FDI and Global Value Chains:
From Dependent Development to Embedded Reciprocity

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Abstract

This paper analyzes the vulnerabilities and restructuring of global value chains (GVCs) in an era marked by escalating geopolitical tensions, protectionism, and geoeconomic fragmentation. As major powers weaponize interdependence through trade restrictions, financial sanctions, and technological decoupling, developing economies—particularly across ASEAN—face heightened risks from systemic disruptions and asymmetric shocks. While trade diversion and "friend-shoring" offer initial opportunities to attract redirected capital and trade flows, these developments do not automatically foster sustainable economic upgrading. Without deliberate policy intervention, recipient economies risk functioning merely as shallow pass-through conduits or low-value assembly hubs heavily reliant on foreign value added.

To build genuine economic resilience without retreating into inefficient autarky, developing economies must transition from a passive model of FDI-dependent development to a strategic paradigm of "embedded reciprocity". This framework integrates foreign direct investment directly into domestic industrial policy, conditioning public support, tax incentives, and infrastructure access on tangible contributions from multinational enterprises (MNEs). Such contributions include local supplier development, technological diffusion, joint R&D initiatives, workforce upskilling, and increased domestic value addition.

The paper evaluates this strategic imperative across contemporary regional developments, including the ASEAN Framework for Integrated Semiconductor Supply Chain (AFISS), China's Dual Circulation Strategy, and the US-led Pax Silica partnership. By comparing rules-based regional frameworks like RCEP against power-centric bilateral arrangements, the study underscores the need for developing nations to balance major-power commitments while safeguarding national policy autonomy. Ultimately, resilience in a fragmented global economy depends on fostering supplier substitutability, advancing deep regional cooperation, and strategically disciplining foreign investment to build enduring domestic productive capabilities.

Keywords: Global Value Chains, Foreign Direct Investment, Embedded Reciprocity, Geoeconomic Fragmentation, Industrial Policy, ASEAN

I. Introduction

The post–World War II economic order has contributed significantly to global prosperity. Although its benefits have been unevenly distributed and the system has experienced recurrent crises and disruptions, the global economy has demonstrated a remarkable capacity to absorb and recover from these shocks. These include the 1971 Nixon Shock, the 1973 Oil Crisis, the Latin American Debt Crisis of the 1980s, the bursting of Japan's asset price bubble in 1990, the 1997 Asian Financial Crisis, the 2007–2008 Global Financial Crisis, the 2009–2012 Eurozone Debt Crisis, the COVID-19 pandemic, and the 2021–2023 inflation surge. Despite these episodes of instability, the global economy continued to expand and integrate. Between 1968 and 2008, the global trade-to-GDP ratio—a useful, albeit narrow indicator of global economic integration—rose steadily (Figure 1). Trade deepening has helped catalyze catch-up in per capita incomes across countries and a large reduction in global poverty, while in advanced economies, low-income consumers have benefited disproportionately through lower prices (Aiyar, Chen, et al. 2023).

Since 2008, however, the global trade-to-GDP ratio has largely stagnated. This suggests that the series of crises and disruptions may have had lingering effects and that the global economic order has been undergoing a process of adjustment. The slowdown in globalization, in other words, may reflect not simply a cyclical pattern but deeper structural changes in the organization and governance of the global economy.

At the same time, new challenges to the global economic order have emerged, particularly in the form of intensifying geopolitical tensions and, increasingly, the use of geoeconomic strategies. These two forces can reinforce one another, as illustrated in Figure 2. The evolution of US–China relations provides a prominent example. During the early 2000s, the two economies entered a period of deepening interdependence. China's accession to the World Trade Organization (WTO) in 2001 was a critical milestone in this process, facilitating a substantial expansion of trade, investment, and technological linkages between the two countries. It is therefore not coincidental that the steepest increase in the global trade-to-GDP ratio shown in Figure 1 occurred during 2002–2008. This period represented perhaps the high point of globalization.

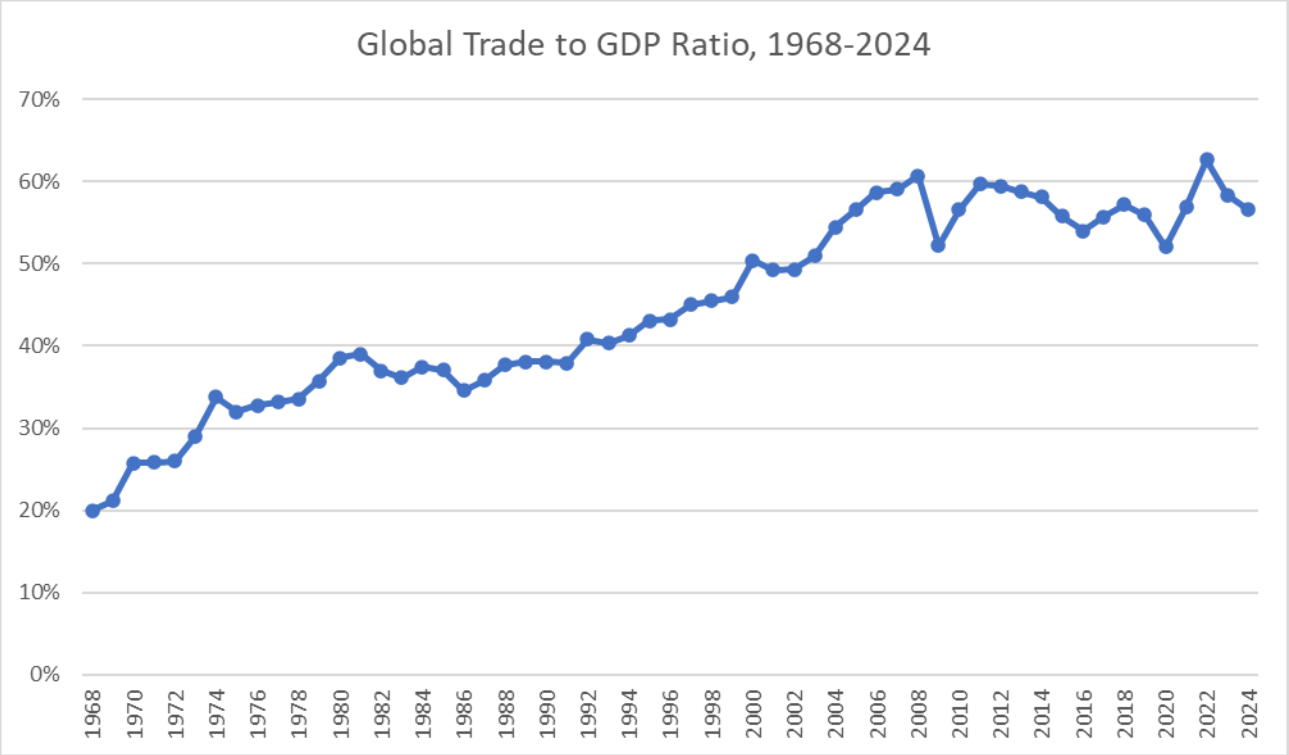
However, the mid-to-late 2000s and early 2010s saw rising concerns in the US about China's growing influence, similar to its unease with Japan's rise in the 1980s. These concerns began to shape political discourse, especially as China moved to expand its presence in global supply chains and sectors like high-tech manufacturing and artificial intelligence. The first major response was the US "Pivot to Asia," which was a strategic shift in American foreign policy initiated during the Obama administration, starting around 2011.

It was around this time that the concept of decoupling began to gain prominence. Decoupling refers to the process by which two economies or systems become less interconnected or interdependent. In the context of US-China relations, decoupling specifically refers to the reduction or severing of economic, trade, investment, and technological ties between the two nations. Interestingly, the approach to China deviated from the manner by which the US dealt with Japan in the 1980s. At that time, the US government pushed Japan to open its markets to American goods and services, particularly in sectors like automobiles and electronics. This included negotiations under the framework of the Plaza Accord in 1985, which aimed to devalue the US dollar against the yen to help balance trade.[1] However, there was no explicit

[1] The 1986 US-Japan Semiconductor Trade Agreement is an outcome of the pressure on Japan. The agreement aimed to address alleged Japanese dumping and market closure in the semiconductor industry, with the goal of securing a 20% share of the Japanese market for foreign firms. Along with the 1985 Plaza Accord and 1987 Louvre Accord, the 1986 trade agreement contributed to the 1990 economic crisis in Japan caused by the collapse in asset prices.

reference to the possibility of decoupling. This is likely because Japan has been considered a full-fledged military ally in the post-war period while China remains to be a political rival.

