

ERIA POLICY DISCUSSION PAPER No.2

Strategic Resilience to Supply Chain Vulnerabilities: How ASEAN Firms Are Adapting to Multiple Uncertainties

Venkatachalam Anbumozhi and Isamu Wakamatsu

Strategic Resilience to Supply Chain Vulnerabilities: How ASEAN Firms Are Adapting to Multiple Uncertainties

Venkatachalam Anbumozhi¹ and Isamu Wakamatsu²

July 2026

ASEAN has become a major hub in global supply chains (GSCs). In recent years, however, GSCs have been reshaped by pandemic-related disruptions, rising US–China geopolitical tensions, growing protectionism, stricter sustainability requirements, and rapid digitalisation. Drawing on firm-level interviews and surveys, this paper examines the combined effects of these developments, with particular attention to how firms are responding and the common challenges they face. The findings show that manufacturing firms are diversifying their procurement, production, and export markets to strengthen supply chain resilience. However, diversifying supply sources and production locations alone is insufficient. Building resilience also requires an integrated value chain approach that strengthens the performance of the entire system. In the short term, policy priorities include stricter enforcement of rules of origin and stronger monitoring of transshipment. Over the medium term, priorities include deeper regional integration through lower non-tariff barriers, harmonised standards, and improved connectivity under existing trade frameworks. In the long term, competitiveness will depend on industrial upgrading, supplier development, decarbonisation, and digital transformation.

Keywords: supply chains resilience, trade protectionism, US–China rivalry, decarbonisation, digital transformation

¹ Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia.

² Institute of Developing Economies (IDE-JETRO), Japan.

This paper is the product of a joint research project between ERIA and IDE-JETRO. The project team consisted of researchers from ERIA, IDE-JETRO, and research institutes across ASEAN and East Asia: CSIS (Indonesia), IKMAS (Malaysia), PIDS (Philippines), TDRI (Thailand), BCSI (Viet Nam), KIEP (Rep. of Korea), and Xi'an Jiaotong-Liverpool University (China). Various inputs from team members, including firm interview data, are reflected in this paper. The authors would like to express their sincere gratitude to all project members for their valuable inputs, insightful comments, and generous support. Any remaining errors or omissions are the sole responsibility of the authors.

The views expressed in ERIA Policy Discussion Papers are those of the author(s) and do not necessarily represent the views of ERIA, its Governing Board, or ERIA management. For inquiries, please contact: publications@eria.org

Please cite this publication as: Anbumozhi, V. and I. Wakamatsu (2026), 'Strategic Resilience to Supply Chain Vulnerabilities: How ASEAN Firms Are Adapting to Multiple Uncertainties', *ERIA Policy Discussion Paper Series*, No.2, Jakarta: ERIA

1. Introduction

The evolution of global supply chains (GSCs) has been shaped by two major waves of transformation. The first wave, beginning in the late eighteenth century with the Industrial Revolution, was driven by innovations such as the steam locomotive and steamship, which dramatically reduced transportation costs and made it possible to separate production from consumption across space. This process is widely referred to as the 'first unbundling' (Baldwin, 2012). It enabled large-scale production, fostered agglomeration economies, and led to the geographic concentration of manufacturing activities.

The second wave was triggered by the information and communication technology (ICT) revolution of the 1980s. Advances in internet-based communication substantially reduced co-ordination costs across the multiple stages involved in manufacturing a single product, making it feasible to distribute production processes geographically to locations offering lower costs. This shift marked the onset of the 'second unbundling', characterised by the global dispersion of production networks.

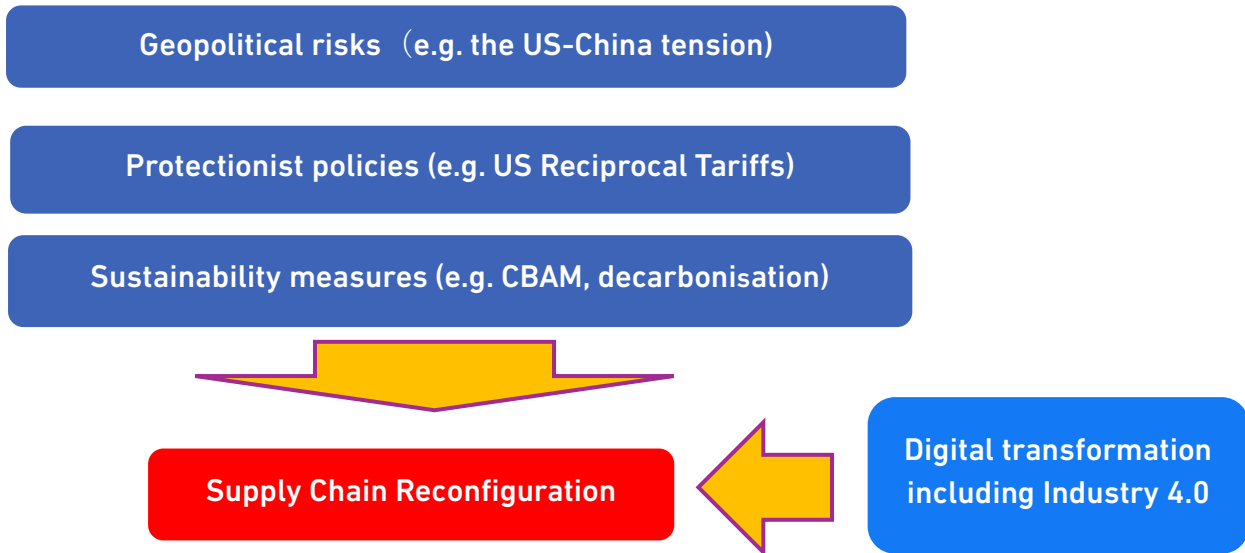
The rise of GSCs fundamentally transformed development strategies in many developing countries (Baldwin, 2012). One prominent example is the rapid economic growth experienced by ASEAN economies such as Thailand and Malaysia in the late 1980s, driven largely by inflows of foreign direct investment (FDI). By attracting multinational corporations (MNCs), these economies integrated into GSCs and achieved export-led growth within a relatively short period. Today, East Asia – including ASEAN – is widely recognised as the region where GSCs, or international production networks, are the most sophisticated and deeply integrated. MNCs in sectors such as electronics and automobiles have established extensive cross-border production linkages, shaping the region's industrial landscape.

Since the onset of the second unbundling around 1990, GSCs have expanded across borders in pursuit of optimal sourcing and production efficiencies. More recently, advances in digital technologies – particularly further developments in ICT since the late 2010s – have reduced the cost of the virtual mobility of people, giving rise to the 'third unbundling'. Through telepresence technologies, such as web conferencing, it has become possible to disaggregate tasks not only across production processes but also at the level of individual workers. As a result, the international division of labour, particularly in the services sector, has increasingly taken place amongst individuals located in different geographical areas (Kimura and Oikawa, 2022).

In recent years, however, GSCs have faced a range of challenges that are not fully explained by conventional theories of industrial agglomeration but rather by overlapping uncertainties and polycrises. Supply chain disruptions caused by the COVID-19 pandemic and increasingly severe natural disasters, geopolitical tensions such as the US–China rivalry, rising protectionism, and growing sustainability pressures have all compelled firms to restructure their supply chains to enhance resilience. Tariff measures introduced under the

second Trump administration in the United States have added further uncertainty and turbulence to global supply chains. At the same time, accelerating digital transformation, including the adoption of Industry 4.0 technologies, is fundamentally reshaping supply chain design and management, as illustrated in Figure 1. Consequently, supply chain resilience has become a central concern in both academic and policy debates.

Figure 1. Changes in the Global Supply Chains Environment



Source: Authors.

