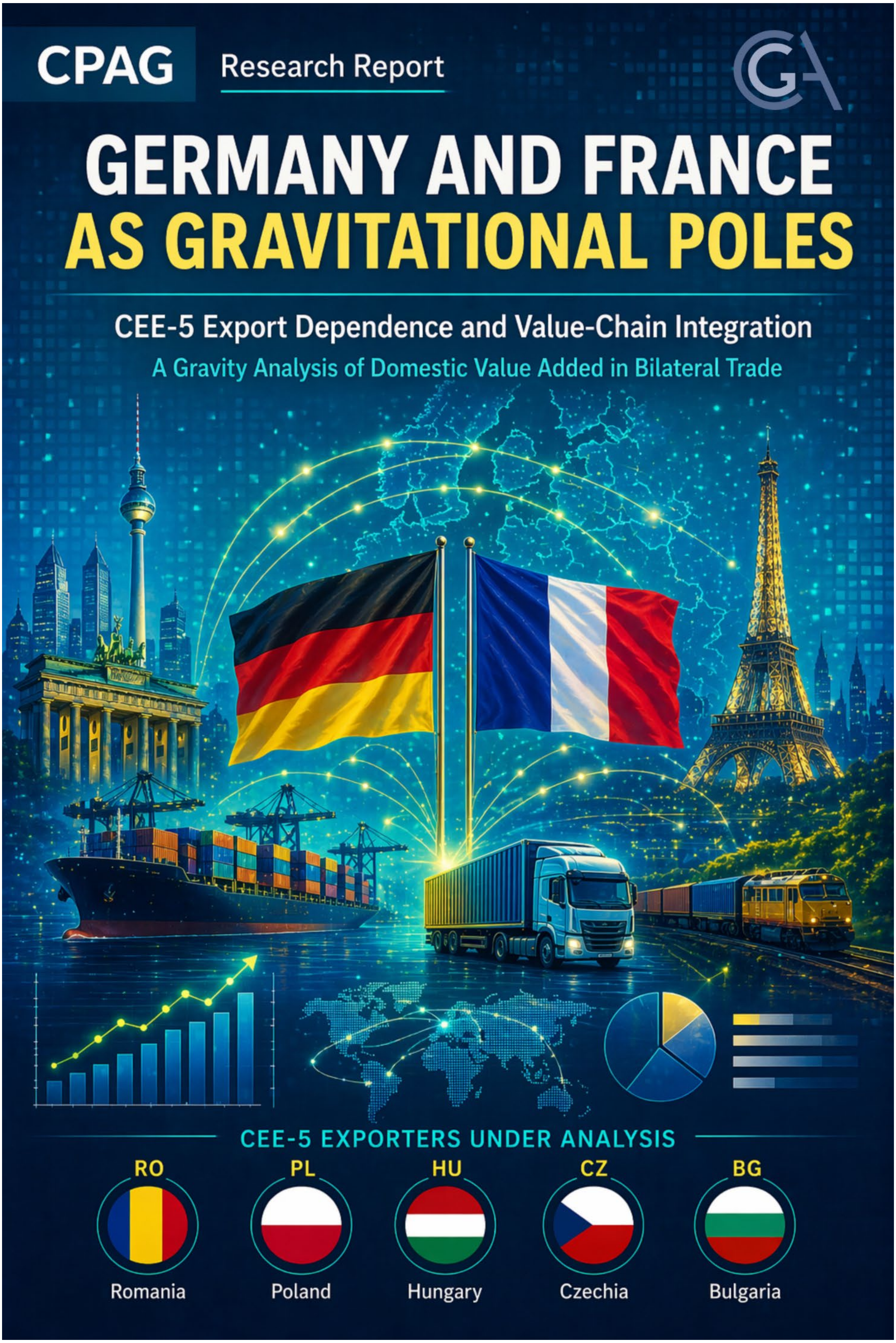
CPAG
Research Report
GERMANY AND FRANCE
AS GRAVITATIONAL POLES
CEE-5 Export Dependence and Value-Chain Integration
A Gravity Analysis of Domestic Value Added in Bilateral Trade
CEE-5 EXPORTERS UNDER ANALYSIS
RO
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GERMANY & FRANCE AS GRAVITATIONAL POLES

CEE-5 Export Dependence and Value-Chain Integration

Prepared by George Stefan, Lead Researcher CPAG

01 EXECUTIVE SUMMARY

Key findings and structural insights

This report examines how much economic value five Central and Eastern European countries — Romania, Poland, Hungary, Czechia, and Bulgaria — generate through their trade relationships with Germany and France. Using fourteen years of data (2010–2023) and formal statistical modelling, we find that productive capacity in CEE economies is the primary engine of trade growth toward both destinations, and that Germany plays a structurally more intensive role than France.

What This Report Measures

Standard trade statistics count goods crossing borders multiple times, overstating the genuine economic benefit. This report instead uses "domestic value added" (DVA) — the share of export revenues that actually stays in the exporting country as wages, profits, and tax. This is a more honest measure of how much each country benefits from its trade relationships.

Key Findings

- Every €1 billion of additional productive capacity in a CEE economy translates into roughly €0.79–1.68 billion of additional domestic value added shipped to Germany and France. This supply-led relationship is robust across all modelling approaches tested.
- The importer's own economic size (Germany's or France's GDP) matters less than conventional wisdom suggests once year-to-year common shocks are properly accounted for. Trade flows are driven more by CEE supply expansion than by Western European demand cycles.
- Germany's pull effect is structurally stronger: CEE economies generate three to five times more domestic value added in exports to Germany than to France. Romania and Bulgaria have grown fastest in both corridors over the period but remain smaller in absolute terms than Poland and Czechia.
- Geographic distance reduces trade by a factor of approximately 0.38–0.51 per cent for each additional percent of distance — but this effect is substantially cushioned by EU single-market integration. Sharing a land border with Germany (Poland, Czechia) provides an additional "trade premium" of roughly 46 per cent.
- **Policy implication:** improving export performance requires investment in productive capacity and supply-chain capability, not currency policy or demand-side stimulus. For Romania in particular, both corridors show the fastest growth rates in the CEE group, signalling a genuine structural upgrading of its export position.

