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BEYOND DECLINE:

GLOBAL VALUE CHAIN DEPENDENCE AND
THE POPULIST BACKLASH IN EUROPEAN REGIONS

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Abstract

Does the political response to globalisation depend on how regions are integrated into global production networks? We combine regional input-output measures of global value-chain exposure with lower-house election outcomes for 249 NUTS-2 regions in 24 European countries over 2000–2010. We distinguish seller-side exposure to foreign final demand (FPEX) from buyer-side exposure to foreign production (FPEM), and measure regions' average position relative to final demand. In two-way fixed-effects specifications, FPEX is positively associated with populist vote shares: a one-within-region-standard-deviation increase in FPEX (about 1.1 percentage points) is associated with an increase of roughly 3.5 percentage points in the populist vote share. When FPEX and FPEM are included jointly, FPEX remains positive and statistically significant, the buyer-side estimate is small and statistically not significant, and a formal test rejects equality of the two coefficients. The FPEX association is weaker in regions with higher average upstreamness and higher service-employment shares. The FPEX point estimate is larger in Central and Eastern Europe; a pooled interaction confirms a positive difference, although it is significant only at the 10 percent level under wild-cluster-bootstrap inference. Results are qualitatively similar under an alternative, narrower authoritarian-populist classification and are not reproduced for green-party voting. The findings highlight a politically relevant distinction within the architecture of international integration: dependence on foreign final demand is more consistently associated with populist voting than total buyer-side dependence on foreign production.

JEL Class.: F14, F60, D72, P16.

Keywords: Global value chains, populism, political backlash, structural dependence, input-output analysis, regional economics.

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Beyond Decline: Global Value Chain Dependence and the Populist Backlash in European Regions *

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1 Introduction

The political consequences of globalisation are highly uneven across space. A large empirical literature shows that local exposure to international competition can have persistent effects on employment, wages, and electoral outcomes. Regions more exposed to import competition have experienced larger labour-market disruptions and, in several settings, greater support for nationalist, populist, and anti-establishment parties ([Autor et al., 2013](#), [2020](#); [Colantone and Stanig, 2018a,b](#); [Dippel et al., 2022](#)). The central insight is that the politics of globalisation cannot be inferred from aggregate national gains alone: exposure is spatially concentrated and politically consequential. Yet most existing evidence characterises international exposure through realised trade shocks or measures based on the volume and direction of trade. This leaves a more structural question: among regions integrated into international production, does the political response depend on the form that integration takes?

Similar degrees of openness can conceal different forms of external dependence. Consider two regions with comparable levels of international integration. Production in one may rely heavily on foreign inputs while ultimately serving domestic final demand; production in the other may rely more heavily on domestic production networks while being

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sustained by final demand abroad. Conventional trade measures do not fully reveal these distinctions because intermediate transactions can obscure both the ultimate source of demand and the full set of production requirements embodied in final expenditure. Global value-chain (GVC) accounting provides a natural way to separate them. It allows us to distinguish seller-side dependence on foreign final demand from buyer-side dependence on foreign production and, separately, to characterise the average distance of regional production from final use.

We focus in particular on seller-side dependence. When a substantial share of regional production is ultimately sustained by foreign final demand, regional output and income become more contingent on expenditure decisions originating outside the domestic economy. We use the term *market sovereignty* as shorthand for the extent to which the final demand sustaining regional production originates within, rather than outside, the national political jurisdiction. This concept does not imply that buyer-side dependence is economically innocuous, nor that foreign suppliers are necessarily easier to replace than foreign customers. Seller-side and buyer-side dependence instead expose regions to different sources of uncertainty and different margins of adjustment. Whether these distinctions are politically relevant is therefore an empirical question.

This perspective complements two established accounts of political discontent. The globalisation-backlash literature shows that realised trade shocks can generate political responses through labour-market disruption and economic insecurity. A related literature emphasises prospective insecurity: international production linkages can affect political preferences by making workers and places vulnerable to shocks that have not yet materialised (Scheve and Slaughter, 2004; Ballard-Rosa et al., 2021; Guiso et al., 2019, 2024). At the same time, the geography-of-discontent literature documents the political consequences of long-run regional decline, relative stagnation, and territorial disadvantage (Rodríguez-Pose, 2018; Iammarino et al., 2019; Dijkstra et al., 2020; Rodríguez-Pose et al., 2023). Recent work further shows that the political consequences of global market pressures depend on local industrial structures and place-based spillovers (Hee, 2026; Kim and Pelc, 2026; Betz et al., 2026). We connect these perspectives by examining a structural dimension of regional external dependence. Structural dependence may overlap with regional decline, but it is conceptually distinct from it: the architecture through which regional production is connected to foreign markets can matter even when current economic performance is not itself the object being measured.

We study this question using a panel of 249 NUTS-2 regions in 24 European countries

over 2000–2010. Our GVC measures are constructed from multiregional input-output tables using the shocks-based approach to exposure measurement developed by [Baldwin and Freeman \(2022\)](#), [Baldwin et al. \(2022, 2023\)](#), and extended to European regions by [Baldwin et al. \(2025\)](#). Foreign Production Exposure on the export side (FPEX) measures the share of regional production ultimately sustained by foreign final demand, tracing demand through direct and indirect production stages. Foreign Production Exposure on the import side (FPEM) measures the foreign share of the complete gross-production requirements associated with final demand. Upstreamness measures the average distance of regional production from final use. We combine these indicators with regional results from lower-house parliamentary elections and construct populist vote shares using the party classifications of [Van Kessel \(2015\)](#) and [Norris and Inglehart \(2019\)](#). Our baseline specification includes region and year fixed effects and regional controls, with standard errors clustered at the country level.

The estimates reveal a clear difference in the empirical patterns associated with seller-side and buyer-side exposure. FPEX is positive and statistically significant across the baseline specifications. A one-within-region-standard-deviation increase in FPEX – approximately 1.1 percentage points – is associated with an increase of about 3.5 percentage points in the populist vote share. When FPEX and FPEM are included jointly, FPEX remains positive and statistically significant, whereas the FPEM estimate is close to zero and statistically not significant; a formal test rejects equality of the two coefficients. Wild-cluster-bootstrap inference leaves the main FPEX result intact. The association with FPEX also varies with regional production structure. The interaction between FPEX and average upstreamness is negative, indicating a weaker FPEX association in regions whose production is, on average, further from final demand. The interaction between FPEX and the service-employment share is also negative. In the country-group analysis, the FPEX point estimate is larger in Central and Eastern European regions. A pooled interaction confirms a positive CEE–non-CEE difference, although the evidence is significant only at the 10 percent level under wild-cluster-bootstrap inference. The main results are qualitatively similar, though generally weaker, using the alternative, narrower authoritarian-populist classification of [Norris and Inglehart \(2019\)](#), and the same GVC variables do not systematically predict green-party vote shares in the comparison exercise.

The paper contributes to three literatures. First, it adds to research on the political consequences of international trade by distinguishing the extent of international exposure from its structural form. Existing work has shown that different trade shocks can have dif-

ferent political effects: [Dippel et al. \(2022\)](#), for example, find that import competition and export opportunities have opposite electoral consequences in Germany. Our distinction is different but complementary. We ask whether a region depends on foreign economies on the selling side, through the ultimate final demand sustaining its production, or on the buying side, through the foreign production required to satisfy final demand. These dimensions are not visible in the same way in conventional gross-trade statistics because GVC accounting follows both ultimate demand and higher-order production linkages.

Second, the paper contributes to the economic geography of political discontent. The existing literature has established that persistent regional decline and territorial disadvantage can have important political consequences. We introduce a complementary dimension of regional vulnerability associated with external economic dependence. The evidence does not establish that GVC dependence replaces decline as an explanation of populist voting, nor does the current design directly classify regions as declining or non-declining. Rather, it shows that a structural feature of regional international integration is systematically associated with political outcomes and can therefore complement accounts centred on regional economic performance.

Third, we connect quantitative GVC measures to a growing literature on the political consequences of production networks. Economic-geography research has long stressed that regions are embedded in global production networks through qualitatively different relationships with firms, suppliers, and markets ([Coe et al., 2008](#); [MacKinnon, 2012](#); [Smith et al., 2014](#)). More recent political-economy research shows that production-network position and local production linkages can shape political influence and the spatial transmission of global-market pressures ([Betz and Hummel, 2025](#); [Betz et al., 2026](#)). Our contribution is narrower and specific: to our knowledge, this is the first study to use regional seller- and buyer-side look-through exposure measures of the Baldwin type to examine populist voting in a multi-country regional panel.

We interpret the estimates with appropriate caution. Region fixed effects absorb persistent regional differences and year fixed effects absorb shocks common to all regions, but the design does not eliminate all time-varying regional confounding, rule out feedback from politics to economic outcomes, or establish the mechanisms through which GVC exposure may affect voting. The estimates should therefore be read as conditional within-region associations rather than fully identified causal effects. With this qualification, they indicate that distinguishing different forms of GVC dependence can add to our understanding of the regional political economy of globalisation.

The remainder of the paper is organised as follows. Section 2 relates our argument to the literatures on the globalisation backlash, the geography of political discontent, and global production networks. Section 3 describes the data and construction of the GVC indicators. Section 4 documents the geography and evolution of foreign exposure across European regions. Section 5 presents the empirical strategy and results. Section 6 concludes.

2 Related Literature

- **Globalisation, economic insecurity, and political backlash.** The proposition that international economic integration can generate political demands for protection has a long intellectual history. Polanyi (1944) described market expansion as generating a counter-movement through which societies seek protection from disruptive market forces. Rodrik (1997) recast this argument for modern globalisation by emphasising the tension between deeper external integration and the domestic institutions required to insure citizens against economic risk; he later framed this tension in terms of the compatibility of deep integration, national political autonomy, and mass democracy (Rodrik, 2011, 2018). Contemporary empirical research has shifted the emphasis from this broad theoretical tension to the specific economic shocks and local conditions through which international integration affects political behaviour.

A large empirical literature shows that trade exposure can have persistent local consequences. Autor et al. (2013) document substantial labour-market effects of rising Chinese import competition across US commuting zones, and Autor et al. (2020) link similar exposure to political polarisation. European evidence points in the same general direction. Colantone and Stanig (2018b) find that import competition increased support for nationalist and radical-right parties in Western Europe, while Colantone and Stanig (2018a) connect trade exposure to support for Brexit. Becker et al. (2017) document the local economic correlates of the Brexit vote. Dippel et al. (2022) show that trade exposure affected voting in Germany through labour-market adjustment, with import competition increasing and export opportunities reducing support for nationalist parties. Automation and technological displacement provide a parallel source of spatially concentrated economic change (Frey et al., 2018; Acemoglu and Restrepo, 2020). Scheiring et al. (2024) synthesise a broad quasi-experimental literature linking economic insecurity to populist outcomes.

How economic exposure becomes politically salient remains debated. Cultural-backlash accounts emphasise status, identity, and long-run value change (Inglehart and Norris, 2016; Norris and Inglehart, 2019), whereas political-economy approaches give greater weight to material risks, adjustment costs, and the institutions through which those risks are mediated (Rodrik, 2021; Walter, 2021; Broz et al., 2021). These explanations need not be mutually exclusive: economic change can alter status, identities, and political narratives, while cultural and institutional contexts condition how economic shocks are interpreted.

For our purposes, the distinction between realised losses and prospective insecurity is especially important. Scheve and Slaughter (2004) show that the globalisation of production can increase workers' perceptions of economic insecurity. Ballard-Rosa et al. (2021) similarly link local trade shocks to changes in authoritarian values, while Guiso et al. (2019) show that the political consequences of global shocks depend on institutional constraints on national adjustment. Guiso et al. (2024) further distinguish channels operating through political demand and electoral participation. This literature suggests that the relevant political object need not be a realised adverse shock alone. The structure that determines how exposed workers and places are to future external shocks may also be politically relevant. Our analysis asks whether seller-side and buyer-side GVC dependence capture distinct dimensions of that prospective vulnerability.

- **Place, regional decline, and the geography of political discontent.** Economic exposure is inherently spatial. Trade and technological shocks are concentrated in particular industries, and industries are unevenly distributed across places. The resulting political consequences therefore depend on local economic structures as well as on aggregate shocks. This insight connects the globalisation-backlash literature to a broader economic-geography literature on territorial inequality and political discontent. Rodríguez-Pose (2018) describes the rise of anti-establishment politics as the “revenge of the places that don’t matter”, emphasising regions that have experienced prolonged relative decline and loss of economic status. Iammarino et al. (2019) document widening regional inequalities across Europe and their policy implications, Dijkstra et al. (2020) map the geography of EU discontent, and McCann (2020) highlights the role of perceived regional inequality. Rodríguez-Pose et al. (2023) distinguish the political consequences of interpersonal inequality from those of place-based economic decline. Broz et al. (2021) likewise emphasise the geographic concentration of the globalisation backlash.

