TERRITORIAL FAULT LINES? EU-FUND DEPENDENCE AND REGIONAL DISPARITIES IN HUNGARY DURING THE RRF IMPASSE: A DESCRIPTIVE ANALYSIS, 2014–2024

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Abstract

The 2022–2026 freeze on Hungary's Recovery and Resilience Facility envelope and the related constraints on its 2021–2027 Cohesion Policy allocations constituted a funding shock without precedent since accession. This paper asks how regional disparities among Hungary's eight NUTS-2 regions evolved during the shock, and whether the observed pattern is consistent with a mechanism operating through pre-existing differences in EU-fund dependence. Using Eurostat regional accounts data for 2014–2024, the paper computes beta- and sigma-convergence measures for the pre-shock and shock periods, tests the stability of the convergence relationship, and relates regional gains and losses to an ex ante dependence measure. The analysis is explicitly descriptive: no causal effect of the freeze is identified or claimed. Three findings emerge. The pre-shock period shows weak, statistically insignificant convergence. During the freeze years cross-regional dispersion rose to its highest level in the observation window, driven primarily by the widening lead of the Budapest region, a pattern robust to population weighting and unique to Hungary within the Visegrad group. The association between fund dependence and relative-position losses is negative and moderately sized but imprecisely estimated. The paper concludes with cautious implications for post-2027 Cohesion Policy design.

Keywords: regional disparities, place-based development, Recovery and Resilience Facility, NUTS-2 regions, Hungary

Introduction

The 2022–2026 impasse over Hungary's Recovery and Resilience Facility (RRF) envelope and the associated freeze of a substantial share of the country's 2021–2027 Cohesion Policy allocations represent the largest structural shock to EU-financed investment inflows since the country's 2004 accession. By mid-2026 only nine per cent of the 10.4 billion EUR RRF envelope had been disbursed, and approximately 17 billion EUR – roughly eight per cent of Hungarian GDP – remained frozen across the RRF, the 2020 Conditionality Regulation suspension, and the residual horizontal enabling-conditions procedure (European Commission, 2026; MNB, 2026; Taraczközi, 2026b).

The macroeconomic consequences of this shock have been documented in earlier work (Taraczközi, 2026a; 2026b). What has received far less analytical attention is its sub-national dimension. Regional development research has long established that EU-financed investment is not evenly distributed within recipient member states: it is concentrated in regions with weaker private-sector investment, thinner administrative capacity among implementing bodies, and greater ex ante development gaps (Barca, 2009; Rodríguez-Pose, 2018; Iammarino, Rodríguez-Pose, & Storper, 2019). The corollary is that a compression of EU-financed investment should not be expected to be territorially neutral.

Two qualifications, which shape the entire design of this study, must be stated at the outset. The first concerns the polycrisis context. The post-2020 period combines the COVID-19 pandemic, the energy and cost-of-living crises, Russia's full-scale invasion of Ukraine, global monetary tightening and accelerating climate-related pressures. The funding freeze is one of several interacting shocks, and its contribution to any observed regional pattern cannot be isolated from the others with the data available. The second concerns the evidential standard. With eight cross-sectional units and a shock window of at most three to four years of observed data, formal causal identification is not feasible. The analysis is therefore explicitly descriptive: it documents how regional disparities evolved before and during the freeze, tests whether the convergence relationship was stable across the two sub-periods, and asks whether the cross-regional pattern of relative gains and losses is consistent with – not whether it is caused by – a mechanism operating through differential EU-fund dependence.

Within these limits, the paper asks three questions. First, what convergence dynamics characterised Hungary's eight NUTS-2 regions in the 2014–2019 pre-shock period? Second, how did the cross-regional dispersion of per capita GDP and the beta-convergence relationship change over 2020–2024, and does a formal test support the presence of a structural break? Third, is the regional dis-

tribution of relative gains and losses during the freeze years systematically related to the ex ante EU-fund dependence of the regions, measured from the 2014–2020 programming cycle?

The term territorial fault line is used throughout in a defined sense set out in the "Conceptualising territorial fault lines" subsection: a persistent, structurally embedded divide between territorial units – here, primarily the divide between the capital region and the high fund-dependence eastern and southern peripheries – which an external shock can activate or deepen, but which it does not create. The funding freeze is accordingly treated not as the origin of territorial inequality in Hungary but as a candidate mechanism through which pre-existing inequalities may have been exacerbated. Similarly, under-provision is used in the specific sense defined in the "Conceptualising territorial fault lines" subsection: the shortfall of EU-financed development investment actually received by a region relative to the allocation programmed for it in the relevant operational programmes.

The paper contributes to three strands of research. To the literature on regional convergence in Hungary and the wider region (Egri & Tánczos, 2018; Egri, Csugány, & Tánczos, 2024; Monfort, 2020), it adds descriptive estimates for the 2020–2024 period computed from the most recent Eurostat regional accounts. To the place-based development literature, it offers a case discussion of what happens to territorially targeted funding when disbursement is interrupted for reasons unrelated to territorial policy. To the post-2027 policy debate, it derives design implications that follow from the observed heterogeneity of sub-national fund dependence, stated with the caution that the descriptive evidence warrants.

