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Can a more performance-based setting bring additional efficiency to EU cohesion policy?

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Can a more performance-based setting bring additional efficiency to EU cohesion policy?

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Abstract:

The paper investigates cohesion policy programmes' ability to define accurate policy outputs, in the form of targets. More specifically, the analysis explores the extent to which targets set by ERDF programmes to assess their performance are revised over time and seeks to identify specific patterns in relation to different areas (spending categories; typology of regions; etc.). The results point to significant challenges experienced by programmes in producing realistic targets as a vast majority of these are subject to frequent and significant amendments over the course of the programming period. The paper brings valuable evidence to the emerging debate as to whether embracing a full performance-based approach making the funds conditional upon the achievement of outputs/results would improve the efficiency and effectiveness of cohesion policy.

Keywords: cohesion policy; Recovery and Resilience Facility; ERDF; performance; European Union

JEL code: H11; H83; R58

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1. Introduction

Cohesion policy is the main investment policy of the European Union (EU) and world's largest regional development programme (McCann et al., 2021) with a budget of 392 billion euro for the period 2021-2027. Its main goal is to tackle regional disparities and promote regional competitiveness in Europe. Both the significant financial size and political importance of cohesion policy have attracted considerable academic interest resulting in a vast literature debating its performance (Fratesi and Wishlade, 2017). Research on the subject has been conducted mainly from two perspectives. The first one investigates the broader socio-economic impact of the funds (see for instance: Boldrin and Canova, 2001; Becker et al., 2010; Crescenzi and Giua, 2020). The second one, appearing more recently, explores the capacity to spend (and absorb) allocated resources (e.g. Incaltarau et al., 2020; Cace et al., 2009; Surubaru, 2017; Tosun, 2014).

So far, academic work on the administrative performance of cohesion policy has focused mostly on the absorption rate of funds (Cunico et al., 2021). However, there exists another less explored dimension which relates to the ability by programmes' authorities to define clear policy outputs and successfully achieve them (Mendez and Bachtler, 2022). More specifically, programmes are legally required to establish specific targets reflecting their main objectives. For monitoring purposes they must report progress towards the achievement of these targets all along the programming cycle¹. This exercise is particularly important for assessing the effectiveness of programmes, as it provides valuable information on the quality of their management and implementation. The collected data are also an important basis for (ex-post) evaluation analyses of Cohesion policy funding. Setting out accurate indicators and targets is therefore a key pre-condition for a reliable assessment of programmes' performances. Nevertheless, there is little analysis into this process and its potential challenges. This paper represents a first contribution to bridge such research gap. It explores in particular how ERDF programmes have set out and modified their output targets (policy outputs) throughout the programming period 2014-2020², and seeks to identify specific patterns according to different criteria (categories of regions; time-frame; etc.).

Our analysis is also relevant in light of the debate as to whether the application of performance-based approaches or performance conditionalities to Cohesion policy can contribute to addressing its long-standing efficiency and complexity predicaments (on this topic see for instance: Wostner, 2008; Crescenzi et al., 2022). This discussion is not new but has gained traction in the past three years in the wake of the establishment of the NextGenerationEU programme (see below). Performance-

¹ The monitoring and evaluation framework has been further strengthened in the 2021-2027 period with the obligation to set out intermediate targets that should be reached by the first half of the period alongside final ones. See in particular article 17 of Regulation EU 1060/2021

² Cohesion policy programmes run for several years in line with the EU budgetary cycle (e.g. 2014-2020). For the period 2014-2020, they can spend their resources until the end of 2023.

based approaches may be of different kind (see next section): in our paper we specifically refer to performance-based mechanisms directly linking the access of funding to the fulfilment of certain performance criteria. In this respect, cohesion policy harbours already various performance-based elements. Two cases in point are the Performance Reserve and the “financing not linked to costs” methodology. The first, which has been applied in the 2014-2020 period, makes a small amount of the resources (6% of the overall allocations) conditional upon achievement by programmes of pre-defined financial and output targets.³ Financing not linked to cost is a payment method programmes can voluntarily adopt for an investment priority or part of it according to which the reimbursement of expenditures is based on the fulfilment of certain conditions or results.⁴

Nonetheless, cohesion policy remains largely based on a real cost-based model, just like most EU instruments: that is, most of its funding is disbursed by the European Commission on the grounds of actual expenditures incurred and reported by programmes/projects. By contrast, the recently adopted Recovery and Resilience Facility (RRF) instrument – the main pillar of the EU post-Covid recovery programme named NextGenerationEU (NGEU) – has introduced a novel approach in the realm of EU funds (bar the external aid family) in that it is the first instrument which is entirely performance-based: that is, the disbursement of all its resources by the European Commission is contingent upon the achievement of pre-agreed milestones (reforms) and investment targets set by Member States in so-called National Recovery and Resilience Plans (NRRPs).

The performance-based philosophy underpinning the RRF is likely to represent an important reference for the design of post-27 EU funding instruments. It will certainly have a positive influence on the discussion about how reinforcing the performance orientation of future cohesion policy in order to achieve more simplification and result-orientation. The aim of this paper is therefore to contribute to this debate by identifying potential bottle-necks and challenges that need to be taken into account in designing a more performance-oriented cohesion policy in the vein of the RRF. Despite major differences, the monitoring system of cohesion policy follows a similar logic to the RRF, as it also entails setting performance targets but does not link the payments to their achievement (except for the Performance Reserve). In this sense, there is a two-fold interest in investigating the process of setting and reviewing output targets by cohesion policy programmes. Firstly, the analysis helps to understand what challenges may arise in shifting cohesion policy to a full-scale performance-based model. Secondly, the paper can provide useful insights on the performance-based model

³ The conditions for the application of the performance reserve are spelled out in articles 20-22 of the Regulation EU 1303/2013. The performance reserve has been discontinued in the programming period 2021-2027.

⁴ Article 95 of the regulation 1060/2021 sets out the general rules for establishing financing not linked to costs schemes.

applied to the RRF at a time the instrument is only 2 years into its implementation and there is still little evidence about its implementation.

Our analysis focuses, in particular, on the extent to which ERDF programmes for 2014-2020 have modified overtime their output targets compared to their initial estimates. To this end, we employ as main source two datasets available on the cohesion policy Open Data which aggregate information reported by programmes' authorities on an annual basis in regards to the common and specific output targets which they have committed to achieve by the end of the period (2023). We investigate in particular the frequency and intensity with which targets were modified during the period 2015-2022 (2015 being the first year of implementation de facto and 2022 being the last year for which data were available at the time the analysis was conducted). In addition, we measure these variations by year, Member States, thematic objectives, categories of regions to identify specific patterns.

The paper is structured as follows. Section 2 provides a short literature review whilst section 3 details the data and the methodology employed. Section 4 presents the results of our analysis followed by a discussion of their potential determinants (section 5). Finally, section 6 outlines the policy implications of our work, in particular how the analysis feeds into the current debate on the future of cohesion policy funds.

2. Literature review

Performance budgeting has been in use for many decades with its uptake having increased sharply from the 90s onwards (Sapala, 2019). There is therefore a non-negligible amount of academic works on the topic, notably in the field of public management studies (see for instance: Robinson, 2005; Robinson, 2007). Multiple definitions of performance budgeting are provided in literature reflecting different applications. This notwithstanding, we can generally characterise it as the systematic use of performance information in budget planning or allocation (OECD, 2019: pag. 13). The extent to which this concept is operationalised into the management of public finances can vary significantly. The OECD identifies three broad categories: presentational, performance informed, and direct performance budgeting (OECD, 2017). The first two types entail respectively the simple presentation of performance information in parallel with the annual budget (e.g. for transparency purposes) and the use of performance information to make budgetary decisions. In contrast, direct performance budgeting links the allocation of resources to the achievement of outputs and results. It is this form of performance budgeting that this paper focuses on, as aspects of it are already built into the cohesion policy and represent the underlying funding logic of the RRF.

