Financial Implementation and Development Outcomes in EU Cohesion Policy: An Exploratory Analysis and Implications for Programme Management

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ABSTRACT

Financial implementation is a necessary part of cohesion policy management, although its relationship with development outcomes requires separate examination. This study compares the European Commission's cumulative net payment ratios for the 2014 to 2020 ERDF, ESF and Cohesion Fund programmes at the end of 2023 with changes in five national indicators between 2015 and 2023. It covers all 27 current EU Member States and uses archived Eurostat exports, accounting for differences in definitions and breaks in the series. Pearson coefficients range from -0.292 for net greenhouse gas emissions per capita to 0.140 for renewable energy, with none of the five associations reaching statistical significance at the 5% level. Rank correlations and adjustments for each indicator's initial level yield the same conclusion at that threshold. The estimates are imprecise and do not establish the causal effects of cohesion policy or the role of institutional quality. Comparisons of Poland, Romania, Bulgaria and Germany show how development trajectories differ across indicators even when payment ratios are relatively close. Read alongside the institutional literature, the findings support a discussion of how financial monitoring can be connected to project selection, implementation quality and the distribution of benefits.

KEYWORDS: *cohesion policy, financial implementation, development outcomes, programme management, regional development.*

JEL CLASSIFICATION: *R58, H77, O19, C21*

1. INTRODUCTION

Managing authorities face an immediate operational problem when a programme cannot commit its resources or reimburse eligible expenditure within the applicable rules and deadlines. Financial progress therefore deserves close attention, but difficulties arise when a high payment or absorption rates is also taken as sufficient evidence of development success. The amount transferred provides little information about the investments selected, the people who benefited or the durability of those benefits.

Cohesion policy pursues several objectives simultaneously, and progress in one area need not be accompanied by improvements elsewhere. An investment may support economic activity without reducing income inequality, while environmental infrastructure can improve local conditions even as national emissions respond mainly to developments in other parts of the economy. Similarly, a country may make substantial progress on a social indicator while remaining far below the European average in living standards. Assessing performance requires these different outcomes to remain visible.

This study examines whether national differences in financial implementation are associated with changes in GDP per capita relative to the EU average, the risk of poverty or social exclusion, income inequality, net greenhouse gas emissions per capita, and the share of

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renewable energy. Changes in these five indicators are measured over a common observation window from 2015 to 2023 and compared with the Commission's end-2023 payment snapshot for the 2014 to 2020 programming period.

This study makes an exploratory comparison of financial progress with several development measures, with particular attention to the interpretation of aggregate indicators. Institutional quality provides a theoretical context for discussing programme management, although it is not measured in the dataset. The management framework developed later in the article therefore draws on the literature and the descriptive findings; its proposed mechanisms are not tested by the correlations.

2. LITERATURE REVIEW AND THEORETICAL CONTEXT

2.1 Public Management and Programme Effectiveness

The relationship between institutional quality and public programme effectiveness is one of the most consistent findings in comparative public administration research. Hood (1991) identified accountability, transparency and results orientation as the defining principles of effective public management, while Pollitt and Bouckaert (2011) associated the absence of these principles with systematic underperformance in public service delivery. Andrews et al. (2017) demonstrate empirically that organisational capabilities, specifically the capacity to plan, implement, monitor and evaluate - explain more of the variance in public programme outcomes than financial resources alone. Building on this tradition, Bovaird and Loeffler (2009) emphasise that public management effectiveness depends on the co-production of public value through multi-stakeholder governance arrangements, a perspective that is directly applicable to the design of managing authorities for EU structural funds.

Applied to cohesion policy, this literature generates a clear expectation: managing authority quality should be a stronger predictor of development outcomes than payment volumes alone. Osborne (2006) and Skelcher (2004) extend the analysis to new public governance, arguing that public value creation requires network management competences, stakeholder co-production and accountability systems oriented towards outcomes rather than compliance. North (1990) provides the deeper institutional foundation: formal and informal institutions determine whether financial transfers generate productive investment or rent-seeking behaviour, a dynamic relevant to understanding why countries with similar payment ratios can produce markedly different development outcomes.

2.2 EU Cohesion Policy: Effectiveness and Institutional Conditions

Research on cohesion policy effectiveness has generated substantial but contested evidence. Becker et al. (2012) investigate the intensity of transfers using a generalised propensity-score approach, and their later study uses a regression discontinuity design to examine heterogeneous effects. The latter finds that human capital and institutional conditions affect the ability of regions to translate transfers into growth and investment (Becker et al., 2013). Pellegrini et al. (2013) apply a similar regression discontinuity design and confirm that effects on growth are positive but conditional on context. Rodriguez-Pose and Fratesi (2004) show that human capital investments generate more durable impacts than infrastructure spending, while Boldrin and Canova (2001) question whether structural funds reduce regional disparities at all without accompanying structural reforms.