The paper proceeds as follows. The analytical framework develops the key concepts, followed by the data and method, the pre-shock period, and the 2020–2024 analysis and structural-break test. The subsequent sections examine fund dependence and the observed pattern, including counter-evidence and endogeneity, then discuss the May 2026 political agreement and post-2027 implications. The paper concludes with a synthesis of the descriptive findings.

Analytical framework

Regional convergence: measurement and evidence

The two canonical measures of regional convergence are beta convergence – a negative cross-sectional relationship between initial income levels and subsequent growth – and sigma convergence – a decline over time in the cross-sectional dispersion of income levels (Barro & Sala-i-Martin, 1992; Sala-i-Martin, 1996).

Applied to the EU's NUTS-2 regions, these measures underpin a large empirical literature documenting moderate convergence between member states combined with substantial divergence within them, particularly between metropolitan agglomerations and peripheral regions (Iammarino, Rodríguez-Pose, & Storper, 2019; Cutrini, 2019; Alcidi, 2019). Monfort (2020) shows that the post-2008 period re-opened regional disparities inside many member states even as cross-country convergence resumed, and De Michelis and Monfort (2008) caution against reading short-run movements in regional GDP dispersion as verdicts on cohesion policy, given measurement noise and the long lags of territorial development – a caution directly relevant to the short window examined here.

For Hungary specifically, the convergence literature documents deep and persistent territorial divides. Egri and Tánczos (2018) show that economic and social convergence in Central and Eastern Europe follows markedly different spatial patterns, with a pronounced northeast–southwest developmental slope in Hungary. Egri, Csugány and Tánczos (2024) identify distinct local convergence clubs in Hungary over 2001–2020, with club membership shaped by initial conditions and structural factors, implying that aggregate convergence statistics conceal strongly divergent local trajectories. On the effects of cohesion funding itself, the evaluation literature finds positive but conditional and regionally heterogeneous growth effects (Becker, Egger, & von Ehrlich, 2010, 2013; Di Caro & Fratesi, 2022), with effectiveness depending on absorptive capacity and territorial endowments (Fratesi & Perucca, 2019). Di Caro and Fratesi (2022) in particular estimate region-specific policy effects and show that the same policy produces effective, ineffective and marginal outcomes in different regions – a finding that warns against assuming a uniform regional impact of either the presence or the absence of EU funding.

The place-based paradigm

The place-based development paradigm, articulated in the Barca Report and elaborated in subsequent work, holds that development interventions are most likely to deliver lasting convergence outcomes when they are tailored to the specific endowments, constraints and institutional conditions of the places they target, rather than applied as spatially blind transfers (Barca, 2009; Rodríguez-Pose, 2018). The paradigm does not claim that tailored interventions always succeed, nor that untailored ones always fail; it claims that the territorial fit of an intervention is a first-order determinant of its effectiveness. For the present analysis the paradigm supplies an expectation about shock incidence rather than policy design: where EU-financed investment has been a quantitatively important and territorially targeted component of regional investment, its interruption should be

felt most where dependence on it was highest.

Conceptualising territorial fault lines: causes, mechanism, consequences

The reviewers of regional inequality rightly insist on distinguishing what a funding shock can and cannot explain. The conceptual structure used in this paper separates three layers. The causes of Hungary's territorial inequality are long-run and structural: the concentration of high-productivity services in the capital, the industrial geography inherited from successive waves of foreign investment, the northeast–southwest slope documented in the Hungarian convergence literature, and the thin economic base of the southern and northeastern peripheries (Egri & Tánczos, 2018; Egri, Csugány, & Tánczos, 2024). These causes predate the RRF impasse by decades and are not attributed to it.

The mechanism examined here is narrower: differential exposure to an interruption of EU-financed investment. Because Cohesion Policy allocations are deliberately concentrated in lower-income regions, the ex ante dependence of regional investment on EU co-financing varies systematically across the eight regions. A general funding freeze therefore constitutes an asymmetric shock even though it is uniform at the national level: the same national-level event withdraws a much larger share of investment financing from a high-dependence periphery than from the capital.

The consequences, finally, are the observable movements in regional disparities during the shock period: changes in the dispersion of per capita GDP, in the beta-convergence relationship, and in the relative positions of individual regions. A territorial fault line, in the sense used here, is the conjunction of the three layers: a pre-existing structural divide (cause) that a general shock deepens through asymmetric exposure (mechanism), leaving a measurable widening of disparities (consequence). The empirical sections of this paper document the consequences and assess the consistency of their cross-regional pattern with the dependence mechanism; they make no claim about the relative weight of this mechanism against the other shocks of the polycrisis period.

Two further definitions complete the framework. Under-provision denotes the shortfall of EU-financed development investment actually received by a region relative to the allocation programmed for it in the operational programmes of the relevant cycle; it is in principle measurable as the gap between programmed commitments and actual disbursements attributable to the region, although the regionalisation of disbursement data is only partially published. Fund dependence denotes annualised Cohesion Policy commitments as a share of regional GDP, as operationalised in the "Data sources" subsection.