€0.79–1.68	3–5×	+232%	2010–2023
Supply elasticity	Germany/France ratio	Romania growth	14-year period

Romania's Dual Advantage

Romania shows the fastest DVA growth to Germany (+232%) and France (+187%) among CEE-5 economies over 2010–2023. Bulgaria is close behind (+248% to Germany, +151% to France), signalling genuine structural upgrading of both economies' export positions despite starting from smaller bases.

Romania also stands out for retaining a larger domestic share of export value than its peers. Although the domestic value added share in gross exports has declined across all CEE-5 economies since the mid-1990s as supply-chain integration deepened, Romania's reduction has been far more limited — only 8.7 percentage points toward Germany and 3.2 percentage points toward France over 1995–2022 — indicating a more gradual integration into import-intensive European value chains.

02 INTRODUCTION

The Gravity Model and CEE Trade Integration

1.1 What This Report Measures

Romania, Poland, Hungary, Czechia, and Bulgaria have deepened their economic ties with Western Europe dramatically since EU accession. Germany in particular anchors a vast manufacturing network that stretches across Central and Eastern Europe — supplying components to German car and machinery factories is the single largest source of export income for several of these economies. France represents a second, less intensively integrated relationship with different trade composition and dynamics.

Understanding how much these relationships contribute to each economy requires looking beyond raw trade flows. When a Romanian car plant exports a gearbox to Germany, much of the steel, electronics, and tooling embedded in that gearbox was itself imported. The genuine Romanian contribution — the wages of the workers, the profits of the factory, the taxes paid — is the "domestic value added" (DVA). This report tracks DVA in CEE-5 bilateral exports to Germany and France from 2010 to 2023 based on the Eurostat – FIGARO database.

1.2 The Gravity Model: Core Logic and Literature Review

The intellectual origins of the gravity framework trace to Jan Tinbergen's 1962 monograph Shaping the World Economy, in which the model received its first systematic empirical application to bilateral trade flows. Drawing on an analogy with Newton's law of universal gravitation, Tinbergen proposed that the volume of trade between two countries is directly proportional to their economic masses — operationalised as gross domestic product — and inversely proportional to the geographic distance separating them.

The Gravity Model Concept

Just as Newton's law of gravity says that two objects attract each other more strongly when they are larger and closer together, the gravity model of trade says that two countries trade more when their economies are bigger and when they are geographically closer. This deceptively simple idea has been shown to fit trade data remarkably well across decades and dozens of country pairs. In this framework, bilateral DVA flows between an exporting country i and an importing country j depend on: the productive capacity of i (exporter GDP), the absorption capacity of j (importer GDP), and the costs of trading between them — measured here by geographic distance and whether they share a land border. The standard theoretical derivation (Anderson and van Wincoop 2003) implies that each country's trade is also influenced by its trade costs with all other partners, not just the bilateral partner — a concept called "multilateral resistance." We account for this through country and year fixed effects in the statistical models.

A key practical interpretation: when the model estimates an "elasticity" of, say, 0.88 for exporter GDP, this means that a 1 per cent increase in the exporting country's GDP is associated with a 0.88 per cent increase in the domestic value added it ships to Germany or France — holding everything else constant.

Estimated on a cross-section of country pairs, the specification fit the data with a precision that surprised contemporaries and established the gravity equation as one of the most robust empirical regularities in international economics. The model's weakness at that stage was entirely theoretical: Tinbergen offered no formal derivation from optimising behaviour, and critics noted that an equation borrowed from physics could not, by itself, constitute an economic explanation. It was this gap that animated the subsequent theoretical literature — Anderson (1979), Bergstrand (1985, 1989), and eventually Anderson and van Wincoop (2003) — which demonstrated that the gravity equation emerges necessarily from a wide class of trade models in which goods are differentiated by country of origin and consumers trade-off between varieties at a stable and predictable rate, transforming Tinbergen's empirical regularity into a structural result.

The present analysis stands in direct continuity with that tradition: the specifications estimated here are structural implementations of the gravity equation, with fixed effects absorbing the multilateral resistance terms that Tinbergen's original cross-section left uncontrolled.

Literature Review on CEE Trade Integration

Since the wave of EU enlargements in 2004 and 2007, a substantial empirical literature has applied gravity frameworks to quantify the trade integration of Central and Eastern European economies with Western Europe. Bussiere, Fidrmuc, and Schnatz (2008) use an enhanced gravity model to benchmark the actual trade links of CEE economies against predicted "normal" levels, finding that trade integration between most of the largest CEE accession countries and the euro area was already relatively well advanced by the mid-2000s, while South-Eastern European countries retained significant untapped potential (Bussiere et al., 2008).

The specification concerns that arose in that generation of studies — notably the omission of multilateral resistance terms — were addressed structurally by Spornberger (2022), who applies a three-way fixed-effects PPML estimator to bilateral manufactured goods trade over 1995–2014. Spornberger (2022) estimates that trade shares between EU-15 countries and the newly acceded Central and Eastern European countries increased by approximately 40 per cent as a result of EU integration effects — a finding that is robust to the inclusion of pair fixed effects and accounts for the already-existing level of integration at the start of the data period.

In a related contribution directly relevant to the CEE-5 economies studied here, Chen and Novy (2022) develop a flexible gravity framework with heterogeneous trade cost elasticities and show that trade cost effects are significantly stronger for thinner bilateral relationships — precisely the configuration that characterises Bulgaria's and Romania's trade with Germany and France relative to the denser Visegrad corridor.

