out of the total each of the two instruments allocates to R&I in Italy), but less in absolute terms (see Annex III for further detail).

5.2. Horizon Europe

There is a good degree of alignment between Horizon Europe and RRF measures in the R&I sector. Lithuania's participation in Horizon Europe is strategically aligned with national R&I priorities and complements key investments under the RRP, particularly in promoting green innovation and digital transformation. The thematic orientation of Lithuanian Horizon Europe projects closely mirrors national Smart Specialisation Strategy (S3) priorities, such as health technologies (e.g., ThrombUS+ for AI-powered thrombosis monitoring), ICT (e.g., A-IQ Ready for quantum-edge AI systems), and sustainable production (e.g., GIFFT for low-emission glass manufacturing), which are also embedded in the RRF's innovation and green transition agenda. Further support from Horizon Europe through the European Innovation Ecosystems (EIE) and the European Innovation Council (EIC) has brought over EUR 22.2 million to Lithuania, reinforcing the development of high-potential startups and deep-tech sectors. These instruments complement RRF-funded capacity-building and infrastructure investments, creating a coordinated path from foundational support to frontier innovation. For instance, RRF funding

([18]) Available here.

has enabled the development of digital innovation tools and green finance expertise, which are further enhanced through Horizon Europe's support for applied R&I and pan-European collaboration. These interlinkages illustrate both co-funding synergies, where different cost components of shared projects are covered by separate programmes, and RRF-funded infrastructure and institutional upgrades facilitate higher success rates in Horizon Europe calls. Additionally, RRF investments are contributing to supporting access to other programmes by improving the readiness of public authorities, SMEs, and research institutions to engage with competitive EU-level funding opportunities. For example, the preparation of a national energy system modelling study, supported jointly by RRF and Horizon Europe, builds the analytical and planning capacities necessary for developing green energy projects, many of which may be eligible for subsequent Horizon or InvestEU support. In Italy, a measure funding "Projects presented by young researchers" [M4C2I1.2] offers an example of a successful synergy: under this measure, research grants were awarded to Marie Skłodowska-Curie Individual Fellowships and Postdoctoral Fellowships (MSCA), as well as to Seal of Excellence (SOE) and European Research Council (ERC) grantees. Moreover, ERC researchers were hired as second-level university professors or second-level researchers; MSCA and SOE researchers were hired as researchers. In Portugal, in the context of the Interface Mission investment included in the Portuguese RRP, Horizon Europe funds have been used by beneficiary organisations to complement RRF funding, thereby strengthening the financial and scientific capacity of the organisations involved in the projects.

Challenges related to the justification of double funding avoidance limited the possibility of synergies. In Spain, the possibility of complementing RRF funding with Horizon Europe was foreseen in the Spanish plan, and these complementarities were explored by the Spanish authorities, but the process for justifying the avoidance of double funding made it reportedly very time-consuming for the Spanish authorities to co-fund projects and represented a clear hurdle. Nevertheless, thematic complementarities can be clearly found in matters such as renewable energy or artificial intelligence, where Spanish organisations have been beneficiaries. In this regard, Italy offers the example of an initially ambitious approach to synergies between RRP and Horizon Europe, which, however, did not prove successful. The original Italian RRP included a measure called "Partnerships for research and innovation – Horizon Europe" [M4C2I2.2], with an associated cost of €200 million, which aimed to fund research projects identified through calls for participation in 7 EU partnerships. However, in 2024 the Italian government requested the removal of this measure from the RRP, because "market evolution had determined an insufficient demand" ([19]), which had put into question the ability of this measure to reach its targets in time ([20]). According to interview feedback, a reason contributing to the removal of the measure from the RRP was the difficulty of the process to justify the avoidance of double funding. During implementation, the possibility of co-funding (and justifying avoidance of double funding) revealed itself as more complex than it had initially seemed – also, according to interview feedback, due to evolving guidance from the Commission. This evolution created significant obstacles to implementing synergies between diverse funding streams. It introduced legal and procedural uncertainty into the implementation framework. According to interview feedback, in such contexts—especially amid broader economic instability—this uncertainty can also lead to a decline in private investment (and participation in calls), as businesses are reluctant to commit resources without regulatory clarity.