Recent research reinforces the importance of place while moving beyond a simple mapping from shocks to directly affected workers. [Hee \(2026\)](#) studies the spatial distribution of trade effects and populist voting. [Kim and Pelc \(2026\)](#) show that employment losses in industrial hubs generate stronger political reactions than comparable shocks elsewhere, pointing to local networks and regional identity as amplifying mechanisms. [Betz et al. \(2026\)](#) show that global market pressures can reshape local political representation and that effects can spread through local production clusters. These studies are particularly relevant because they show that the political consequences of globalisation are mediated by the economic structure of places, not solely by individual exposure.

Our paper builds on this place-based perspective but focuses on a different characteristic of regional economies. The geography-of-discontent literature is primarily concerned with adverse shocks, persistent disadvantage, and relative decline. We ask whether the architecture of international integration itself contains politically relevant information. A region can have high dependence on foreign final demand and high dependence on foreign production for very different reasons, and those dimensions can move differently over time. Structural dependence may correlate with regional development and decline, but the concepts are not identical. The current empirical design should therefore be read as introducing and documenting a distinct structural correlate of regional political outcomes, rather than as establishing that GVC dependence supersedes decline as an explanation.

• **Global value chains, production networks, and regional dependence.** Economic geography has long argued that globalisation should be understood through the networks connecting firms and places rather than through trade volumes alone. The global production network perspective emphasises the embeddedness of regional economies in multi-scalar systems of production and the heterogeneous territorial consequences of different forms of network integration ([Coe et al., 2008](#)). [MacKinnon \(2012\)](#) develops this argument through the concepts of coupling, recoupling, and decoupling between regions and global production networks. [Smith et al. \(2014\)](#) show how integration into international production networks can generate differentiated trajectories of regional industrial change and upgrading in Eastern Europe. Related work on global investment and regional development stresses that local outcomes depend on the nature of external linkages and regional capabilities, not simply on the presence of international integration ([Crescenzi and Iammarino, 2017](#); [Capello and Dellisanti, 2024](#)).

A parallel international-economics literature provides the accounting framework needed

to measure these relationships. The fragmentation of production across borders, formalised in early work by [Jones and Kierzkowski \(2001\)](#) and associated with the “slicing up” of the value chain described by [Krugman \(1995\)](#), implies that gross bilateral trade flows provide an incomplete account of production dependence. Value-added decompositions by [Johnson and Noguera \(2012\)](#), [Koopman et al. \(2014\)](#), and [Los et al. \(2016\)](#), together with subsequent measures of GVC participation and position ([Borin and Mancini, 2023](#); [Antràs, 2020](#)), make it possible to trace the origin and destination of production through multiple stages. The task-based approach of [Grossman and Rossi-Hansberg \(2008\)](#) provides a complementary theoretical account of production fragmentation.

The indicators used here are closest to the shocks-based approach developed by [Baldwin and Freeman \(2022\)](#) and [Baldwin et al. \(2022, 2023\)](#). The framework designs exposure measures around the economic shock of interest and traces that exposure through the full input-output network. It distinguishes the export or seller side from the import or buyer side and distinguishes directly observed exposure from dependencies operating through higher-order production linkages. FPEX attributes regional output to the location of ultimate final demand, whereas FPEM measures the foreign share of the complete gross-production requirements associated with final demand. Upstreamness captures a different property of the production structure: the average distance of production from final use ([Antràs et al., 2012](#); [Antràs, 2020](#)). [Imbs and Pauwels \(2025\)](#) provide a closely related approach to measuring higher-order foreign exposure.

Bringing these measures to the regional level has become possible through advances in multiregional input-output data. The EUREGIO database constructed by [Thissen et al. \(2018\)](#) embeds European NUTS-2 regions in the global input-output system while preserving regional and international linkages. [Giammetti et al. \(2022\)](#) use these data to show that deglobalisation scenarios generate highly heterogeneous effects across European regions. [Almazán-Gómez et al. \(2023\)](#) extend the regional evidence on European participation in GVCs, while [Capello and Dellisanti \(2024\)](#) examine regional participation, position, and performance. [Baldwin et al. \(2025\)](#) develop a regional toolkit of seller- and buyer-side exposure measures, and [Coveri et al. \(2025a,b\)](#) show how functional diversification shapes exposure and resilience to GVC disruptions.

Production networks have also begun to enter political-economy research directly. [Betz and Hummel \(2025\)](#) show that firms’ positions in domestic production networks shape their political influence in trade politics. [Betz et al. \(2026\)](#) show from the voter side

that global market pressures can propagate through local production clusters and affect political representation. These contributions make a broad claim that production networks have not been studied politically untenable. The gap addressed here is more specific. We use regional seller- and buyer-side look-through exposure measures to ask whether different forms of GVC dependence are associated with populist voting across a multi-country regional panel. To our knowledge, this particular application of the Baldwin-type regional exposure framework to electoral outcomes is new.

3 Data

3.1 GVC Indicators

Our GVC measures are constructed from multiregional input–output (MRIO) tables, which record intermediate transactions and final demand across regions, countries, and sectors. The updated panel covers 249 NUTS-2 regions in 24 European countries over the period 2000–2010. It contains 2,739 region–year observations and is balanced over the eleven years. The indicators are first constructed at the region–sector–year level for 14 macro-sectors and are subsequently aggregated to the regional level. Although the estimation sample is European, the underlying MRIO system traces the foreign suppliers and final-demand destinations located outside the estimation sample as well. The data therefore capture the global, rather than merely intra-European, production network.

Let $q = (r, i)$ denote sector i in region r , and let $p = (s, j)$ denote another region–sector pair. For each year t , let $\mathbf{Z}_t$ be the matrix of intermediate transactions, $\mathbf{x}_t$ the vector of gross output, and $\mathbf{f}_t^d$ the vector of final demand absorbed in destination country d . Total final demand is $\mathbf{f}_t = \sum_d \mathbf{f}_t^d$. The matrix of technical coefficients and the Leontief inverse are

$$\mathbf{A}_t = \mathbf{Z}_t \text{diag}(\mathbf{x}_t)^{-1}, \quad \mathbf{L}_t = (\mathbf{I} - \mathbf{A}_t)^{-1} = \mathbf{I} + \mathbf{A}_t + \mathbf{A}_t^2 + \cdots.$$

The accounting identity is

$$\mathbf{x}_t = \mathbf{A}_t \mathbf{x}_t + \mathbf{f}_t = \mathbf{L}_t \mathbf{f}_t.$$

Thus, the element $\ell_{pq,t}$ of $\mathbf{L}_t$ measures the gross output of p required, directly and through every higher-order production tier, per unit of final demand for q . This “look-through” perspective is central to the shocks-based approach of [Baldwin and Freeman \(2022\)](#) and [Baldwin et al. \(2022\)](#): it records both observed first-tier links and dependencies hidden

further up or down the production network.

The export side of Foreign Production Exposure (FPEX) measures seller-side exposure to foreign final demand. Define

$$g_{q,t}^d = [\mathbf{L}_t \mathbf{f}_t^d]_q,$$

the part of gross output in region–sector q that is ultimately induced by final expenditure in destination country d . If $c(q)$ is the country in which q is located, look-through export-side exposure is

$$\text{FPEX}_{q,t}^{\text{LT}} = 100 \frac{\sum_{d \neq c(q)} g_{q,t}^d}{x_{q,t}}. \quad (1)$$

The numerator includes both output sold directly to foreign final users and output that reaches foreign final demand indirectly after passing through other domestic or foreign industries. FPEX is therefore not a conventional export share: it assigns output to the location of ultimate final demand and follows all production tiers. It is bounded between zero and 100. A high value means that a large fraction of the seller’s gross output depends on expenditure decisions abroad, making the sector vulnerable to foreign demand contractions or trade-policy changes beyond the region’s control.

The import side of Foreign Production Exposure measures buyer-side exposure to foreign production. For a unit of final demand for q , the column $\mathbf{L}_{\cdot q,t}$ gives the gross output required from every source region–sector. Total look-through import-side exposure is therefore

$$\text{FPEM}_{q,t}^{\text{LT}} = 100 \frac{\sum_{p: c(p) \neq c(q)} \ell_{pq,t}}{\sum_p \ell_{pq,t}}. \quad (2)$$

The denominator includes requirements sourced both domestically and abroad, so the index reports the foreign share of the complete gross-production requirements needed to satisfy final demand for q .

Both FPEX and FPEM are gross-output measures; they can count the same value more than once when products cross borders at multiple production stages. That is a feature of the gross-production concept used to measure exposure, but it distinguishes these indicators from value-added trade measures.

FPEX and FPEM measure the intensity of foreign exposure, whereas upstreamness

locates production within the sequence of stages leading to final use. Following the production-staging approach reviewed by [Antràs \(2020\)](#), the output of q can reach final demand immediately, after one intermediate transaction, after two transactions, and so forth. Weighting these components by the number of stages gives

$$U_{q,t} = \frac{1}{x_{q,t}} [\mathbf{f}_t + 2\mathbf{A}_t\mathbf{f}_t + 3\mathbf{A}_t^2\mathbf{f}_t + \dots]_q = \frac{[(\mathbf{I} - \mathbf{A}_t)^{-2}\mathbf{f}_t]_q}{x_{q,t}}. \quad (3)$$

Equivalently, if $\mathbf{B}_t = \text{diag}(\mathbf{x}_t)^{-1}\mathbf{Z}_t$ is the matrix of allocation coefficients, the vector of upstreamness scores solves

$$\mathbf{U}_t = \mathbf{1} + \mathbf{B}_t\mathbf{U}_t, \quad \mathbf{U}_t = (\mathbf{I} - \mathbf{B}_t)^{-1}\mathbf{1}.$$

The index is bounded below by one. A value equal to one means that all output is absorbed directly by final demand. Larger values indicate that output is used as an intermediate input and must pass through more production stages before reaching consumers or investment demand. Upstreamness should consequently not be read as another exposure share: it is an average distance from final use.

All three concepts are constructed first for each region–sector. Regional aggregation uses fixed, productivity-corrected employment weights. Let $E_{ir,2000}$ denote employment in sector i and region r in the base year, and let ρ_i denote sector i 's EU-27 value added per worker relative to the economy-wide mean. The weight is

$$\omega_{ir} = \frac{E_{ir,2000}/\rho_i}{\sum_k E_{kr,2000}/\rho_k}, \quad \sum_i \omega_{ir} = 1. \quad (4)$$

Using base-year weights prevents changes in a region's indicator from being mechanically generated by contemporaneous shifts in its employment structure. The regional headline measures are

$$\text{FPEX}_{r,t} = \sum_i \omega_{ir} \text{FPEX}_{ir,t}^{\text{LT}}, \quad (5)$$

$$\text{FPEM}_{r,t} = \sum_i \omega_{ir} \text{FPEM}_{ir,t}^{\text{LT}}, \quad (6)$$

$$U_{r,t}^L = \sum_i \omega_{ir} U_{ir,t}. \quad (7)$$

The sectoral data are therefore used directly in constructing both the regional exposure measures and the chain-position moderator, even though the current baseline analysis does not estimate separate political coefficients for each of the 14 sectors.

Table 1 reports the main regional aggregates used by the updated analysis, including the overall, between-region, and within-region standard deviations. FPEX and FPEM are expressed as percentages; the upstreamness measure is an index. The within-region standard deviation of FPEX is 1.119 percentage points, which is the scale used to interpret the baseline coefficient below. Country-level descriptive statistics are reported in Appendix Table A1.

Table 1: Summary statistics for the GVC indicators. The full sample contains 249 regions observed over 11 years (2000–2010). Between SD is the standard deviation of region-specific time means; within SD removes region means and adds back the grand mean. FPEX is seller-side look-through exposure to foreign final demand. FPEM is total buyer-side look-through exposure to foreign inputs, including face-value and hidden tiers. Upstreamness is the employment-weighted average distance from final demand.