Data and method

The eight Hungarian NUTS-2 regions

Hungary has eight NUTS-2 statistical regions: Budapest (HU11), Pest (HU12), Közép-Dunántúl (HU21), Nyugat-Dunántúl (HU22), Dél-Dunántúl (HU23), Észak-Magyarország (HU31), Észak-Alföld (HU32) and Dél-Alföld (HU33).[1] The NUTS 2016 revision, applicable from 2018, separated Budapest from the surrounding Pest county, producing the current eight-region structure. Eurostat publishes the regional accounts backcast to the current boundaries, so the full 2014–2024 series used here is consistent with the eight-region classification throughout.

One measurement property of this classification matters for everything that follows: per capita GDP overstates the economic position of Budapest and understates that of Pest, because commuters resident in Pest contribute to GDP recorded in the capital while appearing in Pest's population denominator. The robustness checks in the "Convergence results in detail" subsection therefore include a variant in which the two regions are merged into a single capital-region unit.

Data sources

The analysis rests on three data streams, each publicly accessible. The first is Eurostat's regional economic accounts, dataset nama_10r_2gdp[2] (data download 10 February 2026 update), from which per capita GDP in purchasing power standards (PPS, EU-27 from 2020, per inhabitant) is taken for the eight regions over 2014–2024. The 2024 observations are flagged by Eurostat as provisional; no observation after 2024 is used in any computation. Because the PPS series is expressed relative to a common EU price level, cross-regional comparisons within a year are unaffected by national inflation, while growth rates computed from the series combine real growth with changes in relative price levels; all sub-period comparisons below are therefore either cross-sectional or based on relative positions within the national cross-section, which removes the common component.

The second is the ex ante EU-fund dependence measure, computed as annualised 2014–2020 cycle Cohesion Policy commitments (ERDF, ESF and Cohesion Fund combined) as a share of regional GDP, averaged over 2015–2020, from the regionalised allocation data published on the European Commission's Cohesion Open Data Platform[3] and the territorial annexes of the Ninth Cohesion Report[4]. The measure ranges from approximately 1.2 per cent of regional GDP for Budapest to approximately 4.8 per cent for Észak-Alföld.

A third stream supports the robustness and benchmark analyses: regional gross fixed capital formation from Eurostat dataset nama_10r_2gfcf[5] (available through 2023), and per capita GDP in PPS for the NUTS-2 regions of Czechia, Poland and Slovakia from the same regional accounts dataset as the Hungarian series. The fourth is the set of policy indicators on the freeze and its partial resolution: the Recovery and Resilience Scoreboard country pages[6] and the relevant Council decisions. One feature of the Hungarian response deserves explicit mention, because it attenuates the shock examined here: from 2022 onwards the Hungarian government pre-financed a part of the suspended programmes from the national budget, so the effective compression of development investment in the regions was smaller than the headline volume of frozen EU commitments. No published source quantifies this pre-financing at regional level; its existence is a further reason to treat the analysis as descriptive and the freeze as an upper bound on the actual regional funding shock.

Analytical strategy and its limits

The strategy has four steps. First, beta-convergence regressions of average annual growth of log per capita GDP on initial log per capita GDP are estimated for the 2014–2019 pre-shock window and for three shock-era windows (2019–2024, 2020–2024 and 2022–2024, the last corresponding to the freeze period proper), with full coefficient detail reported. Second, sigma convergence is tracked as the cross-sectional standard deviation of log per capita GDP for each year, both for all eight regions and excluding Budapest. Third, the stability of the convergence relationship across sub-periods is assessed with a Chow test on the pooled annual-growth panel (eight regions, ten annual transitions), splitting at 2022. Fourth, each region's change in relative position – its log per capita GDP deviation from the cross-regional mean – over 2021–2024 is related to the ex ante dependence measure by rank and product-moment correlation.

The limits are stated plainly. Eight cross-sectional units yield very low statistical power, and conventional significance thresholds are correspondingly hard to reach; coefficient estimates are reported with standard errors and exact p-values so that the reader can see the precision, or lack of it, directly. The dependence measure is an ex ante exposure proxy, not a measure of funds actually withheld from each region. And the endogeneity problem discussed in the "Interpretation, counter-evidence and endogeneity" subsection – poorer regions are more fund-dependent and may converge more weakly in any crisis – means that even a tight correlation would not identify the funding channel. These are the reasons the paper claims consistency, not causality.

The pre-shock period, 2014–2019

Three features characterise the pre-shock baseline. First, the level differences are large and persistent. In 2019 per capita GDP in PPS in Budapest (49,200) exceeded that of Észak-Alföld (14,900) by a factor of 3.3, with the remaining six regions between 15,100 and 22,700. Second, beta convergence over 2014–2019 is weak and statistically insignificant: the estimated coefficient on initial log GDP per head is −0.0043 (standard error 0.0083, $t = -0.51$, $p = 0.63$, $R^2 = 0.04$, $N = 8$), implying an annual convergence rate of approximately 0.4 per cent that is statistically indistinguishable from zero (Table 1). Third, the sigma measure – the cross-sectional standard deviation of log per capita GDP – declined modestly from 0.403 in 2014 to 0.379 in 2018, before rising back to 0.397 in 2019 on the strength of Budapest's pre-COVID surge (Figure 1).