The institutional threshold is a recurring finding. Ederveen et al. (2006) demonstrate that Cohesion Fund effectiveness is positive and significant only in countries above a minimum governance quality threshold: below it, funds may be absorbed but not efficiently transformed into outcomes. Rodriguez-Pose and Garcilazo (2015) confirm this pattern at the regional level,

linking the quality of regional government directly to the economic returns of cohesion expenditure. Panel-data approaches reinforce this conclusion: Mohl and Hagen (2010) find that only some model specifications produce positive growth effects, while Beugelsdijk and Eijffinger (2005) show that the effectiveness of structural policy was limited across the EU-15 between 1995 and 2001, with results sensitive to specification.

The social dimension of cohesion policy has received comparatively less systematic empirical attention. Crescenzi and Giua (2020) find that country context shapes the effects of a common European policy framework, with substantial variation remaining within countries. The environmental dimension is even less studied, with evidence suggesting that green transition is driven primarily by national energy policy and carbon pricing rather than structural fund absorption. The present study addresses these gaps by examining all three sustainability dimensions simultaneously for all EU Member States.

2.3 Administrative Capacity and Implementation Quality

The concept of administrative capacity, defined by Horvat and Maier (2004) as the institutional capacity to design, implement, monitor and evaluate effective public programmes, has received particular attention in the EU fund-management literature. Milio (2007) examines administrative capacity and differences in Structural Funds implementation in Southern Italy, finding that capacity constraints explain more of the variation in outcomes than financial allocations. Ferry and Bachtler (2013) document the challenges facing managing authorities in Central and Eastern European countries, identifying human capital gaps and procedural instability as major barriers to effective implementation. Wostner and Slabe-Erker (2009) show that administrative capacity affects not only absorption speed but also the developmental quality of absorbed investments, with higher-capacity managing authorities selecting better projects and remaining less vulnerable to capture.

Barca (2009) places local context and institutional arrangements at the centre of a reformed cohesion policy. This perspective calls for a practical distinction between financial implementation, the delivery of funded activities and the changes those activities seek to produce. Each dimension requires its own evidence: payment records document financial transactions, administrative records establish whether a service or asset was delivered, and impact evaluation requires a credible account of what would have happened without the intervention. Méndez (2011) extends this argument, noting that the rigid N+2 expenditure rule, which penalises slow absorption through decommitment, creates incentives to prioritise administratively simple investments over complex, targeted programmes with stronger distributional impact.

3. DATA AND METHOD

3.1 Coverage and Financial Measure

The analysis uses the Member State as its unit of observation, yielding 27 observations for the current EU membership. The United Kingdom and Interreg allocations recorded separately from national programmes are excluded. Changes between two dates are examined in a cross-sectional design, with equal statistical weight assigned to each country; the reported correlations therefore assign small and large member states the same weight.

Financial data come from the Commission's ESIF 2014-2020 EU payments time series, dataset gayr-92qh, retrieved on 16 September 2026 (European Commission, 2026). The analysis uses only the annual snapshot labelled “2023” and retains ERDF, ESF and Cohesion Fund records assigned to the 27 countries, excluding the REACT-EU category. YEI, agricultural, fisheries and external cooperation funds fall outside this definition. The extract contains 529 programme-

, fund- and regional-category records, with no duplicate combinations of those identifiers within the selected year.

For each country, the payment ratio is calculated as 100 multiplied by the sum of total net payments divided by the sum of net planned EU amounts. Aggregating the amounts before division produces an allocation-weighted national ratio. Because the annual snapshots are cumulative, they are not added together. The measure includes net pre-financing and net interim payments recorded by the Commission and must therefore be distinguished from a rate based on certified beneficiary expenditure.

The reported ratios are retained without truncation and range from 85.24% in Malta to 100.61% in Estonia, with Cyprus also exceeding 100% (at 100.46%). In the latter two countries, recorded net payments exceed the contemporaneous net planned amounts; this arithmetic relationship does not establish that all beneficiary expenditure was certified or that programme closure was complete. A supplementary calculation caps both ratios at 100% to assess whether these values affect the findings.

3.2 Development Indicators and Source Versions

The outcome data are taken from Eurostat exports downloaded in April 2026, to maintain a consistent source version rather than mixing revisions from different extraction dates. More recent values available online may therefore differ from those used here. The financial snapshot was retrieved separately, as specified above, and refers throughout to the same reporting year.