Focusing on the four CEE countries that are of direct relevance to the present study, Caporale et al. (2009) estimate the bilateral trade effects of Europe Agreements between the EU-15 and the CEEC-4 (Bulgaria, Hungary, Poland, and Romania) using a fixed-effects vector decomposition approach, finding a positive and significant impact of preferential trade arrangements on bilateral flows — consistent with the hypothesis that institutional integration, not merely geographic proximity, drives trade patterns in this region.

At the methodological level, Lypko (2022) demonstrates in a gravity analysis of CEE trade that GDP and distance remain the dominant determinants of bilateral trade flows in Central and Eastern Europe, and that a higher share of value-added exports significantly increases bilateral trade intensity between pairs within the region. The use of domestic value added (DVA) rather than gross bilateral trade flows as the object of analysis follows directly from the input-output decomposition literature initiated by Hummels, Ishii, and Yi (2001) and formalised by Koopman, Wang, and Wei (2014), who propose a unified accounting framework that decomposes a country's gross exports into value-added components by source and additional double-counted terms, bridging official trade statistics and national accounts.

Johnson and Noguera (2012) operationalise bilateral value-added trade using global input-output tables and show that the ratio of value-added to gross exports varies substantially across country pairs — systematically lower in supply-chain-intensive relationships, precisely because imported intermediates form a large share of exported output in those cases. More recent evidence from the European Commission based on the FIGARO database confirms that total GVC integration in the EU rose from approximately 50 per cent of gross exports in 2010 to 54 per cent by 2022–2023, driven largely by services and backward participation — that is, by increasing reliance on imported inputs to produce goods for export (European Commission, 2025).

For CEE economies in particular, the ECB's Occasional Paper from 2017 on GVC integration documents that the main channel for technology transfer in the CEE region is the import of intermediate inputs from parent economies, most of which are located in the euro area, and that the global income elasticity of trade has declined since the Great Recession from approximately twice the GDP growth rate to near unity since 2012 (ECB, 2017). Against this background, DVA is the appropriate metric for gauging how much of the economic gains from export relationships accrues domestically.

Another block of literature relevant for our study analyse the CEE integration into German supply chains. The German supply-chain anchor identified in this study has been documented at the sectoral level in the automotive industry, which accounts for a disproportionate share of CEE–Germany bilateral value flows. Analysing Czechia and Hungary specifically, Gaspar et al. (2023) traces direct backward linkages in automotive production and finds a gradual transfer of productive capacities to the CEE region alongside increasing interconnectedness within regional value chains — with German value added and local CEE value added both rising simultaneously as suppliers integrated more deeply into the network. Further, an Eurostat's own FIGARO-based analysis of the EU automotive sector corroborates this at the aggregate level: in 2023, Germany and Poland recorded the largest numbers of jobs in the EU automotive industry driven by foreign final use, with 274,000 and 109,000 persons respectively, reflecting the depth of supply-chain interdependence between the two economies (Eurostat, 2025).

Romania has received comparatively less gravity-model attention than the Visegrád economies, but several recent studies establish a useful benchmark against which the present results can be interpreted. Davidescu et al. (2022) estimate a panel gravity model of Romanian exports over 2008–2019 and find that exports are significantly influenced by the demand of major EU trading partners — Germany, Italy, France, and Hungary among the most important — and that the pandemic year 2020 produced a sharp V-shaped contraction and recovery in a uniform-shock scenario.

A complementary study on Romania's bilateral trade determinants — employing GLS estimation with a broader set of institutional covariates — finds that improved governance quality and corruption control within Romania, alongside the economic size and institutional strength of partner countries, are significant additional drivers of bilateral trade performance beyond the standard gravity variables (Hu, 2025).

All these institutional channels complete the supply-capacity mechanism identified in the present analysis: productive capacity accumulation that is accompanied by institutional improvement generates compounded gains in bilateral DVA flows. Our study extends this Romania-specific literature by shifting the focus from gross bilateral trade flows to value-added content and by situating Romania explicitly within a comparative CEE-5 framework, allowing direct benchmarking of its export position against peer economies at different stages of supply-chain integration.

1.3 Data

The dataset covers ten bilateral trade relationships (five CEE exporters × two destinations) across fourteen years, giving 140 data points. Value-added trade data come from Eurostat's FIGARO database — a specialised input-output framework that decomposes bilateral trade flows into domestic and foreign content. GDP figures come directly from Eurostat's national accounts (retrieved March 2026). Distances are standard capital-to-capital great-circle distances.

Table 1: Descriptive statistics of the selected sample (2010-2023)

Variable	Average	Std. dev.	Smallest	Largest	Pairs
Value added in exports (€ thousand)	7,702	8,490	386	45,103	140
GDP of exporting country (€ million)	214,266	159,720	38,289	751,931	140
GDP of importing country (€ million)	2,792,171	610,512	1,996,075	4,219,310	140
Distance between capitals (km)	1,074	598	280	2,053	140
Shared border (yes=1, no=0)	0.20	—	0	1	140

Source: Eurostat FIGARO; Eurostat nama_10_gdp

The DVA averages conceal enormous variation: Poland's average annual DVA in exports to Germany (€28 billion) is thirty times larger than Bulgaria's (€0.9 billion). This cross-country variation is a core input to the statistical estimation.

03 ECONOMIC ANALYSIS

Trade patterns and estimation results

2.1 Trade Flows Over Time

Figure 1 traces DVA flows to Germany and France from each of the five countries over the full period. Several patterns are immediately apparent.

- Poland is the largest contributor in both corridors during the period 2010-2023.

- Romania and Bulgaria show the fastest growth, particularly toward Germany: Romania's domestic value added to Germany grew by 232 per cent over the period (from €3.2 billion to €10.6 billion), while Bulgaria's grew by 248 per cent.
- The 2020 pandemic caused a visible dip across all series, followed by an uneven recovery among countries.