	N	Mean	Overall SD	Between SD	Within SD	p25	Median	p75
FPEX (%)	2739	14.609	6.091	5.999	1.119	10.109	13.190	18.782
FPEM (%)	2739	16.917	5.245	5.085	1.322	12.870	15.758	20.557
Upstreamness	2739	1.862	0.188	0.184	0.038	1.776	1.864	1.958

3.2 Electoral Data

To measure the populist vote at the regional level, we first need an electoral database with the same level of granularity as the database on GVC indicators. To build this dataset, we relied on the same source used by Guiso et al. (2019). We began by retrieving the European Election Database (EED), which is no longer hosted by the Norwegian Centre for Research Data and has been acquired by the Global Archive for Election Administration (GAEA). The data were requested from GAEA at the NUTS 2 level, and most countries were already available with this spatial classification.

For a group of countries where the data were organized according to different administrative units, typically electoral districts, we reallocated the results to the NUTS 2 level using population shares for each region. The complete list of countries and elections is reported in the appendix (Table A2). The final database includes 67 lower-house parliamentary elections from 24 countries between 2000 and 2010. In cases with mixed

electoral systems, we considered only the proportional component. The data include the number of voters and the number of votes received by each party.

To measure the populist vote at the regional level, we draw on two independent classifications of European political parties.

The first is the dataset assembled by [Van Kessel \(2015\)](#), which provides a comprehensive inventory of populist parties across Western and Eastern Europe. Van Kessel adopts a broad, ideologically agnostic definition of populism centred on the claim that “the people” should govern and that “the elite” has corrupted politics. Our dependent variable using this classification, denoted Pop^{VK} , is the share of the regional vote obtained by parties classified as populist by Van Kessel.

The second classification is from [Norris and Inglehart \(2019\)](#). It is an alternative, narrower authoritarian-populist classification that places greater weight on explicit anti-liberal and authoritarian cultural features. Our dependent variable Pop^{NI} is the regional populist vote share under this classification.

Table [A3](#) in the Appendix provides a comprehensive list of populist parties according to the two different classifications, while [Figure 1](#) presents the historical trend and [Appendix Figure A1](#) shows the regional distribution of populist votes. The trend shows the percentage of populist votes for each year across the 24 countries examined between 2000 and 2010. The two maps report the average percentage of populist votes (one for each classification) for each region over the same period.

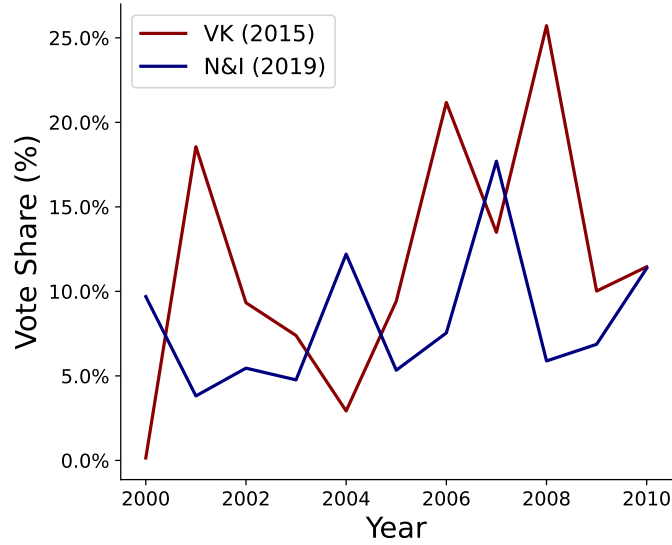


Figure 1: Aggregate vote share obtained by populist parties in lower-house parliamentary elections held in each year between 2000 and 2010 across the 24 countries in the sample. For each classification, the annual share is calculated as the total number of votes received by parties classified as populist divided by the total number of valid votes recorded in that year. The series are therefore weighted by the number of votes. VK refers to [Van Kessel \(2015\)](#), while N&I refers to [Norris and Inglehart \(2019\)](#). *Source:* authors’ calculations based on European Election Database (EED) data retrieved through GAEA.

We also construct a list of green parties, which we use in the placebo test reported in Section 5.3. The purpose of this classification is to provide a comparison group of parties whose electoral performance should not be systematically affected by regional exposure to global value chains. The list is therefore not taken from the political-science literature on party families. Instead, it is based on the active members of the European Green Party, also including predecessor parties where relevant. We exclude parties that did not contest national elections during our period of analysis or parties whose vote share remained below 1 percent and the electoral data are not available in the EED. Table A4 in the Appendix reports the resulting list of green parties used in the placebo analysis.

3.3 Regional controls and moderators

The regressions in Section 5 augment the GVC indicators with a small set of regional characteristics, all measured at the NUTS-2 level. The *service-employment share* is the fraction of regional employment in service activities—sectors ss10–ss15 in our classifi-

cation: distribution and trade, hotels and restaurants, transport and communication, financial and business services, and non-market services—computed from Eurostat regional employment-by-industry statistics (`nama_10r_3empers`) and fixed at the year-2000 baseline. This is the same year-2000 employment that underlies the productivity-corrected aggregation weights of Section 3.1, and it enters as the moderator in the service-interaction specification.

The remaining three controls are standard NUTS-2 indicators from Eurostat, matched to each election year: *population*, total resident population on 1 January (`demo_r_d2jan`), entered in logarithms; *education*, the share of the population aged 25–64 not having attained at least upper-secondary education (ISCED 2011 levels 0–2; `edat_1fse_04`); and *unemployment*, the unemployment rate of the population aged 15–74 (`lfst_r_lfu3rt`). Because these regional series have incomplete coverage in the early 2000s, they are matched to the nearest available year where necessary; their inclusion reduces the estimation sample to 527 observations, so Section 5 also reports the full sample without controls (Table A6).

4 GVC Dependence across European Regions: Levels, Geography, and Changes

Before turning to the econometric analysis, we describe the main patterns in our updated GVC indicators. The measures show persistent differences in how European regions depend on foreign demand and on production activities located abroad. These differences were already present at the start of our panel and became more pronounced over the decade, before the Global Financial Crisis interrupted, but did not eliminate, these patterns of dependence. This section provides a structured descriptive analysis of the two headline exposure measures—Foreign Production Exposure on the export side (FPEX) and total look-through Foreign Production Exposure on the import side (FPEM)—at the regional, country, and temporal levels.

4.1 Trends in Foreign Exposure, 2000–2010

Figure 2 plots the evolution of FPEX and FPEM across European regions over 2000–2010. Both measures were relatively stable at the start of the decade, increased through the

mid-2000s, declined sharply during the Global Financial Crisis, and partially recovered in 2010. The shaded bands report 95% confidence intervals around the unweighted cross-regional mean, while the dashed vertical line marks 2008.

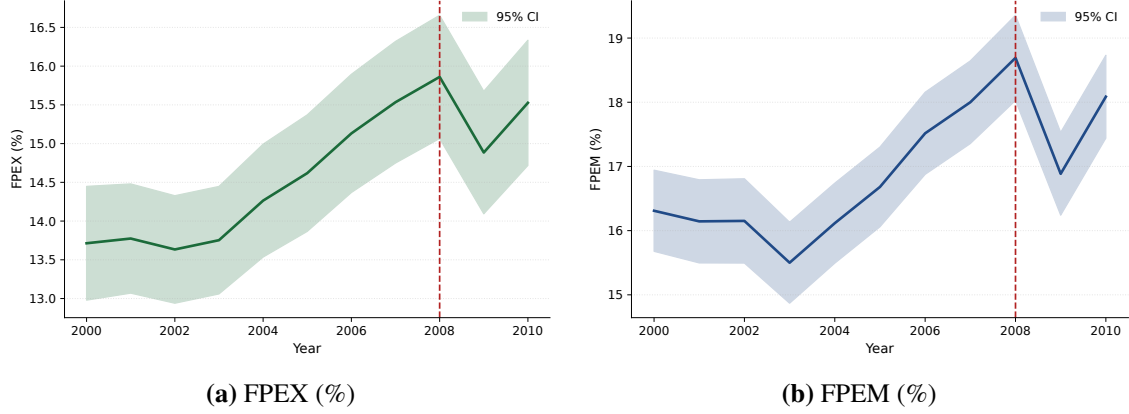


Figure 2: GVC Exposure Trends Across European Regions, 2000–2010. The shaded bands represent 95% confidence intervals around the cross-regional mean. The dashed vertical line marks 2008.

From 2000 to 2008, mean FPEX rose from 13.7% to 15.9%, an increase of 2.1 percentage points, or approximately 16%. Mean total look-through FPEM followed a similar but more pronounced trajectory. After a temporary decline from 16.3% in 2000 to 15.5% in 2003, it increased steadily to 18.7% in 2008, 2.4 percentage points above its 2000 level. The 2009 contraction is visible in both series: FPEX fell by approximately one percentage point and FPEM by 1.8 points. By 2010 they had recovered to 15.5% and 18.1%, respectively, but neither had returned fully to its 2008 peak. This pattern mirrors the global evidence on the trade collapse and recovery documented by [Bems et al. \(2011\)](#) and [Levchenko et al. \(2010\)](#). This pattern is also relevant for our empirical strategy: the within-region variation exploited by the fixed-effects specifications reflects meaningful changes in the international production network rather than only slow-moving structural differences across regions.

4.2 Cross-Country Heterogeneity in Seller-Side Exposure

Figure 3 shows substantial cross-country variation in seller-side exposure to foreign final demand. The country-level period mean of FPEX ranges from 5.8% in Greece to 40.2% in Luxembourg—a nearly sevenfold difference within the European economy. Luxembourg

is followed by Malta (26.9%), Ireland (25.5%), Belgium (25.2%), and Estonia (25.2%). Country size alone does not account for this pattern. The Czech Republic and Finland record mean FPEX values of 23.9% and 23.5%, respectively, placing their regions close to the upper tier of the distribution despite their different economic structures.

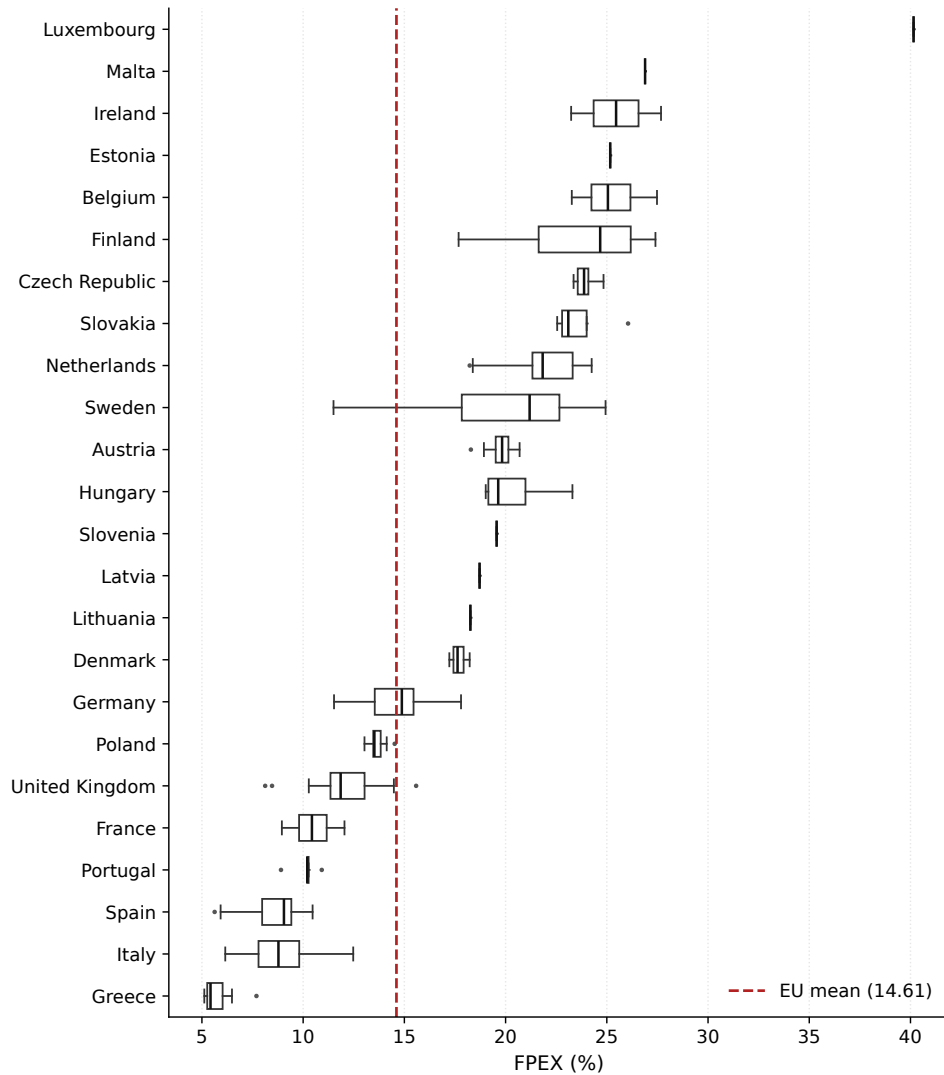


Figure 3: Distribution of FPEX Across European Countries, 2000–2010. Each box represents the distribution across NUTS regions of their 2000–2010 mean FPEX; the horizontal bar is the median; the dashed red line is the European regional mean. Countries are sorted by median FPEX.