Annex III offers further analysis on the sub-national dimension of RRF-Horizon Europe complementarity in the Italian case. Compared to Horizon Europe, the RRP focuses less on more developed regions, but in absolute terms still assigns more resources to them than Horizon Europe (see Annex III for further detail).

([19]) https://data.consilium.europa.eu/doc/document/ST-9399-2024-INIT/it/pdf (own translation)

([20]) The Council accepted the replacement of this measure with the new investment "Innovation agreements". Originally, Innovation agreements were a measure funded through the National Complementary Plan (PNC). They were included in the RRP in 2024 to facilitate timely RRF funds absorption. Vice versa, the funding for Partnerships originally foreseen in the RRP was shifted to the PNC.

6. Conclusions

As a general conclusion, this case study finds that in moderate innovators, the unprecedented influx of resources for the R&I systems brought about a mix of transformative changes and continuity measures. Not all moderate innovators had a high number of reforms, and while there are signs of improved R&I capacities, especially in terms of links between universities and businesses, the boost provided by the RRF will need to be protected and sustained through dedicated support beyond 2026 to ensure its impact over time.

In what follows, this section presents more specific conclusions.

- **EU Moderate Innovator countries show varied yet ambitious approaches to strengthening R&I ecosystems through the RRF**. While investment levels and priorities differ across countries, there is a clear emphasis on integrating reforms and investments. Italy, Portugal, Spain, and Lithuania illustrate systemic strategies addressing structural weaknesses and fostering science-business collaboration.
- **The RRF has emerged as a crucial enabler of national R&I priorities in moderate innovator countries**. Its alignment with existing strategic frameworks and policies is generally high, and the fund has both reinforced and catalysed structural reforms across R&I systems. By supporting diverse actors, sectors, and technology stages, the RRF has enhanced strategic coherence with EU objectives, enabling Italy, Lithuania, Portugal and Spain to pursue long-term innovation goals while addressing legacy weaknesses and systemic fragmentation. These countries deployed a diverse range of instruments addressing various needs, a diversity notably shaped by the significant allocations (and high number of measures) received by Italy, Portugal and Spain. In moderate innovator countries, R&D measures span multiple actors (e.g. universities, research centres, and businesses), technology readiness levels (from basic research to technology transfer), and sectors.
- **In Italy, Lithuania, Portugal and Spain, the RRF enabled a blend of continuity and transformation in R&I systems**. The analysis of these countries shows a mixed relation of R&I measures to the existing policy context. While some structural measures in the R&I domain were largely of a transformative nature, other interventions, such as those reinforcing existing R&I policies, deploying R&I-intensive sectoral strategies like in the space sector, or integrating R&I components into traditional fields like industrial policy or agriculture—mainly represented a continuation of established policies or tools. Ultimately, moderate innovators implemented a combination of transformative and complementary measures.
- **Despite not being a dedicated R&I instrument, the RRF has significantly influenced national innovation policies by providing financial and strategic reinforcement**. Countries used the RRF, aligning it with pre-existing frameworks and long-term priorities, notably those set out in Horizon Europe. Although it is too early to assess the ultimate effectiveness of the RRF, the R&I measures in moderate innovator countries are making progress towards a more coordinated, impact-oriented approach that fosters sustainable, inclusive, and technologically advanced innovation ecosystems.
- **Implementation of RRF-funded R&I measures in moderate innovator countries shows both early achievements and persistent challenges**. While progress varies, many milestones and targets have been met, and reforms and investments are underway. Some countries demonstrate tangible improvements in innovation capacity, infrastructure, and collaboration. However, administrative complexity has remained a significant bottleneck. Sustained efforts and long-term funding will be essential to ensure transformative change and the durability of RRF-supported reforms and investments.
- **Complementarities with Cohesion Policy and Horizon Europe remain somewhat underexploited in moderate innovators**. Some positive examples exist, for instance in terms of strategic alignment or co-funding efforts to support regional ecosystems.

