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GVC participation and inflation in the European Union*

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Abstract

This paper examines how participation in global value chains (GVCs) shapes inflation in the European Union over 1995–2023. Using local projections, we trace the dynamic response of inflation to total, backward and forward GVC shocks, at the aggregate level and across core, peripheral and CEEC economies. GVC integration is, on average, disinflationary, supporting the discipline-on-prices hypothesis. The aggregate result, however, masks substantial heterogeneity: backward sourcing dampens prices in core and CEEC countries, forward linkages generate demand-pull in core suppliers and competitive discipline in CEECs, while peripheral economies behave as price-takers. Results are robust to first-differencing.

Keywords: Global value chains; inflation; Phillips curve; local projections; European Union.
JEL classification: E31, F14, F41, F62.

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1 Motivation

The macroeconomic consequences of globalization, and in particular of global value chains (GVCs), are again at the center of policy debate. The "China shock" literature (Autor et al., 2013, 2016) documented severe regional employment losses in U.S. manufacturing. Once supply-chain linkages are accounted for, however, Wang et al. (2018) find net employment and real wage gains nationally, while Jaravel and Sager (2024); Waugh (2023) emphasize that the dominant adjustment channel of globalization is *prices*: production networks lower tradable-goods prices and raise real disposable income, with disproportionate gains for low-income households. Job losses are concentrated and visible, while price benefits are diffuse, rationalizing the polarized public perception of globalization.

GVC participation has risen since the 1970s, plateauing recently (Antràs, 2020). The COVID-19 crisis exposed the fragility of fragmented production (Santacreu and Labelle, 2022): durable-goods demand mismatches generated upward pressure on producer prices (Santacreu et al., 2021; Amiti et al., 2021). Recently, Chau et al. (2026) show, using a Bartik shift-share design over 1,254 country–industry pairs, that pandemic lockdowns dominated global PPI inflation in 2020–22, with about 90% of the demand channel transmitted indirectly through upstream cost linkages. This evidence speaks to short-run mechanics; the medium-run question of how sustained GVC integration shapes inflation across heterogeneous economies remains open. Fornaro and Wolf (2026) embed this insight in a broader framework where GVC integration, alongside automation and AI, jointly reshapes productivity, the labor share and marginal costs, with implications for the optimal monetary–fiscal mix.

The empirical literature linking globalization and inflation has focused predominantly on the U.S. (Borio and Filardo, 2007a; Auer and Fischer, 2010; Guilloux-Nefussi, 2020; Heise et al., 2022; Obstfeld, 2020), with European evidence remaining scarce. Auer et al. (2017, 2019) document flatter sectoral Phillips curves in U.K. industries sourcing from emerging markets. Only Florio et al. (2025) provide aggregate evidence that GVC participation flattens the Phillips curve in EU economies; a comprehensive cross-country dynamic analysis is, however, lacking.

We fill this gap by estimating impulse response functions using the local projection (LP) method of Jordà (2005), which imposes minimal restrictions, accommodates panels and is robust to misspecification (Plagborg-Møller and Wolf, 2021; Montiel Olea et al., 2024, 2025; Jordà and Taylor, 2025). We make two contributions. First, we adopt both an aggregate and a group-specific perspective, distinguishing core, peripheral and Central and Eastern European Countries (CEECs). Second, we address the simultaneity between integration and macro conditions through the LP lag structure and an instrumental-variable strategy in the spirit of the empirical trade literature (Autor et al., 2013; Dauth et al., 2014; Hummels et al., 2014; Bloom et al., 2016). Section 2 presents the theoretical framework, Section 3 describes the data, Section 4 the empirical strategy, Section 5 the results, and Section 6 concludes.