More striking than the country means is the within-country dispersion shown in Figure 3. Sweden exhibits the largest relative regional dispersion: its regional period means

range from 11.5% to 24.9%, with a within-country coefficient of variation of 0.21. Finland, Italy, and Spain also display substantial internal heterogeneity. These distributions show that national averages conceal economically meaningful differences in the degree to which regional production ultimately depends on expenditure decisions abroad. To keep the main text focused on the headline seller-side measure, the corresponding country box-plot for FPEM is reported in Appendix Figure A2.

4.3 The Regional Geography of Foreign Exposure

The pattern shown in Figure 4 reflects the geography of dependence on foreign final expenditure: it is strongest in small open economies and in regional production platforms whose output ultimately serves consumers and investors abroad. The FPEX map places Luxembourg, Ireland, Belgium, Estonia, Finland, and the Czech and Slovak regions in the upper part of the distribution. By contrast, Greece, southern Spain, southern Italy, and much of France and the United Kingdom exhibit lower seller-side exposure. This is the geography of dependence on foreign final expenditure: it is strongest in small open economies and in regional production platforms whose output ultimately serves consumers and investors abroad.

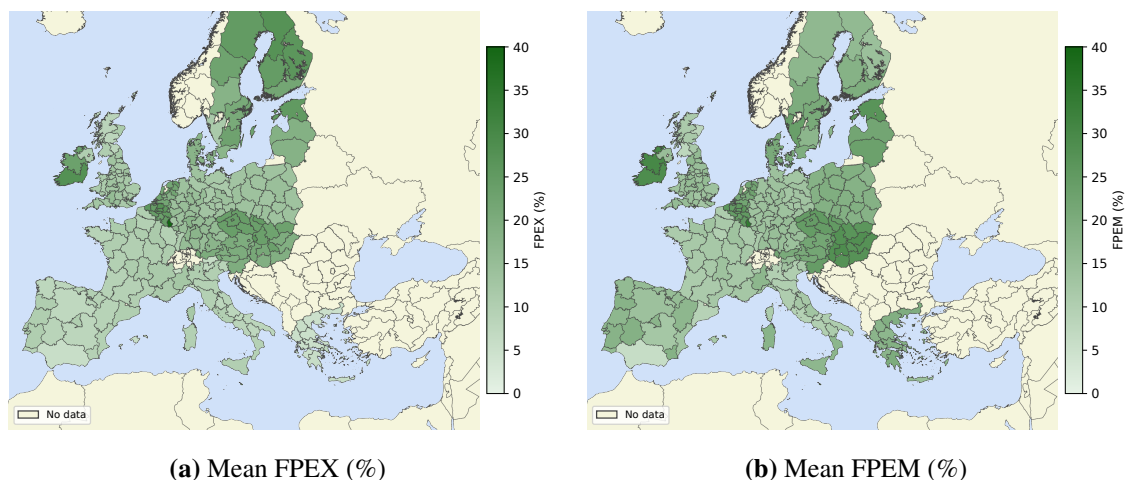


Figure 4: Mean GVC Exposure Across European NUTS-2 Regions, 2000–2010. Panel (a) shows seller-side exposure to foreign final demand (FPEX); Panel (b) shows total look-through buyer-side exposure to foreign production (FPEM). Darker shading indicates greater exposure. Each panel uses its own colour scale.

The FPEM map shifts the centre of gravity eastward, while also highlighting sev-

eral small open economies. Consistent with the country means reported in Appendix Table A1, total look-through FPEM is highest in Luxembourg (34.0%), Malta (30.4%), and Ireland (29.5%). The Czech Republic and Belgium also record relatively high values, while France (11.9%), Italy (12.5%), Germany (13.8%), and the United Kingdom (13.9%) lie below the European regional mean of 16.9%. The contrast between the two maps is economically instructive: foreign exposure is not a single regional characteristic. A region may depend strongly on foreign final demand without displaying the same degree of total buyer-side dependence on foreign production, and vice versa. To keep the main text focused on the two foreign-exposure measures, the corresponding map of regional Upstreamness is reported in Appendix Figure A3.

4.4 Two Dimensions of Foreign Dependence

Figure 5 confirms that FPEX and FPEM are positively related, but far from interchangeable. Across regional 2000–2010 means, their Pearson correlation is $r = 0.742$. Luxembourg and several Finnish and Swedish regions lie well above the fitted line: their seller-side dependence on foreign final demand is much greater than their total buyer-side exposure would predict. Most Greek regions lie below the line, combining relatively low FPEX with substantially higher FPEM. They therefore depend more strongly on foreign production required across their direct and indirect input networks than on foreign final expenditure.

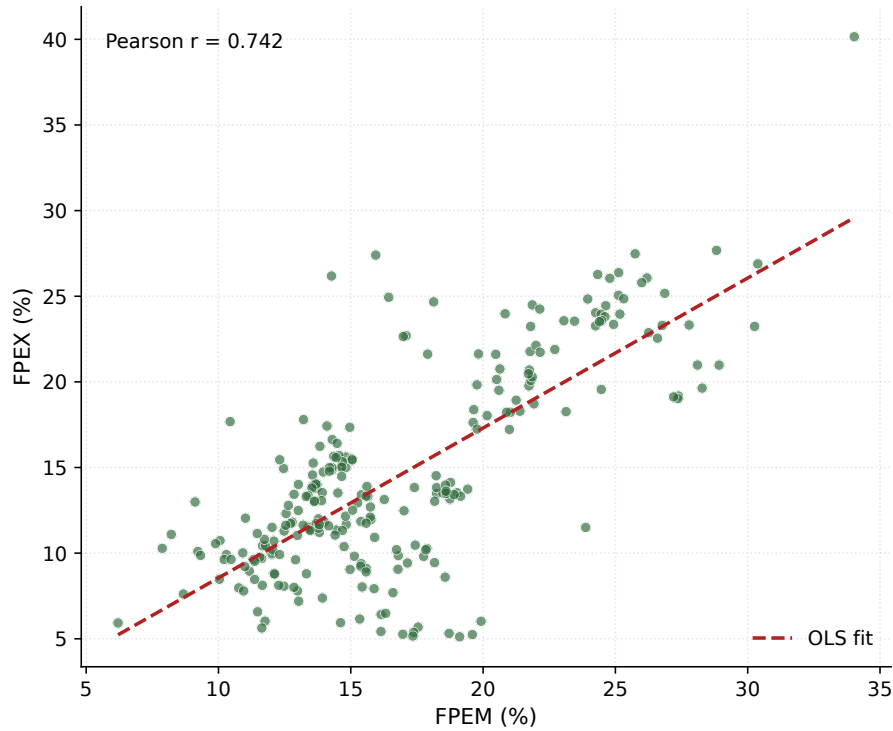


Figure 5: FPEM and FPEX Across European NUTS-2 Regions, 2000–2010. Each dot is a region’s mean over the period. The dashed line is the OLS regression of FPEX on FPEM.

These systematic deviations are important for our empirical strategy. FPEX captures the share of regional output ultimately sustained by foreign demand, whereas FPEM captures the total foreign-production requirements associated with regional final demand, including both first-tier and higher-order linkages. Their common variation reflects the general depth of GVC integration; their independent variation allows the political consequences of seller-side and total buyer-side exposure to be distinguished.

4.5 Changes in Foreign Exposure, 2000–2010

Figure 6 plots the country-level change in FPEX between 2000 and 2010. The broad pattern is one of deepening seller-side foreign exposure: the unweighted regional mean rose by 1.8 percentage points, and 84% of regions recorded an increase. Malta experienced the largest country-level change, at 9.5 percentage points, followed by Hungary (6.5 points), Lithuania (6.2 points), and Ireland (5.6 points). Finland, Estonia, and Latvia moved in the opposite direction, with average declines of approximately two percentage points. Among

countries containing several regions, Hungary therefore stands out as the clearest case of a broad-based increase in dependence on foreign final demand.

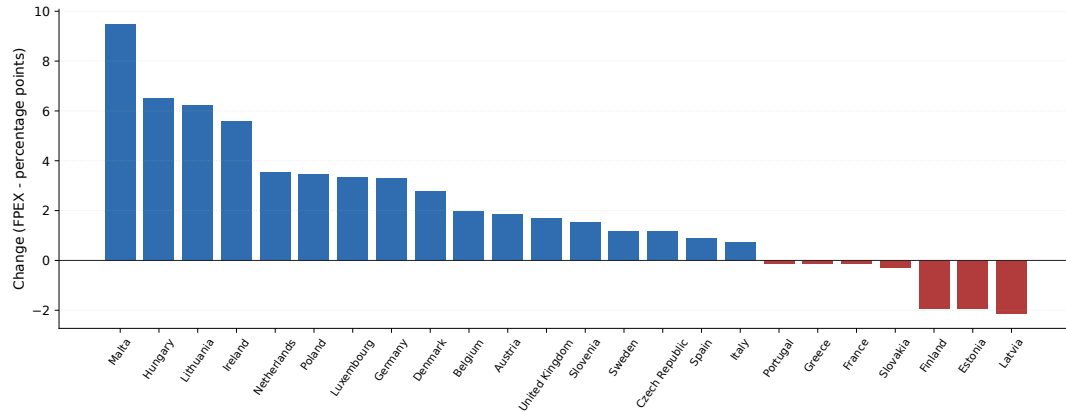


Figure 6: Change in FPEX by Country, 2000–2010. Blue bars indicate increases; red bars indicate decreases in mean regional FPEX over the decade.

The corresponding country-level changes in FPEM are reported in Appendix Figure A4. They reveal a geographically broad increase in total buyer-side exposure: Poland records the largest mean rise (3.7 percentage points), followed by Denmark (3.3 points), Finland (3.2 points), and the United Kingdom (2.9 points). Estonia and Greece display the clearest country-level declines, at approximately 2.1 and 1.0 percentage points, respectively.

The spatial dimension of these changes is shown in Figure 7. FPEX increases are especially pronounced in Hungary, Lithuania, Ireland, and parts of Central Europe, while the sharpest declines are concentrated in Finland, Estonia, and Latvia. FPEM increased in 212 of the 249 regions—85.1% of the sample—slightly more than the 210 regions, or 84.3%, recording an increase in FPEX. Broad FPEM increases are visible across Poland, Germany, the Nordic countries, the United Kingdom, and Italy. The map also reveals a small number of sharp negative outliers, most visibly in eastern Spain, alongside declines in parts of Greece and Estonia.

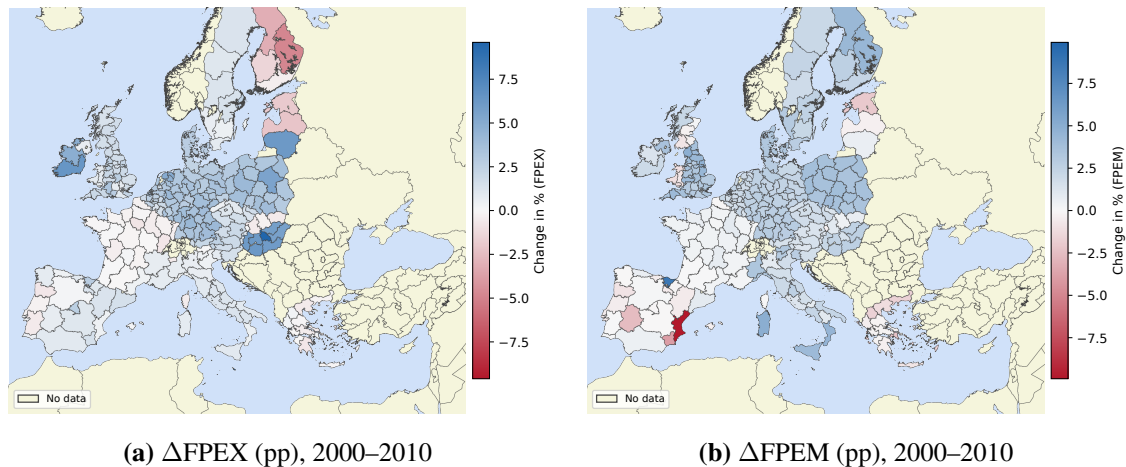


Figure 7: Changes in GVC Exposure Across European NUTS-2 Regions, 2000–2010. Blue shading indicates increases and red shading indicates decreases. Both colour scales are centred on zero. Panel (a) shows the change in seller-side exposure to foreign final demand; Panel (b) shows the change in total look-through buyer-side exposure to foreign production.

