

Linkage between Global Production Networks and Financial Integration: Evidence from Portfolio Investment Positions*

Hyunjin Oh** · Danbee Park***

Abstract

This paper examines how dispersion in global value chain (GVC) linkages affects countries' net portfolio investment positions, using data from 155 countries over 2002 - 2018. GVC linkage dispersion is positively associated with net portfolio positions, suggesting that countries use international financial markets to hedge production network risks. This effect is absent among advanced economies, where outward and inward portfolio flows are more balanced. The results highlight complementarities between real-sector integration and cross-border financial linkages, particularly in less financially liberalized economies.

KRF Classification : F21, F14

Keywords : Global Value Chain, Cross-Border Portfolio Investment,
Financial Integration

* This work was supported by INHA UNIVERSITY Research Grant.

** Ph.D. student, School of Economics, Yonsei University. oh_hyunjin@yonsei.ac.kr

*** Corresponding Author: Associate Professor, Department of International Trade,
Inha University. dbpark@inha.ac.kr

I. Introduction

The relationship between global production networks and international financial markets has become increasingly significant as countries face an era of both deeper integration and rising fragmentation risks. While the expansion of global value chains (GVCs) over the past thirty years has fundamentally changed how goods are produced and traded internationally, the financial structures supporting and interacting with these networks are not yet well understood. This paper explores a vital but overlooked aspect of this relationship: how the structure of countries' GVC participation, especially the dispersion of their production linkages, influences their international portfolio investment positions.

The question of how real and financial integration interact has gained renewed urgency due to recent global disruptions. The 2007-2008 financial crisis showed how financial shocks can spread through production networks, while the COVID-19 pandemic and subsequent geopolitical tensions have revealed the vulnerabilities of highly specialized supply chains. These events emphasize that GVC participation offers not only efficiency gains through specialization but also associated risks that require sophisticated risk management strategies. Understanding whether and how countries use financial markets to hedge these production network risks has significant implications for both international economic theory and policy.

We address this question by examining the relationship between GVC linkage dispersion and net portfolio investment positions using a comprehensive dataset covering 155 countries from 2002 to 2018. Our analysis reveals a novel stylized fact: GVC linkage dispersion is positively associated with net portfolio investment positions for the overall sample, suggesting that countries use international financial markets to hedge production network risks. However, this relationship reverses for advanced economies, where GVC linkage dispersion is

associated with lower net positions. This heterogeneity indicates that the complementarity between production networks and financial integration depends critically on countries' level of development and financial market sophistication.

Our findings contribute to several areas of literature. First, we expand the theoretical understanding of trade-finance complementarities by providing empirical evidence on how production network structures affect patterns of financial integration. Second, we contribute to the growing body of research on GVC risks by revealing a previously overlooked hedging mechanism at the country level. Third, our results inform policy discussions on supply chain resilience and financial stability by emphasizing the interconnectedness of real and financial integration decisions.

The remainder of this paper is organized as follows. Section II reviews related literature and clarifies our contribution. Section III explains our data and methodology. Section IV discusses our empirical results. Section V offers conclusions.

II. Literature Review

The connection between global production networks and international financial markets has become a critical research area, especially after the 2007-2008 financial crisis. While traditional international economics often treats trade and financial flows as separate, recent evidence shows they are closely linked through various channels. The rise of global value chains (GVCs) over the last thirty years has significantly changed not only how goods are produced and traded but also how financial risks are shared across countries (Baldwin and Lopez-Gonzalez, 2015; Johnson and Noguera, 2017). This paper adds to this expanding literature by exploring how the dispersion of GVC linkages influences

countries' net portfolio investment positions.

The theoretical foundation for understanding trade-finance complementarity dates back to early work on informational frictions in international markets. Portes and Rey (2005) demonstrate that information asymmetries are key determinants of cross-border equity flows, while Martin and Rey (2004) show how transaction costs in international financial markets can create home bias in portfolios. The development of GVCs potentially mitigates these frictions by creating information channels and repeated interactions between firms across borders (Antràs and Chor, 2022). However, GVC participation also creates new financial vulnerabilities through supply chain spillovers, as demonstrated during the 2007-2008 crisis when production networks served as transmission mechanisms for financial shocks (Baldwin, 2009; Escaith, Lindenberg, and Miroudot, 2010).

A crucial theoretical insight comes from Kiyotaki and Moore (1997), who model how production networks create financial interdependencies that amplify shocks. In their framework, firms linked through customer-supplier relationships face cascade effects when shocks hit any part of the network. While their model focuses on domestic networks, the logic extends to international production chains, as GVCs often form overlapping network structures through production relationships. In GVCs, firms are linked through credit relationships, operational dependencies, trade credit, and specific investments. When liquidity constraints affect one node in the production network, the effects ripple through the supply chain via reduced trade credit, delayed payments, and potentially disrupted production. This creates systematic risk at the country level, where nations deeply embedded in GVCs face correlated shocks through their production networks. Portfolio investment can serve as a hedge against these network risks, leading countries to increase cross-border financial positions to diversify away from the concentrated risks created by their GVC relationships.