Figure 1: Global Trade to GDP Ratio (%), 1968-2024



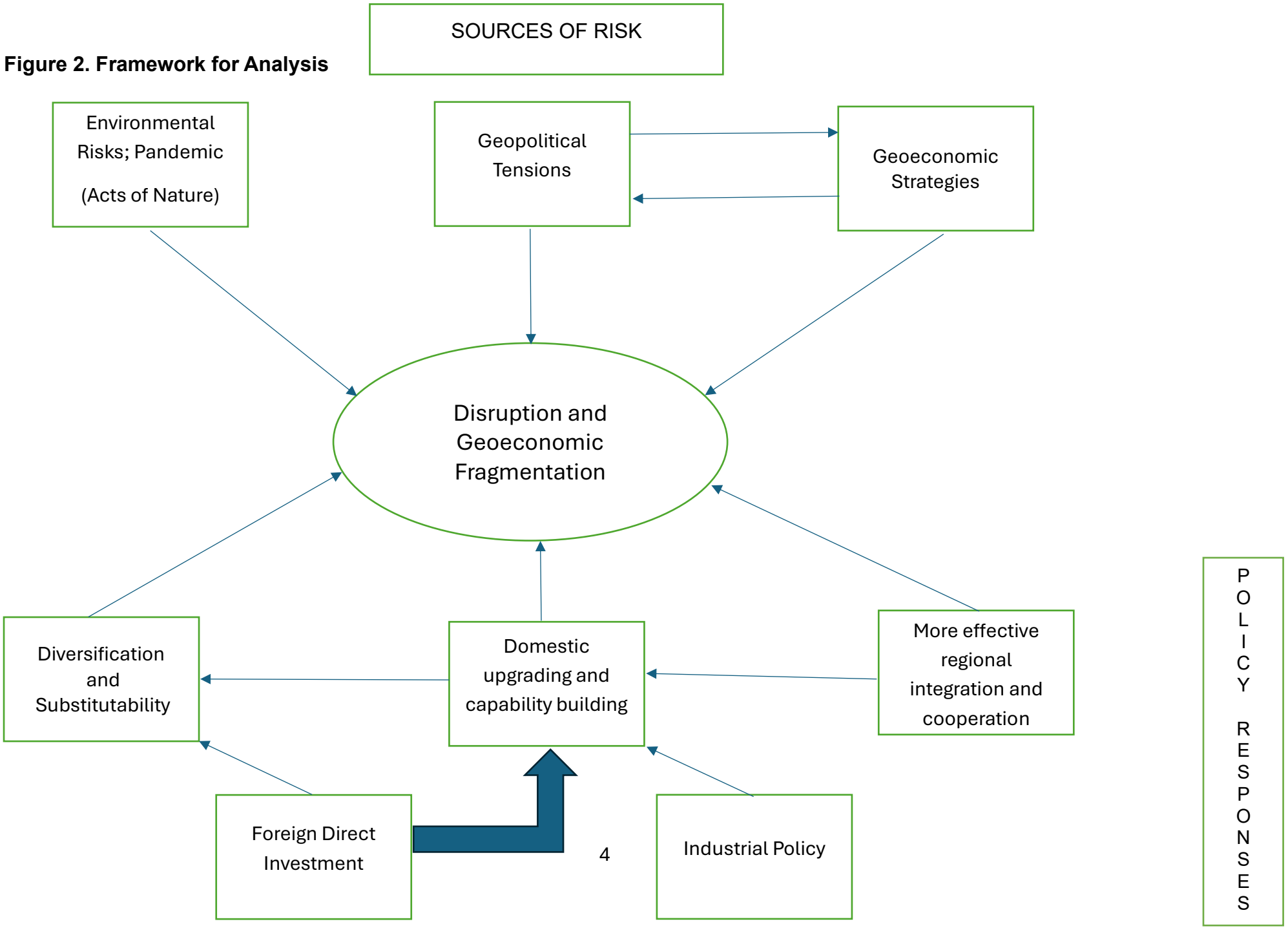
Source: World Bank Key Indicators: https://data.worldbank.org/indicator.

Another turning point in US-China relations came in 2015 with the announcement of China's "Made in China 2025" initiative, which aimed to make China a global leader in high-tech industries, including robotics, aerospace, renewable energy, and semiconductors. This plan raised alarms in Washington, where there was growing concern over China's competitive strategy in industries critical to US economic and national security interests. Not surprisingly, the US government's pursuit of decoupling accelerated under the first Trump administration. Starting around 2017, the US adopted a more confrontational stance toward China, particularly in terms of trade and technology. In 2018, the US imposed tariffs on hundreds of billions of dollars worth of Chinese goods, marking the start of a significant trade war between the two countries.

The possibility of decoupling between the US and China has drawn attention to the analogous and broader issue of geopolitical tensions and economic fragmentation. The latter refers to the breakdown or weakening of global economic integration, where countries or regions reduce their interdependence and shift toward inward-looking or bloc-based economic systems. A more nuanced term is geoeconomic fragmentation (Aiyar, et al. 2023), which is described as a policy-driven reversal of global economic integration often guided by strategic considerations. These considerations could include national or economic security, as well as enhancing autonomy via reduced reliance on other countries.

The main objective of this paper is to examine how economic disruptions arising from geopolitical tensions and geoeconomic fragmentation affect global value chains (GVCs), particularly their structure, functioning, and resilience. It also considers the policies and measures that economies can adopt to mitigate the adverse effects of geoeconomic fragmentation and, where possible, reduce their exposure to such disruptions.

Figure 2. Framework for Analysis



The analysis focuses particularly on developing economies, especially those that are deeply integrated into GVCs. A central argument of the paper is that these economies need to strengthen and upgrade their domestic capabilities if they are to participate more effectively in the restructuring of global production networks and capture a greater share of the value generated within them. Enhancing capabilities in areas such as skills, technology, innovation, infrastructure, and research and development, is therefore critical not only for upgrading but also for strengthening resilience to external shocks.

For ASEAN member states, this implies moving beyond a development strategy that relies heavily on attracting foreign direct investment (FDI) as an end in itself. Instead, multinational enterprises (MNEs) should be embedded within a broader industrial strategy designed to build domestic capabilities. The objective should be to harness the presence of MNEs as a mechanism for strengthening local firms through training and skills development, technology transfer and diffusion, joint R&D and innovation, supplier development, and greater domestic value addition. Such an approach would enable ASEAN economies to move from a predominantly FDI-dependent model toward one in which MNEs become more embedded into—and contribute actively to—the upgrading of domestic productive capabilities.

The next section discusses recent sources of geopolitical tensions and geoeconomic strategies that may cause disruptions and fragmentation of the global economic order. Section III analyzes how these factors lead to economic fragmentation and adversely affect the global economy in general, and GVCs in particular. Meanwhile, Section IV presents a brief overview of possible policies and measures that economies can adopt to mitigate the adverse effects of geoeconomic fragmentation and, where possible, reduce their exposure to such disruptions. The last subsection of Section IV highlights measures related to domestic upgrading and capability building through embedded reciprocity. The interface between FDI, industrial policy, and regional cooperation are explained. Section V situates two recent developments in this framework: the dual circulation strategy (DCS) of China and Pax Silica. The last section concludes.

II. Recent Geopolitical Tensions and Geoeconomic Strategies

In recent years, geopolitical tensions have intensified significantly across the globe. These tensions arise from conflicts and rivalries among states driven by competing strategic interests, territorial claims, or divergent political and ideological orientations. Russia's invasion of Ukraine in February 2022 occurred just as the global economy was emerging from the vestiges of the COVID-19 pandemic. In October 2023, Hamas attacked southern Israel, triggering Israel's subsequent brutal military campaign in Gaza causing more instability in the Middle East. A third major conflict emerged when the United States attacked Iran in February 2026, resulting in the closure of the Strait of Hormuz, a critical artery for global energy and trade. In Asia, meanwhile, the South China Sea—referred to in the Philippines as the West Philippine Sea—remains a prominent geopolitical flashpoint. Maritime and territorial disputes, particularly between China and the Philippines, have intensified and attracted growing international concern. Collectively, these developments, and especially the conflict involving Iran and the disruption of the Strait of Hormuz, have generated significant repercussions for the global economy.

At the same time, US geoeconomic strategies have continued to exert pressure on the global economic system. Efforts to reduce economic dependence on China did not diminish with the change in US leadership in 2021. Although the Biden administration sought to restore diplomatic engagement with Beijing, it largely maintained the structural changes in US trade and technology policies introduced during the Trump administration. The situation has deteriorated further during President Trump's second term. Eight decades of US leadership in building and sustaining the postwar international economic and political order have been

undermined. This shift was particularly evident in the sweeping tariff measures announced by the Trump administration on April 2, 2025. Invoking expansive interpretations of the International Emergency Economic Powers Act (IEEPA), the administration imposed a basic 10 percent tariff on imported goods entering the United States, while substantially higher tariffs were imposed on 57 trading partners based on calculations of perceived trade imbalances. The policy represented a marked departure from the relatively predictable rules-based approach that had characterized much of the postwar trading system.

The legal basis for these measures subsequently came under serious challenge. As a result, the US Supreme Court ruled that IEEPA did not confer unilateral authority on the executive branch to impose broad-based import taxes, thereby requiring billions of dollars in potential refunds to businesses affected by the tariffs. Rather than fundamentally reconsidering its protectionist approach, however, the Trump administration continued to seek alternative legal and political justifications for imposing trade restrictions, even alleging that certain trading partners engaged in trade with economies associated with forced labor. Such measures have further contributed to uncertainty in international trade and have reinforced concerns regarding the politicization of economic relations.

The increasingly aggressive and confrontational posture of the current US administration has also contributed to the deterioration of broader geopolitical relations. Beyond its tariff policies, the United States has signaled a reduced willingness to remain deeply engaged in European security affairs, while calling on its European allies to assume greater responsibility for their own defense. This marks a significant departure from the traditional bipartisan commitment to NATO and strong transatlantic relations that characterized US foreign policy for much of the postwar period. The shift has been particularly evident in President Trump's ambivalent relationship with Ukrainian President Volodymyr Zelenskyy and his comparatively accommodating posture toward Russian President Vladimir Putin. It has also been underscored by the US decision to initiate military action against Iran without prior consultation with its NATO allies, further raising concerns about the erosion of established patterns of alliance coordination and collective security.

The Trump administration has also made provocative statements concerning the territorial and political status of traditional partners. President Trump's remarks regarding the possible annexation of Greenland and his suggestion that Canada could become the 51st US state have been particularly striking. While such statements may at times be dismissed as rhetorical or negotiating tactics, they nevertheless contribute to uncertainty among allies and raise questions about the durability of longstanding assumptions regarding sovereignty, territorial integrity, and the nature of US alliances.

There is, of course, nothing unprecedented about the US placing its national interests at the forefront of its international economic policy. As mentioned earlier, during the 1980s Washington exerted considerable pressure on Japan in response to persistent trade imbalances and growing concerns about Japanese economic competitiveness. What distinguishes the present situation, however, is the breadth and depth of the tensions surrounding US international relations. Canada, in particular, represents an especially prominent case given its longstanding economic, political, cultural, and security ties with the US. The fact that tensions have emerged even with such a close ally underscores the extent to which the foundations of the postwar international order are being challenged.