The two maps show different patterns of change. Finland is the clearest example: its mean FPEX declined by 1.9 percentage points while its total look-through FPEM increased by 3.2 points. More generally, the geography of FPEX change is more concentrated in Central European and small open export platforms, whereas the increase in total buyer-side exposure is dispersed more broadly across European production systems. Some regions therefore became less dependent on foreign final expenditure even as their direct and indirect foreign-production requirements increased. These patterns illustrate the descriptive distinction between the two dimensions of GVC integration: the political economy of GVC integration cannot be reduced to a single measure of openness, because exposure on the selling and buying sides of the production network can move in different directions.

5 GVC Dependence and Populist Voting

This section presents the baseline regression results on the relationship between GVC dependence and populist voting. Seller-side exposure to foreign final demand is the dimension most consistently associated with populist support. FPEX is positive and statistically significant across all baseline specifications, whereas total look-through buyer-side exposure, FPEM, is small and statistically insignificant. Chain position also matters as a

moderator: the negative interaction between FPEX and Upstreamness indicates that the association between seller-side exposure and populist voting weakens as regional production moves further upstream. The negative interaction between FPEX and the service-employment share indicates that this association is also weaker in regions with higher service-employment shares. Thus, both the intensity and the structural form of GVC integration are empirically related to variation in populist voting.

Before turning to the estimates, we briefly outline the empirical specification. Our preferred model is a two-way fixed-effects (TWFE) framework, which is well suited to the panel structure of the data. By absorbing both region and time fixed effects, the model estimates the conditional within-region association between changes in GVC dependence and populist voting while accounting for time-invariant regional characteristics and common shocks. For a complete descriptive table of the regression sample, see Table A5 in the Appendix.

5.1 Two-Way Fixed-Effects Model

We estimate a standard two-way fixed-effects (TWFE) model using the election-year estimation dataset, which is an unbalanced panel because lower-house elections occur in different years across countries and the regional controls are not available for every observation. The time dimension is indexed by year t and the cross-sectional dimension by NUTS regions n . The empirical specification is the following:

$$Pop_{nt} = \alpha_n + \beta_t + \gamma E_{nt} + \delta X_{nt} + \varepsilon_{nt} \quad (8)$$

In this equation, Pop_{nt} denotes the vote share of populist parties in region n at time t . The terms α and β represent region and year fixed effects, respectively. Region fixed effects absorb all time-invariant characteristics of each region – such as geography, historical political culture, long-standing industrial structure, or persistent institutional differences – while year fixed effects capture common shocks affecting all regions simultaneously, including macroeconomic fluctuations, global crises, or EU-wide political dynamics.

The parameter of primary interest is γ , which captures the conditional within-region association between changes in GVC dependence (E_{nt}) and populist vote shares. The vector X_{nt} includes three time-varying regional controls: the logarithm of population, education level, and the unemployment rate. Standard errors are clustered at the country

level to allow for arbitrary correlation of shocks within national boundaries, reflecting shared institutional environments, policy regimes, and macroeconomic conditions.

The TWFE framework estimates γ from within-region variation over time. In other words, the coefficient compares a region with itself at different points in time, after removing both region-specific average differences and common year effects. Potential threats to interpretation include time-varying regional confounding, feedback from political outcomes to GVC dependence, and cross-region spillovers correlated with GVC exposure beyond what is captured by year fixed effects and country-level clustering.

Accordingly, we interpret γ as a conditional within-region association. Residual confounding, differential regional trends, and indirect political feedback cannot be ruled out. The robustness checks below assess the sensitivity of the estimates but do not alter this interpretation.

5.2 Baseline results

Baseline estimates are reported in Table 2. Model (1) includes FPEX and Upstreamness, while model (2) adds their interaction. The coefficient on FPEX is positive, whereas the coefficients on Upstreamness and on its interaction with FPEX are negative. When FPEM is included, the FPEX coefficient remains positive and statistically significant, while the FPEM coefficient is small and statistically insignificant. The interaction between FPEX and the service-employment share is also negative. Across these specifications, seller-side dependence is more consistently associated with populist voting than buyer-side input exposure.

Second, the position of regional activities within global value chains moderates the association with populist voting. The coefficient on Upstreamness is negative in the baseline specification, and the interaction between FPEX and Upstreamness is also negative and statistically significant. This indicates that the association between seller-side exposure and populist voting is weaker in regions whose exposed activities are located further upstream in the value chain. Finally, the negative interaction between FPEX and the service-employment share indicates that the FPEX association is weaker in regions with higher service-employment shares. We therefore treat the service-employment share as a moderator; the interaction does not by itself identify an adjustment process.

	(1)	(2)	(3)	(4)
FPEX	0.031*** (0.007)	0.074*** (0.020)	0.026*** (0.008)	0.099*** (0.024)
Upstreamness	-0.251** (0.103)	-0.014 (0.112)		-0.181* (0.098)
FPEX $\times$ Upstreamness		-0.019** (0.009)		
FPEM			-0.001 (0.004)	
FPEX $\times$ Service				-0.120** (0.043)
N	527	527	527	527
Within R-squared	0.382	0.404	0.339	0.446

Table 2: Baseline estimates of the relationship between GVC dependency and regional populist voting. The dependent variable is the regional vote share of parties classified as populist by [Van Kessel \(2015\)](#). Column (1) includes FPEX and Upstreamness; column (2) adds the interaction between FPEX and Upstreamness; column (3) jointly includes seller-side exposure (FPEX) and buyer-side exposure (FPEM); and column (4) interacts FPEX with the regional service-sector employment share. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors clustered at the country level are reported in parentheses. $*p < 0.10$, $**p < 0.05$, and $***p < 0.01$.

The joint specification in column (3) also permits a direct comparison of the seller-side and buyer-side coefficients. We test the null hypothesis $H_0 : \beta_{\text{FPEX}} = \beta_{\text{FPEM}}$ after estimating the model with region and year fixed effects and the full set of regional controls. The estimated difference, $\hat{\beta}_{\text{FPEX}} - \hat{\beta}_{\text{FPEM}}$, is 0.026; its 90% confidence interval is $[0.008, 0.044]$, and the country-clustered p -value is 0.023. We therefore reject equality at conventional levels. Appendix Table A8 reports the formal test.

Although the underlying panel covers 24 countries, missing election-year controls reduce the baseline estimation sample to 19 country clusters. We therefore supplement conventional country-clustered inference with null-imposed wild-cluster-bootstrap- t tests using Webb weights and 9,999 replications. Appendix Table A9 reports the corresponding results for the four baseline specifications. The FPEX coefficients remain statistically significant throughout. The FPEX interaction with Upstreamness remains significant at

the 5% level, while the interaction with the service-employment share remains significant at the 10% level. Thus, the headline seller-side result is not driven by relying exclusively on asymptotic cluster-robust inference, although some secondary estimates become less precise.

All specifications in Table 2 include three regional controls: the logarithm of population, education level, and the unemployment rate. Since these variables are not available for all region-year observations, their inclusion reduces the sample size to 527 observations. For this reason, Table A6 in the Appendix reports the same set of specifications on the full sample without controls. The estimates without regional controls, reported in Appendix Table A6, are similar in sign and interpretation. In the specification jointly including the two exposure measures, FPEX remains positive and statistically significant, while total look-through FPEM remains statistically insignificant. The interactions with Upstreamness and the service-employment share remain negative.

Table A7, also reported in the Appendix, replicates the analysis using the alternative measure of populism from Norris and Inglehart (2019). This alternative, narrower authoritarian-populist classification places greater weight on anti-liberal and authoritarian cultural features. The results under this classification are qualitatively consistent but generally weaker. FPEX remains positive and statistically significant in columns (1)–(3). The interaction with Upstreamness is negative and significant only at the 10% level, whereas the interaction with the service-employment share is small and statistically insignificant.

5.3 Robustness checks

As a robustness check, we perform a leave-one-out exercise, reported in Figures A5 and A6. The exercise focuses on the main coefficients of interest from the baseline specification in Equation 8, corresponding to model (1) in Table 2. In particular, we re-estimate the model repeatedly after removing, one at a time, either a country or an election year from the sample, and we plot the estimated coefficients on FPEX and Upstreamness. We then repeat the same procedure for the FPEX coefficient and the FPEX $\times$ Upstreamness interaction from model (2) in Table 2.

The results show that the main findings are not driven by any specific country or year. In no case does the exclusion of a single country or a single year make the coefficients of interest statistically insignificant. The coefficient estimates remain stable in sign and broadly similar in magnitude across all leave-one-out replications.

As an additional placebo test, we re-estimate the baseline model in Equation 8 using the vote share for green parties as the dependent variable instead of populist voting. Green parties provide a useful placebo category because their electoral support would not be expected to display the same association with GVC exposure indicators as populist voting.

Table 3 shows that this is not the case. None of the main GVC variables is statistically significant when the dependent variable is the vote share of green parties. The coefficients on FPEX, Upstreamness, $FPEX \times Upstreamness$, and $FPEX \times \text{service-employment share}$ are all statistically indistinguishable from zero. This placebo exercise supports the interpretation that the baseline results capture a specific relationship between GVC exposure and populist voting, rather than a broader pattern linking GVC integration to support for any non-mainstream party family.

	(1)	(2)	(3)	(4)
FPEX	0.004 (0.003)	-0.002 (0.007)	0.004 (0.003)	0.014 (0.010)
Upstreamness	0.005 (0.019)	-0.027 (0.025)		0.016 (0.019)
$FPEX \times Upstreamness$		0.003 (0.003)		
FPEM			-0.001 (0.001)	
$FPEX \times \text{Service}$				-0.018 (0.016)
N	527	527	527	527
Within R-squared	0.091	0.095	0.093	0.108

Table 3: Placebo estimates of the relationship between GVC dependency and regional green-party voting. The dependent variable is the regional vote share obtained by green parties. The four columns reproduce the specifications reported in Table 2: column (1) includes FPEX and Upstreamness; column (2) adds their interaction; column (3) jointly includes FPEX and FPEM; and column (4) interacts FPEX with the regional service-sector employment share. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors clustered at the country level are reported in parentheses. $*p < 0.10$, $**p < 0.05$, and $***p < 0.01$.

5.4 Heterogeneity

To assess geographical heterogeneity in the baseline associations, we distinguish between Central and Eastern European countries and the rest of the sample. We first re-estimate the specifications reported in Table 2 (Equation 8) separately for the two country groups. We then estimate a pooled whole-sample model that interacts FPEX with an indicator for CEE countries. The pooled interaction provides a direct test of whether the FPEX coefficient differs between CEE and non-CEE countries.

Figure 8 reports the coefficients on FPEX and Upstreamness from the baseline model, corresponding to column (1) of Table 2, separately for the two country groups. Although CEE regions account for a minority of the sample, both coefficients are larger in absolute magnitude in this group. In particular, the positive FPEX coefficient and the negative Upstreamness coefficient are larger among CEE countries. These are separate-sample point estimates and do not by themselves establish statistically significant differences between the two country groups.