The honest characterisation of the baseline is therefore not one of robust convergence but of broadly stable disparities with a weak equalising tendency up to 2018. This is consistent with the Hungarian convergence literature, which finds club-type dynamics and persistent spatial divides beneath the national aggregates rather than smooth catch-up (Egri, Csugány, & Tánczos, 2024). It is worth noting that excluding Budapest changes the picture appreciably: the dispersion among the seven non-capital regions fell from 0.201 in 2014 to 0.168 in 2019, indicating that such convergence as occurred in the pre-shock period took place mainly among the non-capital regions, while the capital's lead fluctuated with its own cycle.

The shock period, 2020–2024

Phases of the period

Three phases structure the shock period. The first, 2020–2021, is the COVID-19 phase. The pandemic contraction was concentrated in the service- and tourism-intensive capital, and its immediate effect was mildly equalising: the all-region sigma fell from 0.397 in 2019 to 0.385 in 2021, and Budapest's premium over the mean of the other seven regions narrowed slightly. This compression is a familiar crisis pattern and is not attributed to funding conditions, which were not yet binding.

The second phase, 2022–2024, is the freeze period proper: the Conditionality Regulation suspension of December 2022, the non-fulfilment of the horizontal enabling conditions, and the super-milestone conditionality of the RRF plan together stalled disbursements from both envelopes. In this window the equalising movement of the COVID phase reversed. The all-region sigma rose from 0.385

in 2021 to 0.412 in 2024, the highest value in the entire 2014–2024 observation window, and Budapest's premium over the mean of the other seven regions widened from 102.6 to 110.0 log points (Figure 1). The third phase, from 2025 onwards, lies beyond the reach of the regional accounts: Eurostat data end in 2024 (with 2024 provisional), and the paper accordingly makes no quantitative claim about 2025 or 2026. Qualitatively, the macroeconomic indicators available for 2025 – stagnant public investment and elevated financing costs – give no reason to expect that the 2022–2024 pattern reversed before the May 2026 agreement, but this expectation is not treated as evidence.

Convergence results in detail

Table 1 reports the full beta-convergence results for the four estimation windows. Over 2019–2024 and 2020–2024 the coefficient on initial income turns positive (+0.0056 and +0.0151 respectively) but remains statistically insignificant. Over the freeze window 2022–2024 the coefficient is +0.0280 (standard error 0.0124, t = 2.27, p = 0.064, R^2 = 0.46): richer regions grew faster, a divergence relationship that is marginally significant even with eight observations. The point estimates thus move monotonically from weak convergence before the shock to marked divergence during the freeze years, while the precision of each individual estimate remains low.

Table 1. Beta-convergence regressions, Hungarian NUTS-2 regions (N = 8)

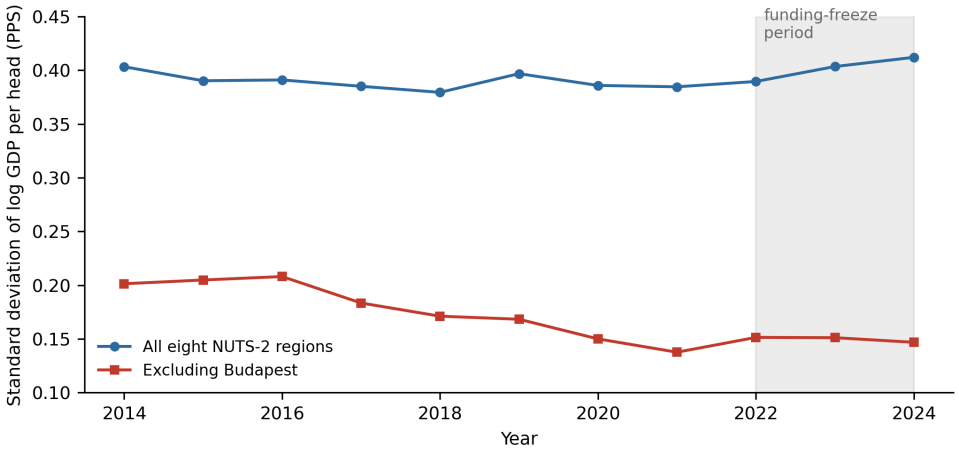
Window	Coefficient on initial log GDP p.c.	Std. error	t	p	R^2	Implied annual rate
2014–2019	−0.0043	0.0083	−0.51	0.63	0.04	convergence ≈ 0.4%
2019–2024	+0.0056	0.0120	0.47	0.66	0.03	divergence ≈ 0.6%
2020–2024	+0.0151	0.0128	1.18	0.28	0.19	divergence ≈ 1.5%
2022–2024	+0.0280	0.0124	2.27	0.064	0.46	divergence ≈ 2.7%

Note: dependent variable is average annual growth of log per capita GDP (PPS) over the window; regressor is log per capita GDP in the initial year; OLS with conventional standard errors. The implied annual rate converts the coefficient into an annual convergence (negative coefficient) or divergence (positive coefficient) rate. Source: author's calculations from Eurostat nama_10r_2gdp[2].

The sigma trajectory is shown in Figure 1, which plots the cross-sectional standard deviation of log per capita GDP for 2014–2024, for all eight regions and excluding Budapest. Two features stand out. The all-region series reaches its 2014–2024 maximum in 2024, having risen in each year of the freeze window.