The cumulative effect is a global environment characterized by greater geopolitical uncertainty, increasing use of economic instruments for strategic purposes, and weakening confidence in the stability of established international rules. Trade, investment, technology, finance, and supply chains are no longer insulated from geopolitical considerations. Instead, economic interdependence itself is increasingly being viewed through the lens of national security and strategic competition. This development has profound implications for the organization and

resilience of GVCs, particularly for developing economies that depend heavily on international trade, foreign direct investment, and access to global markets and technologies.

III. Geopolitical Tensions and Geoeconomic Strategies and Economic Fragmentation

Theoretical interlude

Globalization has generated substantial economic prosperity, but it has also created new forms of vulnerability. Over time, globalization has produced dense and highly interconnected networks spanning trade, finance, technology, logistics, investment, and digital infrastructure. These networks, however, are far from evenly distributed. Rather than forming flat and decentralized structures, they tend to develop into hub-and-spoke configurations in which certain states and institutions occupy strategically important central positions. It is within this context that Farrell and Newman (2019) developed the concept of "weaponized interdependence." The concept highlights how states and other powerful actors can exploit their control over critical nodes in global networks—including financial systems, information networks, and supply chains—to obtain strategic and coercive advantages. Under such conditions, economic interdependence ceases to be merely a source of mutual gains and can instead become an instrument of power, particularly when the dependence between actors is asymmetric. The tariff policies pursued under the Trump administration can be viewed as one manifestation of this broader phenomenon of weaponized interdependence.

Farrell and Newman (2019) identify two principal mechanisms through which interdependence can be weaponized: the panopticon effect and the chokepoint effect. The panopticon effect arises when a state occupying a central position in a network can exploit that position to obtain information about the activities and transactions of other actors, thereby gaining an informational advantage. The chokepoint effect, by contrast, allows a state to restrict, disrupt, or terminate an adversary's access to critical flows within the network, using exclusion as a means of exercising power. The Society for Worldwide Interbank Financial Telecommunication (SWIFT) illustrates the latter mechanism. SWIFT is a global financial messaging network through which financial institutions securely transmit payment instructions and other financial information. Because access to such a system is essential for participation in international financial transactions, restrictions on access can effectively isolate targeted actors from important segments of the global financial system. SWIFT therefore constitutes a potential financial chokepoint through which control over a critical node in a global network can be transformed into geopolitical and economic leverage.

Meanwhile, Mohr and Trebesch (2025) discuss the macro-level field of geoeconomics, identifying the spectrum of economic instruments available to states. The authors define geoeconomics as the field of study that examines the links between geopolitics and economics. Geoeconomics is therefore concerned with how international political rivalry (including war) shapes economic policies and outcomes– and vice versa. Mohr and Trebesch identify numerous geoeconomic instruments including: sanctions; embargoes and blockades; tariffs and trade agreements; export controls; investment restrictions; foreign aid; and sabotage, espionage, and cyberattacks;

Foucault (2025) explains why contemporary great-power rivalry has elevated these instruments into a broader economic geostrategy, emphasizing that economic policies are increasingly deployed in pursuit of security and geopolitical objectives.

Channels through which economic fragmentation emerges[2]

Geopolitical tensions and geoeconomic strategies transmit into economic fragmentation through interconnected financial, real, and broader structural channels. These operate both in the short term (via sudden reallocations and disruptions) and longer term (via reduced diversification and weaker cooperation). These channels interact across borders and geopolitical blocs. Spillovers are larger when tensions involve major, highly integrated economies. "Neutral" countries may attract redirected capital, but absorptive capacity and policy frameworks determine whether inflows are beneficial. Uncertainty about both the transition path and the eventual configuration of a fragmented world magnifies effects.

Financial channel

The most direct pathway involves restrictions on capital flows and payments, heightened uncertainty, and elevated risk aversion. These are generally classified as sanctions, with the SWIFT mechanism as an example. Measures such as capital controls, financial sanctions, asset freezes, and limits on cross-border payments can prompt investors and lenders to reallocate portfolios and cut credit lines away from geopolitically distant countries. Over time, these restrictions can fragment international payment systems and encourage shifts in reserve-asset preferences toward geopolitically aligned currencies or gold, potentially accompanied by transitional volatility.

Real (trade, supply-chain, and commodity) channel

Restrictions on international trade and technology transfer, combined with disruptions to global GVCs and commodity markets, constitute a potent complementary channel. Export bans, tariffs, non-tariff barriers (NTBs), industrial subsidies, and "friend-shoring" or reshoring policies segment markets along geopolitical lines. The impact on GVCs will be examined more closely in a subsequent subsection. Aiyar, Chen, et al. (2023) observed a sharp rise in trade restrictions, particularly in high-tech sectors motivated by national-security considerations, as well as increased mentions of national security in exchange-arrangement reports. These real-side effects feed back into the financial channel: lower trade and growth impair corporate liquidity and profitability, raising credit risk for banks, while monetary tightening in response to inflation can further depress asset prices and raise borrowing costs. Feedback loops are mutually reinforcing; reduced output discourages investment, which further weakens trade linkages.

Technology and knowledge-diffusion channel

Strategic competition increasingly targets high-tech sectors (semiconductors, advanced computing, clean technologies). Export controls, investment screening, data-localization requirements, and restrictions on "persons" supporting certain technologies in rival economies impede the global spread of ideas, R&D spillovers, and technology adoption. Openness historically stimulated innovation through competition, knowledge transfer, and skill enhancement; fragmentation reverses these gains. Technological decoupling amplifies pure trade barriers because productivity depends heavily on access to frontier knowledge and processes.

[2] This subsection is largely based on Aiyar, et al. (2023) and Aiyar, Chen, et al. (2023).

Capital-flow and investment channel (beyond pure finance)

Beyond portfolio and banking flows, FDI is particularly sensitive. Geopolitical alignment increasingly shapes FDI patterns; reduced FDI limits technology transfer, managerial know-how, and financial deepening in recipient economies. Heightened policy uncertainty further deters long-term investment.

Global public goods and cooperation channel

Fragmentation erodes multilateral cooperation required for climate mitigation, pandemic preparedness, debt resolution, and financial stability. Split commodity markets and reduced cross-border investment hinder climate-related capital flows. Lack of coordinated action on external debt problems after COVID-19 risks losses for both creditors and debtors. Non-traditional risks—cybersecurity threats, compliance and reputational risks for financial institutions, and money-laundering/terrorism-financing vulnerabilities—also rise.

Adverse Impacts of Economic Fragmentation

The costs of geoeconomic fragmentation are substantial, asymmetric, and multidimensional. Quantitative modeling (Aiyar, Chen, et al. 2023) indicates that deeper fragmentation produces larger losses; technological decoupling is a powerful amplifier; adjustment/transition costs are high; and emerging-market and developing economies (EMDEs) and low-income countries (LICs) are most exposed. Fragmentation reverses many of the gains of post-1945 and post-1980 integration—catch-up growth, poverty reduction, lower consumer prices, risk sharing, and technology diffusion—while introducing new sources of volatility and coordination failure.

Macroeconomic output and productivity losses

Trade fragmentation alone can reduce global GDP by 0.2–1 percent in limited scenarios and 1.9–7 percent in severe scenarios (depending on elasticities and whether third countries must choose exclusive blocs). Adding technological decoupling can raise losses to 8–12 percent in the most affected countries. Asia-Pacific trade-intensive economies face particularly large hits (around 3.3 percent in some scenarios). Short-run elasticities are lower than long-run elasticities, so transition costs—reconfiguring supply chains, temporary shortages, and elevated commodity prices—can exceed steady-state losses. Reduced knowledge diffusion slows productivity growth and impedes income convergence.

Financial stability risks

Sudden capital-flow reversals raise banks' funding costs, compress profitability, and reduce credit to the private sector. Impacts are larger for less-capitalized banks. Longer-term fragmentation reduces international risk diversification, increasing the volatility of capital flows and domestic asset prices and raising the likelihood of systemic crises. Countries with less-developed financial systems or inadequate external buffers are especially vulnerable.

Distributional and social costs

Unraveling of trade links harms low-income consumers in advanced economies through higher prices and reduces opportunities for workers in developing economies who previously moved into more productive export-oriented activities. Poverty reduction stalls. Restrictions on migration cut remittances. Overall living standards decline even if some domestic producers gain temporary protection.

Inflation, growth, and investment effects

Supply-chain reconfiguration and commodity disruptions generate inflationary pressures.[3] Lower investment (especially FDI) and slower technology diffusion reduce potential growth. Heightened uncertainty further deters capital formation.

Global public-goods failures

Climate transition becomes more disorderly without coordinated investment and technology sharing. Pandemic preparedness and debt resolution suffer. The global financial safety net (GFSN)—comprising reserves, bilateral swaps, regional financing arrangements, and the IMF—risks becoming more fragmented along geopolitical lines, reducing its capacity to support crisis countries and complicating sovereign-debt workouts.

Asymmetric and spillover effects

EMDEs experience sharper capital-flow reversals than advanced economies. Cross-border spillovers via trade and finance can affect countries not directly involved. While some "friend-shoring" may enhance resilience for individual firms or countries, aggregate efficiency losses dominate. Innocent bystanders and vulnerable populations bear disproportionate costs.

Focus on GVCs

Global value chains have been one of the defining features of contemporary globalization. Over the past several decades, production has been increasingly fragmented across national borders, allowing firms to locate different stages of production in economies where particular tasks can be undertaken most efficiently. They have provided developing economies with an important avenue for industrialization. Regional economic integration in East Asia is widely recognized as a market-driven process propelled by regional production networks and expansion of GVCs (Fujita et al., 2011; Athukorala and Hill 2026)

GVCs have allowed firms to exploit economies of scale and specialize in finely defined tasks, thereby generating significant efficiency gains. At the same time, however, the very complexity that produces these benefits can create vulnerabilities when production becomes excessively concentrated in particular countries or regions (Xing, et al. 2023). The COVID-19 pandemic exposed these vulnerabilities, while the intensification of geopolitical tensions has added a new and potentially more persistent source of disruption.

