Foreign Direct Investment and the Limits of Regional Upgrading: Evidence from GVC Roles in Central and Eastern Europe

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Foreign direct investment (FDI) has been a central driver of economic restructuring in Central and Eastern Europe (CEE) since the post-socialist transition. The region has become deeply embedded in European manufacturing and service production networks, generating rapid export growth and substantial productivity gains. However, persistent concerns remain about structural dependence, limited domestic value capture, and weak technological upgrading. The key question of his paper is therefore not whether FDI raises productivity, the empirical literature confirms that, but whether it enables regions to move toward higher value-added, knowledge-intensive positions within global value chains (GVCs).

This paper examines how FDI shapes regional development trajectories in CEE through the joint lens of productivity, technological complexity, GVC positioning, and knowledge-base structure. We argue that FDI-led growth in many CEE regions produces a structural decoupling: efficiency gains occur without systematic functional upgrading. In several cases, FDI reinforces existing assembly-oriented roles rather than enabling transitions toward upstream innovation functions. This pattern contributes to the persistence of an "assembler trap," where regions achieve high productivity in standardized production while remaining dependent on externally controlled knowledge assets.

The theoretical framework integrates three strands of literature. First, the dependent market economy (DME) perspective emphasizes how ownership and governance structures condition upgrading trajectories (Nölke and Vliegenthart, 2009; Pavlínek, 2022). Multinational enterprises typically retain strategic functions (research and development, design, branding, and intellectual property) at headquarters, while subsidiaries specialize in cost-efficient fabrication. Second, the GVC literature highlights the functional hierarchy of value creation, captured by the smile curve, where value concentrates in upstream and downstream knowledge-intensive activities (Baldwin and Ito, 2021, Capello and Dellisanti 2024). Third, capability-based approaches stress the importance of technological complexity and absorptive capacity for endogenous upgrading (Cohen and Levinthal, 1990; Balland and Rigby, 2017; Boschma, 2017). In this sense, CEE is deeply integrated into global value chains, but as a dependent periphery: ownership, control, and high-value knowledge functions remain largely externalized. Regions participate intensively in production networks without equivalent participation in global knowledge creation. This produces a persistent functional and complexity gap, where export competitiveness and productivity coexist with weak endogenous technological capabilities.

Integration therefore occurs primarily at the level of production and standardized services rather than at the level of strategic control functions.

To operationalize these perspectives at the regional scale, the paper builds on the role-based GVC typology developed by Capello and Dellisanti (2024), which distinguishes controller, supplier, assembler, and outsider regions according to their functional position and participation within production networks. Rather than revising this classification, the paper extends it by linking GVC roles to regional knowledge structures and absorptive capacity. This allows direct testing of whether FDI effects are role-contingent and mediated by local innovation ecosystems.

The empirical analysis covers NUTS-2 regions in the Visegrad 4 countries plus Slovenia, Croatia, and Romania over 2008–2018. The dataset integrates Eurostat regional FDI stocks, regionalized input-output tables measuring GVC upstreamness, and EPO patent indicators capturing technological complexity, diversity (entropy), and specialization (Herfindahl index). Regional fitness measures derived from patent-space diversity serve as proxies for capability depth. Panel interaction models with two-way fixed effects estimate how FDI effects vary across regional roles and sectoral structures.

The results confirm that FDI is a strong and robust driver of labour productivity growth. Assembler regions exhibit the highest productivity elasticity with respect to FDI, reflecting their central position in European production networks. Outsider regions benefit less, consistent with weaker integration and thinner supply chains. These findings align with the established spillover literature (Aitken and Harrison, 1999; Javorcik, 2004), but they also reveal pronounced spatial asymmetries. These productivity gains should therefore be interpreted as efficiency improvements without corresponding control over high-value functions. Regions become more productive within their assigned roles, but do not acquire ownership over design, intellectual property, or strategic coordination. FDI reinforces the existing hierarchy of GVC roles rather than transforming it. However, productivity growth does not translate into systematic upgrading. Manufacturing-related FDI remains tied to downstream assembly functions and does not significantly improve upstream GVC positioning. In some peripheral regions, increasing FDI is associated with further downstream integration. By contrast, upstream shifts occur primarily in finance and ICT services and are more strongly associated with regional R&D intensity than with FDI volume itself. This suggests that upgrading depends on local capabilities rather than FDI alone. The evidence points to a decoupling between regional technological capabilities and GVC position. Higher upstreamness does not automatically imply stronger endogenous knowledge bases, and regions with growing capabilities do not systematically move upward in the value chain. FDI is more strongly associated with functional positioning than with technological learning, confirming that participation in GVCs does not guarantee upgrading.

Technological complexity outcomes reinforce this interpretation. Once regional fitness and knowledge structure are controlled for, FDI has only marginal effects on capability building and becomes negative in outsider regions. This supports the complexity-gap thesis: many CEE regions display high economic complexity through diversified export baskets but low technological complexity in terms of domestic invention (Hausmann et al., 2014; Apostol and Musyoka, 2024). Foreign subsidiaries often import knowledge rather than generate it locally. Absorptive capacity theory predicts precisely this outcome: without strong domestic innovation

systems, spillovers remain limited (Cohen and Levinthal, 1990; Ascani, Crescenzi and Iammarino, 2016).

FDI also reshapes regional knowledge structures. Rather than promoting diversification, foreign investment frequently induces specialization, narrowing technological portfolios in assembler and outsider regions. This increases vulnerability to sectoral shocks and reinforces path-dependent trajectories (Boschma, 2017). Regional fitness emerges as the primary driver of endogenous complexity growth. In short, innovation capacity explains upgrading; FDI alone does not. Rather than broadening technological portfolios, FDI frequently drives role-dependent specialization. Controllers concentrate frontier innovation, while assembler and outsider regions experience dependent lock-in around narrow technological niches. Knowledge diversification is primarily driven by regional fitness and absorptive capacity, not by FDI intensity.

Summing up, the findings demonstrate a structural decoupling between productivity gains and knowledge deepening. Regions integrate into global production networks without parallel integration into global knowledge creation. FDI primarily rewards existing GVC positions instead of enabling upward transitions. This complements the Capello-Dellisanti framework by embedding it within a regional innovation perspective: functional roles condition the knowledge effects of foreign investment. The general pattern is one of integration without upgrading. CEE regions are integrated into global production systems but remain only weakly integrated into global knowledge creation. FDI rewards functional position rather than technological depth, stabilizing existing hierarchies instead of enabling transitions toward higher-value roles.

The policy implications are substantial. FDI attraction strategies cannot substitute for domestic innovation policy. Sustainable upgrading requires targeted investments in R&D systems, higher education, and supplier-development ecosystems capable of anchoring high-value mandates locally. Smart specialization strategies must move beyond export competitiveness toward capability building. Without this, FDI-led growth risks locking regions into stable but structurally dependent development paths.

More broadly, the paper contributes to debates on regional resilience and industrial policy in semi-peripheral economies of CEE. By integrating GVC analysis with capability-based regional economics, it provides an original regional-level assessment of how FDI interacts simultaneously with productivity, upstreamness, and technological complexity. The assembler trap is not inevitable, but escaping it requires deliberate ecosystem-building rather than passive participation in global production networks.

Keywords:FDI, global value chains, regional upgrading, assembler trap, technological complexity, knowledge diversification, regional fitness, absorptive capacity, Central and Eastern Europe

JEL Codes

F14, F23, F61, O33, R11

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