The ex-Budapest series, by contrast, declined through 2021 and has moved only moderately upwards since, which identifies the capital's widening lead as the primary driver of the aggregate divergence. The territorial fault line of the title runs, on this evidence, first and foremost between Budapest and the rest of the country, and only secondarily among the non-capital regions.

Figure 1. Sigma convergence: standard deviation of log per capita GDP (PPS) across Hungarian NUTS-2 regions, 2014–2024



Note: annual cross-sectional standard deviation of the natural logarithm of per capita GDP in PPS; 2024 values provisional. The shaded band marks the 2022–2024 funding-freeze period. Source: author's calculations from Eurostat nama_10r_2gdp[2], extracted February 2026.

Whether these movements amount to a statistically identifiable structural break is tested with a Chow test on the pooled annual-growth panel (eight regions × ten annual transitions, N = 80), splitting the sample at 2022. The test statistic is $F(2, 76) = 2.37$ with $p = 0.10$: the null of parameter stability is not rejected at the five per cent level, though it is at the ten per cent level. An equivalent interaction specification with heteroskedasticity-robust standard errors yields an interaction coefficient of +0.021 on initial income in the post-2022 window ($z = 1.06$, $p = 0.29$). The formal evidence for a break is therefore suggestive rather than conclusive, which is the precision that eight regions and three freeze years can deliver. The paper accordingly describes the 2022–2024 period as displaying a divergence pattern consistent with a break in the convergence relationship, and not as a statistically established regime change.

Three robustness checks qualify and on balance support this reading. First, merging Budapest and Pest into a single capital-region unit, which removes the commuting bias noted in the "Eight Hungarian NUTS-2 regions" subsection,

leaves the pattern intact in direction: the seven-unit dispersion falls to 2021 and then rises in each year of the freeze window (0.305 in 2021 to 0.332 in 2024), although the 2024 level remains below its 2014 starting point and the 2022–2024 beta coefficient, while similar in size (+0.026), loses significance with the smaller cross-section ($p = 0.21$, $N = 7$). Second, weighting the dispersion measure by regional population, which prevents the small peripheral regions from dominating an unweighted statistic, reproduces the unweighted result: the weighted standard deviation rises from 0.408 in 2021 to 0.437 in 2024, its maximum in the observation window. Third, the divergence is not an artefact of the PPS unit, since all comparisons are within-year cross-sections or relative positions from which the common national component cancels.

Fund dependence and the regional pattern

Ranking the regions by ex ante dependence

The ex ante dependence measure ranks the eight regions as follows (annualised 2014–2020 Cohesion Policy commitments as a share of regional GDP): Budapest approximately 1.2 per cent, Pest 2.3 per cent, Nyugat-Dunántúl 2.8 per cent, Közép-Dunántúl 3.2 per cent, Dél-Alföld 3.9 per cent, Dél-Dunántúl 4.4 per cent, Észak-Magyarország 4.6 per cent and Észak-Alföld 4.8 per cent (Figure 2, panel a). The ranking mirrors the income ranking almost exactly, which is the design of the policy and, at the same time, the root of the endogeneity problem discussed below.

Dependence and relative-position change during the freeze

Table 2 reports, for each region, the dependence measure together with its average annual growth of per capita GDP (PPS) in the pre-shock window (2014–2019) and the shock window (2020–2024) – both expressed as annual rates – and its change in relative position over 2021–2024, measured as the change in the deviation of log per capita GDP from the cross-regional mean, in log points. The relative-position metric is the preferred one, because it nets out the common national component of PPS growth; the growth columns are reported for transparency.

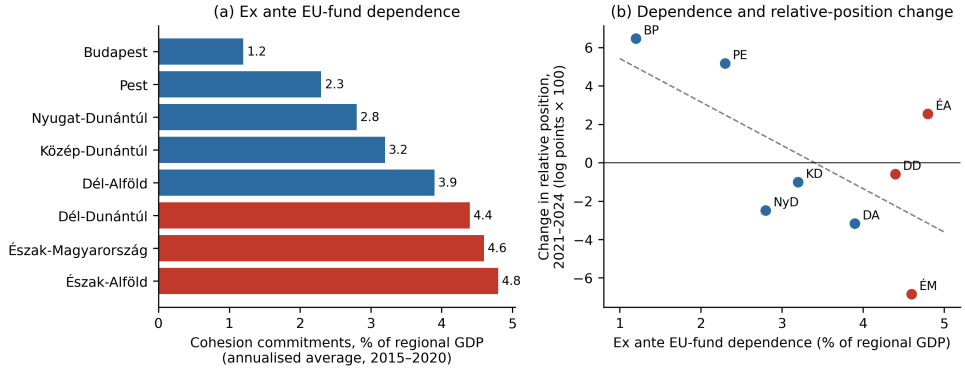
Table 2. Hungarian NUTS-2 regions: fund dependence and growth during the pre-shock and shock windows

Region	EU-fund dep. 2014–2020 (% GDP)	Avg. annual growth 2014–19 (%)	Avg. annual growth 2020–24 (%)	Relative-position change 2021–24 (log pts)
Budapest	1.2	4.8	8.5	+6.5
Pest	2.3	3.7	8.5	+5.2
Nyugat-Dunántúl	2.8	2.7	4.9	−2.5
Közép-Dunántúl	3.2	4.8	6.4	−1.0
Dél-Alföld	3.9	4.9	5.7	−3.2
Dél-Dunántúl	4.4	4.6	6.7	−0.6
Észak-Magyarország	4.6	5.5	5.5	−6.9
Észak-Alföld	4.8	4.5	7.2	+2.5