Recent empirical research has documented how financial shocks transmit through production networks at the firm level. Jinjarak (2015) provides comprehensive international evidence on this mechanism using quarterly firm-level data from 106 countries spanning 2002-2012. His study reveals that global credit market shocks, measured by the TED spread decomposition, significantly influence firms' working capital financing, including trade receivables, trade payables, inventories, and short-term debt. More importantly, he finds that firms in industries with high contract intensity—those that require relationship-specific investments—experience more severe adjustments during credit crunches. A one standard deviation increase in the TED spread is associated with a more than 1% decline in trade credit provision, with effects magnified for firms in high-contract-intensity industries and emerging markets. Such a network perspective has been further explored by Raddatz (2010), who shows that using trade credit in supply chains increases the impact of sectoral shocks, with industries that depend more on trade credit showing higher output correlation with their suppliers and customers. This sectoral co-movement creates systematic risk that cannot be diversified within domestic markets, potentially increasing demand for international portfolio diversification.

Costello (2020) complements this evidence with granular transaction-level data from U.S. supply chains during the 2007-2008 crisis. Using a novel identification strategy based on long-term debt maturity structures, the author documents that suppliers experiencing bank liquidity shocks reduce trade credit to downstream customers by approximately 30% more than unconstrained suppliers. The spillover operates through two channels of immediate reductions in trade credit and delayed reductions in total sales. Moreover, she finds that small firms that are more reliant on trade credit financing experience employment declines of 11% when exposed to constrained suppliers, representing approximately 60% of the magnitude of direct banking shocks.

The micro-level evidence from both studies establishes that production network structure fundamentally shapes how financial shocks propagate through economies. Firms in tightly integrated supply chains face greater economic interdependence, suggesting that countries with more complex GVC participation may require additional financial instruments to hedge these risks. Such interpretation aligns with the corporate risk management literature, in which Froot, Scharfstein, and Stein (1993) establish theoretical foundations for why firms hedge operational risks through financial markets. Countries with diversified GVCs face multiple correlated risks that require sophisticated hedging strategies. Although we cannot observe hedging motives directly, the positive relationship between GVC linkage dispersion and net foreign assets is consistent with precautionary portfolio adjustments documented by Allayannis and Ofek (2001) at the firm level, suggesting similar mechanisms may operate at the country level.

The aggregate implications of these firm-level mechanisms also emerged. Di Giovanni, Levchenko, and Mejean (2018) show that firms' participation in global production networks is a key driver of international business cycle synchronization. Using French firm-level data, they find that multinational companies and their foreign subsidiaries account for a significant share of the overall co-movement between France and its trading partners. This evidence indicates that GVC integration creates correlated cash flow risks across borders, which could encourage cross-border portfolio investment for risk sharing.

While supply chain integration may boost demand for portfolio diversification, the success of this risk-sharing depends on the structure of financial markets. Park (2024) provides recent evidence on how portfolio investment concentration influences capital flows, using IMF Coordinated Portfolio Investment Survey (CPIIS) data from 95 countries between 2001 and 2021. The study shows that investment concentration, measured by the Herfindahl-Hirschman Index (HHI), significantly

reduces foreign portfolio investment inflows. Additionally, the interaction between exchange rate volatility and investment concentration has a notable negative effect, especially on emerging and developing countries. This confirms earlier findings by Lane and Milesi-Ferretti (2008, 2017), who documented changes in financial integration patterns following the crisis, and by Aviat and Coeurdacier (2007), who showed that bilateral trade predicts asset holdings.

Although our analysis focuses on net positions, we recognize the growing emphasis on gross positions in the post-GFC literature. Obstfeld (2012) and Borio and Disyatat (2011) argue that gross positions better capture financial interconnectedness and contagion potential because they reflect the full extent of cross-border exposures that net positions may not. Forbes and Warnock (2012) and Broner, Didier, Erce, and Schmukler (2013) document that gross capital flows exhibit dynamics distinct from net flows, especially during crisis periods. However, net positions remain relevant for understanding countries' overall risk exposure and wealth transfers (Gourinchas and Rey, 2014), which aligns with our focus on how countries balance GVC risks through their aggregate foreign asset positions.

Regional evidence reinforces these patterns. The link between GVCs and financial integration is strong in Asia, where production networks have grown alongside regional financial markets. Lee, Park, Park, and Tian (2023) provide important evidence of this link by examining financial integration among Regional Comprehensive Economic Partnership (RCEP) countries before and after the global financial crisis. Using bilateral portfolio investment data, they find that the crisis significantly altered the region's patterns of financial integration. This suggests that GVC relationships may serve as information bridges that facilitate portfolio investment, aligning with the information channel identified by Portes, Rey, and Oh (2001) and with recent evidence from Dasgupta and Mondria (2018) showing that exporters attract more

foreign equity investment.

The relationship between GVC diversification and portfolio investment likely varies between crisis and normal periods. Milesi-Ferretti and Tille (2011) document that gross capital flows have severely retrenched, while net positions have adjusted more gradually. Kalemli-Özcan, Papaioannou, and Peydró (2013) show that global banks transmitted shocks across borders, amplifying the interaction between production and financial vulnerabilities. Tong and Wei (2011) find that the composition of capital flows was crucial during the crisis, with trade credit and FDI being more stable than portfolio flows. Although our sample covers both crisis and normal periods, modeling such regime-dependent effects remains an important area for future research.