In response to these crises and uncertainties, firms are increasingly shifting from a singular focus on efficiency towards achieving a better balance between efficiency and resilience. Measures to address sudden supply disruptions vary across industries but commonly include building inventories, increasing input substitutability, diversifying production bases and procurement sources, and localising production. Beyond the traditional QCD criteria of quality, cost, and delivery, firms are redesigning their supply chains to account more comprehensively for multiple dimensions of uncertainty. Actual responses, however, are likely to differ depending on firm size, organisational capabilities, and access to information about the external environment.

The growing literature on supply chain resilience provides valuable insights into how firms respond to external shocks (Anbumozhi et al., 2020; Todo et al., 2023; Stadtfeld and Gruchmann, 2024; Bednarski et al., 2025). Several studies examine firm responses to disruptions caused by natural disasters, the COVID-19 pandemic, sustainability pressures, geopolitical risks, and protectionist policies (ADB, 2022; Anbumozhi et al., 2022; Thangavelu et al., 2024). However, much of this literature analyses these disruptions separately and from macro-level perspectives, such as the national or industry level. Firm-level analyses of responses to multiple uncertainties remain limited. Moreover, few studies employ a unified analytical framework to examine not only short-term shocks but also the medium-

to long-term structural challenges and opportunities associated with digitalisation and decarbonisation.

These limitations are particularly evident in ASEAN, which has benefited from trade liberalisation through free trade agreements (FTAs) and attracted substantial FDI from MNCs. Major US, European, Japanese, Chinese, and Korean firms have established production bases and supply chains across the region. Amid intensifying US–China tensions, ASEAN has attracted increasing investment as a neutral ‘China-plus-one’ manufacturing base that can either substitute for or complement China. Although ASEAN offers significant potential for the diversification of production and sourcing amid ongoing supply chain reconfiguration, its Member States also have heterogeneous and often complex regulatory frameworks. In addition, some countries face infrastructure constraints, including limitations in electricity supply, roads, and ports, while non-tariff barriers remain substantial. These factors may hinder firms’ efforts to strengthen supply chain resilience. Nevertheless, empirical evidence on how firms in ASEAN and East Asia are responding to multiple uncertainties and structural changes remains limited.

Against this backdrop, this paper addresses three interrelated research questions:

1. How do multiple uncertainties – including protectionist trade policies, geopolitical risks, decarbonisation targets, and emerging digitalisation opportunities – affect firms’ supply chain strategies?
2. What constraints do firms face in adapting their procurement, production, and sales activities to these changes?
3. How do firms perceive the role of policy interventions, including regional co-ordination mechanisms within the ASEAN framework, in enhancing supply chain resilience?

By focusing on firm-level behaviour and perceptions, this study complements macro-level analyses and sheds light on the micro-foundations of supply chain resilience.

To address these questions, this paper draws primarily on firm surveys and in-depth interviews to examine firm-level responses to uncertainty, focusing on the supply chain restructuring strategies of MNCs and local firms in ASEAN. The analysis concentrates on the automotive and electrical and electronics sectors, where GSCs have evolved into highly integrated international production networks characterised by strong forward and backward linkages.

This paper makes three main contributions. First, it provides timely insights into the short-term challenges arising from new risks of supply chain disruption, including those associated with reciprocal tariff increases introduced under the second Trump administration in the United States. Second, it offers an in-depth analysis of the medium- to long-term challenges and opportunities associated with digitalisation and decarbonisation. Third, drawing on primary data from firm surveys and interviews, it highlights firm-level

responses to uncertainty, focusing on the supply chain restructuring strategies of MNCs and their local suppliers in Southeast Asia.

The remainder of the paper is organised as follows. Section 2 reviews the literature on uncertainty, global supply chain reconfiguration, and firm-level resilience, identifying the key gaps that motivate this study. Section 3 presents the analytical framework, data sources, and research hypotheses. Section 4 presents the empirical findings on firm-level responses to multiple uncertainties in ASEAN in relation to the three hypotheses. Section 5 discusses and tests the hypotheses. Section 6 concludes by summarising the main findings and discussing policy implications for strengthening supply chain resilience.

2. Literature Review: Uncertainty, Structural changes, Supply Chain Reconfiguration, and Firm-Level Responses

2.1. Multiple Uncertainties, structural changes and Supply Chain Reconfiguration

In recent years, global supply chains (GSCs), which have traditionally prioritised efficiency under the assumption of free trade, have become increasingly exposed to multiple sources of uncertainty (UNCTAD, 2020; Tortorella et al., 2025). The drivers of these structural changes are diverse, including pandemics, rising protectionism, geopolitical risks, sustainability imperatives, and digitalisation. A growing body of literature has examined the impacts of these drivers on GSCs.

The COVID-19 pandemic, which began in 2020, caused unprecedented global supply disruptions and significantly heightened interest in supply chain resilience. Numerous empirical studies have investigated its impact on GSCs. An analysis of GSCs using multi-regional input–output data suggests that the pandemic accelerated trends towards the localisation of production and consumption (ADB, 2023). At the firm level, studies have also shown that sourcing intermediate goods from a more diversified set of countries helped mitigate the adverse effects of supply chain disruptions during the pandemic (Ando and Hayakawa, 2022; Todo et al., 2023).

Geopolitical risks have likewise attracted considerable attention in the literature, particularly in relation to supply chain reconfiguration. A wide range of studies has examined specific events such as Brexit, US–China tensions, and Russia’s invasion of Ukraine (Bednarski et al., 2025). In the context of the US–China trade conflict, countries whose exports were substitutes for those of either the United States or China benefited more from trade diversion effects (Fajgelbaum et al., 2024). Moreover, countries that have expanded exports to the United States in place of China are often deeply integrated into China-centred supply chains (Freund et al., 2024). Firm-level studies focusing on production relocation indicate a gradual shift of manufacturing from China to ASEAN Member States (Suvannaphakdy and Thao, 2023; ASEAN Secretariat, 2023).

Triggered in part by the pandemic, concerns over economic security have intensified, accompanied by a rise in protectionist policy interventions (Miroudot and Nordström, 2020; Zahoor et al., 2023). According to the Global Trade Alert (GTA) database, which monitors policy measures affecting global trade and investment, the number of harmful trade and investment interventions introduced worldwide reached 3,505 in 2024 – approximately three times the level recorded in 2019, prior to the pandemic – and has remained persistently high in recent years. In advanced economies, this trend has been reinforced by growing anti-globalisation sentiment and increasing support for domestic industry protection. A notable example is the tariff policy introduced by the second Trump administration, which took office in January 2025. With the stated objective of restoring manufacturing employment and reducing trade deficits, the administration imposed reciprocal tariffs on a country-by-country basis, together with additional duties on sectors such as steel, aluminium, automobiles, and auto parts, contributing to disruptions in the global economy. However, empirical evidence on the effects of these ‘Trump 2.0’ policies remains limited.

In addition, sustainability has emerged as an important determinant of firm competitiveness. The adoption of the Sustainable Development Goals (SDGs) by the United Nations in 2015 symbolises this shift. Correspondingly, sustainability has become an integral component of corporate supply chain management. Amongst these issues, decarbonisation is particularly prominent, with mounting pressure on firms to reduce carbon emissions. Within supply chains, efforts to reduce supplier emissions – commonly referred to as Scope 3 emissions – have become a major challenge, although empirical research on this topic remains limited (Hettler and Graf-Vlachy, 2024; Liew and Cao, 2025).