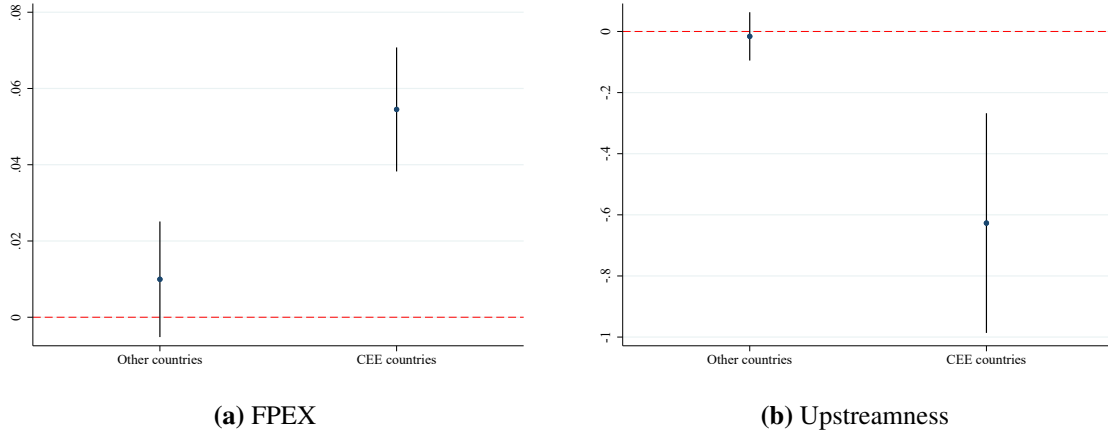


Figure 8: Heterogeneity in the baseline relationship between GVC dependence and populist voting across country groups. The figure reports estimates obtained by separately estimating the baseline specification for Central and Eastern European (CEE) countries and for the remaining countries in the sample. Panel (a) reports the coefficient on FPEX, while panel (b) reports the coefficient on Upstreamness. Points denote coefficient estimates, vertical bars represent 95% confidence intervals, and the dashed horizontal line marks zero. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors are clustered at the country level.

A different pattern is visible in the interaction model with the service-employment share. The coefficient on $\text{FPEX} \times \text{service-employment share}$ is negative and statisti-

cally significant for Western European countries, while it is statistically insignificant and slightly positive for CEE countries (Figure 9). The negative moderating association of the service-employment share therefore appears mainly in Western Europe, although the separate-sample estimates do not establish a statistically significant difference between the two groups. The full set of split-sample estimates and the pooled CEE interaction model are reported in Appendix Table A10.

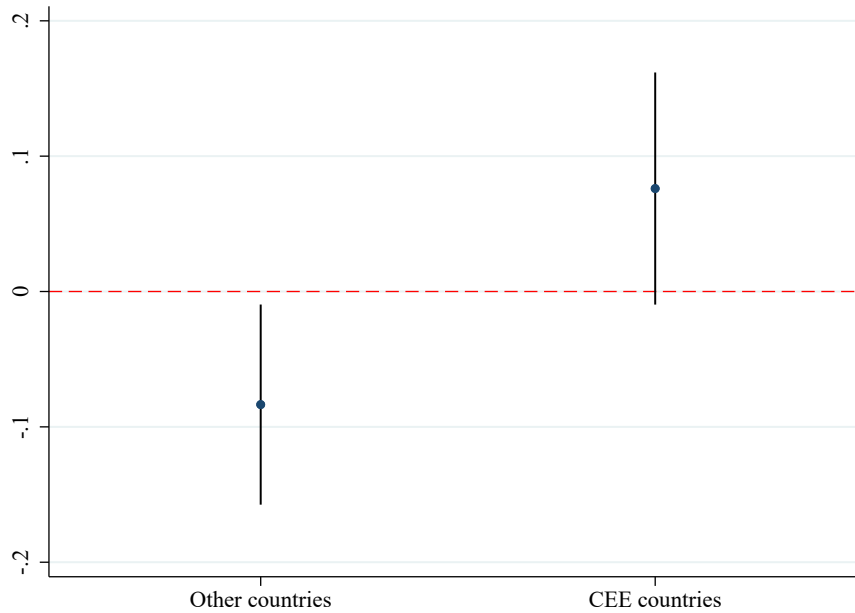


Figure 9: Heterogeneity in moderation by the service-employment share across country groups. The figure reports the estimated coefficient on the interaction between FPEX and the regional service-employment share, obtained by separately estimating the interaction model for Central and Eastern European (CEE) countries and for the remaining countries in the sample. Points denote coefficient estimates, vertical bars represent 95% confidence intervals, and the dashed horizontal line marks zero. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors are clustered at the country level.

The pooled model in column (7) of Appendix Table A10 estimates an FPEX–CEE interaction of 0.021, which is statistically significant at the 5% level under conventional country-clustered inference. Because the split samples contain few country clusters, Appendix Table A11 reports wild-cluster-bootstrap- t inference for the baseline non-CEE model, the baseline CEE model, and the pooled interaction model. Under this correction, the FPEX coefficient in the CEE subsample and the pooled FPEX–CEE interaction re-

main significant at the 10% level, whereas the larger negative Upstreamness coefficient in the CEE subsample is no longer statistically significant. The evidence therefore supports a larger seller-side association in CEE countries, but its precision is sensitive to inference with very few clusters and should be interpreted as suggestive rather than definitive.

6 Conclusions

This paper asks whether the political consequences of globalisation depend on the structural form of regional integration into global production networks. We combine lower-house election outcomes with regional input-output measures for 249 NUTS-2 regions in 24 European countries over 2000–2010. The empirical analysis distinguishes seller-side exposure to foreign final demand (FPEX), total buyer-side exposure to foreign production (FPEM), and regions’ average upstreamness.

The baseline results show that FPEX is positively and statistically significantly associated with populist vote shares. When FPEX and FPEM are included jointly, the FPEX coefficient remains positive and statistically significant, while the FPEM estimate is close to zero and statistically not significant. A formal country-clustered test rejects equality of the two coefficients, strengthening the evidence that seller-side foreign-demand exposure is more closely related to populist voting than total buyer-side exposure. The main FPEX result also survives wild-cluster-bootstrap inference. The FPEX association is weaker in regions with higher average Upstreamness and higher service-employment shares. The main patterns are qualitatively similar, though weaker, under the alternative, narrower authoritarian-populist classification of [Norris and Inglehart \(2019\)](#), and are not reproduced for green-party vote shares.

The geographical heterogeneity exercise provides suggestive evidence that the relationship is not uniform across European regions. The FPEX point estimate is larger in the Central and Eastern European subsample, while the negative interaction with the service-employment share is concentrated in non-CEE countries. In a pooled model, the FPEX–CEE interaction is positive and conventionally significant; under wild-cluster-bootstrap inference it remains significant only at the 10% level. The subgroup evidence should therefore be interpreted more cautiously than the baseline result.

We interpret the results through the concept of *market sovereignty*: the extent to which the final demand sustaining a region’s production originates within the national political jurisdiction. Dependence on foreign final demand can make regional income more contin-

gent on expenditure decisions made abroad. This interpretation is consistent with theories of prospective economic insecurity, but the paper does not directly observe voters' perceptions of insecurity, the substitutability of markets and suppliers, or the pathways linking exposure to political choices. Market sovereignty should therefore be understood as an interpretive framework for the empirical pattern rather than as an empirically identified pathway.

The results also speak to the geography of discontent. Existing research has shown that persistent regional decline and territorial disadvantage are associated with political dissatisfaction. The present evidence adds a structural dimension: changes in the way regional production is connected to foreign final demand are associated with changes in populist voting. This does not demonstrate that GVC dependence operates independently of every form of regional decline, and the title "Beyond Decline" should be read in this conceptual sense unless a direct decline test is added. The contribution is to identify a form of international dependence that is not equivalent, by construction, to a standard measure of regional economic performance.

These qualifications matter for policy. The results do not imply that regions should retreat from global value chains, nor do they establish that any particular diversification policy would reduce populist voting. They instead suggest that the composition of external dependence and the capacity of regions to adjust to foreign-demand shocks are potentially important margins for future research on economic resilience and political discontent.

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Appendix - Tables and Figures

Table A1: Country-level mean GVC indicators, 2000–2010. Entries are unweighted averages of regional observations within each country over 2000–2010. Countries are identified by ISO two-letter codes and sorted by mean FPEX.

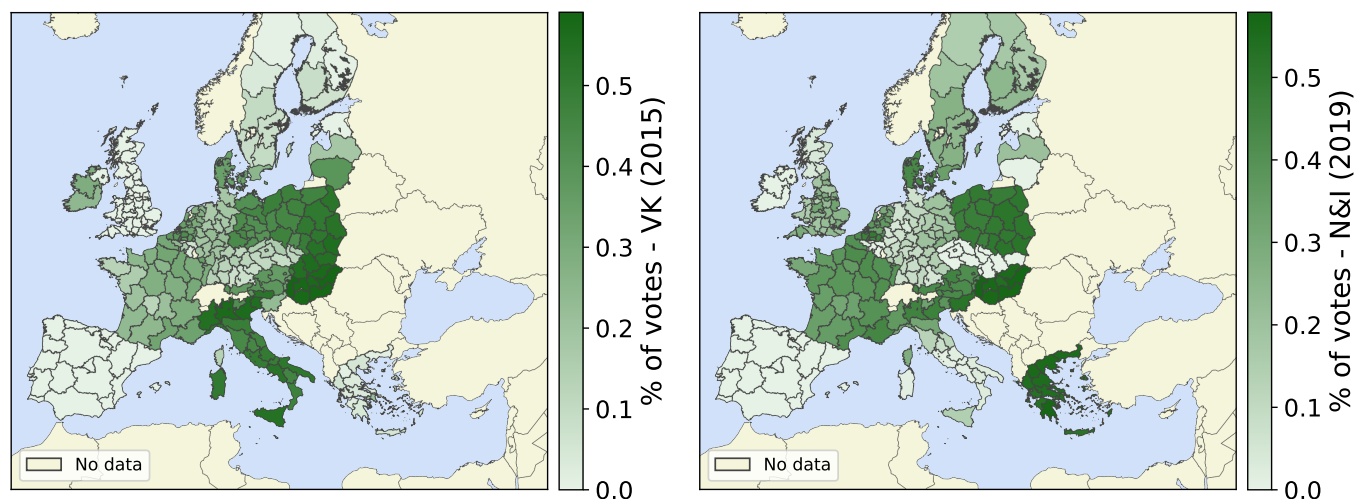
	FPEX (%)	FPEM (%)	Upstreamness
LU	40.153	34.027	2.151
MT	26.891	30.381	1.889
IE	25.458	29.541	1.985
BE	25.239	24.708	2.030
EE	25.168	26.865	2.113
CZ	23.936	24.232	2.269
SK	23.698	26.355	2.094
FI	23.514	15.723	2.208
NL	21.735	21.817	1.926
HU	20.317	27.715	1.927
SE	19.929	19.106	1.940
AT	19.724	21.185	1.883
SI	19.558	24.466	1.954
LV	18.715	21.923	1.970
LT	18.261	23.136	1.755
DK	17.692	20.552	1.840
DE	14.556	13.844	1.833
PL	13.630	18.574	1.958
UK	12.073	13.870	1.807
FR	10.455	11.896	1.798
PT	10.099	16.784	1.799
IT	8.783	12.453	1.754
ES	8.508	14.220	1.874
GR	5.780	17.414	1.470

Table A2: List of elections in the EED dataset. Election results come from the European Election Database (EED), retrieved through the Global Archive for Election Administration (GAEA), and refer to lower-house parliamentary elections held between 2000 and 2010. “Reallocated = Yes” indicates that results originally reported for electoral or other administrative districts were reassigned to NUTS-2 regions using population shares. For mixed electoral systems, only the proportional component is used.

Country	Reallocated	Elections
Austria	No	2002, 2008
Belgium	No	2003, 2007, 2010
Czech Republic	No	2002, 2006, 2010
Denmark	Yes	2001, 2005, 2007
Estonia	No	2003, 2007
Finland	No	2003, 2007
France	No	2002, 2007
Germany	No	2002, 2005, 2009
Greece	No	2000, 2004, 2007, 2009
Hungary	No	2002, 2006, 2010
Ireland	No	2002, 2007
Italy	No	2001, 2006, 2008
Latvia	No	2002, 2006, 2010
Lithuania	No	2000, 2004, 2008
Luxembourg	No	2004, 2009
Malta	No	2003, 2008
Netherlands	No	2002, 2003, 2006, 2010
Poland	No	2001, 2005, 2007
Portugal	Yes	2002, 2005, 2009
Slovakia	No	2002, 2006, 2010
Slovenia	No	2000, 2004, 2008
Spain	No	2000, 2004, 2008
Sweden	No	2002, 2006, 2010
United Kingdom	Yes	2001, 2005, 2010

Table A3: List of populist parties. The table reports the parties used to construct the two regional populist vote shares. VK denotes the broad and ideologically agnostic classification of [Van Kessel \(2015\)](#), centred on the opposition between “the people” and a corrupt political elite. N&I denotes the stricter [Norris and Inglehart \(2019\)](#) classification, which emphasises explicit anti-liberal and authoritarian-populist features. A value of 1 indicates that a party belongs to the corresponding classification, while 0 indicates that it does not. Entries marked “##” indicate that no populist party was identified for that country.