2 A stylised framework

We motivate our specification with a New Keynesian Phillips curve augmented for cross-border production linkages. Consider a representative firm in country i producing

$$Y_{i,t} = A_{i,t}\, L_{i,t}^{1-\phi_i}\, M_{i,t}^{\phi_i}, \tag{1}$$

where $\phi_i \in [0,1]$ is the country-specific share of imported intermediates and indexes *backward* integration. Cost minimization under Calvo-style frictions yields, after log-linearization,

$$\pi_{i,t} = \beta\, E_t \pi_{i,t+1} + \kappa(\phi_i)\, \hat{u}_{i,t} + \lambda_i\, \pi_{i,t}^{m} + \mu_i\, \pi_{i,t}^{x} + \varepsilon_{i,t}, \tag{2}$$

where $\hat{u}_{i,t}$ is the unemployment gap, $\pi_{i,t}^{m}$ the inflation of imported intermediates, and $\pi_{i,t}^{x}$ that of domestically produced intermediates re-exported through forward linkages. Equation (2) nests Phillips-curve flattening, since $\kappa(\phi_i)$ decreases in ϕ_i (Auer et al., 2017; Florio et al., 2025). We do not estimate this slope directly; instead, we recover the dynamic reduced-form response of inflation operating through λ_i and μ_i.

The **cost-channel loading** λ_i depends on the relative bargaining power of foreign suppliers. When firms source from lower-cost partners (core economies offshoring to CEECs, and CEECs themselves), $\lambda_i < 0$: imported-input access disciplines domestic prices. When firms source from concentrated, technologically differentiated suppliers (peripheral economies importing from core producers), $\lambda_i > 0$: cost increases pass through with limited substitution.

The **forward-channel loading** μ_i captures the mirror-image transmission. Upstream suppliers of standardized, low-margin intermediates exposed to global price competition (CEECs) display $\mu_i < 0$. Suppliers of differentiated, technologically advanced intermediates (core economies) display $\mu_i > 0$, as foreign demand tightens domestic capacity and feeds demand-pull inflation (Auer et al., 2019). Peripheral economies, with residual forward participation, exhibit $\mu_i \approx 0$.

Three implications follow: *(i)* the inflation response to GVC shocks is dynamic and persistent; *(ii)* its sign and magnitude vary with the country's position in the production network, rationalizing the heterogeneity we document across core, periphery, and CEECs and the asymmetry of the forward channel between core (positive) and CEEC (negative) suppliers; *(iii)* since λ_i and μ_i are unobserved functions of slow-moving structural traits, a flexible LP method is the natural empirical counterpart.

3 Data

We assemble an annual panel for the 27 EU member states (plus the United Kingdom over its membership period) covering 1995–2023. GVC participation comes from the UNCTAD-EORA database, which decomposes gross exports into value-added components

(De Backer et al., 2018; Feenstra and Hanson, 1996; Amador and Cabral, 2016; Haltmaier, 2015). Following Koopman et al. (2014), we use three measures:

$$Backward_{i,t} = \frac{FVA_{i,t}}{VAX_{i,t}}, \qquad Forward_{i,t} = \frac{DVX_{i,t}}{VAX_{i,t}}, \qquad GVC_{i,t} = \frac{DVX_{i,t} + FVA_{i,t}}{VAX_{i,t}}, \tag{3}$$

where $FVA_{i,t}$ is foreign value added embodied in country i's exports, $VAX_{i,t}$ its value-added exports, and $DVX_{i,t}$ domestic value added embodied in foreign exports. Backward integration captures access to imported inputs and is associated with productivity gains, although extreme reliance may crowd out local value addition (Farole, 2016); forward integration captures the supply of domestic intermediates and is typically associated with productivity spillovers from foreign-buyer standards.

Inflation is the year-on-year change in the harmonized CPI (Eurostat). Controls include the lagged harmonized unemployment rate (Eurostat), oil-price inflation (IMF), and the change in the real effective exchange rate (BIS). All specifications include country and year fixed effects, absorbing common shocks (Global Financial Crisis, sovereign debt crisis, COVID-19).