Research consistently shows that the relationship between production networks and financial integration varies widely across countries' levels of development. Jinjarak (2015) documents larger negative adjustments to credit shocks for emerging market firms, reflecting less developed financial markets and limited financing alternatives. This aligns with broader evidence on the role of financial development. Beck (2002) shows that financial development disproportionately affects manufactured exports, while Manova (2013) demonstrates that credit constraints shape trade patterns. In emerging markets, multinationals rely more heavily on internal capital markets (Alfaro and Chen, 2012), suggesting that GVC participation may partially substitute for underdeveloped local financial markets. Conversely, in advanced economies with deep financial markets, GVC participation may complement existing integration by reducing information asymmetries, a barrier that Coeurdacier and Rey (2013) identify as a key explanation for home equity bias. GVC participation creates information spillovers that facilitate broader financial integration.

These diverse effects have important implications for understanding portfolio investment patterns. Lane and Milesi-Ferretti (2008) show that financial integration grew faster in emerging markets during the 2000s,

but these flows were more volatile during the crisis. However, the effects differ across development levels and extend beyond crisis responses to affect normal operations. Alfaro and Chen (2012) show that multinational firms in emerging markets rely more heavily on internal capital markets within their production networks, suggesting that GVC participation may partly replace underdeveloped local financial markets. The relationship between GVC participation and portfolio investment may thus vary significantly between advanced and emerging economies, which is what our empirical analysis explicitly examines. We recognize that GVC integration and financial development often mature together, particularly in emerging markets (Kose, Prasad, and Terrones, 2009). While our fixed effects and lagged specifications partially address this concern, we cannot fully rule out that broader structural change drives both phenomena. Still, the varying patterns we observe across development levels suggest that financial market maturity fundamentally conditions how countries manage GVC-related risks.

Several mechanisms may link GVC structure to portfolio investment. The information channel operates through reduced asymmetries from repeated interactions and standardized reporting in GVCs. The risk-sharing channel reflects hedging needs for correlated production risks, as modeled by Antràs and Staiger (2012) for offshoring relationships. The collateral channel for emerging markets, highlighted by Caballero and Krishnamurthy (2001), suggests that GVC positions may support international borrowing. These mechanisms likely vary by development level, with emerging markets potentially using portfolio investment to offset domestic financial limitations, while advanced economies leverage GVCs for informational advantages.

While we propose three potential channels of information, hedging, and financial structure through which GVC dispersion may affect portfolio positions, we acknowledge that directly testing each mechanism requires data beyond the scope of the current analysis. A complete

empirical decomposition of these mechanisms remains an important avenue for future research.

Despite extensive literature on trade-finance linkages, several key gaps remain. First, most studies analyze trade or financial flows separately, overlooking potential complementarities and substitution effects. Second, current research mainly focuses on bilateral relationships or firm-level outcomes, with limited evidence on how the overall GVC structure influences country-level financial integration patterns. Third, the impact of GVC linkage dispersion, rather than GVC participation levels, has received little attention despite its potential importance for risk management. More fundamentally, existing studies have not examined how countries strategically use financial positions to manage risks in production networks. While micro-level evidence shows how firms adjust trade credit and working capital during crises (Jinjarak, 2015; Costello, 2020), and macro-level studies highlight portfolio concentration effects (Park, 2024), it appears that the question of whether countries' portfolio investment strategies systematically respond to their GVC structures has yet to be addressed. This omission is especially significant because production networks generate correlated risks across borders that cannot be hedged solely through domestic financial markets. On the other hand, we acknowledge that measuring diversification presents conceptual challenges. As Caselli, Koren, Lisicky, and Tenreyro (2020) and Kramarz, Martin, and Majeau (2020) note, diversification can be measured using various metrics, including concentration indices, entropy measures, and distributional statistics. Our standard deviation measure captures the dispersion of GVC relationships across partners, with higher values indicating greater unevenness. We interpret this as greater variation in bilateral GVC intensity. This differs from traditional concentration measures such as the Herfindahl-Hirschman index, but it still provides complementary information regarding the structure of production networks.

Our research addresses these gaps by directly linking GVC linkage dispersion to country-level net portfolio investment positions. Using bilateral GVC data to construct dispersion measures helps us understand the complexity of production networks beyond basic participation metrics. We summarize our contributions in three points. First, we identify a new empirical regularity in which the relationship between GVC linkage dispersion and net portfolio positions varies systematically with development level. Second, we provide comprehensive evidence on how production network structure influences countries' financial hedging strategies, using data from 155 countries across both pre- and post-crisis periods. Third, by focusing on net positions rather than gross flows, we gain a complete view of how countries manage their international assets and liabilities in response to their GVC exposure. Our approach shows that countries do not simply participate in GVCs and financial markets independently, but instead coordinate these activities based on their risk management needs and financial market capabilities. This finding suggests that the conventional separation of trade and finance is much more blurred in international economics, and that policies affecting GVCs may have important implications for financial stability.

III. Empirical Model and Data

The empirical model is designed to examine the relationship between the global production network and international portfolio investment positions. Specifically, it investigates how the level and volatility of a country's GVC participation affect its net portfolio investment position. The core hypothesis is that greater and more stable integration into global production networks promotes stronger cross-border financial linkages by enhancing information transparency, production complementarities,

and investor confidence.

The baseline model is specified as:

$$\text{NetPortfolio}_{it} = \alpha + \beta_1 \log(\text{GVC}_{it}) + \beta_2 \text{SD}(\text{GVC})_{it} + \beta_3 X_{it} + \mu_i + \lambda_t + \varepsilon_{it}. \quad (1)$$

NetPortfolio_{it} is the net portfolio investment position of country i at time t , defined as log of total portfolio assets(outward) minus log of total portfolio liabilities(inward), incorporating holdings of both equity and debt securities. This measure captures the overall direction and magnitude of cross-border financial exposure derived from the IMF Coordinated Portfolio Investment Survey (CPIS).