Furthermore, rapid advances in digital technologies – including the Internet of Things (IoT), cloud computing, artificial intelligence (AI), big data, blockchain, automation, and three-dimensional (3D) printing – are transforming manufacturing processes. Digitalisation is widely expected to enhance supply chain resilience significantly (Tan, 2023; Ouhrir and Bahha, 2025). Nonetheless, inconsistent data management across supply chain processes, fragmented systems, and complex shipment procedures continue to hinder the development of digital supply chains in ASEAN (Nakayama and Rianto, 2025).

Despite the growing body of literature on these developments surrounding GSCs, most existing studies examine individual sources of disruption and structural changes – such as pandemics, protectionism, geopolitical risks, sustainability pressures, or digitalisation – in isolation. Consequently, relatively little is known about how firms respond when confronted with multiple and overlapping uncertainties simultaneously.

2.2. Firm-Level Responses for Supply Chain Resilience

A substantial body of research has examined supply chain resilience from the firm perspective, particularly in response to supply chain disruptions (Nikookar, 2024; Stadtfeld and Gruchmann, 2024). Academic interest in this area has increased markedly in recent

years. Although there is no universally accepted definition of supply chain resilience (Tan, 2023), it is generally understood as the ability to adapt and transform in response to adverse events (OECD, 2025), suggesting that resilience depends largely on firm-level capabilities. While firms may adopt various strategies to enhance resilience, their ability to do so depends critically on their internal capabilities and resource endowments.

Small and medium-sized enterprises (SMEs), in particular, face specific constraints arising from limited financial and human resources (Bak et al., 2020; Phan et al., 2023). These firms often lack the capacity to invest in redundancy, digital technologies, or compliance systems required to meet evolving regulatory requirements. As a result, they may incur disproportionately high adjustment costs when confronted with multiple uncertainties.

Despite these insights, existing studies often analyse firms' capacity constraints in relation to specific challenges, such as compliance with trade regulations, sustainability requirements, or technology adoption, without fully capturing how multiple uncertainties interact to create compounded pressures. There remains a need to better understand how overlapping uncertainties influence firms' adaptive capacity.

2.3. Research Gap and Contribution

The preceding discussion highlights several important gaps in the existing literature. First, much of the current research focuses on individual sources of uncertainty, while limited attention has been paid to how firms respond to multiple and overlapping uncertainties simultaneously. Second, firm-level evidence on supply chain restructuring remains relatively scarce, particularly in emerging regional contexts such as ASEAN. Third, the role of firm-level capabilities and constraints in shaping firms' adaptive responses under complex operating environments has not been fully integrated into empirical analyses. Finally, the relationship between firm behaviour and the perceived role of policy responses – particularly regional policy co-ordination within ASEAN – remains underexplored.

3. Analytical Framework, Data, and Hypotheses

3.1. Analytical Framework

Building on the literature reviewed in Section 2, this study examines how firms respond to multiple and overlapping uncertainties and how these responses are shaped by firm-level constraints and the broader policy environment.

To address these questions, the study develops an analytical framework that links the external drivers of supply chain restructuring with firm-level responses and outcomes (Table 1). The framework distinguishes between different types of drivers based on their temporal characteristics. Immediate drivers include protectionist trade policies and geopolitical risks, while gradual structural changes include digital transformation and decarbonisation requirements. In addition, the COVID-19 pandemic is treated as a major

systemic shock that has reshaped firms' perceptions of risk and accelerated subsequent adjustments.

Firm responses are analysed along three key dimensions: procurement (including sourcing strategies and supplier diversification), production (including location and capacity adjustments), and sales (including market diversification and export orientation). This structure reflects the core functional areas through which firms adjust their supply chains in response to external shocks and longer-term structural changes.

Table 1. Analytical Framework

Drivers of Supply Chain Restructuring		Firm Responses
Immediate drivers	Protectionist policies (e.g. US reciprocal tariffs)	Procurement (local/import)
	Geopolitical risks (e.g. US–China tension)	Production
Gradual drivers	Digital transformation (e.g. AI and Industry 4.0)	Sales (domestic/export)
	Decarbonisation measures (e.g. NDC targets and CBAM)	

Source: Authors.

3.2. Data

The analysis is based on a combination of firm-level survey data and qualitative evidence from interviews. The primary data sources are as follows:

- More than 40 in-depth interviews with multinational enterprises and local firms operating in ASEAN.
- The JETRO Survey of Japanese Manufacturing Companies (JETRO Survey), covering more than 500 respondents across Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam, conducted between August and September 2025.
- The ASEAN Business Advisory Council (ABAC) Survey, covering approximately 400 firms across ASEAN, conducted between December 2025 and January 2026.
- The CSIS Indonesia firm survey (CSIS Survey), covering 29 firms, conducted in the fourth quarter of 2025

These data sources provide complementary perspectives. The JETRO Survey captures the behaviour of multinational manufacturing firms, while the ABAC and CSIS surveys provide insights into local ASEAN firms, including small and medium-sized enterprises (SMEs). The interview data further enrich the analysis by providing detailed qualitative evidence on firms' strategies, constraints, and decision-making processes.

By combining multiple data sources, the study is able to identify both common patterns and heterogeneity across firms and to link observed firm behaviour to the hypotheses derived from the literature.

3.3. Hypotheses

Based on the literature on multiple uncertainties, supply chain reconfiguration, and firm-level responses, this paper develops three testable hypotheses. These hypotheses are examined using a combination of survey data, secondary information, and qualitative interview evidence.

Hypothesis 1: Firm-Level Resilience Response

Firms are more likely to diversify and regionalise their supply chains in response to multiple uncertainties, particularly when their pre-existing supply chains are geographically concentrated.

Hypothesis 2: Constraints in Adapting to Multiple Uncertainties

Firms facing multiple and overlapping uncertainties are more likely to experience compounded challenges in information acquisition, regulatory compliance, and risk management, particularly when internal resources – such as skilled personnel, financial capacity, and supply chain visibility – are limited.

Hypothesis 3: Perceptions of Policy Innovation and Collective Responses

Firms exposed to higher levels of multiple and overlapping uncertainties are more likely to emphasise the importance of co-ordinated regional policy measures – such as trade liberalisation, regulatory harmonisation, and digital integration – than isolated national responses for strengthening supply chain resilience.

4. Firms' Responses to Supply Chain Uncertainty

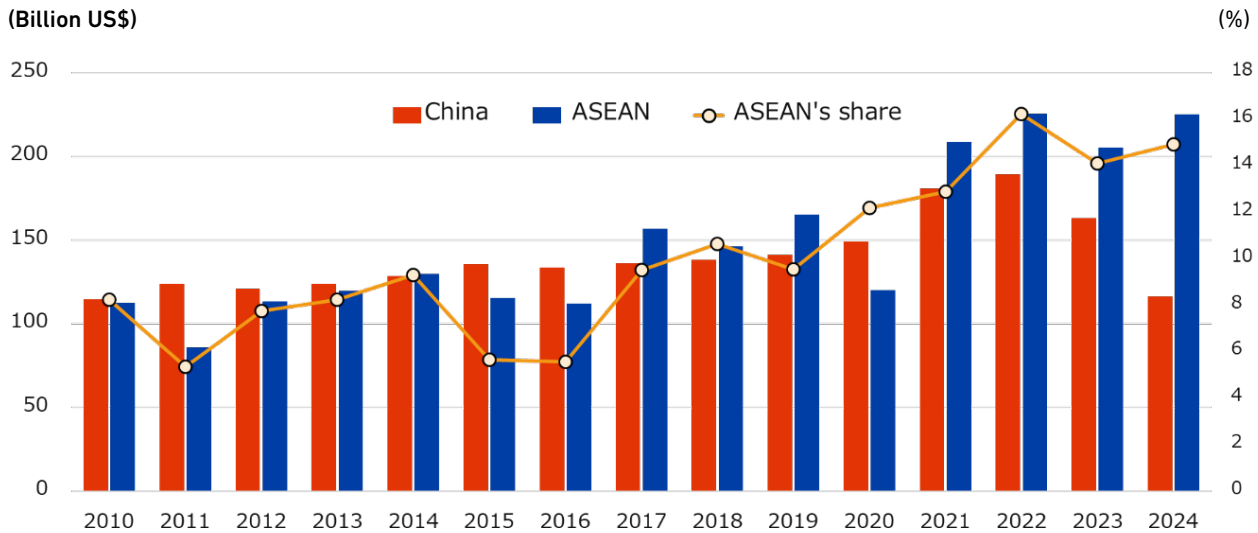
4.1. Accelerating Production Shifts from China to ASEAN

ASEAN's sustained economic growth has strengthened its position as an attractive investment destination for multinational enterprises (MNEs), relative to other regions of the world. As US–China tensions have intensified, ASEAN has increasingly assumed the role of a 'China-plus-one' manufacturing base and a global supply chain hub that both complements and, in some cases, substitutes for China. Correspondingly, inward foreign direct investment (FDI) into ASEAN has continued to expand.