Country	Political Party	VK	N&I	Country	Political Party	VK	N&I
Austria	FPO	1	1	Latvia	For Fatherland and Freedom/LNNK	1	0
	Alliance for the Future of Austria	1	0		All for Latvia	1	0
Belgium	Vlaams Blok	1	1		NA National Alliance	0	1
	Vlaams Belang	1	1	Lithuania	Labour Party	1	0
	Front National	1	0		Party ‘Order and Justice’	1	0
	Lijst Dedecker	1	0	Luxembourg	Alternative Democratic Reform Party	1	1
Czech Republic	Veci Verejne	1	0	Malta	##		
Denmark	Dansk Folkeparti	1	1	Netherlands	List Pim Fortuyn	1	0
Estonia	##				Liveable Netherlands	1	0
Finland	True Finns	1	1		Wilders’ Freedom Party	1	1
France	Front National	1	1		Reformed Political Party	0	1
	Mouvement pour la France	0	1	Poland	Samobrona Rzeczypospolitej Polskiej	1	0
Germany	Die Linke	1	0		Prawo i Sprawiedliwosc	1	1
	NPD	0	1	Portugal	##		
Greece	SYRIZA	1	0	Slovakia	Movement for a Democratic Slovakia	1	0
	Nea Dimokratia	0	1		SMER	1	0
	LA.O.S	0	1	Slovenia	Slovene National Party	1	0
	Golden Dawn	0	1		Slovenska demokratska stranka	0	1
Hungary	Justice and Life Party	1	0		Nova Slovenija	0	1
	MIÉP-Jobbik (2006)	1	1	Spain	##		
	FIDESZ	1	1	Sweden	Sverigedemokraterna	1	1
	Jobbik	1	1	United Kingdom	UKIP	0	1
Ireland	Sinn Fein	1	0		BNP	0	1
Italy	Forza Italia	1	0				
	Lega Nord	1	1				
	Il Popolo della Libertà	1	0				



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Figure A1: Regional populist vote shares according to [Van Kessel \(2015\)](#) and [Norris and Inglehart \(2019\)](#). Regional shares are calculated by pooling votes across all lower-house parliamentary elections held in each NUTS-2 region during 2000–2010. Van Kessel adopts a broad and ideologically agnostic definition of populism, whereas Norris and Inglehart use an alternative, narrower authoritarian-populist classification that places greater weight on anti-liberal and authoritarian cultural features. Darker shading indicates a higher populist vote share. Colour scales are expressed as proportions, so that 0.10 corresponds to 10 percent; each map should be interpreted using its corresponding scale. Areas marked “No data” have no usable electoral observations. Where necessary, electoral results were reallocated to NUTS-2 regions using population shares. *Source:* authors’ calculations based on European Election Database (EED) data retrieved through GAEA.

Table A4: List of green parties. The table reports the parties used to construct the placebo outcome. The classification is based on active members of the European Green Party and includes relevant predecessor parties; it is not drawn from a pre-existing political-science party-family classification. Parties that did not contest national elections during 2000–2010, or whose vote share remained below 1 percent and for which EED data were unavailable, are excluded. Entries marked “###” indicate that no green party was retained under these criteria.

Country	Political Party
Austria	GRÜNE
Belgium	Agalev / Groen Ecolo
Czech Republic	Strana zelených
Denmark	Socialistisk Folkeparti
Estonia	Erakond Eestimaa Rohelised
Finland	Green League
France	Les Verts
Germany	GRÜNE
Greece	Oikologoi Prasinoi
Hungary	Magyarország Zöld Pártja
Ireland	Green Party
Italy	Il Girasole Federazione dei Verdi
Lithuania	###
Spain	###
Luxembourg	Gréng
Latvia	Latvijas Zaļā partija
Malta	###
Netherlands	GroenLinks
Poland	###
Portugal	###
Sweden	Miljöpartiet de gröna
Slovenia	Stranka mladih
Slovakia	###
United Kingdom	Green Party of England and Wales

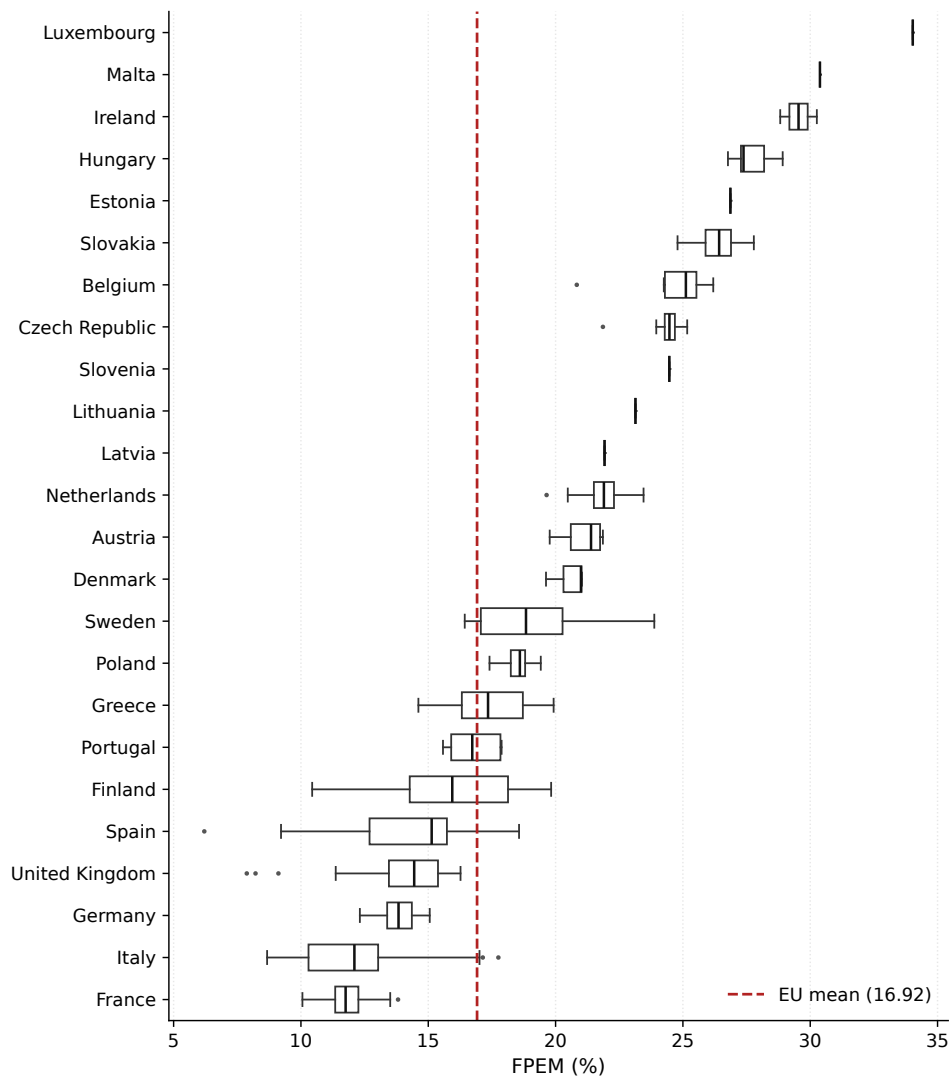


Figure A2: Distribution of FPEM Across European Countries, 2000–2010. Each box represents the distribution across NUTS regions of their 2000–2010 mean FPEM; the horizontal bar is the median; the dashed red line is the European regional mean. Countries are sorted by median FPEM.

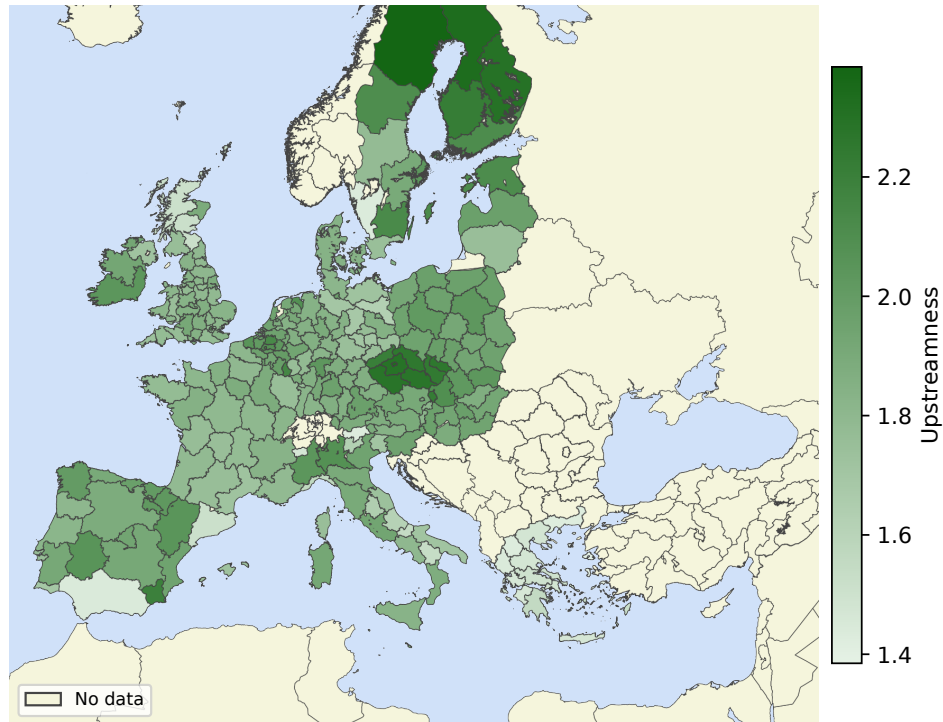


Figure A3: Mean Upstreamness Across European NUTS-2 Regions, 2000–2010. Darker shading indicates a greater average distance of regional production from final demand.

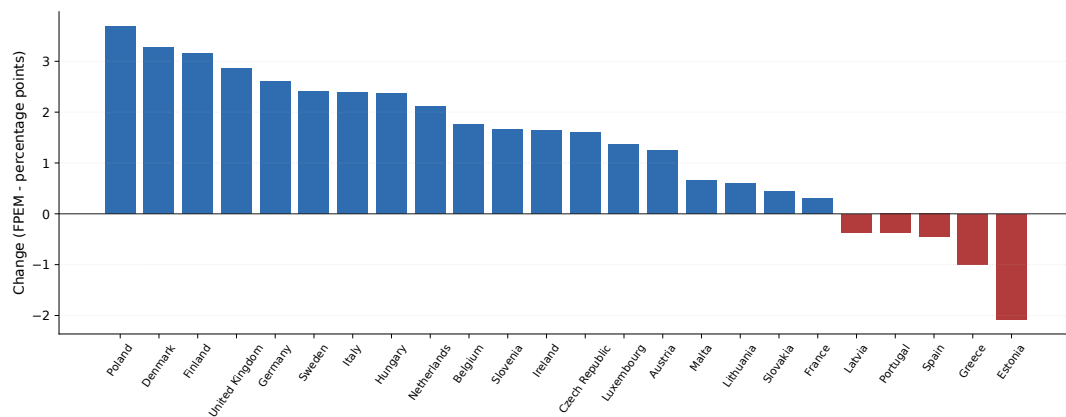


Figure A4: Change in FPEN by Country, 2000–2010. Blue bars indicate increases; red bars indicate decreases in mean regional FPEN over the decade.