Table 1 presents the five outcome variables, their definitions and source datasets. The common baseline is 2015, the first year available in the AROPE series under the EU 2030 definition. The older EU 2020 series is kept separate, without attempting to join the two series or impute values across definitional or coverage gaps.

Table 1. Variables, definitions and Eurostat sources

Variable	Definition and unit	Eurostat dataset
GDP	GDP per capita in PPS, EU27 = 100; change in index points	nama_10_pc
AROPE	Population at risk of poverty or social exclusion; change in percentage points	ilc_peps01n
Gini	Gini coefficient of equivalised disposable income; 0 to 100	ilc_di12
GHG	Domestic net greenhouse gas emissions; tonnes CO_2 equivalent per capita	sdg_13_10
Renewables	Renewable energy share in gross final energy consumption; change in percentage points	nrg_ind_ren

Source: Eurostat (2026a-e). GDP is expressed as a percentage of the EU-27 average in purchasing power standards; an increase represents a change in relative position, not a national real growth rate. GHG emissions include the net contribution of land use, land-use change and forestry.

Even within a common dataset definition, breaks in measurement restrict comparison over time. The GDP export flags a break in 2020 for every Member State, while AROPE and Gini contain country-specific breaks during the observation window. Eurostat also identifies a change in renewable-energy accounting between 2020 and 2021 following the transition from RED I to RED II, although the observations in the selected export do not carry a break flag (Eurostat, 2026f). These long-term differences therefore describe changes in published indicators whose comparability is subject to these qualifications.

3.3 Statistical Procedure

For each indicator, the outcome is calculated as its 2023 value minus its 2015 value. Negative changes in AROPE, Gini and GHG denote reductions in the measured risk, inequality and emissions, whereas a positive change in the renewable-energy share denotes a higher share. An increase in the GDP index is consistent with movement towards the EU average for countries initially below it, but does not provide a universal measure of convergence for countries already above that average.

The main analysis reports Pearson correlations and two-sided p-values from t-tests with 25 degrees of freedom. The 95% confidence intervals use Fisher's z transformation with a standard error of approximately 0.2041 for the transformed coefficient (N = 27). Holm's procedure adjusts the five primary p-values for multiple comparisons. Because the observations comprise all current EU Member States, the coefficients provide descriptive summaries of the population for the selected dates. Inferential statistics are presented as model-based reference measures; the usual assumptions, including independent observations, may be affected by economic interdependence between countries.

Sensitivity checks use Spearman rank correlations and partial correlations controlling for each indicator's 2015 level, with 24 degrees of freedom for tests of the partial correlations. Further checks exclude one country at a time and exclude countries with an AROPE or Gini break flag between 2016 and 2023. GDP is also examined from 2020 to 2023 and renewable energy from 2021 to 2023. These shorter windows reduce specific comparability problems, although they describe different periods and are treated as supplementary diagnostics rather than independent confirmatory tests.

4. RESULTS

4.1 Associations across the EU-27

Table 2 reports the Pearson correlations between end-2023 payment ratios and changes in the five national indicators from 2015 to 2023, together with rank correlations and Holm-adjusted p-values. None of the five associations reaches the 5% significance threshold.

Table 2. Payment ratios and indicator changes, 2015 to 2023: Pearson correlations

Indicator	Pearson r	95% interval	$p-value$	Holm p
GDP index	0.053	-0.333 to 0.425	0.791	1.000
AROPE	-0.028	-0.404 to 0.355	0.888	1.000
Gini	-0.248	-0.574 to 0.146	0.213	0.850
Net GHG per capita	-0.292	-0.605 to 0.099	0.140	0.698
Renewable energy	0.140	-0.254 to 0.494	0.486	1.000

Source: Author's calculations from documented Commission and Eurostat extracts.
N = 27 for all rows. The financial ratio covers selected 2014–2020 funds at the end of 2023.
Confidence intervals are unadjusted; Holm p-values adjust the five primary tests jointly.

The GDP and AROPE coefficients are close to zero, at 0.053 and -0.028 respectively, while the coefficients for Gini and net emissions are negative at -0.248 and -0.292. The coefficient for renewable energy is 0.140. All confidence intervals include zero and allow associations in both directions, leaving considerable uncertainty about the strength and direction of the relationships.

