THEMATIC REPORT ON COLLABORATIVE R&D ACTIVITIES

V.1.0

EXECUTIVE SUMMARY

The second thematic report produced by ISRI - Institute of Studies on Industrial Relations, as part of the "evaluation service of the regional research and innovation strategy for smart specialization - S3 of the Autonomous Region of Friuli Venezia Giulia, for the 2014 programming period -2020 "is entirely focused on the collaborative R&D projects financed under the action 1.3 of the POR FESR aimed at promoting the development of new sustainable technologies, new products and / or new services.

The study, in particular, is intended to answer the evaluation questions below:

- Who are the beneficiaries of the funding?
- What kind of collaborative relationships have been established, with what interaction and with what degree of satisfaction?
- What actual developments are R&D activities having?
- What general effects can be foreseen in the medium to long term for companies?
- What general effects can be foreseen in the medium-long term for research structures?

The methodology used to answer the questions consists of both a preliminary desk level analysis of the monitoring data and a direct survey of the beneficiaries.

The direct survey took place through two semi-structured online questionnaires to the referents of both companies and other types of structures (university departments, research and technology transfer bodies, etc.) involved in collaborative projects.

- The invitation to fill in the questionnaires was sent to 358 companies and 85 research and technology transfer bodies. Over a period of about two months (September - October 2019) a total of 211 completed questionnaires were collected, which corresponds to a survey participation rate higher than 47% of the total.
- The results emerged indicate above all that the policy examined is, in all senses, a good practice, not showing any particular critical element and highlighting - above all - a certainly high level of potential effectiveness, as far as it can be assessed at the moment.

In particular, some conclusions can be drawn from the analyzes carried out, which are summarized below by placing them in direct relation with the main evaluation questions referred to above.

1. *Who are the beneficiaries of the funding?*

The information obtainable from the monitoring system and - above all - the primary data directly collected with the survey, show that the concessions granted by action 1.3 of the POR FESR have reached:

- on the one hand, a varied group of companies which, considered as a whole, identify one of the most qualified, innovative and dynamic components of the regional production system;
- on the other, the main research institutes active in the region, either individual university departments of the two regional universities, or other types of structures that carry out research and / or technology transfer activities.

As regards more specifically companies, the analyzes show that the absolute majority of the beneficiaries (over 57% of the total) are small and very small companies. In fact, we are talking about small firms and, more generally, of SMEs that:

- sell their products / services both in Italy and abroad, whether they sell directly on the final market (less than half of the total), whether they are sub-suppliers or on behalf of other larger companies;
- have a strong aptitude for investing in innovative activities, which is evident from the strong presence of internal human resources dedicated to R&D activities, as well as from the high share of revenues invested in R&D (on average more than 10%);
- show a strong orientation towards innovation, having - in over 80% of cases - introduced in the three-year period preceding the implementation of the collaborative R&D project at least one technological innovation in the products / services offered and / or in the processes used;
- in general, they highlight a significant dynamism, given that in the last three years more than 56% have recorded an increase in turnover and an almost equivalent percentage of growth in employees.

As regards the universities and research bodies that are part of the beneficiary associations of the intervention line 1.3.b, the information collected with the survey highlights that:

- these are generally medium-large organizations, as evidenced by the high average number of employees (about 143 each);
- these structures, for the most part, carry out basic and / or applied research, while only in a third of the cases do they deal more specifically with activities related to experimental and / or prototype development;
- in most cases the basic or applied research that is usually carried out has potential applications in the industrial field, at least according to the declarations provided in this regard;
- this statement is confirmed by the fact that the vast majority of the structures interviewed have already had many previous experiences of collaborating with companies - in particular with SMEs located mainly within the regional territory - to carry out R&D or innovation activities.

2. *What kind of collaborative relationships have been established, with what interaction and with what degree of satisfaction?*

The examined action has undoubtedly favored cooperation between different types of subjects and has stimulated the creation of new collaborative relationships within the regional territory, as demonstrated by the fact that around 36% of companies and 30% of research structures thanks to the funding received, they interacted with new partners with whom they had never previously collaborated.

From the analyzes conducted it is also clear that this action has made a significant contribution to strengthening the links between the regional business system, on the one hand, and research structures / bodies, on the other.

This result could be considered more obvious for intervention line 1.3.b which only finances R&D projects carried out by public-private partnerships where the presence of a university or a research body, alongside companies, was in fact mandatory.

This was more uncertain for the 1.3.a line, which allowed the beneficiary companies to choose the subject with which to collaborate in order to carry out a specific R&D activity aimed at developing new sustainable technologies, new products or new services.

Indeed, the data collected and the interviews show that companies in the agro-food sector and in the other two strategic sectors have also preferred to activate a specific collaboration with a university or with a research organization to carry out their R&D project in approximately 73% of cases.