Nonetheless, challenges such as fragmented governance, limited administrative capacity, and regulatory complexities—especially regarding double funding—have hindered the practical realisation of synergies. Moving forward, strong institutional coordination and clear EU-level guidance (limiting the possibility that the interpretation of implementation rules evolves over time) could be essential to fully leverage the complementarities between different funding streams.

7. Annexes

7.1. Annex I. Methodology

The preparation of the case study has been focused on the following steps:

- **Review of desk-based evidence collected in the context of the MS-level analysis, especially for the three countries selected for in depth analysis.**
- **Review of evidence from interviews.** In the interviews foreseen for all 27 MS (with the RRP National Coordinating Body and Ministries of Science/Research/Innovation), questions were added in case the respective country was selected for a case study. Depending on the country and the outcomes of the horizontal interviews, additional interviews target the following groups: an additional relevant ministry, a key national innovation/research agency, a key representative of target groups, the national body coordinating Cohesion Policy in the country (with some flexibility depending on the country: for instance, in countries where Cohesion Policy plays little role, the related interview might risk having little added value and therefore we may consider swapping it with a more relevant interviewee).
- **Analysis of data**, specifically:
  - The data feeding into the "Overview of measures" section are elaborations mainly based on FENIX datasets received from the Commission. To provide data on the weight of the RRP RDI allocation over the national government allocation to RDI, data from the Eurostat GBARD have been used.
  - For the section on "Synergies with Horizon and Cohesion policy", the data analysis exploited the datasets available for the various programmes of interest. The analysis focused on the allocation of the resources of a programme into specific areas of action (see Annex V of the main report). For the RRF, the considered allocation refers solely to investments.
- **Integration of evidence from the focus group** organised with targeted representatives of the three countries selected for in-depth analysis. The focus groups aimed to discuss the preliminary findings of the case study, enhance the evidence base, and ensure that conclusions are well-founded and nuanced. See Annex VII of the main report for the focus groups' main takeaway messages.
- **Triangulation of evidence**. As a final step, findings were cross-verified to the extent possible using multiple sources of information to ensure the validity, reliability, and completeness of the analysis. This process helps reduce bias and strengthens the credibility of the conclusions.

7.2. Annex II. Further data elaborations and charts

Figure 6: Financial allocations by country, fund and typology. Million EUR.

Country Typology of investment	RRF RDI investments	Cohesion Policy	Horizon Europe
Czechia	**685**	**2,254**	**384**
R&D projects	244	282	64
Research infrastructure	222	773	17
Grants for RDI in enterprises	160	966	9
Public-private partnerships and science business collaboration	59	204	196
Strategic instruments (e.g., roadmaps, strategies)			60
Financial instruments and tax incentives		26	
Skills		2	37
Greece	**502**	**982**	**1,357**
Research infrastructure	180	72	38
Public-private partnerships and science business collaboration	163	60	1,117
R&D projects	140	260	59
Grants for RDI in enterprises	18	481	5
Skills		22	48
Financial instruments and tax incentives		87	
Strategic instruments (e.g., roadmaps, strategies)			88
Hungary	**799**	**1,826**	**158**
Grants for RDI in enterprises	615	906	4
Research infrastructure	184	468	3
Skills			9
Strategic instruments (e.g., roadmaps, strategies)			11
Financial instruments and tax incentives		285	
R&D projects		167	31
Public-private partnerships and science business collaboration			101
Italy	**13,556**	**4,449**	**3,053**
Public-private partnerships and science business collaboration	4,483	743	1,952
R&D projects	4,371	187	585
Grants for RDI in enterprises	2,694	2,539	79