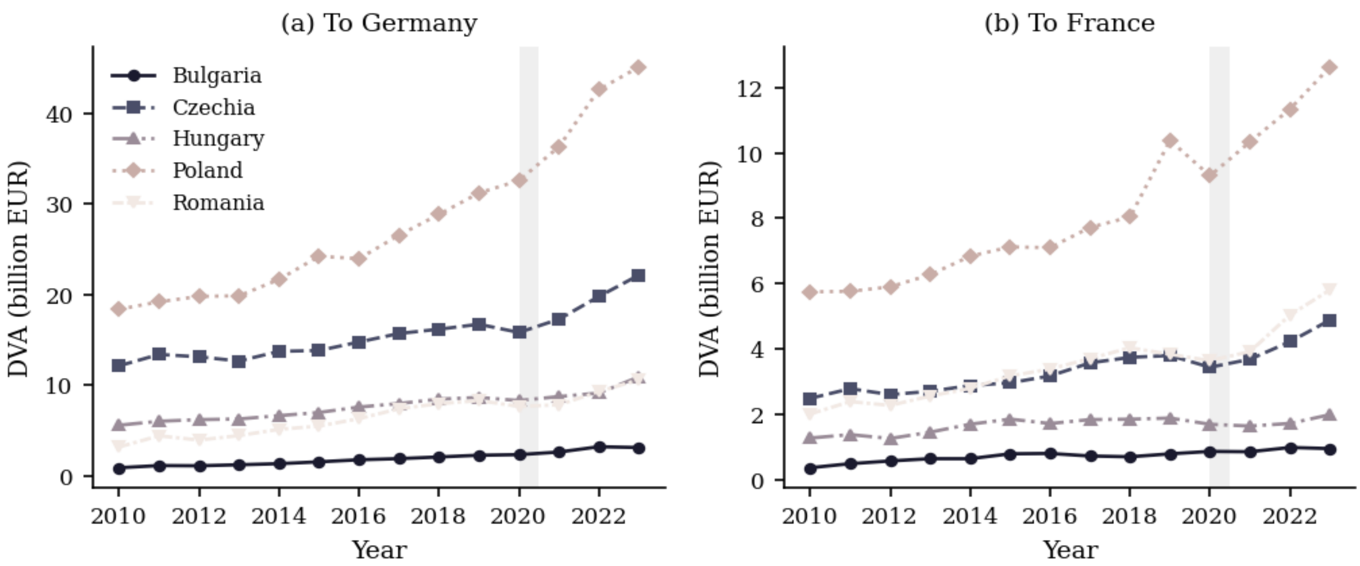

Figure 1. Domestic value added in CEE-5 exports to Germany (left) and France (right), 2010–2023, in billion EUR. The shaded band marks the 2020 pandemic year. Source: Eurostat FIGARO; CPAG calculations.

Figure 2 shows how the five countries' contributions stack up in selected years. Germany's total DVA intake from CEE-5 countries is roughly 3.5 times larger than France's, reflecting the deeper supply-chain integration between Central Europe and German manufacturing.

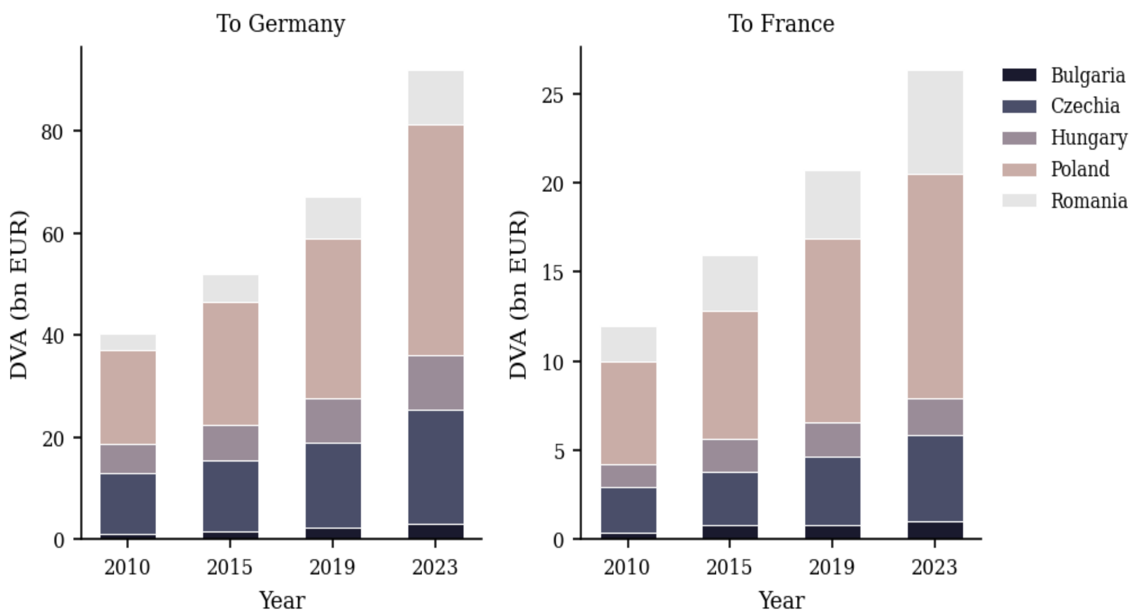

Figure 2. Composition of CEE-5 domestic value added in exports to Germany and France, selected years (billion EUR). Source: Eurostat FIGARO; CPAG calculations.

Figure 3 shows a scatter plot of the raw relationship between each country's GDP and its DVA exports. The upward slope in both panels confirms the basic gravity prediction: richer, larger economies produce more value added for export.