The EU budget has been comprising performance elements of some sort for many years. Increasing interest in performance budgeting at EU level culminated in the presentation of the "EU Budget for

Results” initiative in 2015 (European Commission, 2017) with the stated goal of reinforcing the result-orientation dimension of European funding. The revision of the EU financial regulation in 2018 requires spending programmes to establish performance indicators based on the specific objectives in order to allow for an accurate monitoring of the performance⁵.

Prior to the RRF, however, the overall EU approach to performance budgeting was largely presentational (Downes et al., 2017). Only European Structural and Investment funds (ESI) included aspects of direct performance budgeting. This is the main reason why there is still very little literature on the application of performance-based models in the area of EU funds. Related studies in the field of cohesion policy are essentially theoretical and approach the topic in terms of the relationship between policy conditionalities and performance (Bachtler and Ferry, 2011; Bachtler and Mendez, 2020). Different forms of conditionality designed to enhance the accountability and performance of the funds have been applied to cohesion policy since its establishment in 1998 (Bachtler and Ferry, 2011). One case in point is the N+2 rule (now N+3) introduced in 1999⁶, according to which committed funds should be spent within two (or three years) or else the programme will lose them. The rationale behind this provision is to ensure a timely use of the allocated resources (Davies and Polverari, 2011).

The Barca report (Barca, 2009) marked a turning point for at least two reasons: a) it provided a strong rationale for using conditional grants to address performance issues owing to administrative capacity, elite capture, market failures (Berkowitz, 2017); b) it pleaded for a more pronounced shift of focus from implementation to outcomes and results (Barca and McCann, 2011). These ideas were partially translated into specific performance-based features under the 2014-2020 period, in the form of *ex-ante* conditionalities⁷, a performance framework (performance reserve)⁸ and performance-based funding models (from 2019)⁹.

The performance framework is of particular interest for our paper as it links the disbursement of a small percentage of funding (the so-called performance reserve equivalent to 6% of programmes) to the achievement of (mainly) financial and outcome targets by the programmes¹⁰. In a way, this system has anticipated the performance-based approach underpinning the RRF, although there are clear differences between the two. Nevertheless, its implementation has faced challenges. According to the European Court of Auditors (ECA), about 55% of targets or indicators selected by

⁵ Recital 9, Regulation EU 2018/1046,

⁶ See article 136 of Regulation EU 1303/2013: “The Commission shall decommit any part of the amount in an operational programme that has not been used for payment of the initial and annual pre-financing and interim payments by 31 December of the third financial year following the year of budget commitment under the operational programme [...]”.

⁷ Article 17, Regulation EU 1303/2013

⁸ Articles 20-22, Regulation EU 1303/2013

⁹ Article 67, Regulation EU 1303/2013

¹⁰ Article 22, Regulation EU 1303/2023

programmes for the performance framework were modified between 2014 and 2018 (ECA, 2021). On paper, the ESI funds general regulation for the period 2014-2020 (Regulation EU 1303/2013) allows for such amendments only in duly justified cases, for instance where a target was set on the basis of wrong assumptions. In practice, programmes' authorities made extensive use of this possibility (ECA, 2021), which demonstrates the complexity of setting realistic targets and indicators over time. It is no surprise that a number of authorities surveyed on the issue reported that a high degree of flexibility was needed to make this approach work (McCaster and Kah, 2017).

So far, ECA reports (ECA, 2019; ECA, 2021) represent in all likelihood the only direct empirical analyses into the application of performance-budgeting mechanisms in cohesion policy. However, two additional quantitative papers are worth mentioning. The first by Mendez and Bachtler explores the correlation between the regional quality of government and three variables capturing the administrative performance of programmes, of which one is the percentage of targets achieved by programmes at the end of the period 2007-2013 (Mendez and Bachtler, 2022). The second by Dicharry investigates the influence of the N+2 rule on the effects of cohesion policy funding on GDP per capita growth in EU regions (Dicharry, 2023). The study finds that faster absorption to comply with this rule translates in a lower impact on growth in lagging regions. More comprehensive and systematic analyses on the application of performance budgeting aspects in cohesion policy are thus needed, building on the recent work of the European Court of Auditors.

The establishment of the RRF is expected to stimulate additional academic interest in this field. To date, studies on the RRF have largely focused on the legal aspects of the performance budgeting model and its operationalization in the planning phase (preparation of National Recovery and Resilience Plans). Some scholars have identified room for improvement, for instance by pointing to the spatially-blind nature of milestones/targets (Corti and Ruiz de la Ossa, 2023) or their disproportionate focus on outputs rather than results (Darvas et al., 2023). However, an in-depth assessment of the RRF performance budgeting model is problematic at this stage, as the instrument is barely into its third year of implementation. The current lack of evidence challenges the debate as to whether the approach should be extended to other instruments in the future.

3. Data and methodological approach

Cohesion policy programmes are required to set out indicators and corresponding quantitative targets for each investing priority in order to assess implementation and progress towards achieving their specific objectives¹¹. The identification of both indicators and targets, as well as their modification during the programming period, is subject to the assessment and approval by the European

¹¹ Articles 27 and 96, [Regulation EU 1303/2013](#)

Commission as part of the standard process of adopting or amending programmes. The programmes' authorities report annually on the implementation of indicators. Three types of indicators are set out by the regulation: financial indicators (measuring the financial execution), output indicators (direct outputs produced/generated by projects) and result indicators (effects of funding interventions) (ECA, 2021). Additionally, indicators can be common or programme specific.

The paper focuses on output indicators, and their targets, selected by European Regional Development Fund (ERDF) programmes. The main reason for circumscribing the analysis to only one of the three cohesion policy funds (i.e. the ERDF) is that the European Social Fund (ESF) programmes do not have a legal obligation to express target values for all indicators¹² whereas the Cohesion Fund (CF) has a limited geographical coverage. The choice to restrict the research scope only to output indicators is due to the fact that direct performance budgeting settings in cohesion policy (through the Performance Reserve) and the RRF feature very few result indicators. Moreover, setting accurate result targets is much more difficult exercise as, to a certain extent, they might be by external factors outside the control of the authorities.

The main source of data used for this study is the European Commission's Cohesion Open Data Platform, more specifically two different datasets on common indicators¹³ and programme-specific indicators¹⁴. The datasets comprise, amongst others, the indicators for each programme, the corresponding final target values (target to be achieved by 2023), and implemented values throughout time (i.e. yearly progress reported by programmes authorities towards achieving the final target). All the data are categorised by year allowing to discern if and how the indicators or their targets have been modified from a year to another in the context of one of the frequent revisions of programmes.

Common indicators are predefined ones listed by the European Commission (Annex I; Regulation EU 1301/2013) and selected by the responsible public body overseeing the programs. Some examples are the number of firms receiving grants, the amount of private investment for matching public support to enterprises and the direct employment increase in supported enterprises. Specific indicators refer to bespoke indicators defined by the managing authorities on the basis of the programmes' specific objectives. For example, extent or coverage of the newly constructed next-generation broadband network, energy gain in the residential sector and the total amount of underlying new debt finance originated by the financial intermediary.

¹² Article 5, Regulation EU n. 1304/2013

¹³ [ESIF achievement details on common indicators](#). Data updated on March 17, 2023.

¹⁴ [ESIF achievement details on specific indicators](#). Data updated on March 17, 2023.

After merging the two-abovementioned datasets, we removed all the indicators related to Covid-19 pandemic, REACT-EU¹⁵ and Thematic Objective 13 (Fostering crisis repair and resilience) measures, since they are related to new actions created from 2020 due to unexpected events. Including these indicators in our analysis would have biased the overall results and their policy implications. Inter-regional collaboration programmes (like INTERREG), as well as Thematic Objective 12 (Outermost & Sparsely Populated) and Technical Assistance indicators, are also not included in the analysis due to their specific geographical scope and/or the nature of the targets. Programmes that are discontinued over time because are merged with other are also left out from the analysis.¹⁶

The final dataset covers 202 ERDF programmes for the period 2014–2020 from 27 EU Member States (UK programmes are not taken into consideration). The time series spans the period 2015–2022: 2015 is the first year where a substantial number of programmes started implementation owing to delays in adoption of programmes; 2022 is the last year for which data are available.