Financial instruments and tax incentives	2,008	441	
Research infrastructure		178	81
Skills		362	297
Strategic instruments (e.g., roadmaps, strategies)			58
Lithuania	**34**	**679**	**125**
Public-private partnerships and science business collaboration	17	113	75
Grants for RDI in enterprises	15	320	7
R&D projects	2	113	7
Financial instruments and tax incentives		133	
Research infrastructure			1
Skills			5
Strategic instruments (e.g., roadmaps, strategies)			30
Malta		**17**	**40**
Public-private partnerships and science business collaboration			20
Research infrastructure			0
Strategic instruments (e.g., roadmaps, strategies)			12
Skills		2	3
R&D projects		2	3
Grants for RDI in enterprises		13	1
Portugal	**3,709**	**2,976**	**839**
Public-private partnerships and science business collaboration	3,060	440	501
R&D projects	260	279	126
Skills	215	404	57
Research infrastructure	145	120	23
Grants for RDI in enterprises	21	1,732	33
Strategic instruments (e.g., roadmaps, strategies)	9		98
Slovenia	**90**	**404**	**287**
Public-private partnerships and science business collaboration	73	28	185
Skills	13		22
Research infrastructure	5	88	3
Strategic instruments (e.g., roadmaps, strategies)			34
Grants for RDI in enterprises	0	234	3

Financial instruments and tax incentives		20	
R&D projects		34	40
Spain	**16,939**	**4,025**	**3,584**
Grants for RDI in enterprises	11,063	1,515	137
Public-private partnerships and science business collaboration	2,660	158	2,352
R&D projects	1,739	1,040	605
Strategic instruments (e.g., roadmaps, strategies)	617		103
Research infrastructure	556	804	57
Skills	304	438	329
Financial instruments and tax incentives		72	

Source: Authors based on FENIX data, Horizon Europe country profiles and Cohesion Open Data platform.
Note 1: The data on Cohesion Policy support to R&I presented in the country fiches differs from those in the case studies due to differences in approach. In the country fiches, Cohesion Policy support to R&I refers to the total amounts planned under Specific Objective 1.1 ("Enhancing research and innovation"). In the case studies, however, focusing solely on the overall SO1.1 allocation would have prevented an analysis by investment area (instrumental to establishing correspondences with Horizon Europe and RRF support for the coherence analysis). For this reason, Cohesion Policy support to R&I in the case studies is calculated as the sum of the amounts for each investment area. Annex IV in the main report sets out the definition of each area.
Similarly, the data on Horizon Europe presented in the country fiches differs from those in the case studies due to methodological differences. In the country fiches, Horizon Europe data refer to the total net EU contribution. In the case studies, by contrast, the figures reflect the sum of allocations by investment area (an approach necessary to establish correspondences with Cohesion Policy and RRF support for the coherence analysis). Annex IV in the main report defines each investment area. Discrepancies arise from the impossibility of assigning certain Horizon Europe calls to the investment areas used in this analysis.
Note 2: For each country, the colours illustrate the distribution by investment area of each fund, on a scale from white (least resources from the fund to this area) to dark green (most resources).

7.3. Annex III. Comparing RRF, Horizon Europe and Cohesion Policy: the case of R&D projects in Italy

Introduction

The availability of detailed data on RRF projects, as well as their participants and location, allows to deepen the analysis for the case of Italy. While data on Horizon Europe (HE) projects and participants are also publicly available, 2021-2027 Cohesion Policy (CP) projects data are not yet available. Despite this, the dataset on CP funds allocation is public, and allows to break down the resources by region and type of region.

Based on these data, the Italian case can be further analysed as follows. First, the territorial concentration of RRF, HE and CP can be compared. Second, exploiting the detailed RRF and HE data, the number, type and level of overlap of individual beneficiaries can be explored. Finally, the titles and descriptions of the projects developed by the same entities across the two programmes can be compared to understand the extent of their similarity. This can inform about possible synergies exploited by participants in both programmes.

Methodology

This Annex is based on RRF project-level database, Cordis (Horizon Europe data) and Cohesion Policy open databases.

The RRF projects and participants databases are published ([21]) in Italy in the Open Data catalogue. Data are periodically updated and include all available information on projects and participants under all RRF measures. In the context of this Annex, the full database was sliced to include only data associated with projects financed by one of the 34 Italian RRP R&I measures under scope in this study. Associated projects were found in the database for 25 of these measures. Horizon Europe data were downloaded from Cordis ([22]). The dataset was filtered to include only Italian participants and the corresponding financial awards. Finally, Cohesion Policy data were filtered to include only the relevant Intervention Fields and form of support as listed in the correspondence table of Annex IV of the main report.