Geopolitical tensions affect GVCs because international production networks depend not only on economic efficiency but also on political relationships among the economies in which production takes place. Trade wars, sanctions, export controls, investment restrictions, armed conflict, diplomatic disputes and technological rivalry can interfere with the movement of goods, services, capital, technology and information. The same is true for the majority of geoeconomic strategies. The rest of the subsection examines the impact of geopolitical tensions and geoeconomic strategies on the performance, structure, and resilience of GVCs.

The central policy challenge is therefore not whether GVCs should be abandoned, but how they can be made more resilient while preserving the efficiency and developmental opportunities that international production networks provide. The challenge is to construct a form of resilient globalization in which diversification, regional integration, technological upgrading, domestic capability development and strategic investment complement rather than replace international integration. This is the main topic of Section IV.

[3]An example is the 2021–2023 inflation surge mentioned in Section I.

The efficiency-resilience trade-off

At the outset, it should be recognized that the vulnerability of GVCs is partly a consequence of their success. International production networks were designed primarily around efficiency. Firms sought to minimize costs, exploit economies of scale, access specialized suppliers and locate production where comparative advantages were greatest. However, specialization and concentration also create systemic risks. If a critical input is supplied predominantly by one economy, a disruption in that economy can affect producers far beyond its borders.

The fundamental issue is therefore not simply globalization versus localization. It is the trade-off between efficiency and resilience. A highly concentrated supply chain may be cheaper during normal times but more vulnerable during crises. Conversely, a highly diversified supply chain may be more resilient but involve higher costs because firms sacrifice some economies of scale and maintain relationships with multiple suppliers.

Trade tensions raise costs and disrupt established production networks

Geoeconomic strategies affect GVCs primarily through trade policy. Tariffs increase the cost of intermediate inputs, while export restrictions and non-tariff measures can prevent firms from obtaining critical components. Because intermediate products frequently cross borders several times, the effect of a tariff can accumulate along the chain.

Xing, et al. (2024) document the effects of the US–PRC trade tensions and shows that they altered patterns of trade, including triangular trade through third economies. Some economies benefited from trade diversion. Viet Nam, Thailand, the Republic of Korea and Mexico, for example, increased exports to the United States and other markets. However, the GVC report also notes that some of these gains may reflect inefficient restructuring. Third economies simultaneously increased sourcing of inputs from China while increasing exports to the United States, with evidence of higher import prices in some cases.

This demonstrates that trade diversion should not automatically be interpreted as genuine upgrading. A country can record higher exports without substantially increasing domestic value added. It may simply become a new location through which existing GVCs are reorganized.

Thus, fragmentation can simultaneously create opportunities and risks for developing economies (see Section V). Trade diversion can provide an entry point into new GVCs, but unless supported by domestic capability development, the resulting participation may remain shallow.

The ripple effect and systemic vulnerability

A defining feature of GVCs is interdependence. The disruption of one node can propagate through multiple stages and economies. Bednarski et al.(2025) describe this as the ripple effect: a disruption at one node spreads throughout the supply chain and affects performance, design and planning parameters. Severe disruptions can influence demand, sales, inventories, service levels and costs.

The significance of this phenomenon has increased as GVCs have become more interconnected. A firm may depend on a supplier that itself depends on several upstream suppliers in other countries. Consequently, conventional risk management focused on direct suppliers may underestimate systemic exposure.

The concentration of critical inputs is particularly problematic. Xing, et al. (2023) argue that resilience can be improved through diversification of international suppliers rather than

dismantling GVCs. Diversification reduces dependence on individual economies and creates relationships that can be activated during a crisis.

This insight has important implications for policy. Resilience does not necessarily require self-sufficiency. Indeed, trying to produce everything domestically can make an economy less efficient and potentially less resilient if it lacks the scale, technology or resources necessary to produce critical goods competitively. The more effective objective is substitutability: ensuring that alternative suppliers and production locations exist and that inputs from different sources can be substituted when one source becomes unavailable.

Geopolitical fragmentation and technological decoupling

Geoeconomic fragmentation becomes particularly consequential when geopolitical tensions move beyond conventional trade policy into technology. The semiconductor industry illustrates this clearly. Semiconductor production depends on an exceptionally sophisticated international division of labor involving chip design, electronic design automation, intellectual property, wafer fabrication, specialized manufacturing equipment, assembly, testing and packaging. No single economy can easily reproduce the entire ecosystem competitively.

Technological restrictions can therefore have effects far beyond conventional trade barriers. Export controls on advanced technologies can prevent firms from acquiring specific equipment or components, while investment screening can constrain the establishment of production facilities. Restrictions on technology transfer can also weaken the knowledge flows that traditionally allowed developing economies to upgrade within GVCs.

Xing, et al. (2023) describe the emergence of techno-nationalism in semiconductors, including increasingly stringent US technology controls and restrictions on Chinese high-technology firms. The implication is that technology is increasingly treated not simply as a commercial asset but as a strategic resource.[4]

This development creates a particularly difficult environment for developing economies. They may be pressured to align with particular geopolitical blocs, even when their economic interests would favor maintaining relations with multiple partners. The result can be a narrowing of technological choices, higher investment costs and reduced access to frontier technologies.

The asymmetric consequences for developing economies

The consequences of fragmentation are not evenly distributed. Large economies may possess the resources to subsidize domestic production, maintain strategic inventories and support firms through prolonged disruptions. Developing economies generally have much less fiscal and technological capacity.

At the same time, developing economies are often more dependent on a small number of export markets, imported intermediate inputs and foreign technology. Fragmentation can therefore threaten both sides of the development equation: access to markets and access to production capabilities.

However, developing economies can also benefit from the restructuring of GVCs. Trade diversion has already redirected production toward several Southeast Asian economies (Walker 2026). The evidence of increased indirect trade through ASEAN illustrates how geopolitical tensions can create new opportunities for countries located between major

[4] The recent controversy involving Nvidia and its co-founder and longtime CEO Jensen Huang is a prime example.

economic powers. The challenge is to convert these opportunities into durable domestic capabilities rather than simply becoming alternative assembly locations.

IV. Mitigating measures

Policies can be implemented to mitigate the adverse impacts of economic fragmentation or even address the sources of geopolitical tensions and harmful geoeconomic strategies. Those at the general level are discussed in the next subsection. There are policies and measures specific to GVCs and these are discussed in a subsequent subsection. The last subsection deals with the issue of building domestic capabilities and upgrading.

Policies at the general level

Because full multilateral consensus is difficult under current geopolitical conditions, a pragmatic, multipronged approach is required. Aiyar, Chen, et al. (2023) outline a framework based on the degree of preference alignment: multilateral engagement where interests coincide; open, non-discriminatory plurilateral initiatives where multilateral talks stall; and credible "guardrails" to limit spillovers from unilateral actions. Implementation requires joint effort by international organizations (IMF, WTO, World Bank, and others). The IMF can contribute analytical work on fragmentation channels, surveillance of geopolitical risks, and reinforcement of the GFSN. Over time, rebuilding trust through successive successful cooperations in limited domains can expand the scope for broader multilateralism.

Awareness, monitoring, and risk management

Policymakers must recognize financial-stability risks from geopolitical tensions and devote resources to identification, quantification, management, and mitigation. Supervisors should employ systematic stress testing and scenario analysis to assess transmission of geopolitical shocks to financial institutions. Banks and non-bank financial institutions may need higher capital and liquidity buffers calibrated to geopolitical-risk exposures.

Strengthening the global financial safety net

Adequacy of the GFSN should be ensured through strong national reserve levels, bilateral and regional arrangements, and precautionary IMF credit lines. Efforts should preserve the IMF's universal coverage and representative character so that it remains at the core of a reinforced safety net. Coordination across layers of the GFSN can limit fragmentation of liquidity provision.

Trade and technology policy

Where preferences align (e.g., fisheries subsidies, pandemic response, food-security exemptions), advance focused high-impact multilateral reforms at the WTO. Where consensus is elusive, pursue open and non-discriminatory plurilateral agreements (members keep an open door and do not discriminate among foreign producers) and "deep" regional trade agreements that focus on non-discriminatory behind-the-border measures. Guardrails for unilateral measures include ex-ante notification, explanation of rationale, assessment of cross-border spillovers, and agreements on "safe corridors" for critical goods (food, medicine, essential technologies). Avoid escalation into broad high-tech decoupling that severs knowledge diffusion.

Capital-flow and investment frameworks

Maintain robust macroeconomic policy frameworks that allow beneficial FDI and stable capital flows while managing volatility. Avoid purely geopolitical screening that unnecessarily deters productive investment. Encourage diversification of financing sources without abandoning multilateral risk-sharing.

Global public goods

Prioritize multilateral cooperation on climate mitigation, pandemic preparedness, and debt resolution—areas where fragmentation is especially costly. Support cross-border climate finance and technology transfer even amid broader tensions.

Diplomatic engagement

Ultimately, countries should strengthen dialogue to resolve underlying geopolitical tensions and prevent further economic and financial fragmentation. Diplomatic efforts reduce uncertainty that itself drives capital-flow volatility and investment hesitation.

Domestic complementary policies

To cushion distributional effects, deploy targeted fiscal support, job counseling and retraining, productive infrastructure investment, labor-market reforms, and financial inclusion. These measures help share remaining gains from openness more equitably and build political support for continued integration.

Policies to strengthen resilience of GVCs

From efficiency to resilience

The appropriate policy response is not to reverse globalization but to make international production networks more resilient. This requires a shift from an exclusive focus on minimizing costs toward balancing efficiency, resilience and strategic security. The first measure should be diversification. Xing, et al. (2023) explicitly identify diversification as an alternative to reshoring and argues that resilience can be enhanced by diversifying inputs across economies and making alternative suppliers more substitutable. For developing economies, this means diversifying both export markets and sources of imported inputs. Excessive dependence on a single market exposes exporters to tariffs and sanctions, while excessive dependence on one supplier exposes producers to supply interruptions.

Promoting regional economic integration

Regionalization can provide a useful middle ground between unrestricted globalization and national self-sufficiency. Regional production networks allow countries to remain integrated into GVCs while reducing the geographical distance and potentially the political risks associated with some transactions. For developing economies, regional integration is particularly important because individual markets may be too small to sustain sophisticated production ecosystems. Regional markets can create sufficient scale for investment in logistics, infrastructure, technology and specialized suppliers.