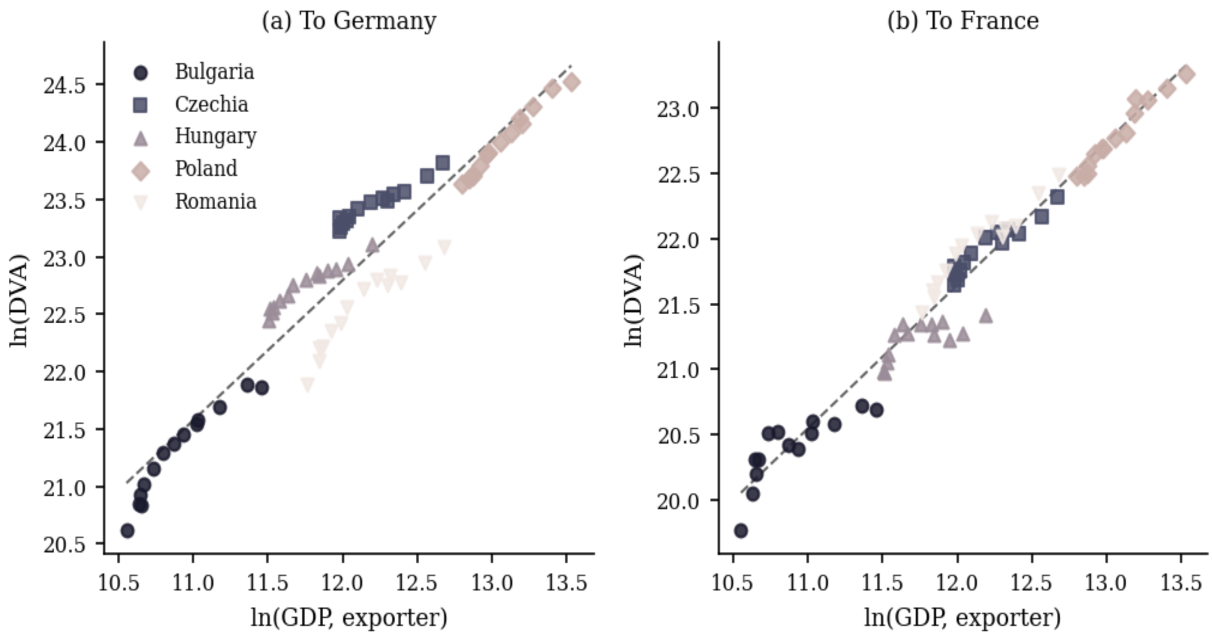

Figure 3. Domestic value added in exports versus exporter GDP, by destination corridor. Each dot is one country-year observation. The dashed line shows the statistical fit. Source: Eurostat FIGARO; CPAG calculations.

Figure 4 shows the ratio of each country's DVA to Germany versus its DVA to France. Czechia and Hungary are the most Germany-concentrated (5× more value added goes to Germany than France); Romania and Bulgaria have a more balanced profile, with Germany attracting roughly 1.6–3 times as much.

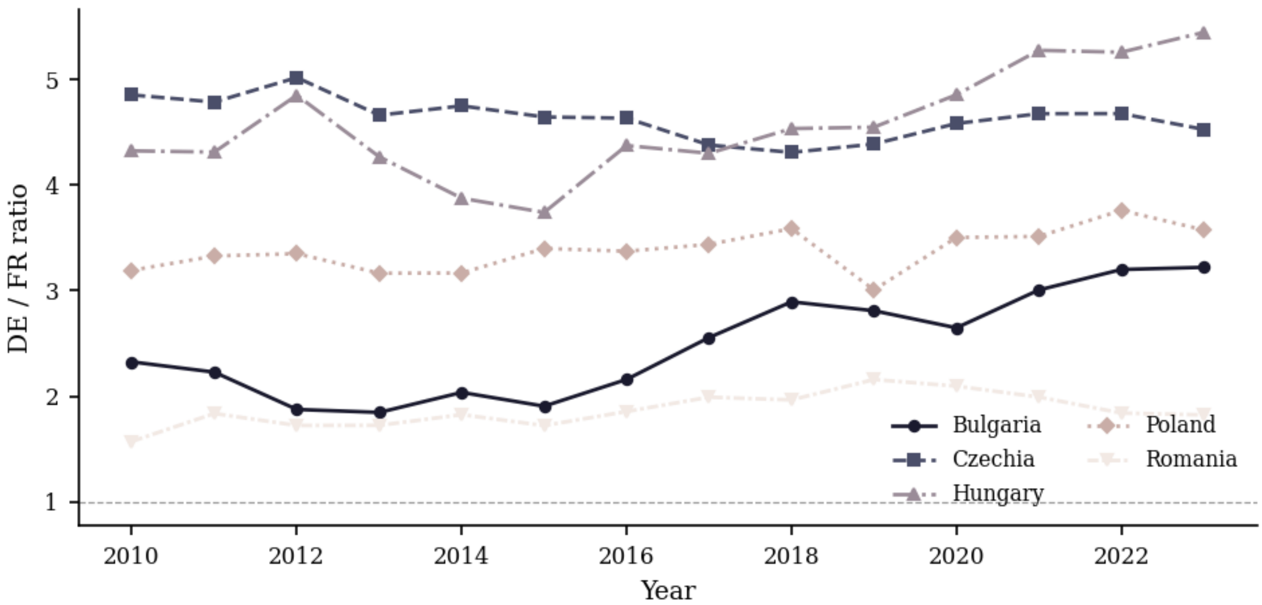

Figure 4. Germany-to-France DVA ratio by country, 2010–2023. A value of 3 means three times more domestic value-added flows to Germany than to France. Source: Eurostat FIGARO; CPAG calculations.

The share of domestic value added in gross CEE-5 exports to Germany and France has declined persistently since the mid-1990s, reflecting deepening backward integration into European global value chains and a rising share of imported intermediate inputs in exported output. Figure 5 traces these DVA shares over 1995–2022. The decline is universal but highly differentiated in magnitude.