Three analyses were performed:

- The territorial concentration of the funds was examined based on the geographical disaggregation of the datasets. While RRF and Horizon Europe data include information on the municipalities of the participants, CP data provide information only on the “type of region”, a classification which distinguishes between more developed, transition and less developed regions. By mapping the regions of beneficiaries of RRF and HE into this classification, it is possible to compare the allocation across this geographical variable.
- The level of overlap between RRF and HE participants was investigated, making use of VAT codes, which allow unique identification of participants across both datasets.
- A similarity analysis between projects done by the same entity was performed by means of a sentence similarity algorithm. Sentence similarity is a Natural Language Processing task that aims to determine the semantic similarity between a pair of sentences. The sentences are first transformed into numerical vectors through a pre-trained Large Language Model. Then, their similarity is computed as the distance between the two vectors in the vector-space.

([21]) https://www.italiadomani.gov.it/it/catalogo-open-data.html
([22]) CORDIS - EU research projects under HORIZON EUROPE (2021-2027), here.

Territorial concentration of RRF, Horizon Europe and Cohesion Policy.

The RRF support to R&I stands between CP and Horizon Europe in terms of concentration by type of region, as shown in the first Figure below, which displays the share of R&I investments by type of region and source of funds in Italy. Horizon Europe participants tend to be in more developed regions, while CP has a higher focus on less developed regions. **The RRF resources, while representing the largest amount in absolute terms, are more balanced across the three categories of regions**. As opposed to the other two funding mechanisms, the RRF emerges as the instrument that plays a crucial role not in one specific category of regions, but in more developed and less developed regions alike. In fact, if we cumulatively consider all R&I-related funds under the RRF, Horizon Europe and Cohesion Policy, Horizon Europe covers a large share (37%) of these funds for more developed regions and a little share (6%) for less developed ones; vice versa, Cohesion policy covers a large share of funds for less developed regions (46%) and a small share (10%) for more developed ones. The RRF covers a large and similar share in both types of regions, instead of about 50% of the total R&I funds (48% in less developed regions, 53% in more developed regions).

The second Figure shows that relative to GDP, the RRF provides most of the support to less developed regions (0.57% of the less developed regions' GDP), while it has the same weight in transition and more developed regions (0.31% each).

Figure 7: Distribution of funds in Italy by regions' development level and funding source, million EUR

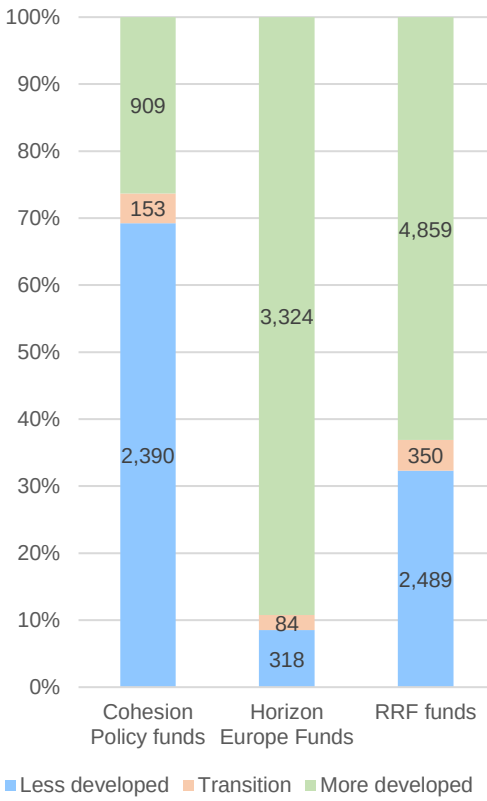
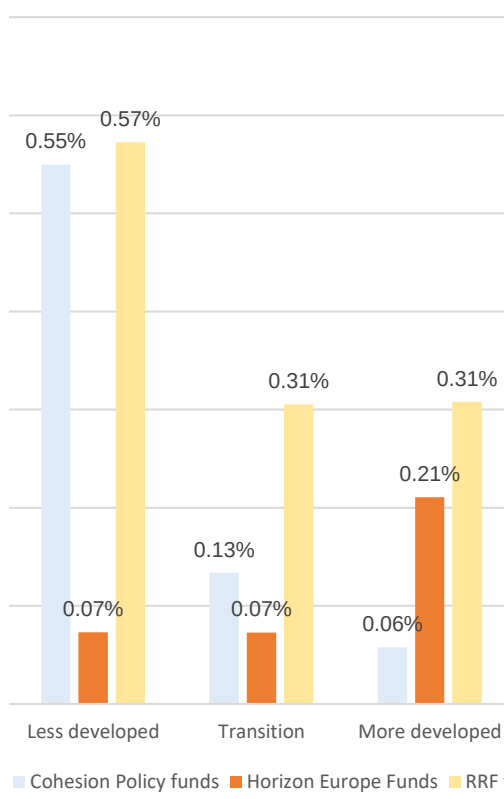