Regional cooperation should therefore extend beyond tariff reduction. It should include harmonization of standards, customs procedures, investment rules, digital regulations and technical requirements. Mutual recognition of standards can reduce the fixed costs of entering regional GVCs. Regional cooperation can also support shared infrastructure. Ports, energy

systems, digital networks, logistics corridors, testing facilities and research institutions can be developed at the regional level where individual economies lack the resources to create them independently. Box 1 below highlights an ASEAN-led effort to promote closer regional integration.

Box 1. AFISS as an Example of Closer Regional Cooperation and Integration

The ASEAN Framework for Integrated Semiconductor Supply Chain (AFISS) is ASEAN's flagship framework for building a resilient, integrated, and future-ready regional semiconductor ecosystem. It responds to major changes in the global semiconductor industry arising from geopolitical tensions, shifting trade alliances, technological disruption, and the growing importance of supply-chain resilience. Rather than allowing ASEAN Member States to compete individually, AFISS seeks to combine their complementary capabilities and position ASEAN as a more integrated and strategically important node in global semiconductor value chains.

The framework covers the extended semiconductor value chain, including raw materials, semiconductor design, electronic design automation and intellectual property, manufacturing and fabrication, equipment and materials, assembly, testing and packaging, and related research and technology activities. Its ambition is to help ASEAN move beyond its traditional concentration in back-end activities toward greater participation in higher-value segments of the industry. Importantly, AFISS is non-binding, allowing each Member State to progress according to its technological capabilities and national circumstances.

AFISS rests on three interconnected focus areas: supply chains, technology and infrastructure, and talent. These are intended to strengthen regional supply-chain connectivity, upgrade technological and physical capabilities, promote R&D and technology transfer, and develop a skilled and mobile semiconductor workforce.

To translate these priorities into action, AFISS proposes six strategic thrusts: (1) infrastructure quality and resilience; (2) technology innovation, transfer and sharing; (3) supply-chain hubs and clusters; (4) industrial and trade policies; (5) market access and connectivity; and (6) talent development and mobility. Together, these seek to improve infrastructure, encourage regional R&D and technology sharing, reduce regulatory and logistical barriers, attract quality domestic and foreign investment, strengthen intra-ASEAN production networks, expand international partnerships, and address critical skills shortages. Under industrial and trade policies is the plan to create a model investment facilitation mechanism to attract and retain investors. This initiative aims to establish a regional best-practice model for investment facilitation, including streamlined processes and aftercare services, to ensure long-term investor confidence.

Ultimately, AFISS is about transforming ASEAN's fragmented semiconductor capabilities into a more integrated regional ecosystem. It seeks not simply to attract more semiconductor investment, but to increase ASEAN's technological capabilities, resilience, connectivity, and value capture while maintaining strategic flexibility amid U.S.–China geopolitical competition. Effective implementation will require a dedicated coordination mechanism, a detailed Plan of Action, and regular reviews so that the framework can adapt to technological and geopolitical changes.

Move beyond just-in-time toward just-in-case where appropriate

Firms and governments should reassess the assumption that minimizing inventories is always optimal. Strategic inventories may be justified for critical products, particularly where alternative suppliers are limited.

However, indiscriminate stockpiling is expensive. The appropriate approach is differentiated risk management. Critical inputs with long lead times, limited suppliers or high switching costs require greater redundancy. Less critical products can continue to be managed through leaner systems.

Bednarski, et al. (2025) identify redundancy, flexibility, agility and collaboration as important resilience characteristics. Collaboration improves information sharing and allows firms to adjust inventories continuously in response to changing conditions. Developing economies should therefore encourage firms to establish supplier-risk monitoring systems and maintain information about alternative suppliers. Public agencies can contribute by developing databases on domestic and foreign production capacity, logistics bottlenecks and critical imports.

Develop domestic productive capabilities without pursuing autarky

One of the most important lessons for developing economies is that resilience requires some domestic capability in strategically important areas. This does not mean attempting to produce everything domestically. Rather, governments should identify sectors in which domestic capability provides important economic or strategic benefits. The distinction is between *strategic capability* and *self-sufficiency*. A country may reasonably seek domestic capabilities in pharmaceuticals, food, energy, digital infrastructure or critical components while continuing to rely on international suppliers for other products.

Table 1 illustrates the imperative to enhance domestic productive capabilities. Viet Nam can be used as a case in point. In 2024, Viet Nam's gross exports reached $429.5 billion, of which $247.3 billion was tied to Global Value Chains (GVCs). However, these GVC exports relied heavily on $201.7 billion in foreign value added (FVA) imports, leaving only $45.6 billion in domestic value added (DVX). While China maintains a more balanced GVC trade profile, ASEAN as a whole remains heavily skewed toward FVA. Upgrading domestic capabilities will therefore require narrowing this gap and shifting toward higher domestic value addition.

A counterargument to the emphasis on DVX is presented in Box 2. However, the underlying philosophy of this argument is at odds with the central thesis of this paper, which is anchored in the concept of embedded reciprocity. The policy recommendation of Athukorala and Hill (2026) is essentially analogous to a passive FDI strategy, one that places greater emphasis on participation in global value chains than on actively shaping the domestic benefits of such participation. In contrast, this paper advocates a fundamental shift in FDI policy—from an investment-attraction paradigm toward a capability-building paradigm, in which foreign investment is leveraged more strategically to strengthen domestic productive capabilities, technological competencies, and linkages with the local economy.

Industrial policy can play an important role in this process. However, support should be linked to measurable improvements in productivity, technological capability, export performance and domestic value added rather than permanent protection. Xing, et al. (2023) emphasize that relocation policies need to be combined with industrial policies that strengthen the competitiveness of domestic production through innovation and cost reduction.

This is particularly relevant to developing economies that receive new investment because of geopolitical diversification. Investment incentives should not simply reward firms for locating

production in the country. They should encourage firms to develop local suppliers, train workers, conduct R&D and move into higher-value activities. This topic is explored in greater detail in the next subsection.

Table 1. Trade in Value Added for Selected Economies and Groups, 2024

Country	Gross Exports of Goods and Services (Bn USD)	Foreign Value Added (FVA, Bn USD)	Domestic Value Added (DVX, Bn USD)	Total GVC Trade (Bn USD)	Ratio of DVX to FVA
China	3,793.1	691.2	652.4	1,343.6	**0.94**
Indonesia	309.7	48.3	66.9	115.2	**1.38**
Japan	915.9	198.2	190.6	388.8	**0.96**
Korea	834.4	273.8	154.7	428.5	**0.56**
Malaysia	241.4	75.2	47.2	122.4	**0.63**
Philippines	119.8	27.7	21.8	49.5	**0.79**
Singapore	688.3	340.5	77.7	418.2	**0.23**
Thailand	366.8	140.3	44.0	184.3	**0.31**
Viet Nam	429.5	201.7	45.6	247.3	**0.23**
US	3,180.2	336.9	897.7	1,234.6	**2.66**
EU27	4,783.1	1,006.1	774.9	1,781.0	**0.77**
ASEAN	1,878.2	664.5	253.7	918.2	**0.38**

Notes: These are 2024 data. ASEAN excludes Myanmar.
FVA - Foreign value added content of gross exports (backward participation in GVCs)
DVX - Domestic value added content of foreign gross exports (forward participation in GVCs)
Total GVC Trade = FVA+DVX
Source: ADB Multiregional Input-Output (MRIO) Tables

Box 2. Why Increasing DVX is Not a Viable Goal

A common criticism of specialization within GVCs is that it results in "shallow" industrialization, characterized by weak linkages between export-oriented activities and the broader domestic economy. The value-added ratio—the proportion of domestic value added retained in gross output, or equivalently, the share of domestic content—is often cited as the principal indicator supporting this argument (DVX in Table 1).

However, relying on this conventional measure to evaluate the national benefits of GVC participation is problematic. Global production sharing inherently entails the geographical fragmentation of value-adding activities across countries within a vertically integrated production process. Consequently, the domestic value-added share generated in any particular location will naturally be lower than under horizontal specialization, where the production of an entire good takes place within a single country. Moreover, the composition of inputs used in component manufacturing and final assembly at any given location is determined by the requirements and organizational logic of the entire international production network. It is therefore difficult, if not virtually impossible, to configure individual production tasks in ways that fully conform to the industrial policy priorities of a particular host economy.

The national gains from participation in GVCs should thus not be evaluated solely on the basis of domestic value-added ratios. Equally, if not more, important is the volume effect: the expansion of gross output and sales turnover made possible by access to large international markets through participation in global production networks. Evidence from Southeast Asian economies indicates that deeper integration into GVCs, as reflected in

increased output and employment, does not necessarily result in a corresponding increase in domestic value added per unit of gross output. This further underscores the limitations of treating the value-added ratio as a stand-alone measure of the economic benefits of GVC participation.

Taken together, these considerations point to an important policy trade-off in the era of global production sharing. Strengthening domestic economic linkages and raising the domestic value-added content of production may not always be compatible with maximizing the gains from international production networks in terms of output expansion, export growth, and employment generation. The challenge for policymakers is therefore not simply to maximize domestic value-added ratios, but to identify ways of leveraging GVC participation to expand productive capabilities, generate employment, and progressively deepen the domestic economic benefits of integration into the global economy.

Source: Athukorala and Hill (2026), pages 81-83.

Strengthen MSMEs and domestic suppliers

A resilient GVC requires a resilient domestic supplier base. Developing-economy governments should therefore pay particular attention to small and medium-sized enterprises. Xing, et al. (2023) find that MSMEs often participate indirectly by supplying intermediate goods to large firms with local operations. Such linkages can provide access to knowledge, technology and credit. Foreign firms and local suppliers interact closely to maintain supply-chain performance, creating opportunities for tacit knowledge transfer and domestic capability development.