Table A5: Descriptive statistics for the regression sample. The first three variables are regional vote shares and range from zero to one. Population is expressed in logarithms, while education and unemployment are expressed as percentages. Populism (VK) follows the broad and ideologically agnostic classification of [Van Kessel \(2015\)](#). Populism (N&I) follows the narrower classification of [Norris and Inglehart \(2019\)](#), which emphasises anti-liberal and authoritarian-populist features. Green parties are the comparison group used in the placebo analysis and are identified from European Green Party members and relevant predecessor parties.

	min	max	p50	mean	sd
Populism (VK - 2015)	0.000	0.762	0.042	0.108	0.148
Populism (N&I - 2019)	0.000	0.762	0.012	0.059	0.115
Greens	0.000	0.201	0.025	0.041	0.046
Population (Log)	11.078	16.266	14.171	14.130	0.780
Low Education	3.300	84.000	25.400	29.893	16.729
Unemployment	1.900	26.000	7.000	8.271	4.843

	(1)	(2)	(3)	(4)
FPEX	0.036*** (0.008)	0.076*** (0.026)	0.029*** (0.008)	0.089*** (0.024)
Upstreamness	-0.260*** (0.074)	-0.058 (0.117)		-0.224*** (0.070)
FPEX $\times$ Upstreamness		-0.018* (0.010)		
FPEM			0.002 (0.003)	
FPEX $\times$ Service				-0.092** (0.042)
N	734	734	734	734
Within R-squared	0.309	0.326	0.270	0.338

Table A6: Baseline estimates without regional controls. The dependent variable is the regional vote share of parties classified as populist by [Van Kessel \(2015\)](#). Column (1) includes FPEX and Upstreamness; column (2) adds their interaction; column (3) jointly includes FPEX and FPEM; and column (4) interacts FPEX with the regional service-sector employment share. The specifications are estimated on the larger sample available when log population, education, and unemployment are excluded. All columns include region and year fixed effects. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

	(1)	(2)	(3)	(4)
FPEX	0.031*** (0.007)	0.079*** (0.025)	0.029*** (0.007)	0.040 (0.040)
Upstreamness	-0.098 (0.058)	0.172 (0.162)		-0.089 (0.064)
FPEX $\times$ Upstreamness		-0.022* (0.011)		
FPEM			-0.001 (0.004)	
FPEX $\times$ Service				-0.017 (0.065)
N	527	527	527	527
Within R-squared	0.395	0.427	0.388	0.397

Table A7: Baseline estimates using the alternative measure of populist voting. The dependent variable is the regional vote share of parties classified as populist by [Norris and Inglehart \(2019\)](#), whose definition places greater emphasis on anti-liberal and authoritarian-populist features. Column (1) includes FPEX and Upstreamness; column (2) adds their interaction; column (3) jointly includes FPEX and FPEM; and column (4) interacts FPEX with the regional service-sector employment share. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Table A8: Formal test of equality between the FPEX and FPEM coefficients. The table reports the test of $H_0 : \beta_{\text{FPEX}} = \beta_{\text{FPEM}}$ in the specification that jointly includes FPEX and FPEM. The model includes region and year fixed effects and controls for log population, education, and unemployment. The 90% confidence interval and p -value use standard errors clustered at the country level.

	FPEX	FPEM	Difference	90% CI: lower	90% CI: upper	Clustered p -value	N	Clusters
FPEX minus FPEM	0.026	-0.001	0.026	0.008	0.044	0.023	527	19

Table A9: Wild-cluster-bootstrap inference for the baseline specifications. The four columns reproduce the specifications in Table 2. All models include region and year fixed effects and controls for log population, education, and unemployment. Observed test statistics from wild-cluster-bootstrap- t tests are reported in parentheses. Significance stars are based on null-imposed wild-cluster-bootstrap p -values using Webb weights, 9,999 replications, and country clusters. $*p < 0.10$, $**p < 0.05$, and $***p < 0.01$.

	(1)	(2)	(3)	(4)
FPEX	0.031*** (4.280)	0.074*** (3.675)	0.026** (3.197)	0.099** (4.048)
Upstreamness	-0.251** (-2.430)	-0.014 (-0.125)		-0.181* (-1.858)
FPEX $\times$ Upstreamness		-0.019** (-2.197)		
FPEM			-0.001 (-0.144)	
FPEX $\times$ Service				-0.120* (-2.767)
N	527	527	527	527
Within R-squared	0.382	0.404	0.339	0.446

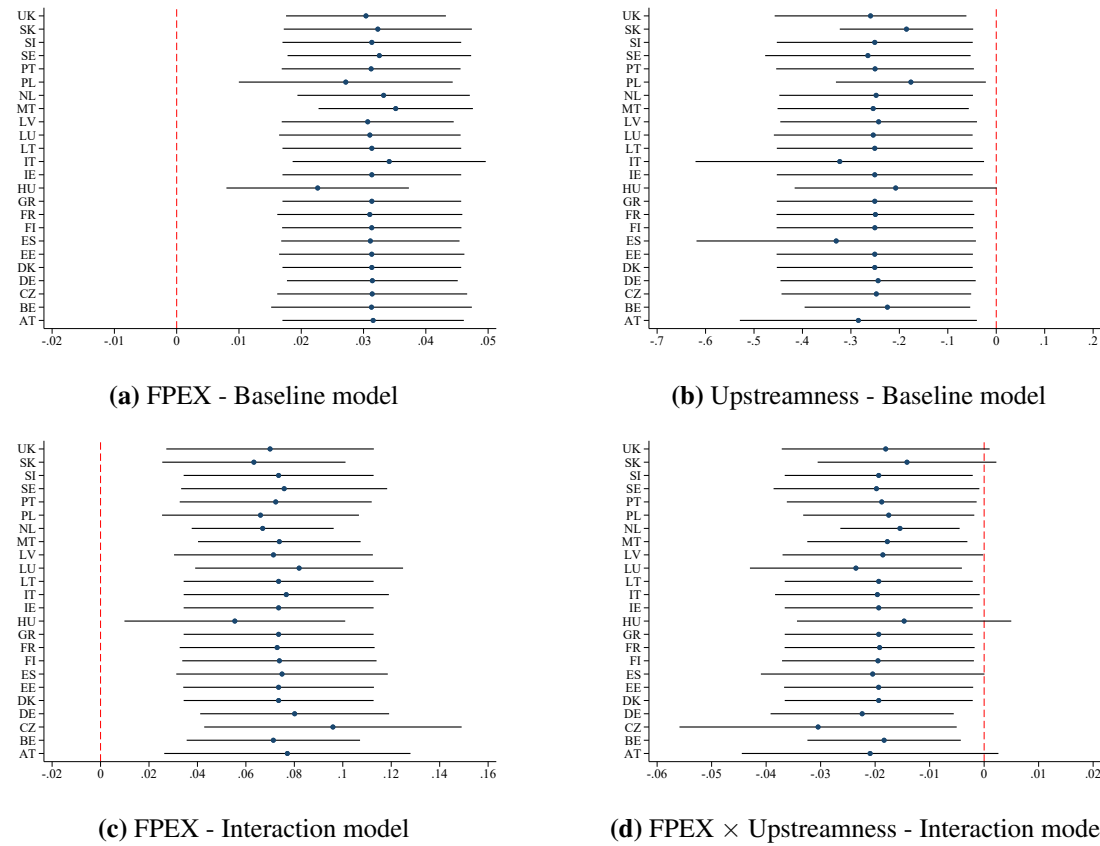


Figure A5: Leave-one-country-out robustness checks. Each point reports the coefficient obtained after re-estimating the relevant specification while excluding the country indicated on the vertical axis. Panels (a) and (b) report the coefficients on FPEX and Upstreamness from the baseline model, respectively. Panels (c) and (d) report the coefficients on FPEX and on the interaction between FPEX and Upstreamness from the interaction model. Horizontal bars represent 95% confidence intervals, and the dashed vertical line marks zero. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors are clustered at the country level.

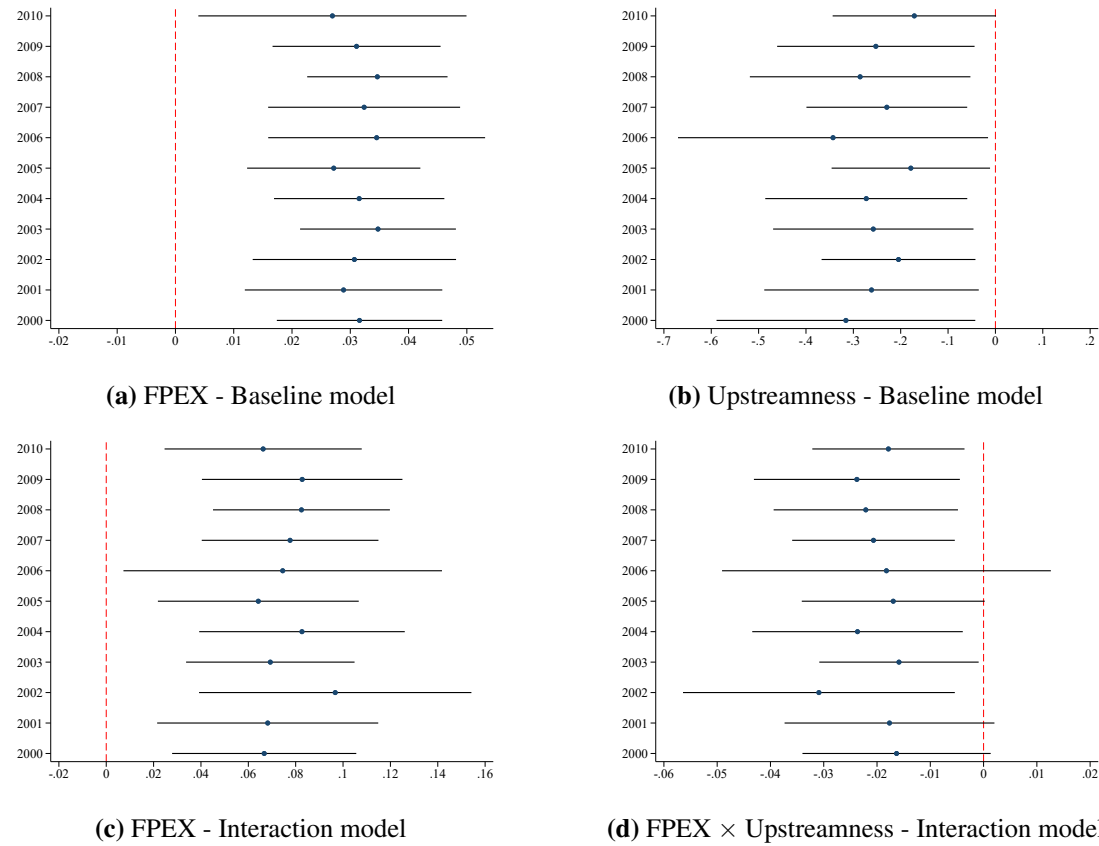


Figure A6: Leave-one-year-out robustness checks. Each point reports the coefficient obtained after re-estimating the relevant specification while excluding the election year indicated on the vertical axis. Panels (a) and (b) report the coefficients on FPEX and Upstreamness from the baseline model, respectively. Panels (c) and (d) report the coefficients on FPEX and on the interaction between FPEX and Upstreamness from the interaction model. Horizontal bars represent 95% confidence intervals, and the dashed vertical line marks zero. All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors are clustered at the country level.

	Other countries			CEE countries			Whole sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FPEX	0.010 (0.008)	0.042 (0.026)	0.065** (0.024)	0.055*** (0.008)	0.130** (0.039)	0.015 (0.020)	0.014* (0.008)
Upstreamness	-0.016 (0.040)	0.125 (0.130)	-0.018 (0.040)	-0.627** (0.183)	0.379 (0.753)	-0.625** (0.183)	-0.147 (0.097)
FPEX $\times$ Upstreamness		-0.015 (0.012)			-0.038 (0.021)		
FPEX $\times$ Service			-0.084** (0.038)			0.076 (0.044)	
FPEX $\times$ CEE							0.021** (0.008)
N	438	438	438	87	87	87	527
Within R-squared	0.165	0.180	0.188	0.619	0.647	0.632	0.455

Table A10: Heterogeneity in the relationship between GVC dependency and populist voting across country groups. Columns (1)–(3) are estimated for non-CEE countries and columns (4)–(6) for Central and Eastern European (CEE) countries. Within each group, the first column includes FPEX and Upstreamness, the second adds their interaction, and the third interacts FPEX with the regional service-sector employment share. Column (7) uses the whole sample and interacts FPEX with the CEE indicator; non-CEE countries are the reference group. The dependent variable is the regional vote share of parties classified as populist by [Van Kessel \(2015\)](#). All specifications include region and year fixed effects and controls for log population, education, and unemployment. Standard errors clustered at the country level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

Table A11: Wild-cluster-bootstrap inference for CEE heterogeneity. Columns (1) and (2) report the baseline models for the non-CEE and CEE subsamples; column (3) reports the whole-sample pooled-interaction model. All models include region and year fixed effects and controls for log population, education, and unemployment. Observed test statistics from wild-cluster-bootstrap- t tests are reported in parentheses. Significance stars are based on null-imposed wild-cluster-bootstrap p -values using Webb weights, 9,999 replications, and country clusters. $^*p < 0.10$, $^{**}p < 0.05$, and $^{***}p < 0.01$.

	Other countries (1)	CEE countries (2)	Whole sample (3)
FPEX	0.010 (1.288)	0.055* (6.715)	0.014* (1.872)
Upstreamness	-0.016 (-0.398)	-0.627 (-3.494)	-0.147 (-1.518)
FPEX $\times$ CEE			0.021* (2.789)
N	438	87	527
Within R-squared	0.165	0.619	0.455