Note: growth rates are average annual rates of change of log per capita GDP in PPS over the stated window; because the PPS series embodies relative price-level changes, these rates overstate real growth uniformly and are comparable only across regions. The relative-position change is the change in the region's deviation of log per capita GDP from the eight-region mean between 2021 and 2024, in log points × 100. Dependence is annualised ERDF+ESF+Cohesion Fund commitments as a share of regional GDP, averaged 2015–2020. Sources: Eurostat nama_10r_2gdp[2]; European Commission Cohesion Open Data Platform[3]; author's calculations.

The pattern in the final column is the central descriptive finding. The two regions with the lowest dependence – Budapest and Pest – are the only two that gained relative position during the freeze window by a clear margin, together advancing by between five and six and a half log points. Five of the six higher-dependence regions lost ground, with Észak-Magyarország losing most (−6.9 log points). The product-moment correlation between dependence and relative-position change is −0.64 ($p = 0.09$) and the rank correlation is −0.48 ($p = 0.23$): negative and moderately sized, but imprecisely estimated, as eight observations dictate (Figure 2, panel b).

Figure 2. Ex ante EU-fund dependence and relative-position change of the Hungarian NUTS-2 regions



Note: panel (a): annualised 2014–2020 Cohesion Policy commitments as a share of regional GDP (the three highest-dependence regions shaded); panel (b): the same measure against the change in relative position over 2021–2024 as defined in Table 2; the dashed line is the OLS fit ($r = -0.64$, $p = 0.09$). Sources: as for Table 2.

The investment channel: regional gross fixed capital formation

If the freeze operated through the EU-financed investment channel, its first imprint should appear in regional gross fixed capital formation (GFCF), which Eurostat publishes through 2023. The regional investment record turns out to be heterogeneous rather than uniform. One high-dependence region, Észak-Magyarország, suffered an investment collapse of exactly the kind the dependence mechanism predicts: its share of national GFCF fell from 10.7 to 7.7 per cent between 2019 and 2023, and its investment volume declined in nominal euro terms over the period. But the two other high-dependence regions moved the opposite way: Észak-Alföld's share of national investment rose from 11.8 to 14.4 per cent and Dél-Alföld's from 11.6 to 12.8 per cent, in both cases on the strength of large private manufacturing projects, while Budapest's share fell by almost four percentage points. The cross-regional correlation between fund dependence and relative GFCF change over 2019–2023 is accordingly close to zero.

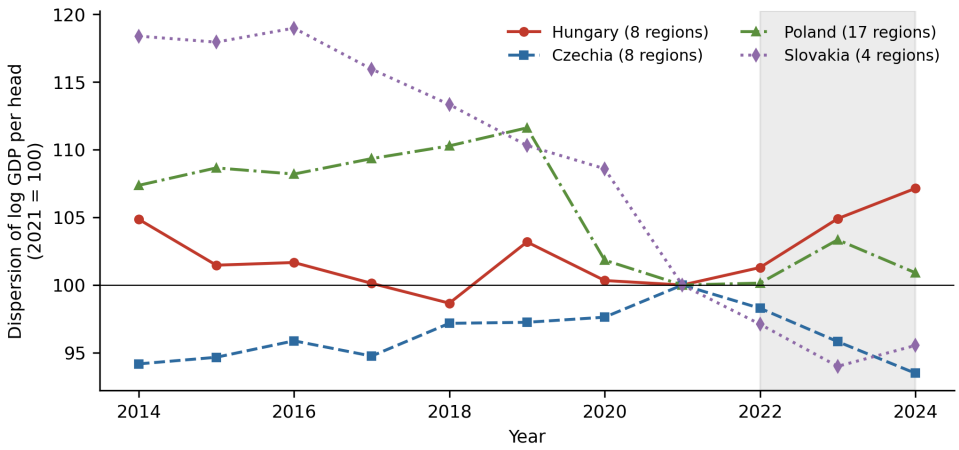
The investment evidence therefore does not show the uniform compression of capital formation in fund-dependent regions that a pure dependence mechanism would imply. What it shows is a composition shift: public, EU co-financed investment contracted – visible in the Észak-Magyarország collapse and in Budapest's shrinking share – while private, largely foreign-financed manufacturing investment expanded strongly in the eastern Alföld regions. The GDP divergence documented in the "Shock period, 2020–2024" section is thus not the mir-

ror image of an investment divergence along dependence lines; it is better described as the capital's service economy pulling ahead in output terms even as its investment share fell, while the peripheries' fortunes varied with their success in attracting the private investment wave. This heterogeneity is reported here as a finding in its own right, and it feeds directly into the interpretive limits discussed in the "Interpretation, counter-evidence and endogeneity" subsection.