Policy should therefore focus on supplier-development programs, quality certification, access to finance, technical assistance and digitalization. This is preferable to policies that simply increase the percentage of local content. Local-content requirements can force firms to purchase domestically even when local suppliers are not competitive. The more effective objective is to *make domestic suppliers competitive enough to become indispensable partners* in international production networks.

Strengthen international and regional institutions

Resilience cannot be achieved solely through national policy. GVCs are international systems and therefore require international cooperation. The erosion of multilateral trade rules creates uncertainty for firms and increases the possibility that economic relations will be governed by unilateral measures. Developing economies have a particular interest in maintaining predictable rules because they generally have less bargaining power than major economies.

Regional institutions can complement the multilateral system by creating mechanisms for consultation, crisis coordination and information sharing. Agreements should also facilitate the movement of goods during emergencies and discourage unnecessary export restrictions. The objective should not be to eliminate geopolitical competition, which is unrealistic, but to prevent geopolitical competition from unnecessarily destroying the economic networks on which global prosperity depends.

GVCs and embedded reciprocity[5]

FDI has long occupied an ambiguous position in development policy. For developing countries, multinational enterprises (MNEs) can provide capital, employment, export markets, technology, managerial expertise and access to global value chains (GVCs). However, foreign presence does not automatically generate these benefits. An economy can receive substantial FDI while remaining technologically dependent, weakly connected to domestic suppliers and concentrated in low-value activities. The central policy question is therefore not simply how to attract foreign investment, but how to convert the presence of MNEs into domestic productive and technological capabilities.

This requires a reconsideration of conventional industrial policy (see for example Criscuolo (2025) and Masina (2026)). Traditional industrial policy has nurtured domestic firms through tariffs, subsidies, public investment, infrastructure, credit, procurement and R&D, treating FDI mainly as an investment-promotion issue. FDI and MNE operations are now integral because modern production is largely organized through GVCs. The response is not to abandon traditional industrial policy for FDI-led development, but to reconfigure it around the interaction between domestic and foreign capabilities. MNEs should be partners, sources of knowledge, lead firms, buyers, trainers, investors in local ecosystems and, where appropriate, participants in national innovation systems.

An FDI-enhanced industrial policy should move from an investment-attraction paradigm to a capability-building paradigm. Governments should select and attract MNEs whose activities complement national development objectives; embed them more deeply in the domestic economy; condition public support on activities that generate learning and upgrading; develop the absorptive capacity of domestic firms and workers; and establish institutional mechanisms through which government and MNEs jointly discover and address constraints. Policy must remain selective, performance-oriented and adaptable, with the appropriate mix depending on development stage, type of FDI, market size, government capacity and fiscal space.

<u>From FDI attraction to structural transformation</u>

The conventional justification for attracting FDI is straightforward: foreign firms bring capital, create employment, generate exports, introduce technologies and connect domestic production to international markets. In a GVC environment these benefits matter especially because developing countries need not establish entire industries domestically before entering international networks. However, the assumption that FDI automatically generates development is problematic. Theoretical spillovers do not materialize automatically; their extent depends on the foreign firm's characteristics, the absorptive capacity of domestic firms, and host-country institutions and structure.

This is consistent the characterization of FDI by Simões and Mamede (2024) as simultaneously a restriction and an instrument of industrial policy: a restriction because MNEs operate according to global corporate strategies and may be less responsive to host objectives; an instrument because FDI can drive structural change and provide access to technological, managerial and marketing capabilities. The fundamental question therefore shifts from "How can government attract more FDI?" to "How can government use the

[5] This section is largely based on Simões and Mamede (2024) and Fernandes and Ree (2026). The term embedded reciprocity was coined by this author and refers to a mutually beneficial and institutionally embedded relationship between the state and foreign or domestic firms in which access to public resources, markets, infrastructure, incentives, and other forms of support is reciprocated by commitments to domestic capability building, technological upgrading, local linkages, skills development, R&D, and other developmental objectives.

bargaining, coordinating and complementary capabilities of MNEs to accelerate the development of domestic productive capabilities?"

An FDI strategy measured principally by capital attracted may reward investments that generate employment and exports without substantially increasing domestic value added or technological capabilities. An industrial strategy should judge FDI by its contribution to structural transformation: technology acquisition, supplier upgrading, skills development, domestic R&D, movement into higher-value functions, diversification and the strengthening of domestic firms. FDI should therefore be integrated into industrial strategy where governments identify strategic activities and capabilities, and FDI policy should be subordinate to a broader strategy of structural transformation.

A differentiated approach to MNEs

Not all FDI contributes to capability building in the same way. Resource-seeking FDI can provide capital, employment, exports and processing capabilities, but may leave the host dependent on low-value extraction. Market-seeking FDI can stimulate domestic production and learning, yet may crowd out domestic suppliers or create weak local sourcing. Efficiency-seeking FDI, particularly in manufacturing and assembly, can create employment and export capacity and introduce GVCs, but often remains characterized by low-skilled employment, low value added and weak embeddedness. Strategic asset-seeking FDI can provide sophisticated technology and skills, but acquisitions may result in foreign control over strategic assets and crowding out of domestic firms.

Industrial policy should therefore differentiate types of FDI by developmental contribution. For countries at an early stage of industrialization, attracting manufacturing FDI may itself be a major capability-building objective, with emphasis on employment, basic skills, production capabilities, export participation, standards and supplier development. For economies attempting technological catch-up, policy should shift toward higher-value functions, local supplier development, product and process adaptation, R&D and technology development. For countries approaching technological leadership, the emphasis should be on foreign subsidiaries' R&D, joint innovation, advanced skills, strategic technology fields and integration of domestic firms into high-value segments. This sequencing is reflected in Simões and Mamede's (2024) framework distinguishing building-up capabilities, catching-up and sustained technology leadership. The "right" MNE is the investor whose global activities complement the host's intended trajectory of capability accumulation, not necessarily the largest investor.

Condition investment incentives on capability creation

The most immediate adjustment is to change the nature of investment incentives. Tax holidays, subsidized infrastructure, preferential financing and similar instruments should no longer be justified principally by investment volume or jobs created. They should be linked to measurable capability-building activities. Incentives should operate as both carrots and sticks: support encourages investment in new areas, while performance-based conditionality, monitoring and sunset provisions discipline non-delivery. Cofinancing—requiring firms to commit their own resources—helps screen serious investments.

Enhanced incentives can be offered when a foreign investor establishes a supplier-development program; increases local value added; trains domestic workers beyond immediate needs; establishes an engineering or R&D facility; develops local suppliers to international certification standards; undertakes joint R&D with universities; develops domestic firms as higher-tier suppliers; introduces new products or processes locally; exports higher-value products; or transfers production and engineering functions to the subsidiary. Rigid technology-transfer requirements are not always appropriate; they can work in large markets,

while smaller economies may need conditional tax incentives, public-private innovation hubs and jointly funded research. The critical principle is conditionality rather than coercion: governments offer firms something valuable in exchange for activities that produce broader developmental benefits.

From local content to supplier development

One of the most important ways to embed MNEs is through supplier development. Traditional local-content requirements aim to grow domestic firms via MNE purchasing, but they are problematic when domestic suppliers lack the capabilities to meet international standards: they raise costs, reduce competitiveness and may discourage investment. Local-content policies work best when domestic supply capabilities are already sufficiently strong.

The more effective approach is to shift from local-content enforcement to supplier capability development. Government must help close the information and capability gap between MNEs and domestic firms. MNEs know the components, services and standards they require; domestic firms often do not know what is needed to become qualified suppliers. A comprehensive policy can provide information, matchmaking, technical assistance, financing, certification assistance and training. The Czech Republic is instructive: CzechInvest found that multinationals imported 90–95 percent of components despite interest in local suppliers, and established a demand-driven program of information, matchmaking and tailored upgrading that helped participating suppliers secure more than US$46 million in new contracts (Taglioni and Winkler 2016).

The broader lesson is that the MNE itself becomes part of the industrial-policy delivery mechanism. Government can use the MNE's knowledge of markets, specifications, technology and supply chains to identify the capabilities domestic firms need. This transforms supplier policy from a static localization requirement into a dynamic learning mechanism.

MNEs as trainers and developers of human capital

MNEs possess knowledge of production technologies, quality systems, management practices and international standards that domestic educational institutions may lack. Their presence creates an opportunity to align skills development with industrial demand. GVC participation generates benefits through increased demand for skilled labor, training by MNEs and buyers, and labor turnover that moves knowledge embodied in workers to other domestic firms. Industrial policy should amplify these mechanisms by cofinancing MNE training programs, establishing industry-led curricula, supporting apprenticeships and internships, and encouraging secondments between MNEs, domestic firms, universities and technical institutes.

The objective should not merely be to train workers for a particular MNE, but to build portable capabilities that remain in the domestic economy. A foreign electronics manufacturer can train workers in statistical process control, cleanroom procedures, automated production, quality assurance and advanced equipment maintenance. If those capabilities remain confined within the subsidiary, developmental impact is limited; if workers move into domestic firms, universities, suppliers and start-ups, the effect becomes cumulative. Industrial policy should therefore encourage MNEs to participate in national skills ecosystems rather than treating their workforce requirements as a private matter.

MNEs as components of the national innovation system

The most ambitious form of MNE integration involves innovation. Traditional industrial policy often separates foreign investment policy from science and technology policy; an FDI-enhanced industrial policy should deliberately connect them. Absorptive capacity is closely

related to technology, R&D intensity, skills and innovation infrastructure. Domestic firms with smaller technology gaps relative to foreign firms are more likely to benefit from productivity spillovers.

Policy must therefore improve domestic firms' ability to absorb foreign technology while encouraging foreign subsidiaries to undertake activities that make advanced knowledge available locally. Instruments can include matching grants for joint R&D; public-private research centers; joint laboratories between MNEs and universities; co-funding of applied research; industrial technology consortia; incentives for engineering and design centers; joint development of prototypes; and collaborative programs addressing industry-specific bottlenecks. Technology-development consortia involving FDI firms, local firms and national technology centers, together with incentives for product and process adaptation R&D, move policy beyond attracting factories toward attracting higher-value functions.