4. Results

4.1 Change in the number of output indicators

Before delving into the analysis of the targets, it is necessary as a preliminary step to look at the indicators on which they are based. Table 1 shows that the total number of output indicators selected by programmes varies marginally in the period 2016 through 2022 (2015 being less relevant)¹⁷. However, we observe a certain turnover of indicators (Table 2) throughout the period analysed, with the highest share observed in 2018. The reasons might be diverse, including monitoring failures, the establishment of new investment priorities, the effects of Covid-19, etc. It is possible that the substantial replacement of indicators observed in 2018 is partially driven by programmes' efforts to secure the first tranche of the performance reserve by introducing new indicators whose (intermediate) targets were more attainable by end 2018.

Overall, 1268 indicators were removed from 2017 to 2022 (Table 2), whereas 1.129 were added. These results suggest a certain stability in the use of indicators. This means that, in spite of substantial re-programming, the overall objectives of the programmes, which are indirectly reflected in the

¹⁵ The Recovery assistance for cohesion and the territories of Europe (REACT-EU) extends the crisis-response and crisis-repair measures delivered through the Coronavirus Response Investment Initiative (CRII) and the Coronavirus Response Investment Initiative plus (CRII+).

¹⁶ They refer to “Smart Growth (merged 2017 with Multi-regional Spain) - ES – ERDF” (2014ES16RFOP001), “Research and Innovation (Merged in 2019 with "Integrated Infrastructure") - SK – ERDF (2014SK16RFOP001), SME Initiative (merged 2018 with Regional OP) - RO – ERDF (2015RO16RFSM001).

¹⁷ The sharp increase from 2015 and 2016 has no particular significance in the context of our analysis in that it is explained by the fact that several programmes were adopted with some delay and started implementation only in 2016.

indicators used to monitor the implementation, have not changed markedly. Yet, the share of indicators substituted over the course of the programming period is non-negligible.

Table 1. Number of indicators observed per year

Nr. of years the same indicator is observed	Year the indicator is observed							
	2015	2016	2017	2018	2019	2020	2021	2022
1	12	70	18	5	16	2	0	18
2	39	364	343	51	35	6	45	41
3	163	217	255	159	105	225	158	158
4	41	152	157	161	274	164	159	156
5	95	116	118	511	512	417	397	394
6	113	125	276	277	277	276	164	154
7	16	2,565	2,565	2,565	2,565	2,565	2,565	2,549
8	5,346	5,346	5,346	5,346	5,346	5,346	5,346	5,346
Total indicator per year	5,825	8,955	9,078	9,075	9,130	9,001	8,834	8,816

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

NB: The table shows the total number of indicators by year and the number of years the same indicator has been used by the programme (from 1 to 8 years). This number varies because programmes remove or add indicators over time, which means some indicators can be observed only for less years than the overall observed period. For instance of the 5,825 indicators in 2015, 12 are only kept for 1 year, 39 for 2 years, and so on.

Table 2. Number of indicators observed per year: added and removed

	2015	2016	2017	2018	2019	2020	2021	2022
Indic. added	5,825	3,144	232	502	172	164	41	18
Indic. removed		14	109	505	117	293	208	36
Total Nr indic. (accum)	5,825	8,969	9,201	9,703	9,875	10,039	10,080	10,098
TT Net Nr Indic. (accum)	5,825	8,955	9,078	9,075	9,130	9,001	8,834	8,816

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

4.2 Changes in target values

As explained above, programmes are allowed to adjust their final targets (to be achieved by 2023) throughout the programming period. Such changes must be negotiated and approved by the European Commission, which implies a revision of programmes. Our analysis shows that very extensive changes to the target values took place during the period which we have analysed. On average, 65.8% of the programmes' targets were revised at least once (figure 1). In other words programmes revised their initial estimates in relation to the final outputs of their interventions for roughly 2/3 of the selected indicators. It is noteworthy that more than a quarter of all targets (26.6%) was changed at least two times over the observed period (39.2%) whereas 39.2% were amended only

once. Breaking down the data per category of regions (according to the 2014-2020 Cohesion criteria classification), we see only minor differences between less developed, transition and more developed regions.

Figure 1. Number of indicators with at least one change in target value (%), by category of region, ERDF 2014-2020, EU27

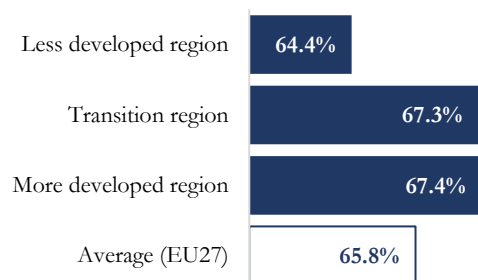
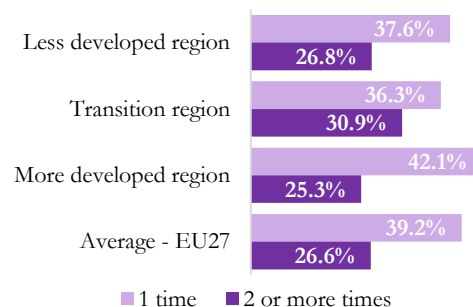


Figure 2. Number of times the target value of the indicator has changed(%), category of region , ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Category of regions refers to the cohesion policy eligibility criteria established in the period 2014-2020 (art. 90, Regulation EU 1303/2013). Total number of indicators: 9,669. This number is slightly lower than total number of indicators in table 2 as only indicators observed 2 or more consecutive years are included in this analysis. Indicators not assigned to a specific category of region are also included.

Table 3. Results mean-comparison tests: Number of indicators with at least one change in target value (%), by region category, ERDF 2014-2020, EU27

Group for comparison	Nr. obs.		Mean		Diff.	S.E.	P-value
	G1	G2	G1	G2			
Less develop (G1) vs More develop (G2)	3,993	3,579	0.643	0.673	-0.030	0.011	0.006
Less develop (G1) vs Transition (G2)	3,993	2,097	0.643	0.673	-0.030	0.013	0.022
More develop (G1) vs Transition (G2)	3,579	2,097	0.673	0.673	0.000	0.013	0.952

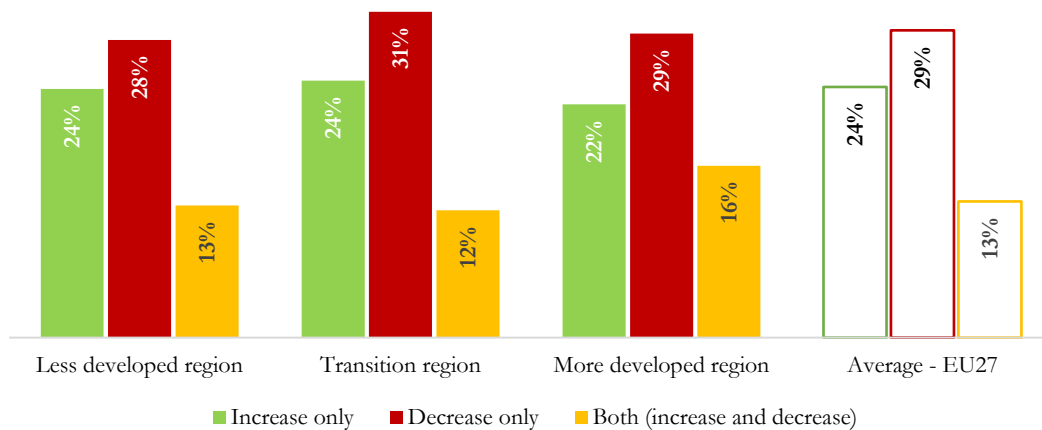
Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Category of regions refers to the cohesion policy eligibility criteria established in the period 2014-2020 (art. 90, Regulation EU 1303/2013). Only indicators observed 2 or more consecutive years are included in the analysis. Indicators without region classification are also included. Total number of indicators: 9,669.