It is clear that the collaboration established was generally profitable for all the subjects involved and that it presumably favored an enrichment process from which all the participants benefited, as is shown by the fact that almost all the companies (about 95% of the total), as well as the research structures (about 90% of the total), expresses an undoubtedly positive evaluation of the relationships intertwined with the other partners during the realization of the project, defining them very intense and collaborative.

3. *What actual developments are R&D activities having?*

Having ascertained that the examined action certainly favored the collaboration relationships within the regional context and that these were profitable for all the partners involved, we wanted to understand what concrete developments the R&D project carried out jointly by companies and bodies research has already had, or could theoretically have in the near future.

Focusing first and foremost on the beneficiary companies, the responses to the questionnaires show that subsidized R&D projects will be able to give a strong boost to product and process technological innovation - in some cases simultaneously - since:

- in about three quarters of cases, research should encourage the development and subsequent adoption of a process technology - new or significantly improved - which will be mainly used by the developing companies to create new products / services or to improve the quality of the products / services already offered on the market;
- in almost 50% of cases the R&D activity should also allow the development of a new or significantly improved product / service, in terms of technical and / or functional characteristics, use of materials, etc., which the same company expects to be able to enter the market quickly.

Looking at the universities and other research structures benefiting from intervention line 1.3.b, the most frequently reported immediate spillovers relate to: the start / opening of new lines of research which are assumed to be of specific interest to regional companies resulting from activities R&D carried out in collaboration with local businesses; the acquisition of new specialist skills that have presumably developed due to the exchange of know-how and fruitful interaction with the other project partners; finally, the temporary hiring of one or more researchers, an opportunity which was obviously made possible by participation in the R&D project and the funding received.

The analysis of the possible effects both short and medium-long term (see the following points in this regard) cannot however be separated from the analysis of the degree of additionality of the aid, because the effectiveness of the policy is greater when it is able to stimulate the implementation of R&D projects and, consequently, to generate effects that would not have occurred in the "counterfactual" scenario, that is, in the absence of support.

The analysis of this specific aspect was carried out in this Report with reference to the degree of perceived additionality, based exclusively on the assessments made in this regard both by the companies and by the research structures directly benefiting from the funding.

The answers collected undoubtedly indicate that the concessions granted seem to have had a strongly stimulating effect, since very few companies (1.2% of the total) and even no research structure would have carried out the R&D project in any case even in the absence of contributions public.

If this is the more general result, in the case of companies, it should be emphasized that the additional effect of the subsidy tends to increase significantly as the size of the beneficiaries decreases, reflecting the fact that the financial contribution offered by action 1.3 is to be It has been particularly effective precisely in stimulating the R&D investments of smaller companies which, on the other hand, constitute the primary target of the observed policy.

4. What general effects can be foreseen in the medium to long term for companies?

Beyond the actual developments that the action-funded R&D project may have in the near future, we want to understand to what extent participation in collaborative R&D has led to significant discontinuities in the innovative behaviors and strategies of the beneficiary companies.

Since at the time of the survey most of the projects were not fully completed or had been completed for too short a time (less than a year), the assessment of this aspect had to be necessarily based not on the discontinuities actually found in the beneficiary companies (comparison between the "ex ante" situation the project and the "ex post" situation), but more simply on expectations.

Having clarified this methodological aspect, the responses collected through the online survey highlight that participation in the collaborative R&D project is capable of generating - in the medium to long term - additional effects that are quite significant in terms of both innovative inputs and outputs, as well as a modification of more general strategies adopted by companies.

Compared to before the collaborative R&D project, at least 40% of the companies interviewed expect, in fact, to increase:

- investments in innovation, starting with the expenses in R&D carried out within your company;
- its results in the field of innovation, with a growth not only of the technological process and / or product innovations introduced by the company, but also of the innovations in the field of marketing and business organization, even if only a minority - equal to 21% of the total - plan to increase patents;
- their aptitude to collaborate and interact more continuously with external subjects (other companies, universities or research and technology transfer centers) to carry out R&D and innovation activities.

5. What general effects can be foreseen in the medium-long term for research structures?

Even in the case of universities and other research organizations, the analysis of this topic had to be based necessarily on the expectations expressed, and not on objective evidence, given that the projects - at the time of the survey - were, for the most part, still in progress or just completed.

Given that the expected effects are very wide and different, the most frequent indications concern:

- the growing participation in networks / networks with regional companies to carry out R&D or innovation activities,
- a strong increase in applied research activities carried out within the structures.

If the focus is shifted to the results that these changes will actually determine in the research structures, the main ones concern:

- the growing professional qualification of the staff employed within the research structures;
- a growing production of scientific publications that may directly result from the closer interaction with the regional business system.