From subsidiaries as enclaves to embedded production ecosystems

A recurring problem is the creation of foreign-owned enclaves. An MNE may operate a highly productive export facility while importing most inputs, employing workers in relatively narrow tasks and undertaking strategic R&D elsewhere, generating substantial gross exports without equivalent domestic capabilities. Analysis distinguishes between economic upgrading (moving into better products, processes and functions) and densification (bringing more domestic firms and workers into existing GVC activities). Both can increase domestic value added; industrial policy should pursue both.

This implies a shift from a firm-level approach to an ecosystem approach. Government should seek to build clusters around MNEs in which domestic suppliers, universities, technical institutes, logistics providers, financial institutions and start-ups interact. Industrial parks address coordination failures and concentrate infrastructure and complementary services, but should not become foreign enclaves. Their design should facilitate interaction through common testing facilities, training centers, laboratories, logistics systems, supplier databases and technology centers. The ultimate objective is embeddedness: foreign firms as nodes within domestic productive networks rather than isolated export platforms.

Institutionalizing government–MNE interaction

If MNEs are to become participants in industrial policy, governments require institutional mechanisms for sustained interaction. This does not mean allowing corporations to dictate policy; it means creating channels through which government obtains information about technological trends, investment opportunities, supply-chain bottlenecks and skill requirements. Fernandes and Ree (2026) describe this as "embeddedness": effective industrial policy requires two-way communication in which firms communicate constraints and opportunities while government communicates instruments, regulations and public services, through private-sector representation, structured consultations and industry-specific diagnostics.

This is particularly relevant to MNEs because their knowledge extends beyond the host economy. A foreign semiconductor, automotive or electronics firm can provide information about global demand, technology trajectories, competing locations and supplier standards, helping government identify realistic upgrading opportunities. However, embeddedness must be combined with accountability to avoid regulatory capture. Clear mandates, performance targets, reporting, transparency and performance-based incentives are essential. The appropriate relationship is neither distance nor capture, but disciplined embeddedness: close enough for learning and coordination, yet sufficiently institutionalized to preserve public objectives.

V. Special Topics

The Dual Circulation Strategy and the Second China Shock

In May, 2020, China launched a new economic framework called the Dual Circulation Strategy (DCS). Its main idea was to strengthen China's vast domestic market ('internal circulation'), while shifting its foreign trade ('external circulation') to suit the needs of Chinese customers more closely, rather than those of overseas buyers, as is typical for an export-led growth model. The strategy revolves around three main objectives (Weller 2020a, 2020b):

1) Technological innovation: China needs to accelerate its research into advanced technologies and become a pioneer in areas such as AI, quantum computing, and the use of blockchain ledgers for administrative services;
2) Industrial upgrade and increase in consumption: This involves the use of more efficient production processes in manufacturing, leading to higher incomes for Chinese workers who will then have greater spending power.
3) Free flow of factors of production: Further reforms are needed in areas such as the transfer of land rights, movement of labor (i.e. Hukou reform), and the transfer of intellectual property and data.

García-Herrero (2021) argued that the fundamental objective of the DCS is to ensure that a greater share of rising domestic demand is met by domestic production rather than imports. In this respect, the DCS can be viewed as a continuation of the government's earlier *Made in China 2025* initiative, which sought to strengthen China's technological capabilities and reduce its reliance on foreign inputs. As domestic technological capabilities have advanced, China has become increasingly able to substitute imported high-end goods and intermediate inputs with domestically produced alternatives.

The DCS incorporates explicit industrial-policy measures, including targets for increasing domestic sourcing of intermediate goods in strategically important industries, ranging from semiconductors to electric vehicles. These efforts have contributed to a reduction in China's dependence on imported intermediate inputs. Indeed, recent research points to a growing convergence between the DCS and *Made in China 2025*, with both strategies emphasizing technological upgrading, domestic production capacity, and greater economic self-reliance (Putra et al. 2024).

In this sense, the DCS represents a shift in the focus of China's economic rebalancing. Earlier efforts sought primarily to reduce the economy's dependence on exports by strengthening domestic demand. The DCS, by contrast, places greater emphasis on reducing dependence on imports and strengthening domestic supply capabilities. It can therefore be understood as a strategy of "hedged integration": China seeks to remain deeply integrated into global markets and continue benefiting from overseas demand while simultaneously reducing its vulnerability to external disruptions by developing greater domestic technological and production capabilities.

These strategies have contributed to a sharp expansion in China's exports of advanced products, including electric vehicles, photovoltaics, and batteries (Walker 2026). Yet China's development trajectory differs significantly from that of earlier industrialisers. Rather than relinquishing lower-value manufacturing as it moves into higher-value activities, China has retained substantial competitiveness in labor-intensive and lower-value-added manufacturing while simultaneously expanding its presence in technologically sophisticated sectors. This dual advantage makes it increasingly difficult for developing ASEAN economies to capture the

opportunities traditionally associated with the expansion of labor-intensive manufactured exports (Coxhead 2026). Some refer to this as the second China shock.[6]

China's ability to retain its position in lower-value manufacturing reflects the combined effects of industrial policy, an undervalued currency, and rapid automation. As a result, China's industrial upgrading does not necessarily create the same space for latecomer economies that was available during earlier episodes of structural transformation.

The implications are particularly significant for the less advanced ASEAN economies. As China retains its competitiveness across both ends of the manufacturing spectrum, these economies risk being pushed toward complementary activities such as natural-resource extraction, agriculture, and tourism (Coxhead 2026). While such sectors can generate employment and foreign exchange, they generally offer fewer opportunities than manufacturing for sustained productivity growth, inter-industry linkages and externalities, skills development, and research- and development-driven innovation. China's simultaneous dominance of both lower- and higher-value manufacturing therefore risks narrowing the industrialization pathways available to developing ASEAN economies.

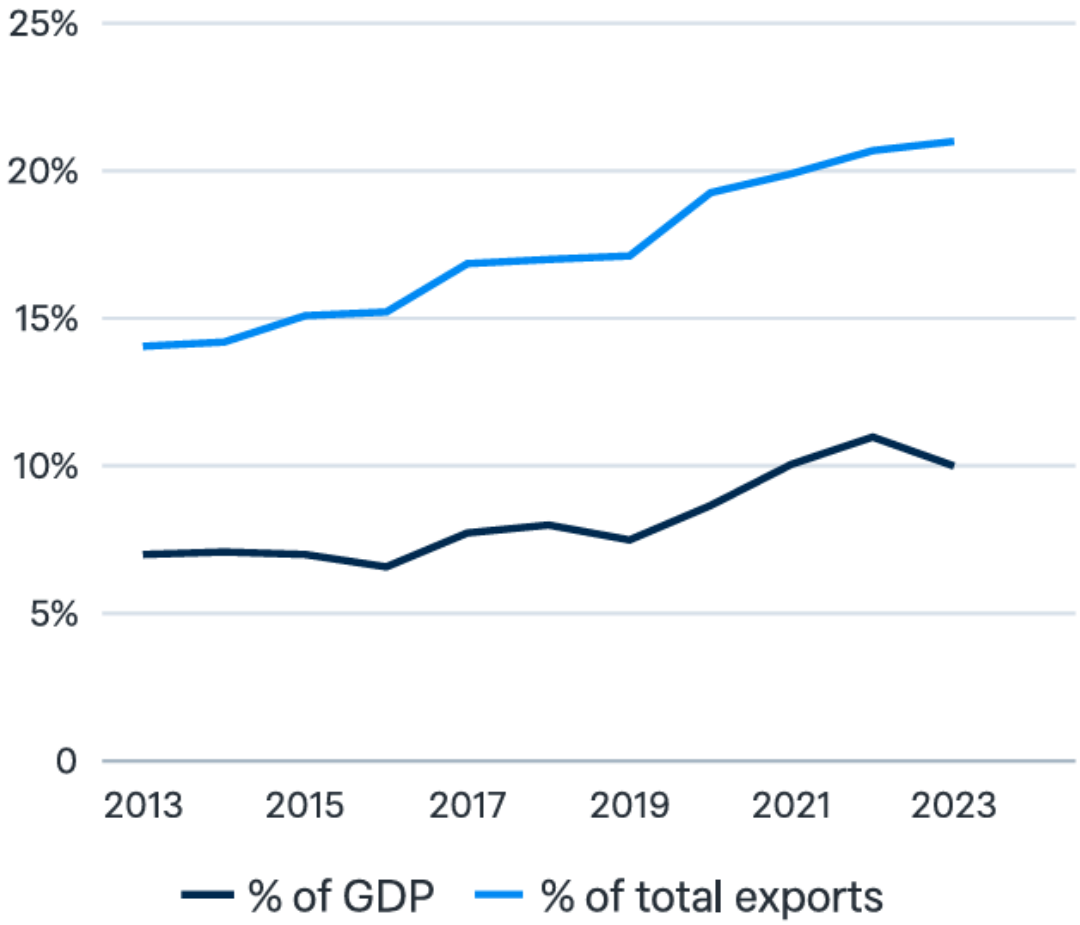
Other authors offer a more positive assessment. Rajah (2026), for example, argues that Southeast Asia has, on balance, been gaining alongside China rather than being crowded out by it. China's merchandise exports increased by 5 percent in 2025 and by 51 percent since 2019, while Southeast Asia's exports rose by 13 percent and 54 percent, respectively. Similarly, China's trade surplus increased by 20 percent in 2025 and 178 percent since 2019, compared with increases of 39 percent and 142 percent, respectively, in Southeast Asia's collective trade surplus, despite the region's widening trade deficit with China.

Wells (2025) provides further evidence of this complementary relationship. Strategic supply chains—industries critical to economic and geopolitical security, including semiconductors, advanced technologies, renewable energy technologies, electric vehicles, batteries, and critical minerals—have become increasingly important to Southeast Asia (Figure 3). Strategic exports now account for more than 20 percent of the region's exports and around 10 percent of its economy. At the same time, approximately 90 percent of Southeast Asia's imports from China consist of intermediate inputs and capital goods rather than final consumer products. This suggests that Chinese trade is increasingly integrated into the region's production networks. Chinese investment has also expanded rapidly. Chinese direct investment in Southeast Asian manufacturing increased from US$5.7 billion in 2019 to US$15.4 billion in 2024. Total Chinese direct and portfolio investment has tripled to approximately US$75 billion, equivalent to almost 2 percent of Southeast Asia's GDP (Rajah 2026).