To capture the European core–periphery structure of production networks (ECB, 2019), we group countries as follows. *Core*: Austria, Belgium, Denmark, Finland, France, Germany, Luxembourg, the Netherlands, Sweden, the United Kingdom. *Periphery*: Cyprus, Greece, Ireland, Italy, Malta, Portugal, Spain. *CEECs*: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia.

4 Empirical strategy

We quantify the dynamic response of inflation to GVC shocks using local projections (Jordà, 2005; Jordà and Taylor, 2025). The baseline panel specification, in levels, is

$$\pi_{i,t+h} - \pi_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta_h \, GVC_{i,t-1} + \boldsymbol{\nu}_h' \, X_{i,t-1} + \varepsilon_{i,t+h}, \qquad h = 0, 1, \ldots, 5, \tag{4}$$

where $X_{i,t-1}$ collects the controls and α_i^h, γ_t^h are country and time fixed effects. The horizon-specific coefficient β_h traces the cumulative response of inflation h years after a one-percentage-point increase in GVC participation. As a robustness check, following Piger and Stockwell (2023), we re-estimate equation (4) in first differences.

Identification. Since macroeconomic conditions may simultaneously drive inflation and integration (Dovì et al., 2021), the lag structure provides a first line of defense. We complement it with an instrumental-variable strategy in the spirit of the empirical trade literature (Autor et al., 2013; Hummels et al., 2014): for each country i in group g (core, periphery, CEEC), we instrument GVC participation by the average participation of all other

countries $j \in g, j \neq i$ in the same group. This within-group average captures common external variation (global supply-chain reorganization, trade policy, sectoral demand) while remaining plausibly exogenous to country-specific inflation. Restricting the peer group to structurally comparable economies sharpens instrument relevance. Inference relies on Driscoll–Kraay standard errors, robust to autocorrelation and cross-sectional dependence.

Separate vs. joint regressions. We estimate backward and forward participation in separate regressions. Each coefficient captures the *total reduced-form effect* of that margin, the policy-relevant parameter; conditioning on one when estimating the other introduces bad-control bias, since both are jointly determined by the same structural factors (Angrist and Pischke, 2009).[1]

5 Results

In all figures, the solid line traces the cumulative IRF; shaded bands denote 68% (dark) and 95% (light) confidence intervals.

5.1 Benchmark specification in levels

Figure 1 reports the response of inflation to a one-percentage-point shock to GVC participation, separately for the aggregate panel and the three country groups, and for each measure (total, backward, forward).

Aggregate panel. Total GVC participation exerts a negative, gradually increasing effect on inflation, reaching about -0.4 pp at $h = 5$ and significant from $h = 2$, in line with the globalization-as-discipline-on-prices hypothesis (Rogoff, 2003; Ball, 2006; Bianchi and Civelli, 2015). The *backward channel* accumulates to roughly -1.1 pp at $h = 5$: imported intermediates compress unit costs and dampen domestic price pressures (Borio and Filardo, 2007b). The *forward channel* delivers the largest aggregate effect, about -2.2 pp at $h = 5$, as upstream specialization exposes producers to international price competition over the medium term.

Core economies. The aggregate signal masks heterogeneity. The response of inflation to total participation is small (-0.05 to -0.10 pp) and statistically indistinguishable from zero, because backward and forward channels offset each other. The backward channel is significantly negative (≈ -0.4 pp at $h = 5$): by sourcing from lower-cost CEEC partners, core economies import lower production costs (Auer et al., 2017; Saygılı, 2020). The

[1] A joint specification yields broadly consistent results, available upon request.

forward channel is positive and significant from $h = 3$, reaching +1.2 pp at $h = 5$: as the dominant upstream providers in the European network, core economies transmit external demand to domestic prices via tighter capacity utilisation, the demand-pull mechanism of Auer et al. (2019).