The main explanatory variables include the logarithmic measure of GVC participation $\log(\text{GVC}_{it})$ and the volatility term $\text{SD}(\text{GVC})_{it}$, representing the standard deviation of GVC linkages with partner countries.

To capture the volatility or dispersion of a country's GVC linkages across partner economies, we construct a standard deviation measure of GVC participation using the bilateral GVC variable. For each country i in year t , the bilateral GVC with partner countries j are denoted as GVC_{ijt} . The standard deviation of GVC participation across all partners j is then calculated as:

$$\text{SD}(\text{GVC})_{it} = \sqrt{\frac{1}{N_{it}-1} \sum_{j=1}^{N_{it}} (\text{GVC}_{ijt} - \overline{\text{GVC}_{it}})^2} \quad (2)$$

N_{it} is the number of partner countries for country i in year t , and $\overline{\text{GVC}_{it}}$ is the mean bilateral GVC linkage for country i in year t . This measure reflects the degree of dispersion or heterogeneity in a country's GVC structure — higher values of $\text{SD}(\text{GVC})_{it}$ indicate greater heterogeneity in value-added linkages across trading partners.

$\text{SD}(\text{GVC})$ is conceptually and empirically distinct from concentration

measures such as the Herfindahl-Hirschman Index (HHI) or top-partner concentration ratios (CR5). While HHI and CR5 assess how GVC linkages are concentrated toward a single dominant partner, SD(GVC) measures the heterogeneity of linkage intensities across all trading partners.¹⁾ A higher SD(GVC) indicates that a country exhibits highly varied linkage intensities across its trading partners, whether through substantial dependence on a single dominant partner coupled with marginal secondary partners or through a broad dispersion of engagement levels.

To capture the degree of integration in the global production network, this study employs three complementary measures derived from the UNCTAD - Eora Global Value Chain (GVC) database: Foreign Value Added (FVA), Domestic Value Added embodied in Foreign Exports (DVX), and Total GVC Participation, which is the sum of the two. These measures collectively capture both the backward and forward linkages that characterize a country's position within global value chains.

First, the Foreign Value Added (FVA) component measures the share of foreign intermediate inputs that are embodied in a country's exports. It represents the extent to which domestic exporters rely on imported intermediate goods and services for production and thus indicates the country's backward GVC participation. A higher FVA value implies stronger integration into upstream global supply chains, as domestic industries source more foreign inputs for export-oriented production. For example, economies with large manufacturing assembly sectors – such as those in East and Southeast Asia – typically exhibit high FVA ratios due to their reliance on imported components and materials.

Second, the Domestic Value Added in Foreign Exports (DVX)

1) The sample correlation between SD(GVC) and HHI is 0.04, and between SD(GVC) and CR5 is 0.02, indicating that these two measures are nearly orthogonal and capture different structural attributes of GVC networks.

component captures the domestic value added embodied in other countries' exports. This reflects the country's role as a supplier of intermediate inputs to foreign production networks and represents forward GVC participation. High DVX values indicate that domestic industries provide critical inputs—such as parts, components, or raw materials—that are re-exported after further processing abroad. Resource-rich economies or technologically advanced input suppliers tend to show greater forward participation, as their domestic value-added is embedded in global downstream production.

Finally, the Total GVC Participation index is computed as the sum of backward and forward linkages (FVA + DVX). This measure provides a comprehensive assessment of how deeply a country is integrated into global production networks, both as a user and as a provider of foreign value-added. By applying a logarithmic transformation to each measure, this study captures the elastic relationship between GVC integration and financial outcomes. Additionally, the dispersion or volatility of these linkages across partner economies—measured as the standard deviation of bilateral FVA and DVX—serves as an indicator of the stability and diversification of a country's GVC structure, which may influence cross-border investment behavior.

X_{it} is a vector of control variables, including the World Governance Index (WGI), financial development (*fin_dev*), foreign exchange rate volatility (*FX_vol*), the log of GDP per capita, and capital openness (*K_open*). Country and year fixed effects (μ_i , λ_t) control for unobservable heterogeneity and time-specific shocks.

The sample covers 155 countries over the period 2002–2018. Summary statistics are reported in Table 1.

<Table 1> Summary statistics (2002–2018)

All countries				Advanced countries ²⁾			
Variable	Obs	Mean	Std. dev.	Variable	Obs	Mean	Std. dev.
ln_total_net	2,631	-10.447	9.461	ln_total_net	595	-0.556	2.785
ln_gvc	2,634	20.586	6.359	ln_gvc	595	25.333	1.360
ln_dvx	2,634	19.998	6.199	ln_dvx	595	24.478	1.383
ln_fva	2,634	19.708	6.173	ln_fva	595	24.703	1.385
gvc_sd	2,618	1137.42	2723.78	gvc_sd	595	4020.64	4141.38
dvx_sd	2,618	590.59	1494.31	dvx_sd	595	1920.69	2264.60
fva_sd	2,618	593.10	1495.33	fva_sd	595	2237.49	2375.51
WGI	2,632	-0.021	0.891	WGI	595	1.175	0.525
fin_dev	2,634	0.325	0.237	fin_dev	595	0.654	0.185
FX_vol	2,634	0.014	0.003	FX_vol	595	0.014	0.003
K_open	2,634	0.555	0.380	K_open	595	0.899	0.200
ln_gdp	2,634	8.542	1.444	ln_gdp	595	10.308	0.603