Figure 8: Distribution of funds in Italy as a share of 2023 GDP of the regions' classes



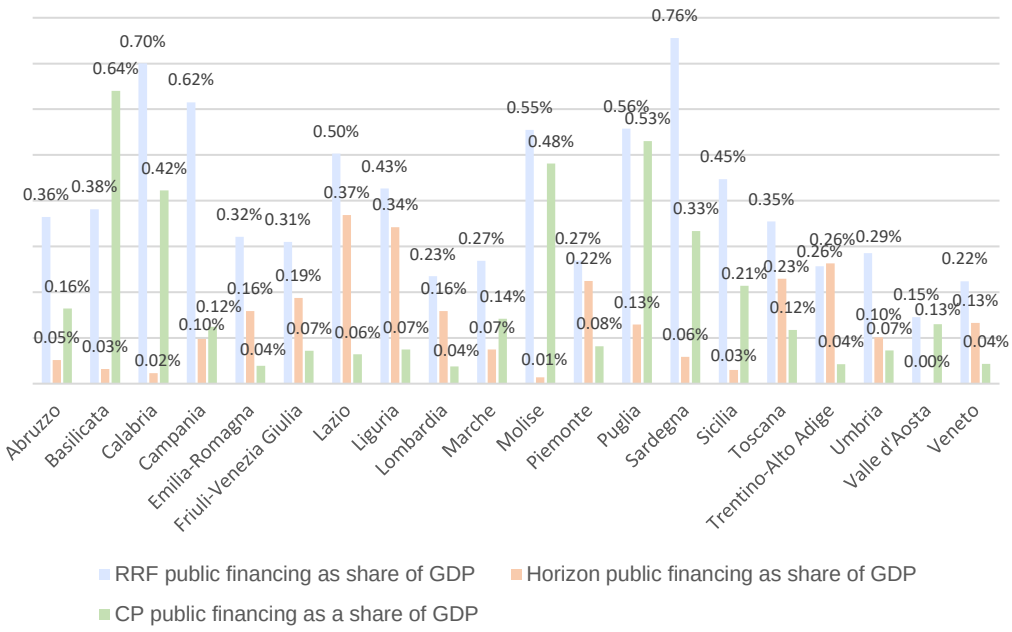
Source: Authors based on Italian Open Data catalogue, Cordis and Cohesion Policy data. Note: RRF data refer to a sub-set of 25 R&I measures on which data are available.

Overall, this analysis's importance lies in providing hard data on sub-national patterns of RRF R&I measures, a topic on which literature has so far been absent. In fact, concerning the sub-national dimension, Molica and Marques Santos (2024) analyse the territorial concentration of RRF, Cohesion Policy and Horizon Europe, and acknowledge that due to a lack of data, an analysis on the RRF could only be made at the national level. Mentioning that "the current lack of data on the territorial concentration of RRF funds suggests […] caution in drawing conclusions from the comparison with the other two instruments", they state that while Cohesion Policy focuses on less developed regions and Horizon Europe on more developed regions, the RRF "shows a less clear-cut trend than the other two funding streams". Noting that in 2014-2020 the bulk of Horizon 2020 funding was geographically rather concentrated in territories leading in R&I, which may contribute to agglomeration dynamics, the authors noted a high potential for complementarities with the RRF. Ultimately, the analysis conducted here offers hard data to confirm their conclusion that the RRF shows a less clear-cut trend than Horizon Europe and Cohesion Policy, providing a disaggregation at the regional level for the Italian case.

