

Geopolitical Fragmentation in Pharmaceutical Supply Chains: Stage-Differentiated Evidence from Bilateral Trade

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Abstract

This paper examines whether geopolitical alignment is associated with pharmaceutical trade differently across supply-chain stages. Recent debates on geoeconomic fragmentation suggest that geopolitical tensions may reshape international trade networks, but existing evidence provides limited insight into how such effects vary across vertically differentiated production structures. Drawing on insights from both fragmentation and global value chain research, the paper argues that observed patterns of trade reconfiguration are associated with the interaction between political responsiveness and supply-chain rigidity.

The analysis focuses on pharmaceuticals, a strategically important sector characterized by substantial differences between upstream pharmaceutical inputs and downstream finished pharmaceutical products. Using bilateral trade data covering 2002–2024 and a structural gravity framework estimated with exporter-year, importer-year, and dyad fixed effects, the paper evaluates three manifestations of alignment-related trade reconfiguration: China-centered dependence, alignment-based clustering, and post-2018 intensification.

The results reveal a clear stage-differentiated pattern. In downstream finished pharmaceutical products, countries more politically aligned with China import significantly more from China. By contrast, geopolitical alignment is not systematically associated with imports of upstream pharmaceutical inputs from China. Across both stages, there is little evidence of generalized clustering among geopolitically similar countries. Furthermore, alignment-related trade patterns do not intensify after 2018; if anything, the association between political alignment and downstream imports from China weakens modestly in the post-2018 period.

These findings suggest that geoeconomic fragmentation in pharmaceuticals is selective rather than systemic. Rather than indicating broad geopolitical bloc formation, the evidence points to limited and stage-specific trade reconfiguration. More broadly, the paper highlights the importance of supply-chain structure in shaping the extent to which geopolitical alignment is associated with international trade patterns.

Keywords: Geopolitical fragmentation; pharmaceutical trade; trade reconfiguration; structural gravity model