IV. Empirical Results

The empirical results in Table 2 reveal a significant link between the dispersion of global value chain (GVC) participation and a country's international portfolio investment position. Across the full sample of 155 countries, the coefficients of the standard deviation measures—SD(GVC), SD(DVX), and SD(FVA)—are all positive and statistically significant. This suggests that greater dispersion or heterogeneity in GVC linkages across partner economies is associated with an expansion of a country's net portfolio investment position. In other words, as a country's production networks become more heterogeneous in their bilateral linkage intensities, its outward portfolio holdings tend to increase. This finding can be interpreted as evidence that GVC linkage dispersion enhances cross-border financial integration by broadening information channels and reducing home bias in investment decisions.

2) The advanced countries sample includes OECD countries and Singapore.

However, when the analysis is restricted to advanced economies, the results reveal a different pattern. In this subsample, the coefficients for SD(GVC), SD(DVX), and SD(FVA) turn negative and insignificant, indicating that greater GVC dispersion among advanced economies is associated with increases in both outward and inward positions. This implies that in highly developed financial systems, greater GVC linkage dispersion may attract foreign portfolio capital.

In Table 3, the analysis is extended by incorporating one-period lagged variables of both the level and dispersion of GVC participation, to address potential endogeneity between GVC participation and international investment positions.

The estimation results remain largely consistent with the baseline findings in Table 2. In the full sample, the coefficients of the lagged dispersion variables are all positive and statistically significant. This suggests that a higher degree of dispersion in global production linkages in the previous year is associated with an expansion of the current net portfolio investment position. The results reinforce the earlier interpretation that broader and more diversified GVC participation tends to promote outward portfolio investment, possibly through improved risk-sharing and cross-border information flows that reduce home bias over time.

For the advanced economy subsample, the coefficients of the lagged dispersion variables are negative, though not statistically significant. The lack of statistical significance suggests that in advanced economies, the expansion of outward portfolio positions resulting from GVC linkage dispersion is offset by simultaneous growth in inward positions. This finding indicates a more balanced pattern of cross-border financial integration in mature markets, where production and financial globalization progress hand in hand without yielding large net shifts in external positions.

Additionally, the results show that the $\log(\text{GDP})$ variable exhibits a

negative and weakly significant relationship with the net portfolio investment position in the advanced countries' sample. This finding suggests that as the GDP size increases, countries are more likely to be net debtors in terms of their external portfolio positions. Countries with high GDP tend to attract more foreign portfolio investment relative to the expansion of their outward holdings, reflecting their deeper and more liquid financial markets that serve as safe destinations for global investors.

To further explore heterogeneity in the relationship between global production network dispersion and international portfolio investment positions, the analysis is extended by dividing the sample according to the degree of capital openness. For each country, the average level of capital openness over the sample period (2002 - 2018) is calculated, and the median value of these country-specific averages is used as the cutoff point to classify countries into two groups: a low-capital-openness group and a high-capital-openness group. This approach allows us to assess whether the intensity of capital liberalization conditions the impact of GVC dynamics on external portfolio positions. The results are reported in Table 4.

In the low-capital-openness group, the coefficients on the lagged dispersion measures are positive and statistically significant. This indicates that among countries with relatively closed capital accounts, greater dispersion of GVC linkages in the previous year is associated with an increase in the net portfolio investment position, reflecting an expansion of outward portfolio holdings. The result suggests that when financial markets are less liberalized, production-network dispersion plays a prominent role in facilitating outward financial integration.

In contrast, for the high capital openness group, the coefficients of all GVC-related variables are statistically insignificant. This implies that in economies with highly liberalized capital markets, variations in GVC dispersion or participation have no significant effect on net portfolio

positions.

To examine whether the relationship between GVC linkage dispersion and portfolio investment positions varies across financial stress regimes, we expand the baseline specification with an interaction between the GVC dispersion measure and annual FX volatility. Table 5 reports the results. In the full sample, the positive effect of GVC dispersion on net portfolio positions is robust, while the negative and significant interaction term indicates that this effect attenuates during periods of elevated exchange rate volatility. This pattern aligns with the broader literature documenting retrenchment of outward portfolio investment during financial stress episodes (Milesi-Ferretti and Tille, 2011; Broner, Didier, and Schmukler, 2013). In the advanced economy subsample, neither coefficient is statistically significant, supporting the finding that GVC structure and portfolio positions are not systematically linked among advanced economies.

Although our net portfolio position framework does not allow a direct decomposition into asset and liability components, two features of our results are more consistent with an asset-accumulation interpretation than with a liability-reduction channel. First, the significant effect in low-capital-openness countries, where foreign investor exit is constrained by capital controls, suggests that the positive net position effect stems from domestic outward investment rather than from a contraction of foreign liabilities. Second, the attenuation of the effect during high FX volatility episodes reported in Table 5 mirrors the retrenchment of outward portfolio investment documented during financial stress periods (Broner, Didier, and Schmukler, 2013), rather than the pattern one would expect if the effect operated through the liability side. A full decomposition into gross asset and liability positions remains an important direction for future research.