Target values were revised downwards for 29% of the indicators and upwards for 24% (figure 3). 12% of the targets were modified both upwards and downwards over the same period. The intensity of the changes is also an important aspect to look at. Our analysis finds that targets were increased by a median of 58.4% and decreased by a median of 39.2% (figures 4 and 5). This suggests that the

intensity of changes is in general quite significant. Overall, the results illustrated in figures 1 to 5 highlight wide-spread challenges in setting accurate targets. This in turn led programmes' authorities to modify not only a relatively high number of targets over time (including more than one time) but also to revise their values substantially.

Figure 3. Number of indicators with at least one change in target value (%), by category of region and by type of change, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Category of regions refers to the cohesion policy eligibility criteria established in the period 2014-2020 (art. 90, Regulation EU 1303/2013). Only indicators observed 2 or more consecutive years are included in the analysis. Indicators without region classification are also included. Total number of indicators: 9,669.

Figure 4. Intensity of target change (median) when negative change is observed between two periods, ERDF 2014-2020, EU27

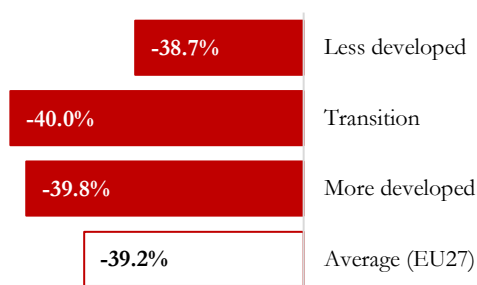
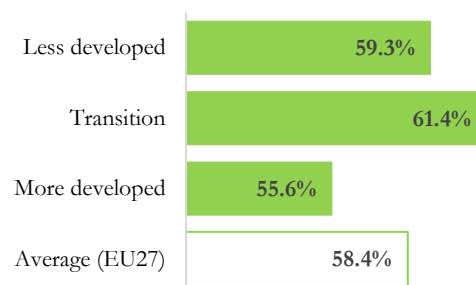


Figure 5. Intensity of target change (median) when positive change is observed between two periods, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Regions category refers to Cohesion criteria classification. Only indicators observed 2 or more consecutive years are included in the analysis. Indicators without region classification are also included. Total number of indicators: 9,669.

Table 4. Results mean comparison: Number of indicators with at least one change in target value (%), by region category and by type of change

Group for comparison	Nr. obs.		Mean		Diff.	S.E.	P-value
	G1	G2	G1	G2			
Increase only							
Less develop (G1) vs More develop (G2)	3,993	3,579	0.236	0.244	0.008	0.010	0.415
Less develop (G1) vs Transition (G2)	3,993	2,097	0.236	0.222	-0.015	0.011	0.198
More develop (G1) vs Transition (G2)	3,579	2,097	0.244	0.222	-0.022	0.011	0.052
Decrease only							
Less develop (G1) vs More develop (G2)	3,993	3,579	0.282	0.309	0.027	0.011	0.011
Less develop (G1) vs Transition (G2)	3,993	2,097	0.282	0.288	0.007	0.012	0.607
More develop (G1) vs Transition (G2)	3,579	2,097	0.309	0.288	-0.021	0.013	0.104
Both (increase and decrease)							
Less develop (G1) vs More develop (G2)	3,993	3,579	0.126	0.12	-0.005	0.007	0.529
Less develop (G1) vs Transition (G2)	3,993	2,097	0.126	0.163	0.037	0.009	0.000
More develop (G1) vs Transition (G2)	3,579	2,097	0.12	0.163	0.043	0.009	0.000

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Category of regions refers to the cohesion policy eligibility criteria established in the period 2014-2020 (art. 90, Regulation EU 1303/2013). Only indicators observed 2 or more consecutive years are included in the analysis. Indicators without region classification are also included. Total number of indicators: 9,669.

Unsurprisingly, the percentage of changes is not constant over time (Figure 5). It varies widely across the period observed. Two years stand out showing a much higher degree of changes. The first one is 2020 with 50.6%: this percentage can be largely attributed to a Covid-19 effect whereby considerable re-programming of funds to face the shock has logically resulted in a revision of final targets. The other year showing a high degree of changes is 2018, barely two years into the de facto implementation of programmes. This figure could be partially explained by the fact that many programmes adjusted their intermediate targets (for 2018) for the Performance Framework: under this mechanism, as explained above, programmes receive an additional allocation (the so-called performance reserve) if they achieve certain targets (financial and output indicators) in 2018 and 2023. This process may have influenced the setting of final targets of the overall monitoring framework, as some indicators overlap with those of the Performance Framework ones. Regardless, this suggests that a considerable share of the estimates related to the targets already seemed to be incorrect by 2018, 2 or 3 years after they were set. Figure 6 shows that decreases in target values were greater than increases in all but two years.

Figure 6. Number of indicators with a change in target value (% total) by year, ERDF 2014-2020, EU27

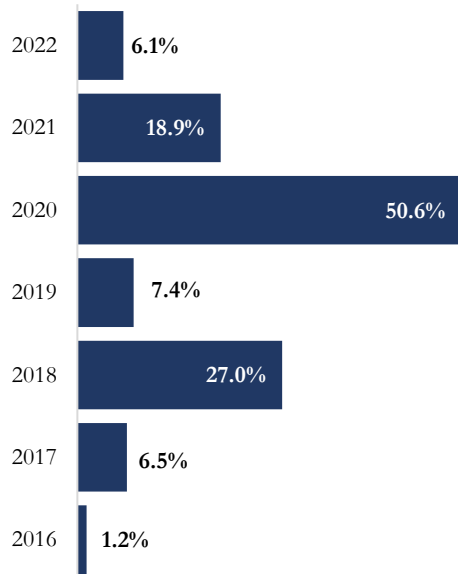
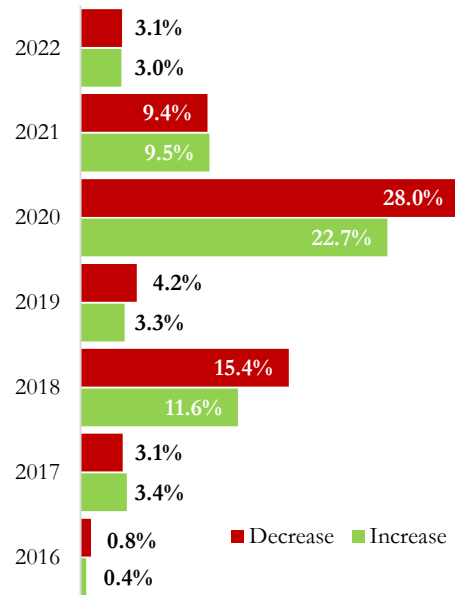


Figure 7. Number of indicators with a change in target value (% total) by type of change and by year, ERDF 2014-2020, EU27

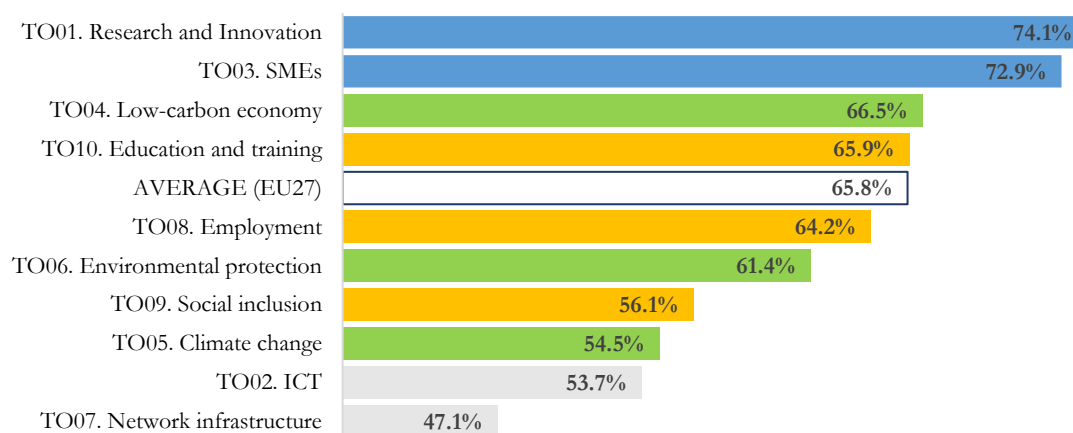


Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed 2 or more consecutive years are included in the analysis. The figured include 56.153 year-observations.