Before the COVID-19 pandemic, annual FDI inflows into ASEAN generally ranged between US\$10 billion and US\$15 billion. Since 2021, however, inflows have consistently exceeded US\$20 billion, reflecting the region's expanding market and the ongoing relocation of manufacturing activities. As of 2024, the United States remained the largest source of investment, followed by intra-ASEAN investment centred on Singapore, as well as

investment from China, the European Union, and Japan. Notably, FDI from China has increased significantly. ASEAN's share of global FDI has also risen to around 15%, underscoring the region's growing attractiveness as a destination for global investment (Figure 2).

**Figure 2. Trends in Foreign Direct Investment
(Amount, Global Share)**



Source: Prepared by JETRO based on UNCTAD data.

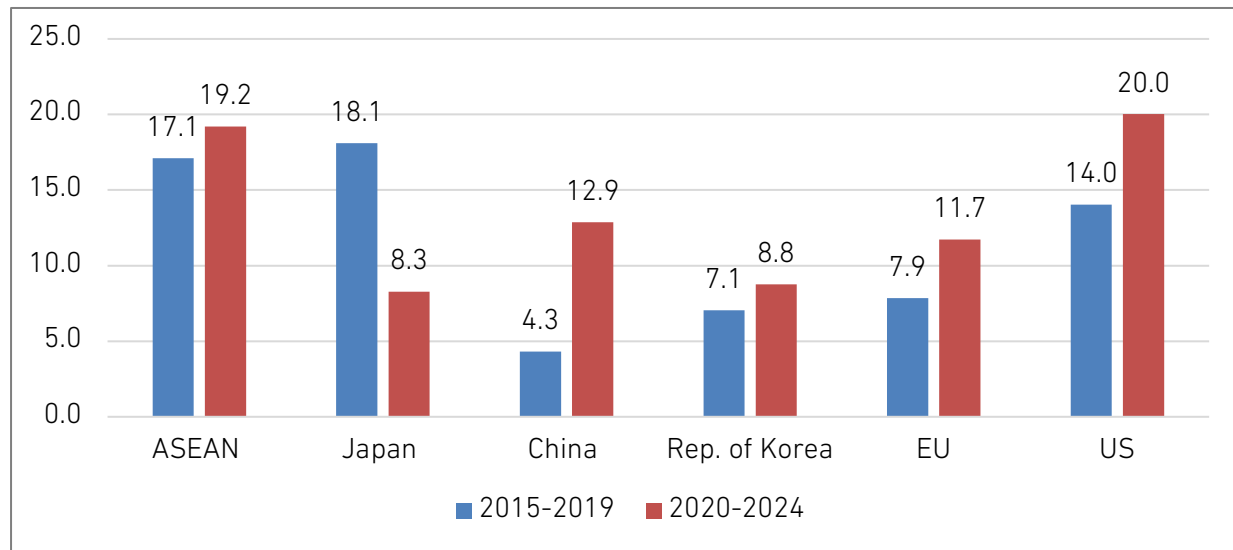
Alongside the growth in FDI inflows, the sources of investment have also become increasingly diversified. Figure 3 illustrates changes in the country and regional composition of manufacturing FDI into ASEAN. Comparing the average shares between the first and second halves of the past decade, the share of investment originating from China nearly tripled, rising from 4.3% to 12.9%. This increase accelerated following the onset of the US–China trade war in 2018, as Chinese firms expanded investment in ASEAN Member States, including Indonesia, Thailand, and Viet Nam, both as alternative export bases and as new markets, particularly in the electric vehicle (EV) and electronics sectors.

By contrast, Japan's share declined from 18.1% to 8.3%. Japanese firms began investing heavily in ASEAN following the appreciation of the yen after the 1985 Plaza Accord and have therefore maintained a long-standing presence in the region. Major manufacturing firms are already well established across ASEAN, and, as a result, recent Japanese investment has tended to focus on expanding existing operations rather than establishing new ones.

Korean firms have also shown a clear shift towards ASEAN. Korean investment in China peaked in 2017 and has declined markedly since 2020. Within ASEAN, Viet Nam and Indonesia have become key destinations for Korean FDI. At the same time, India has emerged as another major investment destination, reflecting broader diversification in Korean firms' production and investment strategies.

Figure 3. Manufacturing Foreign Direct Investment (FDI) into ASEAN – Share of Sources by Country/Region

(%)



Source: JETRO compilation based on ASEAN Secretariat data.

4.2. Impacts of US Trade Policy (Reciprocal Tariffs)

A major recent shock to supply chains in ASEAN and East Asia has been the imposition of reciprocal and additional tariffs by the second Trump administration. During the first Trump administration, tariffs were targeted primarily at China, generating trade diversion effects that benefited ASEAN (Hayakawa, 2022). In contrast, the current round of tariffs has been extended to ASEAN Member States as well.

Furthermore, the US–China summit in October 2025 resulted in a reduction of US tariffs on Chinese products to 20%, eroding ASEAN's previous tariff-based competitive advantage relative to China. To assess the impact of these developments, the IDE–GSM model was used to simulate their effects on national economies, measured by gross domestic product (GDP). The simulations indicate negative GDP impacts for Viet Nam, Thailand, the Philippines, and Malaysia, reflecting the erosion of the trade diversion gains that ASEAN had previously enjoyed (Figure 4). By contrast, Indonesia experiences only limited negative effects because of its relatively low dependence on the US market.

It should also be noted that, in February 2026, the US Supreme Court ruled the reciprocal tariff measures unconstitutional, leading to the adoption of a uniform 10% tariff under Section 122 of the Trade Act.