Central and Eastern European Countries. CEECs display the most robust pattern: all three measures generate negative significant responses. Total participation produces a persistent disinflation of about -0.5 pp at $h = 5$. The backward channel delivers the largest single-group effect (-1.1 pp at $h = 4$, with partial reversal afterwards), reflecting the high importance of imported intermediates in CEEC production. The forward channel grows to ≈ -1.0 pp at $h = 5$: upstream specialization in low-cost intermediates exposes CEEC producers to fierce international price competition, in line with the competitive-discipline hypothesis (Hummels et al., 2001).

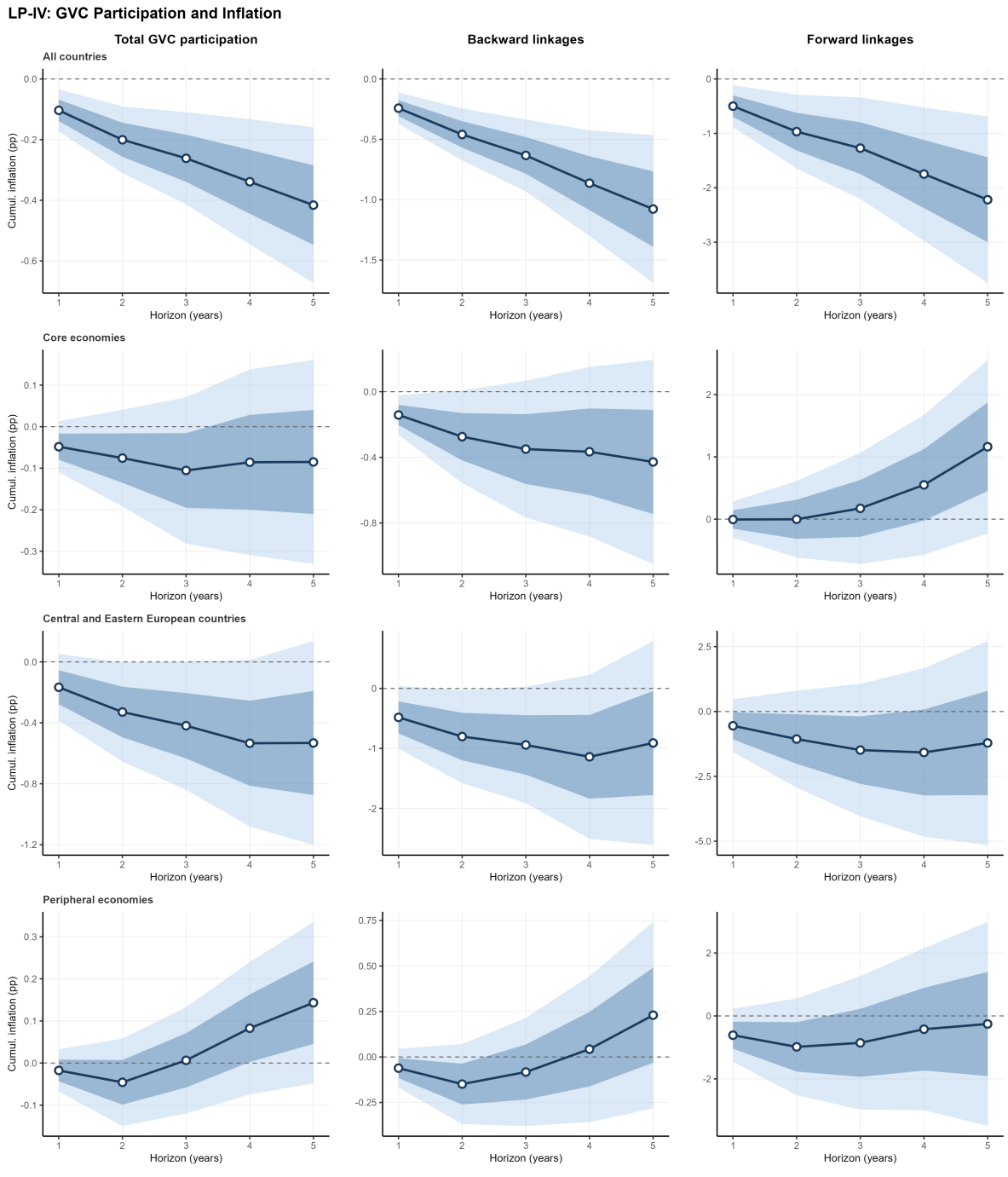
Peripheral economies. The peripheral group exhibits a sharply different pattern. Total GVC participation produces a positive and increasing inflation response, reaching +0.14 pp at $h = 5$ (significant from $h = 3$); the backward channel mirrors this, growing to +0.2 pp. Unlike core and CEEC countries, peripheral economies appear unable to translate imported-input access into cost reductions, plausibly because their import baskets concentrate in higher-priced, differentiated intermediates supplied by core producers. The forward channel is small and imprecisely estimated, consistent with their marginal upstream role. Peripheral economies thus behave as *price-takers*: deeper integration translates into cost pass-through rather than efficiency gains.