Another important aspect is whether estimates about target values change more frequently for some categories of spending than others. Our analysis points to substantial differences in relation to thematic objectives (Figure 8), with indicators for TO01 (Research and Innovation), TO03 (Small and Medium-sized enterprises - SMEs) and TO04 (Low carbon economy) exhibiting above average targets’ modifications. This is likely to be caused by the different intrinsic nature and complexity of target settings across different thematic investment areas.

Figure 8. Number of indicators with at least one change in target value (%), by Thematic Objective, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,896 (excluding indicators without thematic objective classification).

Table 5. Results mean-comparison tests: Number of indicators with at least one change in target value (%), by Thematic Objective, ERDF 2014-2020, EU27

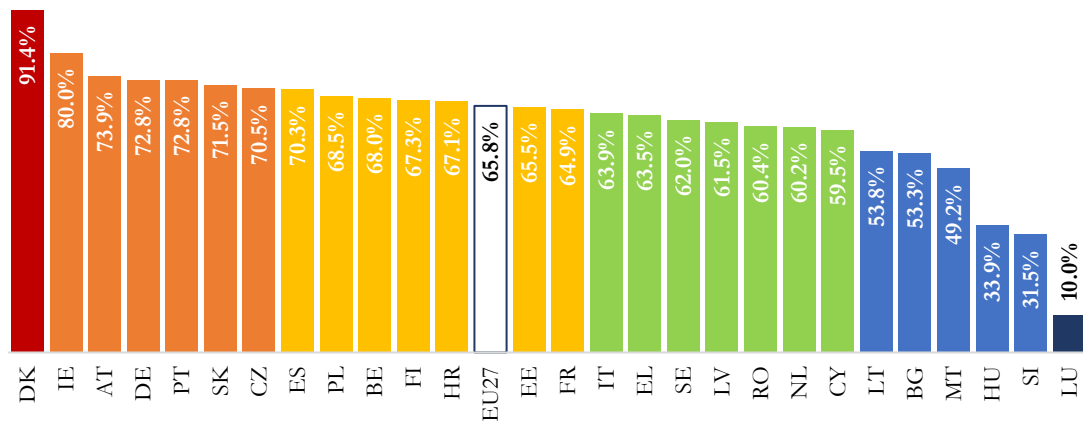
Comparison group	Nr. Ob.		Mean		Diff.	S.E.	P-value
	TO(x)	Other TOs	TO(x)	Other TOs			
TO01 vs other TOs	1,720	8,206	0.741	0.641	0.100	0.013	0.000
TO02 vs other TOs	825	9,101	0.537	0.669	-0.132	0.017	0.000
TO03 vs other TOs	2,397	7,529	0.729	0.636	0.093	0.011	0.000
TO04 vs other TOs	2,085	7,841	0.665	0.656	0.009	0.011	0.458
TO05 vs other TOs	244	9,682	0.545	0.661	-0.116	0.030	0.000
TO06 vs other TOs	1,068	8,858	0.614	0.663	-0.049	0.015	0.002
TO07 vs other TOs	482	9,444	0.471	0.668	-0.197	0.022	0.000
TO08 vs other TOs	120	9,806	0.641	0.658	-0.017	0.044	0.698
TO09 vs other TOs	685	9,241	0.56	0.665	-0.105	0.019	0.000
TO10 vs other TOs	270	9,656	0.659	0.658	0.001	0.030	0.975

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,896 (excluding indicators without thematic objective classification).

An even greater different can be observed by country: the changes range from 91.4% in the case of Denmark to only 10% for Luxembourg (Figure 9). A bit surprisingly, some countries with relatively small allocations have a very high percentage of changes. In general, however, targets modifications appear to be proportional to the size of national allocations (**Error! Reference source not found.**). Finally the percentage of changes for targets associated with common indicators is higher than for programme-specific ones (Figure 10).

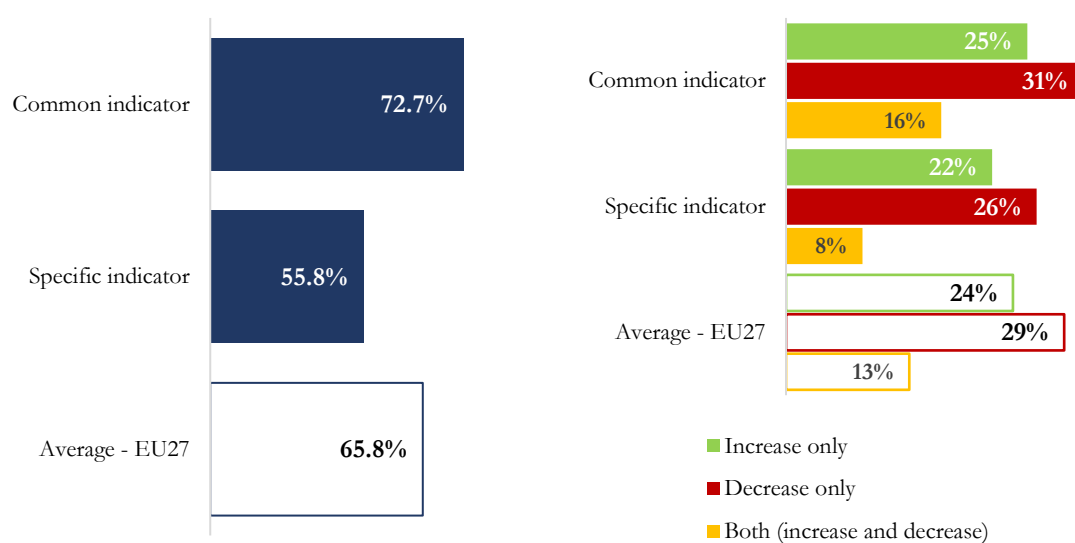
Figure 9: Number of indicators with at least one change in target value (%), by country, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926.

Figure 10. Number of indicators with at least one change in target value (%), by type of indicator and type of change, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926 (excluding indicators with classification of typology).

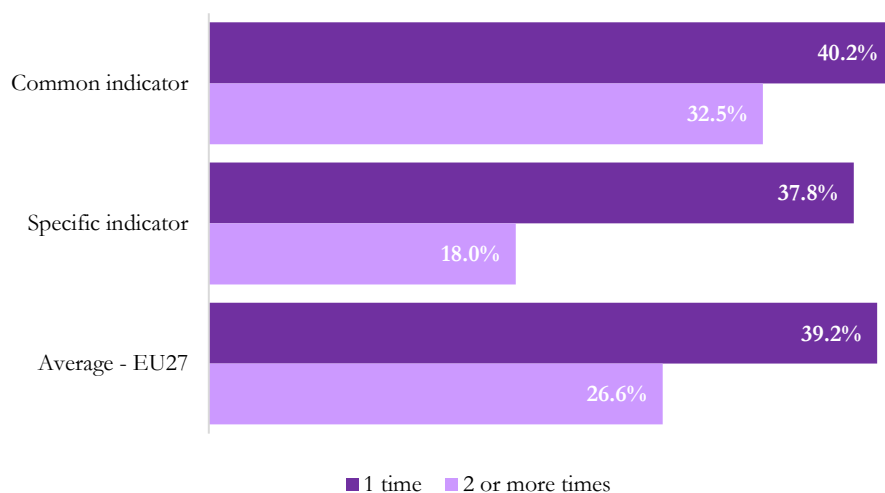
Table 6. Results mean-comparison tests: Number of indicators with at least one change in target value (%), by type of indicator and type of change, ERDF 2014-2020, EU27

Variables	Nr. Obs.		Mean		Diff.	S.E.	P-value
	Common indic.	Specific indic.	Common indic.	Specific indic.			
Overall change	5,900	4,026	0.727	0.558	0.169	0.009	0.000
Increase only	5,900	4,026	0.253	0.216	0.037	0.009	0.000
Decrease only	5,900	4,026	0.311	0.263	0.048	0.009	0.000
Both	5,900	4,026	0.163	0.080	0.083	0.007	0.000

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926 (excluding indicators with classification of typology).