〈Table 2〉 GVC linkage and net financial investment position

VARIABLES	All countries			Advanced countries		
	(1)	(2)	(3)	(4)	(5)	(6)
	In total net	In total net	In total net	In total net	In total net	In total net
ln_gvc	0.560 (1.188)			-2.006 (2.760)		
gvc_sd	0.00066*** (0.000221)			-0.000349 (0.000246)		
ln_dvx		1.253 (1.032)			-1.028 (1.257)	
dvx_sd		0.00135*** (0.000326)			-0.000688 (0.000454)	
ln_fva			-0.578 (1.119)			-1.336 (2.762)
fva_sd			0.00073*** (0.000239)			-0.000449 (0.000342)
WGI	0.476 (1.395)	0.560 (1.373)	0.544 (1.405)	-0.0737 (1.748)	0.0213 (1.708)	-0.325 (1.769)
Fin_dev	7.734 (6.151)	6.591 (5.962)	8.946 (6.497)	-11.83 (8.817)	-11.35 (8.691)	-11.55 (8.730)
FX_vol	-243.7 (583.1)	-186.6 (587.5)	-463.4 (572.5)	173.5 (827.3)	198.3 (1,017)	118.0 (761.0)
K_open	-2.283 (1.443)	-2.207 (1.436)	-2.266 (1.445)	-0.0841 (3.040)	-0.0476 (2.974)	-0.347 (3.069)
ln_gdp	0.393 (1.829)	-0.266 (1.971)	0.885 (1.971)	-1.058 (1.513)	-2.278* (1.298)	-0.773 (1.651)
Constant	-21.75 (28.17)	-29.87 (24.17)	-0.578 (28.08)	63.19 (66.00)	49.98 (40.10)	44.15 (61.48)
Year, Country FEs	O	O	O	O	O	O
Observations	2,612	2,612	2,612	595	595	595
R-squared	0.038	0.048	0.028	0.117	0.115	0.110
Number of countryid	155	155	155	35	35	35

Robust standard errors in parentheses: *** p<0.01, * p<0.1

〈Table 3〉 GVC linkage and net financial investment position using lagged variable

VARIABLES	All countries			Advanced countries		
	(1)	(2)	(3)	(4)	(5)	(6)
ln_gvc_lag(1)	ln total net 0.277 (1.069)			ln total net 1.270 (1.252)		ln total net
gvc_sd_lag(1)	0.000634** (0.000245)			-0.000280 (0.000226)		
ln_dvx_lag(1)		0.820 (0.960)			0.309 (0.740)	
dvx_sd_lag(1)		0.00135*** (0.000400)			-0.000542 (0.000418)	
ln_fva_lag(1)			-0.464 (1.026)			1.716 (1.460)
fva_sd_lag(1)			0.00072*** (0.000274)			-0.000430 (0.000346)
WGI	0.476 (1.395)	0.560 (1.373)	0.544 (1.405)	1.240 (1.575)	1.233 (1.566)	1.132 (1.496)
Fin_dev	7.734 (6.151)	6.591 (5.962)	8.946 (6.497)	-11.35 (8.279)	-11.21 (8.220)	-11.36 (8.254)
FX_vol	-243.7 (583.1)	-186.6 (587.5)	-463.4 (572.5)	485.1 (433.3)	557.3 (451.6)	443.3 (445.1)
K_open	-2.283 (1.443)	-2.207 (1.436)	-2.266 (1.445)	-2.395 (3.256)	-2.342 (3.214)	-2.500 (3.340)
ln_gdp	0.393 (1.829)	-0.266 (1.798)	0.885 (1.971)	-2.369* (1.300)	-2.197* (1.261)	-2.273* (1.186)
Constant	-21.75 (28.17)	-29.87 (24.17)	-0.578 (28.08)	-6.825 (27.86)	13.97 (23.03)	-16.84 (29.64)
Year, Country FEs	O	O	O	O	O	O
Observations	2,459	2,459	2,459	560	560	560
R-squared	0.037	0.047	0.028	0.135	0.130	0.134
Number of countryid	155	155	155	35	35	35

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 4) GVC linkage and net financial investment position across the level of capital openness

VARIABLES	Low capital openness			High capital openness		
	(1)	(2)	(3)	(4)	(5)	(6)
	In total net	In total net	In total net	In total net	In total net	In total net
ln_gvc_lag(1)	-1.186 (1.244)			0.841 (1.647)		
gvc_sd_lag(1)	0.00192*** (0.000346)			-0.000102 (0.000118)		
ln_dvx_lag(1)		-0.295 (1.096)			0.244 (1.424)	
dvx_sd_lag(1)		0.00263*** (0.000399)			-0.000164 (0.000232)	
ln_fva_lag(1)			-1.888 (1.238)			1.271 (1.592)
fva_sd_lag(1)			0.00409*** (0.00126)			-0.000187 (0.000193)
WGI	2.216 (1.774)	2.103 (1.776)	2.041 (1.782)	-0.583 (1.846)	-0.539 (1.805)	-0.788 (1.896)
Fin_dev	9.382 (8.537)	8.885 (7.974)	13.28 (10.99)	2.372 (8.383)	2.529 (8.354)	2.143 (8.367)
FX_vol	45.48 (652.1)	12.99 (667.1)	76.15 (666.2)	698.7 (869.9)	659.0 (920.5)	678.2 (894.2)
K_open	-5.548** (2.532)	-5.614** (2.604)	-5.323** (2.373)	-1.430 (1.679)	-1.453 (1.701)	-1.401 (1.651)
ln_gdp	-0.675 (2.303)	-1.105 (2.330)	-0.0579 (2.560)	2.181 (2.492)	2.438 (2.539)	2.084 (2.467)
Constant	14.45 (30.88)	2.257 (26.86)	19.19 (34.82)	-55.76 (43.00)	-44.59 (38.99)	-62.67 (39.40)
Year, Country FEs	O	O	O	O	O	O
Observations	1,110	1,110	1,110	1,349	1,349	1,349
R-squared	0.172	0.178	0.152	0.033	0.032	0.034
Number of countryid	70	70	70	85	85	85