Finally, it is also possible to delve into a finer level of analysis and study the distribution of R&I funds at the regional level. The regions which received the largest amount of RRF R&I funds compared to their GDP are Sardinia, Calabria and Campania, all less developed regions. Conversely, Lombardy, Valle d'Aosta and Veneto, all more developed regions, received less funds as a share of their GDP. A similar territorial distribution is observed with Cohesion Policy funds: Basilicata, Puglia and Molise (all less developed regions) received the largest amount compared to their GDP, while Emilia-Romagna, Lombardy, Trentino-Alto Adige and Veneto (all more developed) received comparatively less. The picture is reversed with Horizon Europe: more developed regions, and namely Lazio, Liguria and Trentino-Alto Adige, are the regions where the share of funds compared to their GDP is highest, while Molise, Calabria and Sicily, all less developed regions, benefited far less of these funds ([23]).

([23]) To be more precise, this is true among regions with at least one Horizon Europe beneficiary. In fact, Valle d'Aosta, a more developed region, is not home to any Horizon Europe beneficiary. While this information might be surprising, it should be noted that this is the smallest region of Italy both in terms of GDP and population.

Figure 9: Distribution of funds in Italian regions as a share of 2023 GDP



Source: Authors based on Italian Open Data catalogue, Cordis and Cohesion Open data platform.

Beneficiaries of RRF and Horizon Europe

RRF R&I-related measures in Italy have financed ([24]) 23,328 projects. 19,332 distinct final beneficiaries are participating in these projects. Out of these beneficiaries, 14,389 do not have any VAT number associated: these are mostly natural persons and agricultural firms. Without the VAT number, it is not possible to search for the same entity in the Horizon Europe database. Horizon Europe has financed ([25]) 4,569 projects in Italy instead. These projects are being carried out by 2,025 distinct organisations.

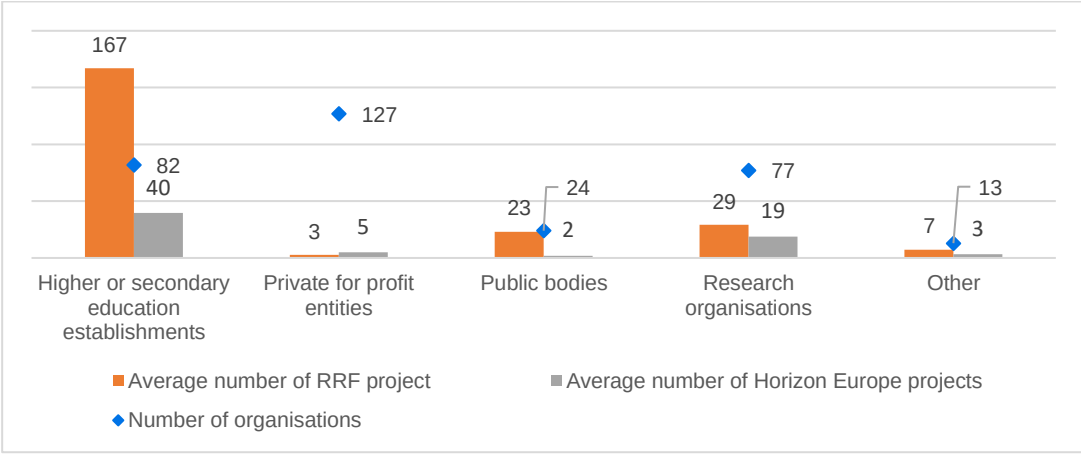
322 final beneficiaries of RRF are also Horizon Europe's participants. These organisations participated in 16,936 RRF projects and 3,521 Horizon projects, securing 3,534 and 2,319 million EUR from the two instruments, respectively. On average, entities benefiting from both programmes participate in 53 RRF and 17 Horizon Europe projects.