These findings extend the short-run evidence of Chau et al. (2026): the same network architecture that amplifies pandemic demand surges through upstream cost linkages also conditions the medium-run disinflationary discipline of GVC integration. The asymmetry between core and peripheral economies points to a structural dimension that short-run shock-identification cannot recover – the country's position in the production hierarchy is a slow-moving characteristic that only manifests over the medium-run horizons examined here.

5.2 Robustness: first differences

We re-estimate equation (4) in first differences to address concerns that time-invariant unobservables jointly drive participation and inflation. Figure 2 shows results broadly consistent with the levels benchmark. At the aggregate level, all three channels remain negative and grow with the horizon. For core economies, the backward channel preserves its negative sign. For CEECs, all three channels remain negative, with significance surviving most clearly for the forward channel. For peripheral economies, the backward channel turns negative, attenuating the levels result, while the forward channel remains impre-

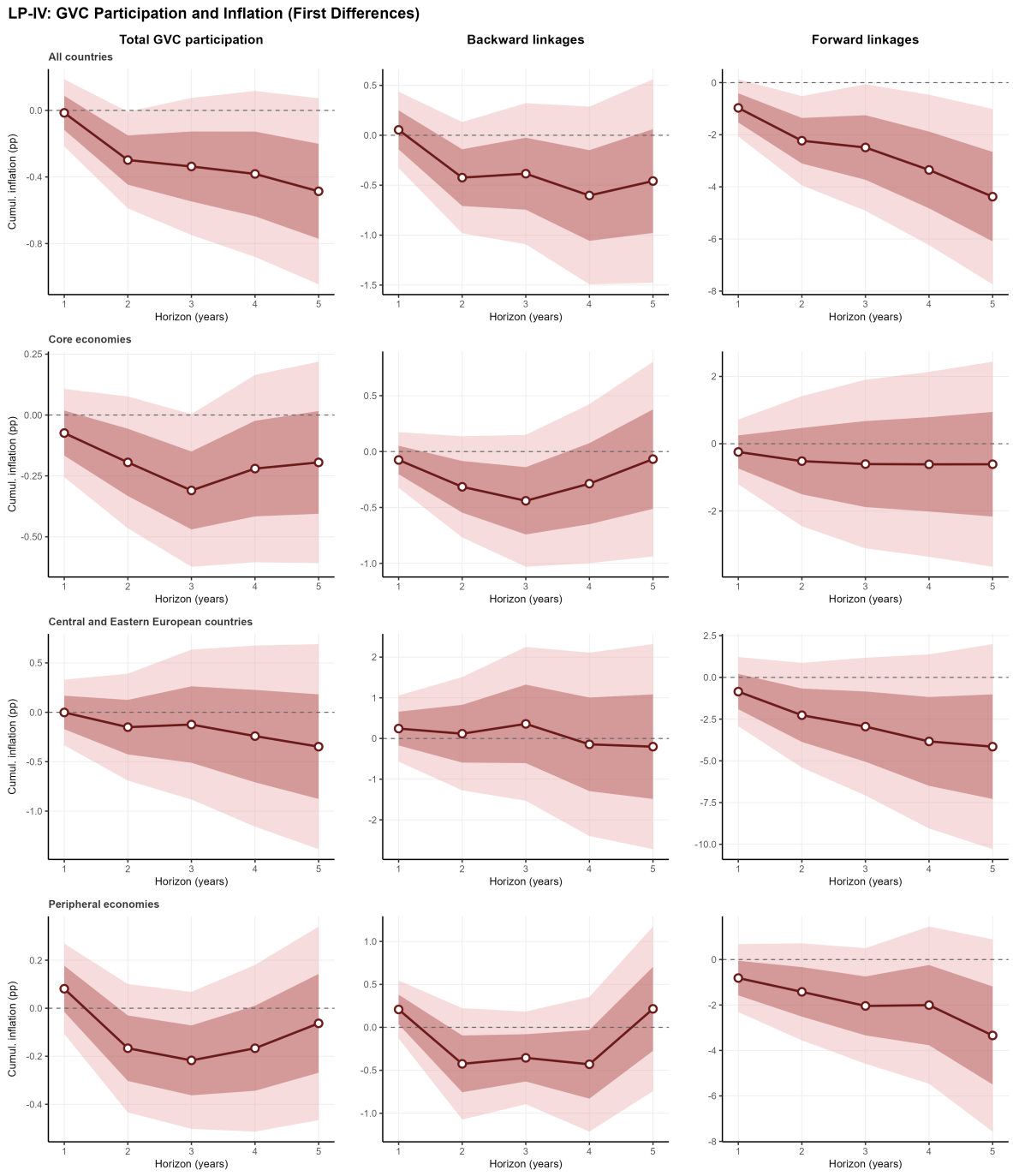
Figure 1: IRF of GVC participation on inflation. Specification in levels.