Figure 11. Number of times the target value of the indicator has changed (%), by type of indicator, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926 (excluding indicators with classification of typology).

Figure 12. Intensity of target change (median) when negative change is observed between two periods, ERDF 2014-2020, EU27

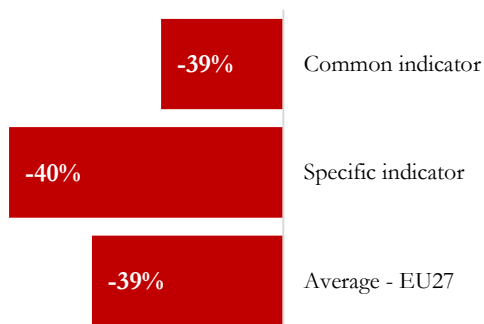
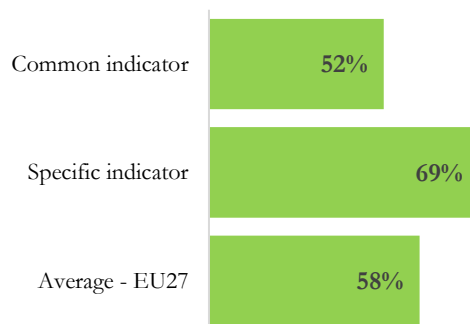


Figure 13. Intensity of target change (median) when positive change is observed between two periods, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926 (excluding indicators with classification of typology).

5. Discussion

The results of our analysis point to major difficulties experienced by ERDF programmes in defining accurate and realistic target values for monitoring and evaluation purposes. This is confirmed by the very high number of indicators for which changes in corresponding targets have been made throughout the period observed. A further proof is the fact that changes to target values have been on average significant. Endogenous factors, such as the size of allocations, spending category, or type of indicator, appear to influence the share and scale of changes. Likewise, contextual factors, such as the Covid-19 crisis, also have an impact on the number of changes.

Possible causes for such a high level and intensity of changes are diverse. There are certainly predictability limitations, in that it is inherently difficult to define final target values for a *de facto* ten year long funding programme. However, the high rate of changes observed in 2018 suggests, albeit indirectly, problems in defining accurate targets even in the short term. Secondly, evolving priorities over time as well as unforeseen events (such as economic crises) prompt programmes to rearrange the objectives of the programmes and resources' distribution across them, which inevitably entails a revision of final targets. Thirdly, lack of administrative capacity, having a negative impact on the absorption and economic impact of the funds (Rodríguez-Pose and Garcilazo, 2015; Milio, 2007), can equally hamper programmes' authorities ability to produce accurate estimates. Adequate evaluation expertise may still be missing in some administrations whereas lack of quality data may also represent a considerable problem (Polverari, 2015). There is also a more "behavioural" dimension that needs to be taken into account. The existence of risk-aversion attitudes in programmes' authorities (Mendez and Bachtler, 2011) can result in an underestimation of target values. Political factors may also influence the definition of target values (e.g. lower targets are set out to make sure they are achieved to avoid criticism from local decision-makers or because the local government is keen to get credit for a successful implementation; the opposite is also true: higher targets are set to impress local decision-makers). These general causes may not explain alone the high frequency and intensity of changes. The analysed period has been also marked by specific legislative and contextual factors that exerted influence of their own on the amendments of the targets: the first one is the novel performance framework, which partially explains the high rate changes in 2018 as pointed out above; the second is the slower implementation since the onset of the period; the third is the prolonged period of crisis owing to the effects on the economy of the Covid-19 and war in Ukraine which has in turn elicited an unprecedented re-programming of resources across investment priorities. It is important to note that both the increasing frequency of shocks and the risk of implementation delays appear to be affecting the current programming period as well.

There are two aspects that is worth highlighting in assessing these results. First of all, considerable adjustments to target values, all the more towards the end of the period, can bias the evaluation of

programmes' administrative performance. In other words, an objective assessment into whether a programme has achieved its objectives is compromised by the very possibility to revise extensively and frequently the targets associated with its policy outputs. What are we really measuring if we can constantly change our targets? How can we expect to assess objectively the performance of a programme if we can adjust at any time, and by a large scale, its policy outputs. These are important questions that need to be explored. On the other hand, the long life-span of cohesion policy programmes alongside the need to re-programme on the grounds of evolving circumstances and unforeseen events beg for a flexible approach to target-setting. Thus, there are inevitable trade-offs at the heart of the monitoring and evaluation framework. One could also see merits in the process from a policy learning perspective: in some cases targets may be revised iteratively as the consequence of a sort of learning process; in which case the process implies a successful learning by doing.

Secondly, the possibility to change targets in a relatively easy way may encourage programmes' authorities to adopt a less rigorous approach to setting the indicators and their associated targets. In other words, it can operate as a disincentive to strengthen evaluation capacity, especially in those administrations that are still underperforming in this area.

6. Policy implications

The academic and policy-making debate over the future shape of cohesion policy will intensify in the coming years. One question that is expected to take centre stage is whether introducing a more pronounced performance-based dimension can improve the efficiency of the policy. It is also likely that discussions over the merits of a shift to a direct performance-based model will target a broader range of EU funds, well beyond cohesion policy. Against this background, the findings of our empirical analysis offer some avenues for reflection.

First of all, there is little doubt that performance-based mechanisms can be instrumental in making the policy more efficient and result-orientated (Barca, 2009). For instance, the introduction of simplified cost options and financing not linked to cost methodologies in cohesion policy presents evident benefits. However, it appears important to anticipate the challenges which may result from a more performance-driven setting and design the future mechanisms accordingly. Our analysis suggests that certain conditions would need to be put in place for this new approaches to yield concrete benefits. The first condition is that all programmes' authorities employ more rigorous approaches to the definition of indicators: this requires employing expertise and tools/methodologies leading to more accurate estimates. It is also important to define which support the Commission could provide to programmes authorities in that respect. The second condition consists in restricting the scope for modifying the targets during the programming period by clearly defining the circumstances under which this can be done (e.g. economic shocks; re-programming). The third

condition is that a certain degree of flexibility is applied in the definition of the targets: one idea could be to set out targets in form of a range of values, in the place of a single value, given the difficulty to produce accurate estimates in the medium to long term. Or the achievement of the targets can be deemed satisfactory above a certain threshold (e.g. 85% of final target value as it is currently the case for the Performance Framework). Finally, the establishment of rigid deadlines associated with the targets is likely to lead to more revisions, and ultimately may have the perverse effect of re-programming funds away from certain key priorities in accordance with downward modifications in the values. In this sense, the more flexible schedule in terms of conditions or results to be met in the existing the financing not linked to cost methodology (which requires setting a timeline, nevertheless) may inspire future mechanisms.

The analysis brings also useful insights in relation to the current implementation of the RRF, despite major differences with cohesion policy. There is still little evidence about the operationalisation of direct performance-based into the RRF, the instrument being up and running since two years only. The analysis of target-setting and target-amendment patterns under cohesion policy suggest National Recovery and Resilience Plans might also be facing challenges of the same sort. On paper, the scope for modifying the Recovery and Resilience Plans' indicators and targets is strictly limited by regulation. Member States can request to amend their plans milestones and targets only if those are no longer achievable due to "objective circumstances". By objective circumstances the Commission means events outside the control of Member States such as the effects of inflation hikes or supply chains disruptions on specific investments. Member States need to bring detailed evidence to the Commission as to the circumstances and how they impact the targets. Our analysis suggests that several Member States might face a pressing need to revise their plans targets in the coming years to meet the objectives and access the funds, which will in turn weaken the performance dimension of the overall instrument.