Among beneficiaries of both programmes (see the Figure below), private companies are the most common typology of activity ([26]), followed by higher or secondary education establishments and research organisations. Interestingly, they display the lowest average number of RRF project participation per entity. Furthermore, in terms of the average number of Horizon Europe projects, they have a relatively low participation, although higher than among public bodies and "other" types of activity. Higher or secondary education establishments (note that in the sample that is being discussed, these are all universities) have participated in the largest number of RRF and Horizon Europe projects, followed by research organisations. This is explained by the fact that these types of entities are specialised in R&I and structurally take advantage of public

([24]) Update of 31 March 2025.
([25]) Update of 15 May 2025.
([26]) As per the "activityType" column from Horizon Europe data.

sources of financing. At the same time, compared to private companies, they are far fewer in absolute terms, and this is why there are fewer of them.

Figure 10: Number of distinct organisations, and average number of RRF and HE projects, by type of activity of the organisations

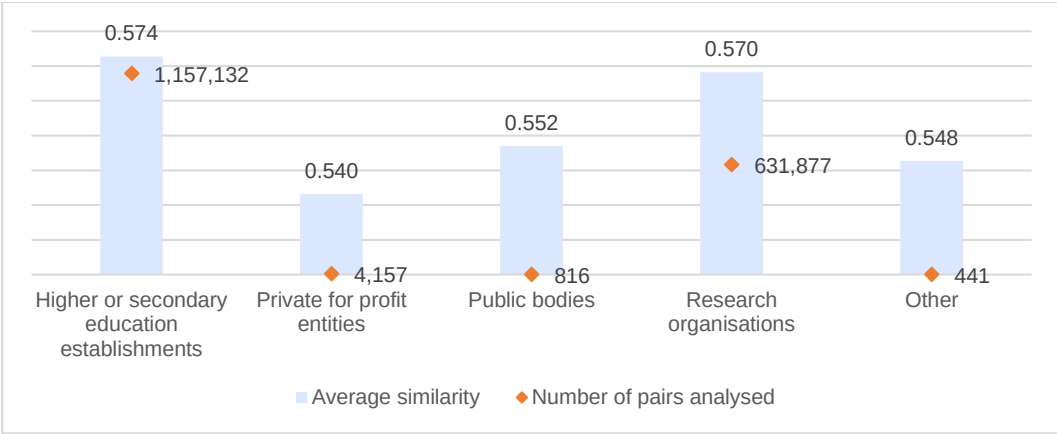


Source: Authors based on Italian Open Data catalogue, and Cordis data.

Similarity

The differences among the average similarity found among the various types of organisations are limited in size but result from a high number of descriptions analysed. What emerges is that universities and research organisations, when funded from both RRF and HE, display higher similarity among their projects, especially if compared to private companies. This similarity in the projects carried out by organisations benefitting from both programmes could point to possible synergies between RRF and HE.

Figure 11: Average similarity and number of pairs on which the average is computed, per type of activity of the organisation



Source: Authors based on the Italian Open Data catalogue and Cordis data. The five categories stem from the "activityType" column in Cordis.

The figures presented above need to be taken with caution. The number of project combinations analysed (a combination is a couple of projects formed by an RRF and an HE project carried

out by the same organisation) is extremely high, especially among higher or secondary education establishments and research organisations, which, as seen above, have the highest number of projects. The reason is that a few organisations participating in many projects financed by both programmes under analysis give rise to most of the combinations. The number of combinations for each organisation is, in fact, the product of the number of RRF and Horizon Europe projects (since the goal is to evaluate the similarity between each of them). This results, in the most extreme case, in one research organisation (CNR - Consiglio Nazionale delle Ricerche, i.e., the National Research Council) giving rise to more than 600 thousand combinations. Four entities alone (CNR and three universities) give rise to more than one million combinations.

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