A regional benchmark: Hungary in the Visegrad comparison

A second way to probe the funding-shock interpretation is to ask whether the Hungarian dispersion dynamics of 2021–2024 were a general Central European phenomenon. Figure 3 plots the cross-regional standard deviation of log per capita GDP for the NUTS-2 regions of the four Visegrad countries, normalised to 2021 = 100. The series diverge clearly: the Hungarian dispersion rose by 7.1 per cent between 2021 and 2024, while the Czech fell by 6.5 per cent, the Slovak by 4.5 per cent, and the Polish was essentially flat (+0.9 per cent). Within the Visegrad group, Hungary is the only member state in which within-country regional dispersion widened appreciably during the freeze years – the years in which it was also the only member state with its EU funding suspended.

Figure 3. Within-country regional dispersion in the Visegrad countries, 2014–2024 (2021 = 100)



Note: cross-sectional standard deviation of log per capita GDP (PPS) across each country's NUTS-2 regions (Hungary 8, Czechia 8, Poland 17, Slovakia 4), normalised to 2021 = 100; 2024 values provisional. The shaded band marks the 2022–2024 Hungarian funding-freeze period. Source: author's calculations from Eurostat nama_10r_2gdp[2].

The benchmark strengthens the case that the Hungarian pattern is country-specific rather than conjunctural, since the common shocks of the period – the energy crisis, monetary tightening, the slowdown of the German industrial cycle – hit the four economies broadly alike. It does not, however, isolate the funding freeze as the operative country-specific factor: Hungary also differed from its neighbours in macroeconomic policy, inflation, and the geography of the private investment wave documented in the "Investment channel" subsection. The benchmark is therefore read as consistent with, and not as proof of, the funding-shock interpretation.

Interpretation, counter-evidence and endogeneity

the "Investment channel" and "Regional benchmark" subsections have supplied the investment-side and comparative evidence that bears on the dependence interpretation; robustness to sectoral composition remains untested and is left for subsequent work. This section draws the threads together into an explicit account of what the available descriptive evidence can and cannot support.

Three considerations limit the dependence interpretation. The first is endogeneity. The dependence ranking coincides almost perfectly with the inverse income ranking, because Cohesion Policy deliberately concentrates resources in poorer regions. Poorer regions, however, may also converge more weakly in any crisis period – through weaker balance sheets, less diversified economic structures and lower resilience – entirely independently of the funding freeze. With eight observations it is impossible to separate the funding channel from this general vulnerability channel, and the paper does not attempt to do so.

The second is the exception visible in Table 2: Észak-Alföld, the most fund-dependent region, gained 2.5 log points of relative position during the freeze window. The explanation is now documented rather than conjectured: the "Investment channel" subsection shows that Észak-Alföld's share of national investment rose by 2.7 percentage points over 2019–2023 on the strength of the large private manufacturing projects concentrated in and around Debrecen, which substituted private external financing for the suspended public external financing. The exception is instructive in both directions: it shows that high fund dependence did not condemn a region to relative decline where an alternative investment channel opened, and it shows equally that the dependence mechanism, if operative, can be overridden by idiosyncratic regional shocks – a further reason for caution with seven degrees of freedom.

The third is the Budapest-centred nature of the divergence documented in the "Convergence results in detail" subsection. If the freeze had operated purely through the dependence channel, dispersion should have widened mainly among

the non-capital regions, whose dependence varies from 2.3 to 4.8 per cent of GDP. Instead, most of the aggregate divergence reflects the capital pulling away from everyone else. Budapest's renewed lead is at least in part the mirror image of the mechanisms the regional literature associates with metropolitan resilience in downturns – sectoral composition, human capital and the location of high-margin services – which the freeze may have amplified but did not create. Read together, these three considerations define the register of the paper's claim: the observed pattern is consistent with the dependence mechanism as one contributing channel, is not explained by it alone, and cannot, with these data, be causally attributed to it.

The May 2026 agreement and post-2027 implications

The conditional unfreezing pathway

The April 2026 change of Hungarian government and the May 2026 political agreement with the European Commission opened a conditional unfreezing pathway, subject to completion of the twenty-seven super-milestones by 31 August 2026, with the Council approving the modified Hungarian plan on 10 July 2026 (Council of the European Union, 2026). Two features are relevant here. First, because the operational programmes allocate a disproportionate share of resources to the high-dependence regions, a resumed flow of funds would be spatially corrective in its programmed design; whether it is corrective in fact depends on implementation systems whose capacity has itself been eroded by four years of interruption. Second, the compressed timeline biases disbursement towards administratively simple, quickly absorbing projects, which are not necessarily those with the greatest developmental payoff in the peripheral regions. The accumulated 2022–2024 widening of disparities documented above is in any case a stock that a resumed flow does not automatically reverse.

Implications for post-2027 Cohesion Policy design

The findings support three design implications, each stated so as to respect the purpose of the conditionality instruments rather than to argue against them. The first concerns territorial impact assessment. The rationale of the financial conditionality toolkit is to protect the Union budget and the rule of law, and nothing in this paper disputes it. What the Hungarian episode shows is that the instrument's incidence is territorially asymmetric: a sanction aimed at a national government falls hardest on the sub-national territories most dependent on the sanctioned funds, which are typically also the poorest. A post-2027 framework could retain the full disciplinary force of conditionality while making its territori-

al incidence visible – for example, through a mandatory territorial impact assessment when suspension measures are prepared, analogous to the proportionality assessment the Conditionality Regulation already requires, and through monitoring of affected regions for the duration of any suspension.