Figure 4. Economic impact of Trump Tariffs on ASEAN

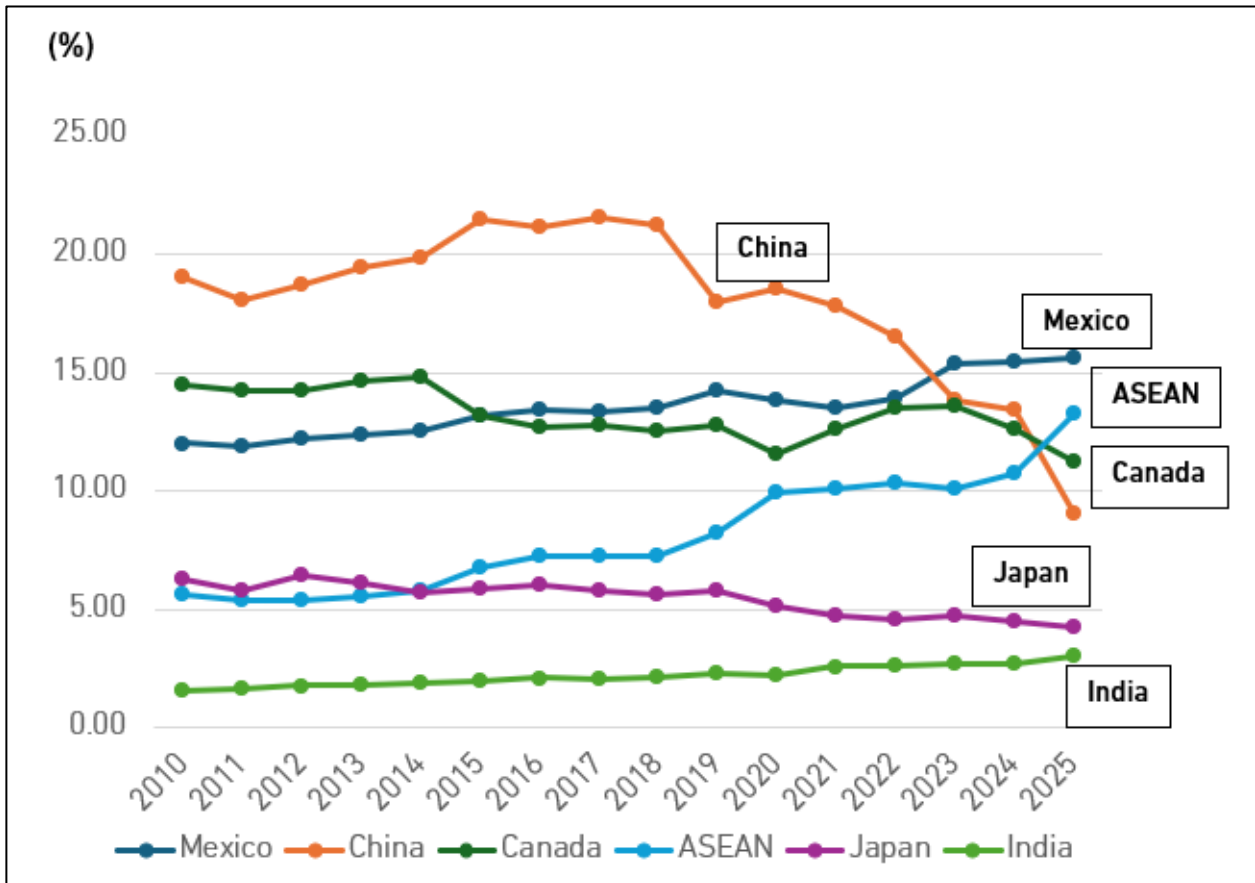
	Agri	Auto	EE	Textile	Food Proc	Oth. Mfg.	Services	Mining	GDP
United States	-1.62%	-4.52%	0.67%	1.36%	0.70%	-0.05%	-3.34%	-5.28%	-3.00%
China	-0.34%	-0.80%	-0.59%	0.03%	-1.23%	-1.44%	-0.43%	0.16%	-0.74%
EU	-0.07%	-0.12%	0.14%	0.42%	0.11%	0.27%	0.08%	0.42%	0.11%
Japan	-0.23%	-0.66%	0.45%	0.17%	0.02%	0.30%	0.07%	0.23%	0.08%
India	-0.03%	-0.16%	0.24%	0.10%	-0.04%	-0.30%	-0.03%	0.23%	-0.07%
Cambodia	0.03%	0.00%	-0.08%	-0.23%	0.21%	-0.06%	0.03%	0.95%	-0.02%
Indonesia	0.02%	-0.37%	-0.06%	-0.46%	-1.47%	-0.02%	-0.02%	0.21%	-0.08%
Lao PDR	0.30%	0.37%	0.08%	0.11%	0.64%	-0.03%	0.48%	3.74%	0.71%
Malaysia	-0.17%	-0.07%	-2.29%	0.05%	-0.49%	-0.10%	-0.23%	0.31%	-0.37%
Philippines	-0.17%	-0.04%	-1.25%	0.22%	-3.75%	0.11%	-0.22%	0.42%	-0.52%
Singapore	-0.35%	0.07%	0.32%	-0.07%	0.02%	0.80%	0.22%	0.23%	0.36%
Thailand	-0.23%	0.07%	-2.44%	-0.11%	-0.73%	-0.65%	-0.25%	0.19%	-0.47%
Viet Nam	-0.37%	-0.62%	-0.44%	0.09%	-1.51%	-1.63%	-0.44%	0.26%	-0.65%
World	-0.18%	-0.61%	-0.25%	0.08%	-0.33%	-0.42%	-0.99%	-0.19%	-0.77%

Source: Isano (2026), IDE-GSM Simulation.

Despite the simulation results, actual developments through the end of 2025 indicate that US tariff measures did not lead to a decline in ASEAN's exports to the United States. On the contrary, ASEAN's exports to the US increased by approximately 30% year on year in 2025. By contrast, US imports from China declined sharply – by around 30% – over the same period.

Figure 5 shows the shares of US imports by country and region. In 2025, ASEAN became the second-largest source of US imports after Mexico.

Figure 5. US Import Share by Country/Region

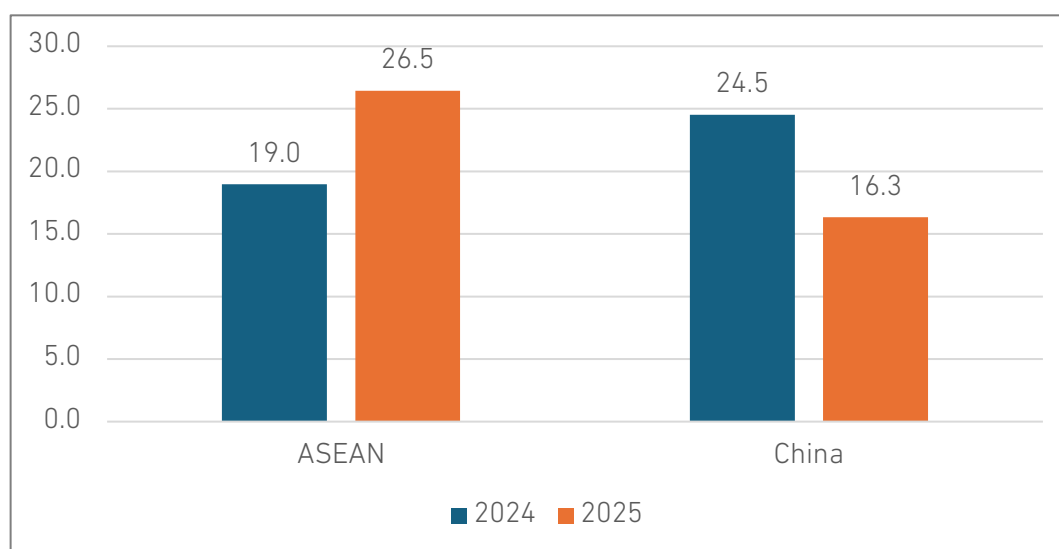


Source: Global Trade Atlas.

Figure 6 illustrates the United States' trade deficit by partner country and region. ASEAN's share of the US trade deficit increased sharply from 19% in the previous year to 26.5% in 2025, making ASEAN the largest regional contributor to the US trade deficit.

These developments suggest that ASEAN may face increased scrutiny from the United States. To avoid being perceived as a conduit for transshipment from China, it will be increasingly important to strengthen measures to prevent illicit transshipment and ensure stricter compliance with rules of origin.

Figure 6. ASEAN and China's Share of the US Trade Deficit (%)



Source: Global Trade Atlas.