Robust standard errors in parentheses: *** p<0.01, ** p<0.05

〈Table 5〉 GVC linkage and net financial investment position - interaction with FX volatility

VARIABLES	All countries			Advanced countries		
	(1)	(2)	(3)	(4)	(5)	(6)
	In total net	In total net	In total net	In total net	In total net	In total net
ln_gvc_lag(1)	0.936 (0.939)			1.263 (1.254)		
gvc_sd_lag(1)	0.000512** (0.000241)			-0.000313 (0.000258)		
gvc_sd_lag(1) X FX_vol	-0.00538** (0.00223)			0.00218 (0.00275)		
ln_dvx_lag(1)		1.102 (0.855)			0.301 (0.743)	
dvx_sd_lag(1)		0.00115*** (0.000387)			-0.000590 (0.000470)	
dvx_sd_lag(1) X FX_vol		-0.00974* (0.00508)			0.00316 (0.00453)	
ln_fva_lag(1)			0.807 (0.842)			1.720 (1.463)
fva_sd_lag(1)			0.000461** (0.000232)			-0.000469 (0.000382)
fva_sd_lag(1) X FX_vol			-0.00516 (0.00373)			0.00277 (0.00405)
Constant	-53.82** (25.63)	-55.81** (23.31)	-50.04** (23.60)	-6.552 (27.95)	14.26 (23.21)	-16.82 (29.68)
Control Variables	O	O	O	O	O	O
Year, Country FEs	O	O	O	O	O	O
Observations	2,385	2,385	2,385	560	560	560
R-squared	0.034	0.045	0.025	0.136	0.130	0.134
Number of countryid	155	155	155	35	35	35

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Received: November 3, 2025. Revised: March 3, 2026. Accepted: March 4, 2026.

◆ References ◆

- Alfaro, L., and M. X. Chen. (2012), "Surviving the Global Financial Crisis: Foreign Ownership and Establishment Performance." *American Economic Journal: Economic Policy* 4(3): 30-55.
- Allayannis, G., and E. Ofek. (2001), "Exchange Rate Exposure, Hedging, and the Use of Foreign Currency Derivatives." *Journal of International Money and Finance* 20(2): 273-296.
- Antràs, P., and D. Chor. (2013), "Organizing the Global Value Chain." *Econometrica* 81(6): 2127-2204.
- Antràs, P., and D. Chor. (2022), "Global Value Chains." *Handbook of International Economics*, Volume 5, edited by G. Gopinath, E. Helpman, and K. Rogoff. Elsevier.
- Antràs, P., and R. W. Staiger. (2012), "Offshoring and the Role of Trade Agreements." *American Economic Review* 102(7): 3140-3183.
- Aviat, A., and N. Coeurdacier. (2007), "The Geography of Trade in Goods and Asset Holdings." *Journal of International Economics* 71(1): 22-51.
- Baldwin, R. (2009), "The Great Trade Collapse: Causes, Consequences and Prospects." CEPR.
- Baldwin, R., and J. Lopez-Gonzalez. (2015), "Supply-chain Trade: A Portrait of Global Patterns and Several Testable Hypotheses." *The World Economy* 38(11): 1682-1721.
- Beck, T. (2002), "Financial Development and International Trade: Is There a Link?" *Journal of International Economics* 57(1): 107-131.
- Borio, C., and P. Disyatat. (2011), "Global Imbalances and the Financial Crisis: Link or No Link?" BIS Working Papers No. 346.
- Broner, F., T. Didier, A. Erce, and S. Schmukler. (2013), "Gross Capital Flows: Dynamics and Crises." *Journal of Monetary Economics* 60(1): 113-133.

- Caballero, R. J., and A. Krishnamurthy. (2001), "International and Domestic Collateral Constraints in a Model of Emerging Market Crises." *Journal of Monetary Economics* 48(3): 513-548.
- Caselli, F., M. Koren, M. Lisicky, and S. Tenreyro. (2020), "Diversification Through Trade." *The Quarterly Journal of Economics* 135(1): 449-502.
- Coeurdacier, N., and H. Rey. (2013), "Home Bias in Open Economy Financial Macroeconomics." *Journal of Economic Literature* 51(1): 63-115.
- Costello, A. M. (2020), "Credit Market Disruptions and Liquidity Spillover Effects in the Supply Chain." *Journal of Political Economy* 128(9): 3434-3468.
- Dasgupta, K., and J. Mondria. (2018), "Inattentive Importers." *Journal of International Economics* 115: 147-168.
- di Giovanni, J., A. A. Levchenko, and I. Mejean. (2018), "The Micro Origins of International Business-Cycle Comovement." *American Economic Review* 108(1): 82-108.
- Escaith, H., N. Lindenberg, and S. Miroudot. (2010), "International Supply Chains and Trade Elasticity in Times of Global Crisis." WTO Staff Working Paper ERSD-2010-08.
- Forbes, K., and F. Warnock. (2012), "Capital Flow Waves: Surges, Stops, Flight, and Retrenchment." *Journal of International Economics*. 88(2): 235-251.
- Froot, K., D. Scharfstein, and J. Stein. (1993), "Risk Management: Coordinating Corporate Investment and Financing Policies." *The Journal of Finance* 48(5): 1629-1658.
- Jinjarak, Y. (2015), "Supply Chains, Global Financial Shocks and Firm Behaviour towards Liquidity Needs." *The World Economy* 38(3): 425-444.
- Johnson, R. C., and G. Noguera. (2017), "A Portrait of Trade in Value-Added over Four Decades." *Review of Economics and Statistics* 99(5): 896-911.
- Kalemli-Özcan, E. Papaioannou, J. Peydró. (2013), "Financial Regulation, Financial Globalization, and the Synchronization of Economic Activity." *The Journal of Finance* 68(3): 1179-1228.