The second concerns the protection of final beneficiaries. The Conditionality Regulation already obliges the member state concerned to continue payments to final recipients; the Hungarian experience of partial national pre-financing shows both that this obligation has real content and that its fulfilment is fiscally fragile where the suspension is large and prolonged. A post-2027 design could strengthen this layer – for instance by allowing direct or indirect payment channels to sub-national beneficiaries in protracted suspension episodes – so that the disciplinary pressure on the central government is preserved while the pass-through to the most dependent territories is dampened. The third concerns information. The regionalisation of disbursement data remains partial and slow; the under-provision concept defined in the "Conceptualising territorial fault lines" subsection could be measured routinely if commitments and payments were published at NUTS-2 level with short lags. A post-2027 transparency requirement of this kind would cost little and would allow episodes like the Hungarian freeze to be evaluated on evidence rather than reconstruction.

For Hungary specifically, the analysis supports a post-2027 territorial recovery emphasis on the high-dependence regions – Dél-Dunántúl, Észak-Magyarország and the parts of the Alföld outside the Debrecen investment pole – whose relative positions deteriorated during the freeze and whose access to the resumed flows depends on implementation capacity that the impasse years have weakened.

Conclusion

This paper has described how regional disparities among Hungary's eight NUTS-2 regions evolved before and during the 2022–2026 EU-funding impasse, using Eurostat regional accounts through 2024. The pre-shock period 2014–2019 shows weak and statistically insignificant beta convergence and a modest decline in dispersion up to 2018, concentrated among the non-capital regions. During the freeze window 2022–2024 the cross-regional dispersion of per capita GDP rose in every year to its 2014–2024 maximum, the beta coefficient turned positive and marginally significant, and the Budapest region's lead over the rest of the country widened appreciably; a Chow test on the pooled growth panel is suggestive of, but does not formally establish, a structural break. The widening is robust to merging Budapest with Pest and to population weighting, and the Visegrad benchmark shows it to be country-specific: Hungary was the

only V4 member state whose within-country dispersion rose appreciably over 2021–2024. The investment record, by contrast, is heterogeneous: alongside an investment collapse in Észak-Magyarország, the eastern Alföld regions expanded their investment shares on private manufacturing inflows, so the output divergence is not the mirror image of a uniform investment divergence along dependence lines. The association between ex ante EU-fund dependence and relative-position loss over the freeze window is negative and moderately sized but imprecisely estimated, and the most fund-dependent region moved against the pattern on the strength of an exceptional private investment inflow.

These are descriptive findings, and the conclusion states them with the corresponding caution. The analysis is partial: it omits, by necessity, the other shocks of the polycrisis period – pandemic recovery dynamics, the energy crisis, monetary tightening, global industrial relocation – any of which may account for part of the observed pattern, and it cannot resolve the endogeneity between fund dependence and general economic vulnerability. What the evidence does support is narrower: the funding freeze coincided with, and through the asymmetric exposure of fund-dependent regions plausibly contributed to, a measurable widening of Hungary's territorial disparities, concentrated in the divide between the capital and the high-dependence peripheries.

A final point of precision concerns institutions. Hungary has no regional-level self-governing institutions responsible for Cohesion Policy, so what the impasse altered was not a tier of regional government but the implementation infrastructure through which EU funds reach the territories – the project pipelines of county and municipal beneficiaries, the co-financing positions of local actors, the staffing of intermediate bodies, and the continuity of planning in the managing authorities' territorial programmes. It is this infrastructure, weakened by four years of interruption, that the post-2026 resumption and the post-2027 framework will inherit. The Hungarian episode is, in this sense, a diagnostic case of the territorial incidence of EU financial conditionality, and the post-2027 Multiannual Financial Framework will determine whether that incidence becomes a recurring structural feature of the Union's funding architecture or an exception that its design learns from.

Endnotes

1. English equivalents: Közép-Dunántúl – Central Transdanubia; Nyugat-Dunántúl – Western Transdanubia; Dél-Dunántúl – Southern Transdanubia; Észak-Magyarország – Northern Hungary; Észak-Alföld – Northern Alföld; Dél-Alföld – Southern Alföld.
2. Eurostat. Gross domestic product (GDP) at current market prices by NUTS 2 region (nama_10r_2gdp). Data downloaded: 10 February 2026. https://doi.org/10.2908/NAMA_10R_2GDP

3. European Commission. Cohesion Open Data Platform (regionalised 2014–2020 Cohesion Policy commitments). Checked: 8 November 2026. https://cohesiondata.ec.europa.eu
4. European Commission. Ninth Report on Economic, Social and Territorial Cohesion (2024). Checked: 8 November 2026. https://ec.europa.eu/regional_policy/information-sources/cohesion-report_en
5. Eurostat. Gross fixed capital formation by NUTS 2 region (nama_10r_2gfcf). Checked: 8 November 2026; original download date not supplied. https://doi.org/10.2908/NAMA_10R_2GFCF
6. European Commission. Recovery and Resilience Facility Scoreboard: Country pages. Checked: 8 November 2026; original download date not supplied. https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/recovery-and-resilience-scoreboard_en

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Additional statements

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