Ultimately, the paper points to the need for more research to support the future design of effective performance-based approaches in the realm of EU funding instruments. Qualitative work is needed to complement this analysis, for instance through interviews with programmes' authorities, to best capture specific behaviours and substantiate some of the hypotheses formulated in the previous section to explain the high rate of target changes. Additional quantitative research, on the other hand, is also needed to explore what factors, either contextual or programme-specific, influences the capacity of programmes to achieve their own targets. This latter dimension is also essential to complement this analysis on the programmes' ability to set out targets.

References

- Bachtler, J., & Ferry, M. (2013). Conditionality and the performance of European structural funds: a principal-agent analysis of control mechanisms in EU cohesion policy. *Regional Studies*.
- Bachtler, J., & Mendez, C. (2020). Cohesion and the EU budget: Is conditionality undermining solidarity. *Governance and politics in the post-crisis European Union*, 121-139.
- Barca F., *An Agenda for a Reformed Cohesion policy. Report to Commissioner for Regional Policy*, 2009 Brussels.
- Barca F., & McCann P. (2011). Outcome indicators and targets: towards a new system of monitoring and evaluation in EU Cohesion policy. European Commission.
- Becker, S. O., Egger, P. H., & Von Ehrlich, M. (2010). Going NUTS: The effect of EU Structural Funds on regional performance. *Journal of Public Economics*, 94(9-10), 578-590.
- Berkowitz, P., A. Catalina Rubianes and J. Pienkowski (2017), The European Union's experience with policy conditionalities, *EC-OECD Seminar Series on Designing better economic development policies for regions and cities*, 28 April 2017.
- Boldrin, M., & Canova, F. (2001). Inequality and convergence in Europe's regions: reconsidering European regional policies. *Economic policy*, 16(32), 206-253.
- Cace, C., Cace, S., Iova, C., & Nicolaescu, V. (2009). Absorption capacity of the structural funds. Integrating perspectives. *Revista de cercetare si interventie sociala*, 27, 7-28.
- Crescenzi, R., & Giua, M. (2020). One or many Cohesion Policies of the European Union? On the differential economic impacts of Cohesion policy across member states. *Regional Studies*, 54(1), 10-20.
- Crescenzi, R., Giua, M., & Sonzogno, G. V. (2021). Mind the Covid-19 crisis: An evidence-based implementation of Next Generation EU. *Journal of Policy Modeling*, 43(2), 278-297.
- Corti, F. & Ruiz de la Ossa, T. (2023). The Recovery and Resilience Facility: What are we really monitoring with a performance-based approach?, CEPS Explainer, <https://www.ceps.eu/ceps-publications/the-recovery-and-resilience-facility-2/>
- Davies, S., & Polverari, L. (2011). Financial accountability and European Union cohesion policy. *Regional Studies*, 45(5), 695-706.
- Darvas, Z., Welslau, L., & Zettelmeyer, J. (2023), The EU Recovery and Resilience Facility falls short against performance-based funding standards, Bruegel, <https://www.bruegel.org/analysis/eu-recovery-and-resilience-facility-falls-short-against-performance-based-funding>
- Dicharry, B. (2023). Regional growth and absorption speed of EU funds: when time isn't money. *Regional Studies*, 57(3), 511-524.
- Downes, R., Moretti, D., & Nicol, S. (2017). Budgeting and performance in the European Union: A review by the OECD in the context of EU budget focused on results. *OECD Journal on Budgeting*, 17(1), 1-60.
- European Court of Auditors (2019), Delivering performance in Cohesion, Briefing Paper 08/2019.
- European Court of Auditors (2021), Performance-based financing in Cohesion policy: worthy ambitions, but obstacles remained in the 2014-2020 period, ECA Special Report.
- European Commission, Directorate-General for Budget, EU budget focused on results – Summary of the 1st annual conference held on 22 September, 2015, De Gasperi Hall, European Commission, Brussels, Publications Office, 2017, <https://data.europa.eu/doi/10.2761/900943>

- Fratesi, U., & Wislade, F. G. (2017). The impact of European Cohesion policy in different contexts. *Regional Studies*, 51(6), 817-821.
- Incaltarau, C; Pascariu, G.C. and Surubaru, N.C. (2020). “Evaluating the Determinants of EU Funds Absorption across Old and New Member States – the Role of Administrative Capacity and Political Governance”, *Journal of Common Market Studies* 58(4): 941–961.
- McCann, P., Ortega-Argilés, R., Rauhut, D., Sielker, F., & Humer, A. (2021). EU cohesion policy: the past, the present and the future. *EU Cohesion Policy and Spatial Governance: Territorial, Social and Economic Challenges*, 17-25.
- McMaster, I., & Kah S. (2017). The performance framework in Cohesion policy: Expectations and reality. IQ-Net Thematic Paper, 41st IQ-Net Conference. EPRC Delft.
- Mendez, C., & Bachtler, J. (2022). The quality of government and administrative performance: explaining Cohesion policy compliance, absorption and achievements across EU regions. *Regional Studies*, 1-14.
- Mendez, C., & Bachtler, J. (2011). Administrative reform and unintended consequences: an assessment of the EU Cohesion policy ‘audit explosion’. *Journal of European Public Policy*, 18(5), 746-765.
- Mendez, C., & Bachtler, J. (2022). The quality of government and administrative performance: explaining Cohesion policy compliance, absorption and achievements across EU regions. *Regional Studies*, 1-14.
- OECD (2017), Performance Budgeting, Evaluation and Spending Review in OECD Countries Highlights, www.oecd.org/gov/budgeting/Performance-Budgeting-Survey-Highlights.pdf
- OECD (2019), OECD Good Practices for Performance Budgeting, OECD Publishing, Paris, <https://doi.org/10.1787/c90b0305-en>
- Robinson, M. and J. Brumby (2005), “Does Performance Budgeting Work? An Analytical Review of the Empirical Literature”, Working Paper WP05/210, International Monetary Fund, Washington DC.
- Robinson, M. (2007), *Performance Budgeting: Linking Funding and Results*, Palgrave Macmillan, New York.
- Sapala, M. (2018). Performance budgeting: a means to improve EU spending: in-depth analysis. European Parliamentary Research Service.
- Surubaru, N. C. (2017). Administrative capacity or quality of political governance? EU Cohesion policy in the new Europe, 2007–13. *Regional Studies*, 51(6), 844-856.
- Tosun, J. (2014). “Absorption of Regional Funds: A Comparative Analysis”, *Journal of Common Market Studies* 52(2): 371-387.
- Rodríguez-Pose, A., & Garcilazo, E. (2015). Quality of government and the returns of investment: Examining the impact of cohesion expenditure in European regions. *Regional Studies*, 49(8), 1274-1290.
- Milio, S. (2007). Can administrative capacity explain differences in regional performances? Evidence from structural funds implementation in southern Italy. *Regional studies*, 41(4), 429-442.
- Wostner, P. (2008), *Micro-Efficiency of the EU Cohesion policy*, Available at SSRN: <https://ssrn.com/abstract=1083477> or <http://dx.doi.org/10.2139/ssrn.1083477>

Appendix

Table A1. Number of times the target value of the indicator has changed (%), by thematic objective, ERDF 2014-2020, EU27

Category	1 time	2 or more times
TO01. Research and Innovation	44%	30%
TO02. ICT	31%	23%
TO03. SMEs	39%	34%
TO04. Low-carbon economy	39%	28%
TO05. Climate change	41%	14%
TO06. Environmental protection	40%	21%
TO07. Network infrastructure	33%	15%
TO08. Employment	41%	23%
TO09. Social inclusion	41%	15%
TO10. Education and training	41%	25%
AVERAGE (EU27)	39%	27%

Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,896 (excluding indicators without thematic objective classification).

Table A2. Number of times the target value of the indicator has changed (%), by country, ERDF 2014-2020, EU27

Country	1 time	2 or more times
DK	81%	10%
BE	59%	9%
CY	54%	5%
IE	53%	27%
EE	52%	14%
FI	51%	16%
NL	49%	11%
DE	49%	24%
LT	47%	6%
SK	47%	25%
FR	45%	20%
PT	45%	28%
AT	43%	30%
BG	43%	10%
CZ	43%	28%
HR	41%	26%
EU27	39%	27%
RO	39%	22%

LV	38%	23%
PL	38%	30%
SE	38%	24%
IT	35%	29%
EL	31%	32%
ES	31%	39%
SI	30%	1%
HU	29%	4%
MT	29%	20%
LU	10%	0%

Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926.