According to the JETRO Survey (JETRO, 2025), which examined the impact of the Trump tariffs on Japanese firms operating in ASEAN, only about one-quarter of respondents reported experiencing 'negative impacts'. Given the relatively low share of exports destined for the US market, the overall effects appear to have been limited. Nonetheless, more than 40% selected 'uncertain' – the largest share amongst all response categories – indicating that the Trump tariffs constitute a significant source of uncertainty for many firms. Interviews further reveal that US tariff measures are complex, contain numerous exceptions, and are frequently revised, making it difficult for firms to obtain accurate and up-to-date information.

To assess the impact on local firms in ASEAN, the ASEAN Business Advisory Council (ABAC), CSIS Indonesia, and JETRO Jakarta jointly conducted a survey between December 2025 and January 2026 covering firms across ASEAN (395 respondents; hereafter, the ABAC Survey). Approximately 40% of respondents reported being affected by the Trump tariffs, while amongst manufacturing firms, roughly two-thirds reported negative impacts. The most frequently cited challenges were 'supply chain disruptions and logistics delays' (59.2%), followed by 'greater uncertainty making business planning difficult' and 'customer requests for price reductions' (57.3%). Similarly, the CSIS Indonesia Survey (29 respondents; hereafter, the CSIS Survey) found that 65% of firms had been negatively affected by the tariffs.

There have, however, also been some positive effects. Some Thai firms reported increased demand from customers seeking suppliers outside China to mitigate tariff-related risks, thereby creating new business opportunities. In Viet Nam, by contrast, firms face greater exposure to risks arising from US transshipment measures and exchange rate volatility

because of their heavy dependence on imported high-tech components and raw materials. This high level of import dependence has itself become a source of vulnerability.

4.3. Firms' Responses to Supply Chain Uncertainty

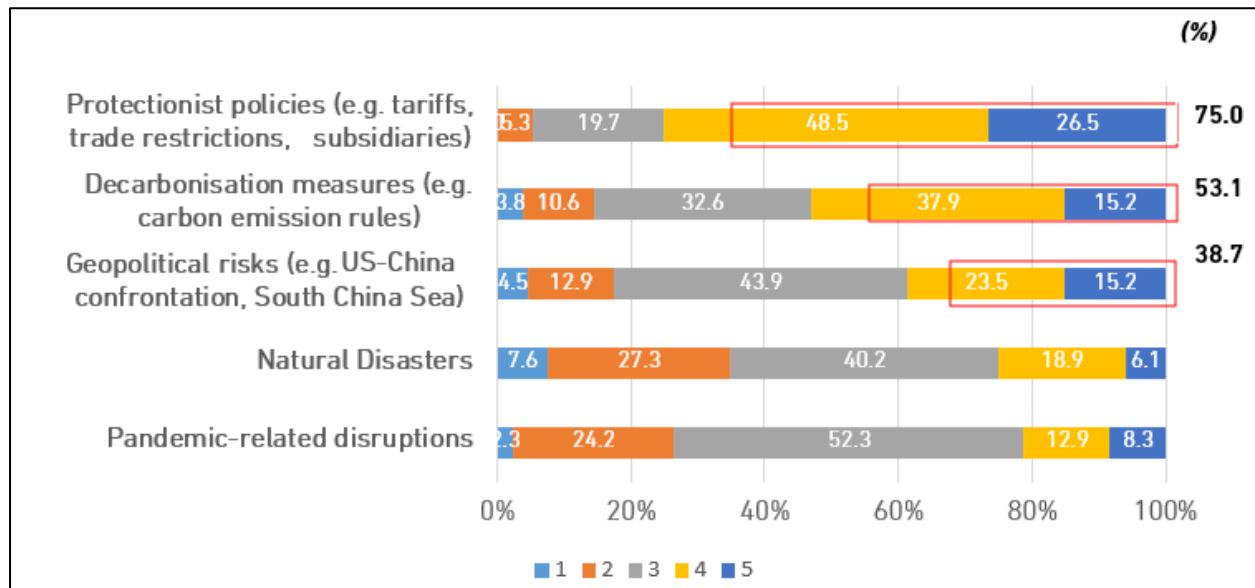
Interviews with Japanese manufacturing affiliates in ASEAN revealed that the COVID-19 pandemic served as a major turning point, accelerating efforts to diversify procurement sources (including through dual sourcing), strengthen local sourcing, and diversify production bases. Firms have also enhanced business continuity planning (BCP) to prepare for potential disruptions arising from geopolitical risks. Preparedness for supply chain disruptions has therefore advanced steadily.

The interviews also confirmed that the shift of production from China to ASEAN has accelerated in response to heightened China-related risks arising from the US–China trade conflict, the pandemic, and rising labour costs. However, as noted earlier, firms have generally not established new production facilities; instead, they have expanded or reallocated production within their existing ASEAN operations. At the same time, many companies have adopted an 'In China for China' localisation strategy to serve the Chinese domestic market.

A key challenge remains limited visibility across supply chains. Many firms lack information about second-tier and third-tier suppliers beyond their direct procurement partners, giving rise to concerns about hidden risks further upstream in the supply chain.

For local firms in ASEAN, the ABAC Survey shows that 75% of respondents expressed strong concern (levels 4 or 5) about protectionist measures. This was followed by concerns about decarbonisation requirements (53.1%) and geopolitical risks (38.7%) (Figure 7). These findings suggest that firms are operating under pressure from multiple and overlapping sources of uncertainty, including protectionism, geopolitical tensions, and decarbonisation-related regulations.

Figure 7. Risk Factors affective Supply Chains – Survey Responses



Note: 1=very low; 5=very high

Source: ABAC survey.

The CSIS Indonesia Survey likewise revealed strong concerns about protectionism and geopolitical risks. Key challenges identified by respondents included regulatory uncertainty, as well as limited access to information, expertise, and analytical capacity. Diversification of procurement has been widely adopted as a risk mitigation strategy. According to the ABAC Survey, 60.6% of firms reported having revised their procurement strategies over the past 5 years. The main areas of adjustment were strengthening environmental, social, and governance (ESG) compliance (76.5%) and diversifying suppliers (71.6%). Nearly half (44.7%) of the firms diversified procurement across borders, with ASEAN by far the preferred destination (93.2%), followed by Japan (54.2%) and China (40.7%). These findings underscore the growing importance of ASEAN regional integration.

At the same time, firms reported significant challenges in revising their procurement strategies, particularly cost constraints (90.0%) and difficulties in meeting sustainability requirements (78.8%). Many firms noted that the relatively low cost and high quality of Chinese components make it difficult to reduce their dependence on China.

With regard to sales and market strategies, 52.3% of firms in the ABAC Survey reported having revised their market or sales strategies over the past 5 years. The most common adjustments were expanding sales within the ASEAN market (73.9%) and strengthening online and digital sales channels (62.3%). These results further highlight the importance of the ASEAN market.