- Hungary exhibits the most pronounced integration: its DVA share in exports to Germany fell from 71.5 per cent in 1995 to 46.6 per cent in 2022 — a reduction of nearly 25 percentage points — while its DVA share in exports to France dropped from 73.7 to 50.8 per cent.
- Czechia followed a similar trajectory, losing 18 and 21 percentage points toward Germany and France respectively, with the steepest descent concentrated in the pre-2008 period coinciding with the rapid scaling of German automotive supply chains into Bohemia.
- Bulgaria recorded the sharpest absolute declines in the early phase (1995–2007), reflecting post-transition absorption into regional production networks, though a partial recovery in the DVA share after the Global Financial Crisis suggests that its integration deepened less linearly than that of the Visegrad economies.
- Poland's decline has been moderate and remarkably symmetric across the two corridors — approximately 19–20 percentage points lost toward both Germany and France — consistent with a diversified export structure that spreads GVC exposure rather than concentrating it in a single destination.
- **Romania is the clear outlier.** Its DVA share in exports to Germany declined by only 8.7 percentage points over the full period (from 77.8 to 69.1 per cent), and by a mere 3.2 percentage points toward France — trajectories that are two to six times shallower than those of its peers. This relative stability does not reflect insulation from GVC integration; rather, it is consistent with Romania's later and more gradual supply-chain entry, the composition of its export basket — which could retain a larger share of labour-intensive processing with lower intermediate import intensity. However, Romania's DVA share has been declining continuously since 2007, suggesting that GVC deepening is ongoing and that the gap with peer economies may narrow further.

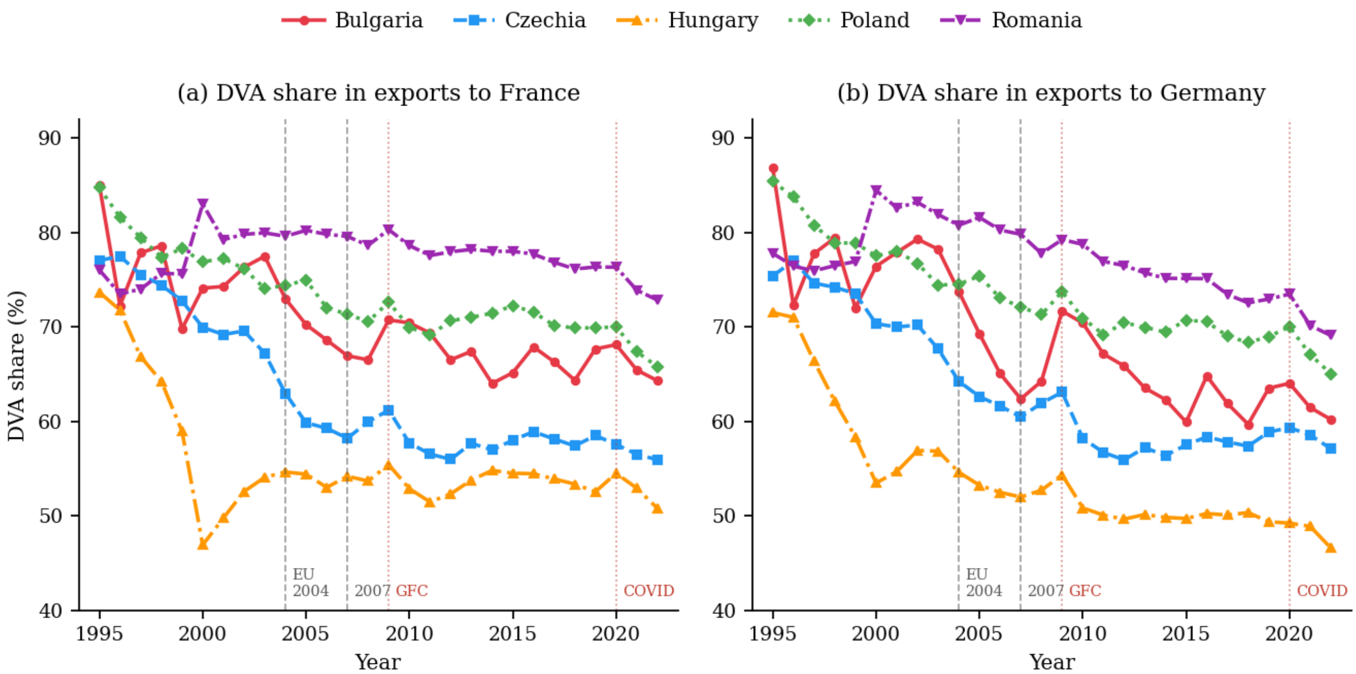

Figure 5. Share of DVA in Gross Exports to France and Germany (1995-2022)
Source: Eurostat FIGARO; CPAG calculations.

2.2 Statistical Results and Key Elasticities

Five different modelling approaches (specifications) were tested to check whether the patterns in the data hold up under different statistical assumptions.

How to read this table

Each row shows what one statistical model found. “Supply elasticity” = how much DVA increases when the exporting country’s GDP grows by 1%. “Demand elasticity” = same for the importing country's GDP. Stars (*** / ** / *) indicate statistical confidence: *** means we are more than 99% confident the effect is real. “Absorbed” means the model design prevents us from measuring that variable separately — its effect is captured in the country-specific constants.

Table 2: Summary of statistical results across five model specifications.