These developments point to an alternative interpretation of the "second China shock": rather than simply displacing Southeast Asian producers, China's growing competitiveness may be creating new opportunities for complementary integration. China's expansion in electric vehicles, batteries, and solar panels, for instance, can generate demand for parts, components, and other intermediate inputs produced in Southeast Asia. The key policy question, therefore, is not simply whether ASEAN economies are being crowded out by China, but whether they can use China's expanding presence to deepen their participation in global value chains and accelerate domestic upgrading. This is where the concept of embedded reciprocity, discussed in Section IV, becomes particularly relevant. ASEAN policymakers can design policies that channel Chinese investment toward technology transfer, local linkages, skills development, and domestic capability building, thereby converting Chinese investment into a catalyst for industrial upgrading.

[6] The "first China shock" refers to the large and sustained increase in Chinese manufactured exports into world markets, particularly following China's accession to the WTO in 2001.

Figure 3. Southeast Asia's Strategic Exports' Rising Importance (relative size)



Source: Figure 1 of Wells (2026).

Pax Silica: A Philippine perspective

Pax Silica is a US-led international initiative focused on securing supply chains for advanced technologies such as semiconductors, artificial intelligence (AI) and rare earth elements. The initiative implicitly targets reducing reliance on China and countering its dominance in these fields. The following are the signatories to this partnership agreement: Argentina, Australia, Chile, Costa Rica, El Salvador, European Union, Finland, Germany, Greece, India, Israel, Italy, Japan, Kazakhstan, Netherlands, Norway, Panama, Philippines, Qatar, Republic of Korea, Singapore, Sweden, United Arab Emirates, and United Kingdom.

For the more advanced economies in this group, the reason for their inclusion is straightforward. In a published news report, Gonzales (2026) lists the potential contributions of some of the economies:

Country	Key role / strategic contribution
United States	**Anchor and coordinator of the coalition.** Provides advanced semiconductor technology, AI capabilities, high-end chip production through Micron, technology firms, capital, and security guarantees. Seeks to integrate allied capabilities while reducing dependence on China.
Japan	**Critical semiconductor materials and manufacturing inputs.** Dominates important chemicals used in EUV lithography and is a major producer of silicon wafers. It also brings experience in reducing dependence on Chinese rare earths.
Korea	**Memory semiconductors.** Samsung and SK Hynix are two of the world's leading memory-chip producers, making Korea particularly important for AI-related computing infrastructure.
Singapore	**Semiconductor manufacturing, equipment and data centers.** A major regional semiconductor hub, accounting for about 10% of global chip production and 20% of semiconductor equipment production. It is also Southeast Asia's leading data-center location.
United Kingdom	**Standards and regulatory alignment.** Contributes expertise in standards-setting and helps align technological and economic rules among coalition members.
Israel	**Advanced AI, defense and intelligence technologies.** Provides high-end technology capabilities, particularly at the intersection of AI, cybersecurity, intelligence and defense.
United Arab Emirates	**AI infrastructure, energy and capital.** Provides large-scale energy resources, investment capital and data-center infrastructure. The planned Abu Dhabi AI campus illustrates its role as an AI-compute hub.
Australia	**Critical minerals.** A major source of minerals needed for advanced technology and home to Lynas, the largest rare-earth producer outside China. Australia therefore helps diversify mineral supplies away from China.

Based on the Philippine and US announcements in April 2026, the country is intended to serve as a manufacturing, critical-minerals processing, AI, and logistics hub within the Pax Silica network. The centerpiece is a proposed 4,000-acre (about 1,620-hectare) economic security zone in New Clark City, within the Luzon Economic Corridor. The US and Philippine governments describe this as the first AI-native industrial acceleration hub. The hub is explicitly intended to accommodate critical-minerals processing, allowing the Philippines to move beyond simply exporting mineral ores toward processing them domestically for use in semiconductors, AI hardware, batteries and other advanced technologies. The Philippines is expected to use the initiative to strengthen its existing semiconductor industry while attracting higher-value semiconductor and advanced-manufacturing activities.

Political, technical, and environmental concerns have been raised regarding Pax Silica. One concern is that the Philippines could become locked into a subordinate position within the value chain—exporting raw materials and undertaking relatively low-value manufacturing while higher-value technologies, decision-making, and profits remain abroad. There are also concerns about the project's potential effects on land use and rural livelihoods. In particular, the proposed industrial zone could accelerate land conversion and potentially displace agricultural production in areas that currently support rice, coconut, and other food systems.

This paper does not seek to resolve these concerns. More pertinent is the question of whether Pax Silica can be structured around the principle of embedded reciprocity, as discussed in Section IV. This is an issue that Philippine policymakers should consider carefully in

negotiating the country's participation in the initiative. At the same time, policymakers should recognize that AFISS and Pax Silica may compete for limited policy, financial, institutional, and human resources. A balance therefore needs to be struck between the Philippines' regional commitments to ASEAN and the requirements and obligations associated with Pax Silica. It has also been suggested that the Philippines can use great-power competition to build domestic capability, diversify sources of finance and technology and preserve room for maneuver (Wang 2026).

Finally, policymakers need to pay close attention to the enforcement mechanisms underpinning these different frameworks. Chinese investments in Southeast Asia were discussed in the previous subsection. These can be managed within the framework of the Regional Comprehensive Economic Partnership (RCEP), which contains a dedicated investment chapter and operates within a broader rules-based system that recognizes the World Trade Organization. Pax Silica, by contrast, is a US-led initiative whose institutional and enforcement arrangements may be more dependent on bilateral commitments and the policies of its leading member. This raises questions about the durability and enforceability of commitments. The issue is particularly relevant given recent developments in US trade policy. During a press conference on August 22, 2026, Canadian Prime Minister Mark Carney observed that "sometimes its [the U.S.] signature was written in pencil" following the sudden collapse of Canada–US bilateral trade negotiations. This underscores the need for Philippine policymakers to assess not only the economic benefits of Pax Silica, but also the credibility, durability, and enforceability of the commitments associated with it.

VI. Conclusion

The global economy is entering a period in which geopolitical considerations increasingly shape the organization of international trade, investment, technology and production networks. The growing use of tariffs, sanctions, export controls and investment restrictions has exposed the vulnerabilities inherent in an increasingly interconnected global economy. For developing economies, particularly those deeply integrated into global value chains (GVCs), these developments present a fundamental challenge. While geoeconomic fragmentation creates opportunities through trade diversion and the relocation of foreign direct investment (FDI), it also raises the risk that countries will become alternative production locations without acquiring the capabilities necessary to sustain industrial upgrading. The central challenge is therefore not simply to maintain participation in GVCs, but to transform that participation into a source of domestic economic resilience and structural transformation.

This paper has argued that resilience should not be equated with economic self-sufficiency or the retreat from globalization. Rather, it requires a more diversified and adaptable system of international production in which alternative suppliers and production locations can substitute for one another when disruptions occur. Regional economic integration is particularly important in this regard. By combining complementary national capabilities, ASEAN member states can achieve economies of scale, strengthen regional production networks and reduce excessive dependence on individual suppliers or markets. Initiatives such as AFISS illustrate how regional cooperation can move beyond conventional trade liberalization toward the development of a more integrated technological and industrial ecosystem.

Nevertheless, regional integration and diversification alone will not guarantee that developing economies capture a greater share of the benefits generated by GVC participation. The experience of Southeast Asia demonstrates that increased exports and investment do not necessarily translate into stronger domestic productive capabilities. Foreign-owned production facilities can remain weakly connected to local enterprises, while higher-value activities such as research and development, product design and technological innovation continue to be undertaken elsewhere. The policy response must therefore go beyond attracting investment

and increasing gross exports. It must focus on developing the technological, organizational and productive capabilities that enable domestic firms and workers to participate in progressively more sophisticated activities.

This is the rationale behind the concept of *embedded reciprocity*, which constitutes the central policy proposition of this paper. FDI should be treated not merely as an independent source of capital, employment and export earnings, but as an instrument of industrial policy. Governments should seek to establish mutually beneficial relationships with MNEs, whereby access to incentives, infrastructure, public resources and other forms of government support is reciprocated by commitments to domestic capability building. These commitments can include supplier development, workforce training, technology diffusion, joint research and development, and the transfer of higher-value production and engineering functions. Importantly, this approach does not imply indiscriminate local-content requirements or coercive technology-transfer obligations. Rather, it emphasizes performance-based incentives, institutionalized government–business dialogue, and the development of domestic firms' absorptive capacity.

The discussion of China's DCS and Pax Silica illustrates the relevance of this framework under contemporary geopolitical conditions. China's growing technological and manufacturing capabilities present both competitive pressures and opportunities for complementary integration with ASEAN. Similarly, Pax Silica could provide the Philippines with opportunities to strengthen its semiconductor industry, develop critical-minerals processing and attract investment in advanced manufacturing and artificial intelligence. However, neither development guarantees domestic upgrading. Their developmental contributions will depend on the ability of host economies to negotiate mutually beneficial arrangements and preserve sufficient policy autonomy. For the Philippines, this also means balancing participation in US-led initiatives with deeper engagement in ASEAN frameworks such as AFISS and the rules-based regional architecture represented by RCEP.

The emerging international economic order may be characterized by greater uncertainty and strategic competition, but it also creates opportunities for developing economies willing to pursue a more proactive development strategy. Rather than becoming passive beneficiaries of investment relocation or choosing sides in the competition among major powers, ASEAN economies should use their strategic position to diversify economic partnerships, deepen regional cooperation and strengthen domestic productive capabilities. The ultimate objective is not to become less interconnected with the global economy, but to become less vulnerable within it—and better equipped to shape the terms of that interdependence.

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