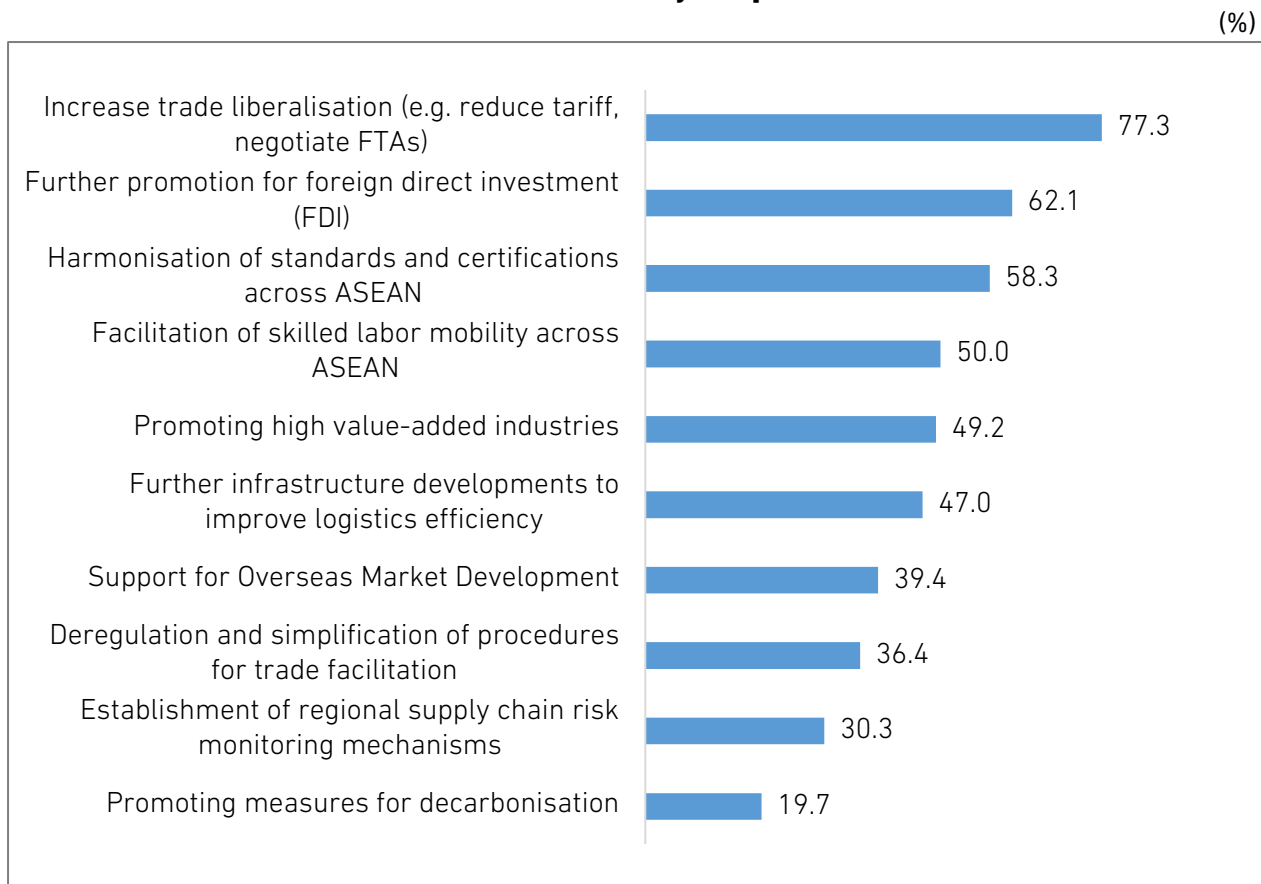
However, firms continue to face significant obstacles. The most frequently cited challenges were tariffs (71.0%) and non-tariff barriers (62.3%). Interviews likewise revealed that market diversification is not straightforward, as differing certification and regulatory

requirements across countries increase compliance costs and administrative burdens. At the same time, interviews with Thai firms identified positive cases in which geopolitical tensions between the United States and China prompted customers to shift procurement from China to Thailand, creating new business opportunities.

SMEs also often lack sufficient resources, resulting in an information gap relative to larger firms, particularly with respect to information on overseas markets and emerging risks.

In the ABAC Survey, when asked to identify priority policy measures for achieving sustainable and resilient supply chains, firms most frequently cited trade liberalisation – including tariff reductions and the promotion of free trade agreements (FTAs) (77.3%). This was followed by further efforts to attract foreign investment (62.1%) and the harmonisation of standards and certification systems (58.3%) (Figure 8).

Figure 8. Public Policy and Support Mechanisms Needed for Enhanced Supply Chain Resilience – Survey Responses



Source: ABAC survey.

4.4. Firms' Responses to Decarbonisation

According to the JETRO Survey, 53.3% of Japanese firms operating in ASEAN are currently undertaking decarbonisation initiatives, and this share rises to around 80% when planned initiatives are included. The most common measures are energy-saving initiatives (69.7%), followed by measuring the company's own emissions (48.6%), installing solar panels on factory rooftops (40.2%), and using renewable energy (37.2%). By contrast, only 7.1% of respondents reported switching to low-emission suppliers or encouraging suppliers to reduce emissions, indicating that supplier-related initiatives remain limited.

The main challenges identified were the high cost of adopting renewable energy (46.1%), lack of resources (30.9%), and insufficient incentives (29.3%). These findings suggest that Japanese firms are focusing primarily on Scope 1 and Scope 2 emissions, while addressing Scope 3 (supply chain-related emissions) remains a major challenge.

Chinese firms exhibit a dual-track pattern of adaptation. Firms integrated into sustainability-oriented supply chains, such as those serving the European market, are advancing green initiatives in response to strong external pressure. By contrast, firms not exposed to such pressures face greater difficulties in adopting green practices because of cost and technological constraints.

Amongst local firms in ASEAN, 63% reported undertaking decarbonisation initiatives, according to the ABAC Survey. The proportion is even higher amongst manufacturing firms (75%). However, the level of engagement varies by firm size: 71% of large firms reported undertaking decarbonisation efforts, compared with only 58% of micro, small, and medium-sized enterprises (MSMEs). Energy-saving measures were the most common initiative (67%). The use of electric vehicles (EVs), renewable energy, and eco-packaging or material recycling was also reported by approximately half of the firms. The major challenges cited included financial constraints, increased competitive pressure resulting from higher costs, and technological limitations.

Similar patterns emerged from interviews with local firms across ASEAN. These findings indicate that many firms face a common set of complex and interrelated challenges in pursuing decarbonisation. Drawing on both the interview findings and the existing literature, these challenges are summarised in Table 2.

Table 2. Key Barriers to the Decarbonisation of Industrial Supply Chains in Asia

Barrier	Key Issues
Economic	High upfront capital requirements; hidden or less visible costs; limited expected returns on investment
Market	Difficulty sourcing low-carbon electricity; weak market incentives; limited consumer demand for low-carbon products
Information	Lack of reliable and verifiable data on emissions and costs; limited awareness of decarbonisation benefits and available technologies; insufficient analytical capacity to develop credible decarbonisation plans
Organisational	Weak commitment from senior leadership; unclear organisational goals; resistance to change; low employee empowerment; limited co-ordination and trust across supply chain partners

Source: Authors.

4.5. Firms' Responses to Digitalisation

For Japanese firms, the JETRO Survey shows that more than half have introduced digital technologies. The most commonly adopted technologies include factory-level digital transformation (DX) solutions, cybersecurity tools, cloud services, and artificial intelligence (AI) applications. However, the adoption of technologies to improve supply chain visibility remains limited at the operational level, partly because of difficulties in obtaining data from suppliers. Many firms are still in the information-gathering and evaluation stage rather than fully deploying and utilising digital technologies.

The main obstacles identified in the survey were shortages of digital talent (70.8%) and high implementation and operating costs (64.7%).

Amongst local firms in ASEAN, the adoption of digital technologies remains relatively limited, according to the ABAC Survey. Decision-making support using AI agents and the application of generative AI for internal knowledge management are amongst the more advanced areas of adoption. The major challenges include cost constraints and a lack of know-how to promote digitalisation, both cited by a majority of firms. Many companies also reported uncertainty regarding the return on investment, as well as insufficient digital and IT literacy within their organisations.

Interviews with firms across ASEAN reveal a common theme: substantial disparities in digital readiness across countries and firms (Table 3).