Specification	Supply elasticity (exporter GDP)	Demand elasticity (importer GDP)	Distance effect	Notes
Spec. 1 — Pooled OLS (baseline)	+0.88 *** (0.024)	+1.58 *** (0.095)	−0.51 *** (0.078)	R^2 = 0.93. Benchmark. No controls for pair-specific factors.
Spec. 2 — Country & Year effects	+1.62 *** (0.608)	+1.23 (0.923)	absorbed	R^2 = 0.97. Controls for all country-specific factors. Distance absorbed.
Spec. 3 — Within-pair (strictest test)	+1.62 *** (0.436)	+1.23 * (0.726)	absorbed	Within-R^2 = 0.91. Based on deviations of each year from each country pair's 14-year average — exploiting within-pair temporal variation.
Spec. 4 — PPML (preferred estimator)	+0.79 *** (0.023)	+1.22 *** (0.094)	−0.38 *** (0.069)	Pseudo-R^2 = 0.95. Corrects for statistical irregularities in trade data. Preferred.
Spec. 6 — Corridor split (Germany vs. France)	Germany: +1.68 *** France: +1.57 ***	Both corridors: not significant	absorbed	R^2 = 0.97. Tests whether Germany and France operate differently. Wald F=11.0, p=0.004.

Source: Eurostat FIGARO and nama_10_gdp; own calculations. Standard errors in parentheses. Specification 5, estimated separately per corridor with year fixed effects, was found to be structurally invalid due to perfect collinearity between importer GDP and year dummies; it is documented in the companion Methodology document.

The single most consistent result across all five specifications is the supply elasticity: **every 1 per cent increase in a CEE country’s GDP is associated with a 0.79–1.68 per cent increase in domestic value added shipped to Germany and France.** This finding is robust to every modelling variation tested.

The demand elasticity (importer GDP) is large and significant in the baseline and PPML models (1.22–1.58), which use variation across both years and country pairs simultaneously. When the model controls for year-by-year common shocks — isolating only the within-country-pair variation — the demand effect becomes statistically undetectable. This suggests that what looks like a ”demand-pull” effect in simple models is actually driven by common business-cycle movements that affect all pairs at the same time, rather than by Germany’s or France’s specific GDP.

However, a closer reading of the estimation results across specifications reveals an apparent paradox that deserves explicit attention. In Specification 4 (PPML), the preferred estimator on statistical grounds, the demand elasticity (importer GDP: +1.22) exceeds the supply elasticity (exporter GDP: +0.79). We may interpret this as evidence that Western European demand — Germany's or France's purchasing power — is the dominant driver of CEE value-added exports, contradicting the supply-led narrative advanced throughout this report. This apparent paradox dissolves once the identification strategy of each specification is carefully considered. Specifications 1 and 4, which pool all variation simultaneously across country pairs and years, cannot separate two distinct sources of variation: the structural size difference between Germany and France as importers (Germany's GDP is roughly 50 per cent larger than France's throughout the sample period and it absorbs correspondingly more CEE exports), and the genuine year-to-year demand fluctuations driven by each importer's business cycle.

The demand elasticity estimated in these pooled specifications is therefore partly a reflection of Germany simply being a larger economy than France — a cross-sectional size effect — rather than a dynamic causal mechanism. Once Specifications 2, 3, and 6 introduce country or pair fixed effects that hold the identity of each importer constant, the demand elasticity collapses to 1.23, while the supply elasticity remains large, stable, and significant throughout. This pattern — demand appearing important in the pooled view and disappearing in the within-country view — is the classical signature of omitted cross-sectional heterogeneity, not genuine demand-pull causation. The appropriate interpretation is therefore that Specifications 1 and 4 are best suited for recovering the trade-cost parameters (distance, contiguity), where their use of cross-sectional variation is an advantage, while the fixed-effects and interaction specifications (2, 3, and 6) provide the cleanest identification of the supply versus demand channel. **Taken together, the five specifications tell a coherent story. The productive capacity in CEE economies is the stable, robust driver of bilateral domestic value-added flows toward both Germany and France, and the demand channel, while visible in simpler models, does not survive the controls that properly account for the structural size asymmetry between the two destination economies.**

2.3 Germany versus France: Corridor Differences

The corridor-comparison model (Specification 6) tests formally whether Germany and France operate as different kinds of trade relationships. The answer is yes, but only modestly: Germany shows a slightly higher supply elasticity (1.68) than France (1.57), and the supply elasticity difference is statistically significant at the 0.1 per cent level ($p = 0.001$). The importer demand effect is statistically indistinguishable from zero in both corridors.

The data do not support a sharp Germany = supply-chain / France = demand-pull distinction. Both relationships are primarily supply-driven. Germany's edge reflects the greater density and contractual intensity of its CEE supply-chain network, not a fundamentally different trade mechanism.