Several features of the comparison help explain why these estimates cannot establish the effectiveness of cohesion expenditure. Payment ratios occupy a relatively narrow range towards the end of the programming cycle and do not capture the amount of support relative to the size

of an economy or its population. Countries with similar implementation rates may thus receive very different resources. Moreover, national outcomes reflect domestic policies, macroeconomic conditions and investments financed outside the selected programmes, meaning that a weak aggregate association can coexist with substantial effects in particular regions or projects. This finding is consistent with Ederveen et al. (2006) and Rodriguez-Pose and Garcilazo (2015), who demonstrate that aggregate financial measures provide limited traction in explaining development outcomes without accompanying institutional variables.

4.2 Sensitivity Checks and Measurement Limitations

Table 3 presents the rank and baseline-adjusted correlations as sensitivity checks. The rank correlations remain non-significant at the 5% level, although adjustment for initial conditions changes some coefficients appreciably.

Table 3. Rank and baseline-adjusted correlations

Indicator	**Spearman rho**	**p-value**	**Partial r**	**p-value**
GDP index	0.184	0.359	0.165	0.422
AROPE	-0.143	0.476	-0.333	0.096
Gini	-0.327	0.096	-0.298	0.140
Net GHG per capita	-0.236	0.235	0.201	0.324
Renewable energy	0.120	0.552	0.140	0.495

Source: Author's calculations. N = 27. Partial correlations control separately for the 2015 level of each outcome. These sensitivity p-values are not adjusted for multiple comparisons.

The AROPE partial correlation becomes , and the GHG coefficient changes sign to 0.201; neither reaches the 5% threshold. This sensitivity warrants caution in interpreting the unadjusted relationships, particularly since a single baseline control leaves allocation endogeneity, omitted variables and reverse causation unresolved.

Excluding countries with recorded breaks in the social series leaves 16 observations for AROPE and 17 for Gini, with correlations of () and -0.355 (), respectively. The shorter observation windows give () for GDP over 2020 to 2023 and () for renewables over 2021 to 2023. Capping the two payment ratios above 100% likewise produces no significant association for any outcome.

4.3 Four National Development Trajectories

Poland, Romania, Bulgaria and Germany illustrate the range of development trajectories behind the aggregate results. They span different income levels and experiences, but they do not constitute a representative qualitative sample. The comparison uses neither administrative-capacity scores nor project evaluations and therefore does not rank their management systems or test institutional mechanisms. Table 4 presents their payment ratios alongside the changes in each of the five indicators.

Table 4. Financial implementation and national changes from 2015 to 2023: four-country comparison

Measure	Poland	Romania	Bulgaria	Germany
Payment ratio (%)	99.51	93.89	88.25	91.87
GDP index change (pp)	+7.1	+18.9	+14.3	-8.6
AROPE change (pp)	-6.2	-12.5	-13.3	+1.3
Gini change (points)	-3.6	-6.4	+0.2*	-0.7
Net GHG change (t/cap)	-0.6	-0.5	-1.9	-2.2
Renewable energy change (pp)	+4.8	+1.0	+4.9	+6.6

Source: Author's calculations using European Commission payment data and Eurostat data. Changes are 2023 minus 2015. GDP in index points; AROPE and renewables in percentage points; Gini in coefficient points; GHG in tonnes CO_2 equivalent per capita.
* The Bulgarian Gini series carries a break in 2016; the net change of +0.2 points requires caution in interpretation.

Poland combines a 99.51% payment ratio with an increase of 7.1 points in its GDP index and reductions of 6.2 percentage points in AROPE and 3.6 points in Gini. Romania has a lower payment ratio of 93.89% but records a larger increase in the GDP index (+18.9 points) and records larger reductions in AROPE (-12.5 percentage points) and Gini (-6.4 points). These observations illustrate why ordering countries by financial implementation does not reproduce their ordering by development outcomes, but they do not identify which funded interventions contributed to those changes.

Bulgaria's published AROPE measure falls from 43.3% to 30.0%, while Gini rises marginally from 37.0 to 37.2. Both social series carry a break in 2016, which makes the net Gini figure unreliable as a measure of long-term change. The practical management observation is narrower: poverty risk and the distribution of disposable income measure different things and deserve separate monitoring, regardless of the direction of either change.

Germany's GDP index declines from 126.2 to 117.6 while remaining well above the EU average, a loss of relative position that does not imply a fall in absolute output per person. Its AROPE measure rises from 20.0% to 21.3%, although a break in 2020 limits interpretation. Over the selected period, Germany also records greater reductions in net emissions per person and a larger increase in renewable energy than the other three countries, consistent with the weight of national energy policy in driving those indicators.