- Kiyotaki, N., and J. Moore. (1997), "Credit Cycles." *Journal of Political Economy* 105(2): 211-248.
- Kose, A., E. Prasad, and M. Terrones. (2009), "Does Openness to International Financial Flows Raise Productivity Growth?" *Journal of International Money and Finance* 28(4): 554-580.
- Kramarz, F., and J. Martin, and I. Majeau. (2020), "Volatility in the Small and in the Large: The Lack of Diversification in International Trade." *Journal of International Economics* 122.
- Lane, P. R., and G. M. Milesi-Ferretti. (2008), "The Drivers of Financial Globalization." *American Economic Review* 98(2): 327-332.
- Lane, P. R., and G. M. Milesi-Ferretti. (2017), "International Financial Integration in the Aftermath of the Global Financial Crisis." *IMF Working Papers* 115.
- Lee, H., D. Park, D. Park, and S. Tian. (2023), "RCEP's Financial Integration before and after the Global Financial Crisis: an Empirical Analysis." *The Journal of International Trade & Economic Development* 32(3): 429-460.
- Manova, K. (2013), "Credit Constraints, Heterogeneous Firms, and International Trade." *Review of Economic Studies* 80(2): 711-744.
- Martin, P., and H. Rey. (2004), "Financial Super-Markets: Size Matters for Asset Trade." *Journal of International Economics* 64(2): 335-361.
- Milesi-Ferretti, G., C. Tille, G. Ottaviano, and M. Ravn. (2011), "The Great Retrenchment: International Capital Flows during the Global Financial Crisis." *Economic Policy* 26(66): 285, 287-342.
- Obstfeld, M. (2012), "Financial Flows, Financial Crises, and Global Imbalances." *Journal of International Money and Finance* 31(3): 469-480.
- Park, D. (2024), "Impact of Foreign Exchange Rate Volatility and Cross-border Investment Concentration: Using Portfolio Investment Data." *Review of International Money and Finance* 14(1): 65-93.
- Portes, R., and H. Rey. (2005), "The Determinants of Cross-Border Equity Flows." *Journal of International Economics* 65(2): 269-296.
- Portes, R., H. Rey, and Y. Oh. (2001), "Information and Capital Flows: The Determinants of Transactions in Financial Assets." *European*

Economic Review 45(4-6): 783-796.

Raddatz, C. (2010), "Credit Chains and Sectoral Comovement: Does the Use of Trade Credit Amplify Sectoral Shocks?" *Review of Economics and Statistics* 92(4): 985-1003.

Tong, H., and S., Wei. (2011), "The Composition Matters: Capital Inflows and Liquidity Crunch during a Global Economic Crisis." *The Review of Financial Studies* 24(6): 2023-2052.

글로벌 가치사슬과 금융통합의 연계성: 포트폴리오 투자포지션에 대한 실증분석*

오 현 진** · 박 단 비***

논문초록

이 논문은 글로벌 가치사슬(GVC) 연계의 분산(dispersion)이 각국의 순 포트폴리오투자 포지션에 미치는 영향을 분석한다. 2002년부터 2018년까지 155개국의 데이터를 이용한 실증분석 결과, GVC 연계 분산은 순포트폴리오 투자 포지션을 유의하게 확대시키는 것으로 나타났으며, 이는 국가들이 생산 네트워크 내의 위험을 금융시장을 통해 헤지(hedge)하고 있음을 시사한다. 그러나 선진국의 경우 GVC 연계 분산이 순포지션에 유의한 영향을 미치지 않았으며, 이는 대외 포트폴리오의 유출과 유입이 균형적으로 움직이는 구조를 반영하는 것으로 해석된다. 전반적으로 본 연구의 결과는 GVC 생산 네트워크가 분산될수록 정보 흐름을 개선하고 투자자의 자국 편향을 완화함으로써 국제 금융 노출을 촉진하며, 실물부문의 통합과 국경 간 금융연계가 상호 보완적으로 작동하고 있음을 보여준다.

주제분류 : F21, F14

핵심 주제어 : 글로벌 가치사슬, 금융통합, 포트폴리오투자

* 이 논문은 2025년도 인하대학교의 지원에 의하여 연구되었음.

** 연세대학교 경제학부 박사과정. oh_hyunjin@yonsei.ac.kr

*** 교신저자: 인하대학교 국제통상학과 부교수. dbpark@inha.ac.kr