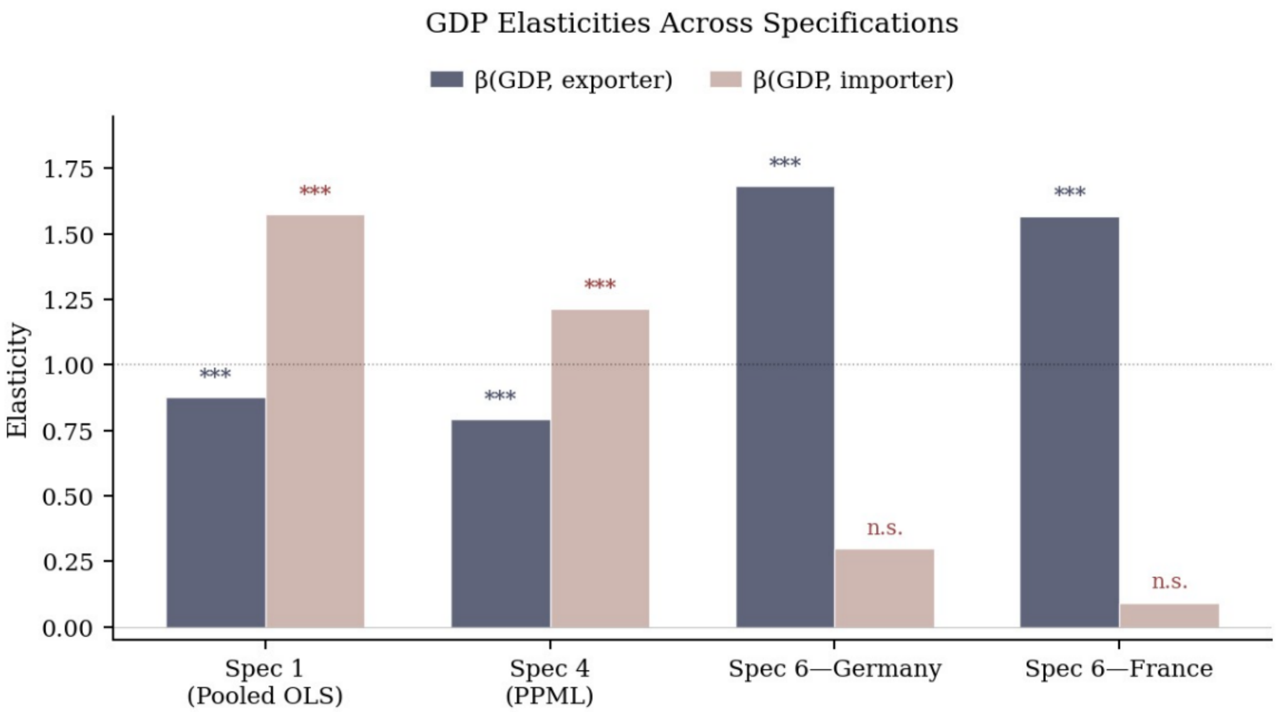

Figure 6. Supply and demand elasticities across all specifications. Taller bars mean a stronger response to GDP growth. Stars show statistical confidence. Spec. 6 bars show derived corridor values. Source: own calculations.

Germany vs France: Trade Characteristics

Germany shows a slightly higher supply elasticity (1.68 vs 1.57), and CEE economies direct 3–5× more domestic value added to Germany than France. This asymmetry reflects: (1) geographic proximity and shared borders with Poland and Czechia, (2) deeper manufacturing value-chain integration in automotive and machinery, and (3) historical trade relationships predating EU enlargement.

Table 3: Domestic Value Added in CEE-5 Exports: Selected Years (€ billions)

Country	Value added to Germany (€ billion)			Value added to France (€ billion)			Germany/France ratio		Growth to Germany	Growth to France
	2010	2019	2023	2010	2019	2023	2010	2023	2010–2023	2010–2023
Bulgaria	0.90	2.28	3.13	0.39	0.81	0.97	2.3×	3.2×	+248%	+151%
Czechia	12.15	16.73	22.15	2.50	3.81	4.89	4.9×	4.5×	+82%	+96%
Hungary	5.59	8.65	10.92	1.29	1.90	2.01	4.3×	5.4×	+95%	+55%
Poland	18.38	31.21	45.10	5.76	10.38	12.62	3.2×	3.6×	+145%	+119%
Romania	3.19	8.31	10.61	2.03	3.85	5.81	1.6×	1.8×	+232%	+187%

Source: Eurostat FIGARO; CPAG calculations

04 KEY FINDINGS

Policy implications for CEE economies

3.1 CEE Export Growth is Supply-Led, Not Demand-Pulled

The dominant driver of domestic value added in CEE exports is the productive capacity of the exporting economy itself. When Romania, Poland, or Czechia expands its industrial base — through investment, FDI absorption, or labour market development — bilateral DVA flows increase proportionally. Changes in German or French GDP, while relevant in the raw data, lose their explanatory power once common economic shocks are properly separated from country-pair-specific dynamics.

3.2 Germany Anchors a Denser Supply-Chain Network

The Germany corridor consistently shows a slightly higher supply elasticity than France, and CEE economies direct between 1.6 and 5 times more domestic value added to Germany than to France. This asymmetry is most pronounced for Czechia and Hungary (both deeply integrated into German automotive supply chains) and least pronounced for Romania and Bulgaria (which have more diversified export profiles).

3.3 Romania's Performance Stands Out

Romania shows the fastest percentage growth among CEE-5 economies in the German corridor (+232%) and the second fastest in the French corridor (+187%), starting from a relatively low base. This trajectory reflects an upgrading of Romania's export position within European value chains over the measurement period — a structural shift rather than a cyclical fluctuation.

> **Romania's Growth Story**
>
> Romania's +232% DVA growth to Germany and +187% to France (2010–2023) is fastest among CEE-5 economies. Bulgaria is close behind (+248% to Germany). Both economies show genuine structural upgrading of export positions, though starting from smaller absolute bases than Poland and Czechia. This signals successful capacity-building and FDI absorption.

3.4 Policy Implications

For policymakers in CEE economies, the supply-dominance finding points clearly toward investment in productive capacity, skills, infrastructure, and supply-chain integration as the primary levers for raising DVA exports. Exchange rate policy, demand-side subsidies, and bilateral trade promotion campaigns address secondary channels. Diversification toward France and other non-German markets is a valid strategic objective but requires supply-chain development — building the products and capabilities that French buyers seek, for example — rather than merely demand-side market access negotiations.

05 APPENDIX

Data and methodology notes

Value-added trade data are from Eurostat FIGARO (dataset naio_10_fgdm, total NACE economic activities), but also OECD. GDP figures are from Eurostat national accounts (nama_10_gdp, indicator B1GQ — GDP at market prices, current prices in million EUR), retrieved directly from Eurostat on March 2026. All values are in nominal euros; no price deflation is applied, which is consistent with the theoretical gravity framework. Distance data follows CEPII GeoDist conventions (great-circle distances between capital cities).

Five statistical specifications were estimated: pooled OLS (baseline), three-way fixed effects (country and year), bilateral pair fixed effects with year controls, Poisson pseudo-maximum likelihood or PPML (the statistically preferred estimator given heteroscedasticity in the data), and a pooled interaction model to test corridor differences. All standard errors are robust to data irregularities. Full technical details including diagnostic tests, unit root analysis, and model equations are in the companion Methodology document.

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