Figure 11. Intensity of target change (median) when negative change is observed between two periods, ERDF 2014-2020, EU27

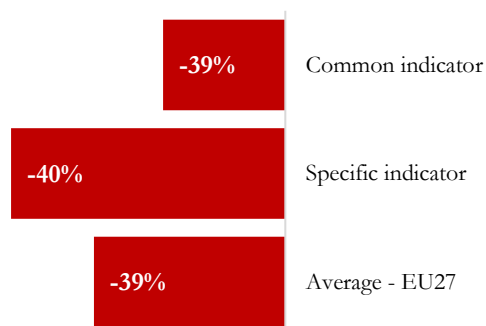
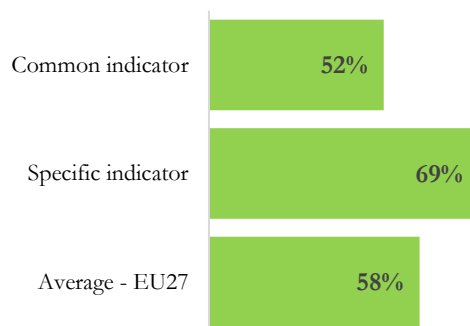


Figure A2. Intensity of target change (median) when positive change is observed between two periods, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission’s Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926 (excluding indicators with classification of typology)

Figure A3. Intensity of target change (median) when negative change is observed between two periods, ERDF 2014-2020, EU27

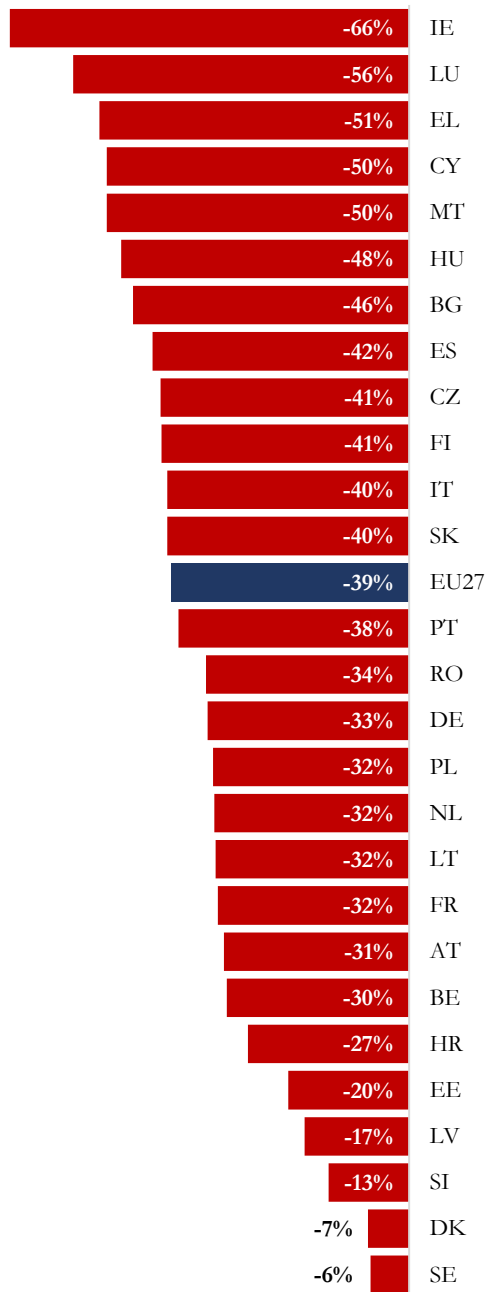
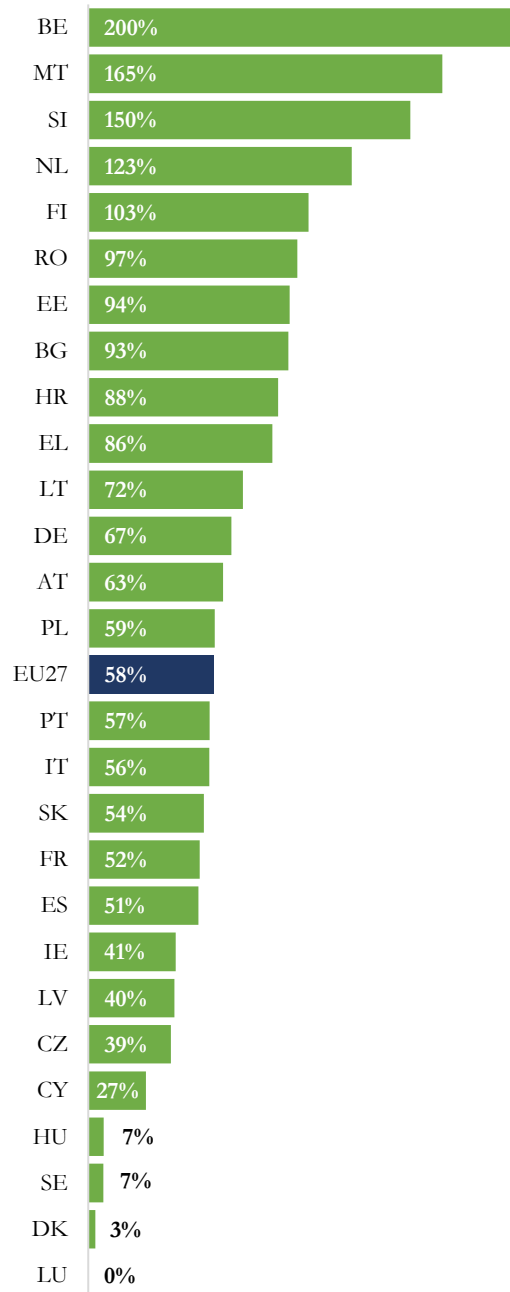


Figure 12. Intensity of target change (median) when positive change is observed between two periods, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,926.

Figure A5. Intensity of target change (median) when negative change is observed between two periods by TO, ERDF 2014-2020, EU27

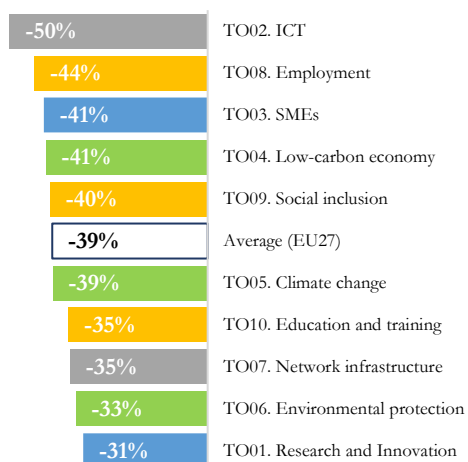
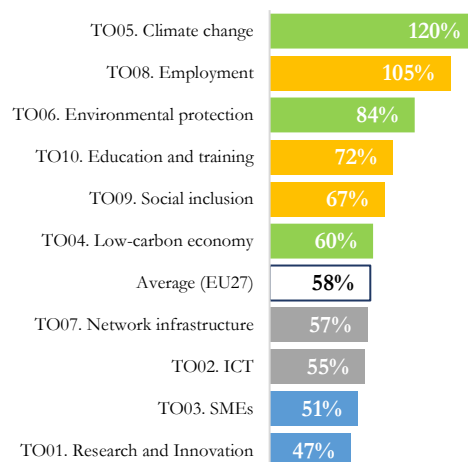


Figure A6. Intensity of target change (median) when positive change is observed between two periods by TO, ERDF 2014-2020, EU27



Source: Own elaboration based on European Commission's Cohesion Open Data Platform.

Note: Only indicators observed in 2 or more consecutive years are included in the analysis. Total number of indicators: 9,896 (excluding indicators without thematic objective classification).

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Joint Research Centre

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