5. IMPLICATIONS FOR PROGRAMME MANAGEMENT

Financial monitoring remains necessary because managing authorities need to track project progress and identify delays in reimbursement. The question is how to connect that information to evidence about the purposes of expenditure. As the institutional literature emphasises, stable procedures, staff expertise and usable information systems are conditions that support effective implementation; their importance cannot be estimated from the present correlations, but their relevance is documented across a range of programme contexts (Hood, 1991; Milio, 2007; Ferry & Bachtler, 2013). This study proposes that this connection be established during programme preparation, when monitoring arrangements can be designed around the intended contribution of the investments.

Project selection offers an early opportunity to make this connection explicit. Applications should explain the need being addressed, the expected beneficiaries and how the investment is intended to improve their circumstances, thereby giving evaluators a basis for assessing the proposed results. Readiness to spend remains relevant, but should be considered alongside evidence of need and the plausibility of the expected benefits. Such an approach follows Barca's

(2009) emphasis on local conditions and institutional arrangements and is consistent with Wostner and Slabe-Erker's (2009) finding that higher-capacity managing authorities select better projects.

During implementation, reviewing financial information alongside delivery and use can reveal problems that a payment record alone would miss. A completed building does not establish that the intended service is accessible or adequately staffed. Delayed construction and low use after completion call for different management responses, so they should be distinguished in monitoring. Mendez (2011) notes that current incentive structures, particularly the N+2 rule, encourage managing authorities to prioritise the speed of expenditure over targeted delivery, a misalignment that this approach seeks to correct.

Monitoring should also establish which groups and territories receive benefits and whether access matches the programme's objectives. Although AROPE and Gini describe the national context, identifying the beneficiaries of individual projects requires programme records and targeted evaluations. Where appropriate and feasible, comparison groups or other credible counterfactual designs can help to assess the contribution of funded activities to the changes observed (Becker et al., 2013).

Connecting expectations established at selection with evidence on delivery, use and the distribution of outcomes provides a basis for organising management decisions. This approach is offered as a practical framework informed by the literature rather than as a validated composite index. Developing a numerical score would require a separate measurement exercise, including decisions about weights and evidence that the score improves decisions.

6. CONCLUSIONS

Across all 27 current EU Member States, end-2023 payment ratios for selected 2014 to 2020 cohesion funds show no statistically significant association according to Pearson's correlation coefficient with the five national indicator changes examined from 2015 to 2023. Given the imprecision of the estimates and the comparability limits of the source series, this finding cannot be taken as evidence that cohesion policy is ineffective. It does, however, leave the relationship between aggregate financial implementation and development outcomes unresolved in this comparison.

The experiences of Poland, Romania, Bulgaria and Germany illustrate the practical issue: their relative positions depend on which economic, social or environmental indicator is considered. A ranking based solely on payment ratios does not capture these differences, which reinforces the case for examining development outcomes separately from financial progress.

For programme management, this implies connecting expenditure monitoring with evidence about project selection, delivery and beneficiaries. The institutional literature, from Hood (1991) and Pollitt and Bouckaert (2011) on public management effectiveness to Barca (2009) and Mendez (2011) on cohesion policy design, provides a rationale for examining these processes. The contribution of these processes to development outcomes, however, requires direct measurement rather than inference from unexplained variation in aggregate data. Financial discipline remains necessary. Assessing the impact of cohesion policy requires a separate evaluation design supported by appropriate data.

7. LIMITATIONS AND FURTHER RESEARCH

The main limitation is that financial implementation and national outcomes are jointly influenced by initial conditions, allocation rules, administrative choices and economic shocks. Neither the simple correlations nor adjustment for a single baseline variable isolates a causal

effect. Differences in funding intensity, sectoral composition and the timing of individual investments also remain outside the analysis, including the possible influence of expenditure made before or after the selected outcome window.

National aggregation further limits interpretation because the location of funded projects and the distribution of support need not correspond to the geography of changes in national averages. Equal country weights are suitable for comparing Member States, but the resulting statistics do not describe the experience of the average EU resident. Economic interdependence and shared shocks also affect the model-based interpretation of the p-values.

Measurement constraints include the breaks in GDP and social series, changes in accounting for renewable energy and revisions to emissions inventories. The sensitivity checks address particular comparability problems without correcting the underlying series. Interpretation also depends on the financial measure: net payments differ from beneficiary expenditure and verified outputs, making the source definition and retrieval date essential to understanding the reported implementation rates.

Future research could link regional or project-level expenditure to outcomes using consistent geographical units and timing, with direct measures of administrative capacity and institutional quality as proposed by Rodriguez-Pose and Garcilazo (2015) and Horvat and Maier (2004). Testing the mechanisms proposed in Section 5 would require a design that addresses the allocation of funds and provides a defensible counterfactual. The present comparison helps define these data and design requirements by showing what can and cannot be learned from national payment ratios.

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