Notes: IV estimates of equation (4). Solid lines plot the cumulative response of inflation (in percentage points) to a one percentage-point increase in the corresponding GVC measure. Shaded bands report 68% (dark) and 95% (light) confidence intervals based on Driscoll–Kraay standard errors. Controls include lagged unemployment, oil-price inflation, the change in the real effective exchange rate, and country and year fixed effects.

cise. As expected when differencing slow-moving structural variables, point estimates are smaller in magnitude, but the qualitative pattern of structural heterogeneity is preserved.

Figure 2: IRF of GVC participation on inflation. Specification in differences.



Notes: IV estimates of equation (4) in first differences. See notes to Figure 1.

6 Concluding remarks

This paper provides new evidence on the inflation effects of GVC participation in the EU over 1995–2023. The aggregate response is unambiguously disinflationary, supporting the discipline-on-prices hypothesis, but conceals sharp structural heterogeneity. The deflationary channel dominates in economies that integrate as efficient producers: the core (through backward sourcing) and the CEECs (through both backward and forward linkages). In the periphery, by contrast, deeper participation is associated with higher inflation, consistent with a price-taker role. The asymmetry of the forward channel between core (demand-pull from upstream supplying) and CEEC (competitive discipline on low-cost upstream suppliers) further illustrates the hierarchical nature of the European production network. Results are robust to first-differencing and to instrumenting GVC participation by group-level variation.

These findings carry direct implications for stabilization policy. To the extent that GVC integration weakens the link between domestic slack and inflation, central banks face Phillips curves whose slope is increasingly conditioned by external supply-chain conditions. The cross-group asymmetries documented here suggest, in the spirit of Fornaro and Wolf (2026), that monetary policy alone may struggle to deliver homogeneous outcomes when supply-side transformations move prices and employment jointly: a coordinated monetary–fiscal mix becomes especially relevant for peripheral price-taker economies, where deeper GVC participation translates into inflationary pressure rather than productivity gains.

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