Table 3. Status of Digital Technology Adoption and Key Challenges

Country	Status of Digitalisation and Key Challenges
Indonesia	Most firms have introduced some digital technologies or cybersecurity measures, but many continue to face capability gaps, regulatory uncertainty, and financial constraints.
Malaysia	Awareness of the benefits of digitalisation is widespread, but interoperability issues, cross-border data regulations, and shortages of digital talent continue to impede progress.
Philippines	Enterprise Resource Planning (ERP) systems are widely used, but adoption of the Internet of Things (IoT) and AI remains limited. Many upstream suppliers have yet to digitalise their operations.
Thailand	Firms in the automotive and electronics industries have adopted ERP systems, dashboards, and Manufacturing Execution Systems (MES), although high investment costs remain a major constraint.
Viet Nam	Shortages of skilled workers and limited organisational awareness continue to constrain digital transformation.

Source: Authors.

Regarding the Digital Economy Framework Agreement (DEFA), the ABAC Survey indicates strong expectations amongst firms, with 59% highlighting its potential to facilitate SME participation in the digital economy. This was followed by expectations for the harmonisation of digital regulations across ASEAN (54%). Nearly half of the respondents also cited enhanced data protection and reduced fraud risks, as well as the simplification of cross-border tariffs and taxation, demonstrating broad-based expectations across multiple policy areas.

5. Discussion and Hypothesis Testing

5.1. Supply Chain Restructuring and Firm-Level Resilience (Hypothesis 1)

This subsection examines how firms have restructured their supply chains in response to multiple uncertainties, with particular attention to the role of pre-existing supply chain configurations. In line with Hypothesis 1, it assesses whether firms are more likely to diversify and regionalise their supply chains when exposed to multiple uncertainties, especially when their initial supply chains are geographically concentrated.

The results indicate a clear trend towards greater diversification and regionalisation of production networks in ASEAN. At the macro level, ASEAN has strengthened its position as a key destination for foreign direct investment (FDI), particularly as firms seek to diversify production away from China. FDI inflows into the region have increased significantly since the COVID-19 pandemic, and the composition of investment has become more diversified,

with rising shares from China alongside continued investment by Japanese and Korean firms. These trends suggest that ASEAN has increasingly served as an alternative or complementary production base within global supply chains.

Firm-level evidence further supports this pattern of restructuring. Interviews with Japanese manufacturing affiliates indicate that the COVID-19 pandemic served as a catalyst for accelerating diversification strategies, including dual sourcing, increased local procurement, and the reallocation of production activities within ASEAN. However, these adjustments have been largely incremental rather than involving large-scale relocation. Firms have generally expanded existing facilities or reallocated production within established networks rather than establishing entirely new production bases. At the same time, many firms continue to localise production in China for the Chinese domestic market, reflecting an 'In China for China' strategy.

Recent US trade policy measures, including reciprocal tariffs, have further reinforced these dynamics. While macro-level data show continued growth in ASEAN exports to the United States, which increased by 28.9% in 2025, firm surveys suggest that the effects of the tariffs have been heterogeneous. Some firms reported negative impacts, including supply chain disruptions and increased uncertainty, while others benefited from shifts in demand as customers sought alternatives to China-based suppliers. These findings indicate that supply chain restructuring has not been uniform across firms but has depended on their initial supply chain configurations and strategic positioning.

Taken together, these findings support Hypothesis 1. Firms are actively diversifying and regionalising their supply chains in response to multiple uncertainties. However, these adjustments have generally been gradual and path-dependent, shaped by existing production networks rather than driven by large-scale relocation.

5.2. Constraints in Adapting to Multiple Uncertainties (Hypothesis 2)

This subsection examines the constraints faced by firms in adapting to multiple and overlapping uncertainties, including trade policy changes, geopolitical risks, decarbonisation requirements, and accelerating digitalisation. In line with Hypothesis 2, the analysis assesses whether firms experience compounded difficulties in information acquisition, regulatory compliance, and risk management, particularly when internal resources are limited.

The findings indicate that firms in ASEAN operate under simultaneous pressure from multiple sources of uncertainty. Survey results show that firms express the greatest concern about protectionist policies, followed by decarbonisation requirements and geopolitical risks. These uncertainties are not encountered in isolation; rather, they interact to create complex operating conditions that complicate business planning and supply chain management.

A key challenge identified across the surveys and interviews is limited information and supply chain visibility. Many firms lack comprehensive knowledge of upstream suppliers beyond the first tier, making it difficult to identify and assess risks embedded in their supply chains. In addition, trade policy measures – particularly US tariffs – are characterised by considerable complexity and frequent revisions, further increasing the difficulty of obtaining accurate and timely information.

Resource constraints also significantly influence firms' ability to respond. Survey evidence indicates that firms face substantial cost pressures when revising procurement strategies, diversifying suppliers, and complying with sustainability requirements. These challenges are particularly acute for small and medium-sized enterprises (SMEs), which often lack financial resources and skilled personnel. Interviews further confirm that SMEs face greater information gaps than larger firms, particularly with respect to international regulatory developments and risk assessment.

The findings on decarbonisation and digitalisation further highlight the importance of firm-level capabilities. While many firms have initiated decarbonisation efforts, such as improving energy efficiency and increasing the use of renewable energy, they continue to face significant challenges, and disparities across firms remain substantial. The principal obstacles include high investment costs, limited incentives, and insufficient technical capacity. Similarly, although digital technologies are being adopted more widely, firms continue to face shortages of digital talent, high implementation costs, and limited interoperability across supply chains.

Overall, the findings provide strong support for Hypothesis 2. Firms facing multiple and overlapping uncertainties experience compounded and mutually reinforcing challenges, and their ability to adapt varies considerably according to their internal capabilities and resource availability.

5.3. Firms' Perceptions of Policy Responses and Collective Action (Hypothesis 3)

This subsection examines how firms perceive the role of policy responses in strengthening supply chain resilience. In line with Hypothesis 3, the analysis assesses whether firms exposed to multiple uncertainties place greater emphasis on co-ordinated regional policy measures.

The findings reveal that firms across ASEAN attach significant importance to policy frameworks that facilitate trade, reduce regulatory complexity, and strengthen regional co-operation. Survey results show that the most frequently cited policy priority is trade liberalisation, including tariff reductions and the expansion of free trade agreements (FTAs). This is followed by policies to attract foreign investment and efforts to harmonise standards and certification systems across countries.

The importance of regional co-ordination is particularly evident in areas such as regulatory harmonisation and digital integration. Survey and interview evidence indicates that

differences in standards and certification requirements across countries create significant barriers to market diversification. As a result, firms express strong demand for more consistent and transparent regulations across ASEAN. Similarly, firms have high expectations for regional digital initiatives, such as the Digital Economy Framework Agreement (DEFA), which are expected to facilitate cross-border business operations and strengthen data governance.

Notably, firms' emphasis on co-ordinated policy responses reflects the limitations of firm-level strategies. Survey and interview evidence indicates that many of the challenges they face – including regulatory complexity, information gaps, and compliance costs – cannot be effectively addressed through individual firm actions alone. Instead, firms view collective policy frameworks as essential for reducing uncertainty and enabling more efficient and resilient supply chain operations.

Overall, these findings support Hypothesis 3. Firms exposed to higher levels of multiple and overlapping uncertainties place greater emphasis on co-ordinated regional policy responses than on isolated national measures, particularly for strengthening medium- to long-term supply chain resilience.

5.4. Synthesis: From Firm-Level Responses to Systemic Resilience

The preceding analysis highlights three key insights. First, firms are actively restructuring their supply chains through diversification and regionalisation, although, in the case of Japanese firms, these adjustments have generally been incremental and shaped by existing production networks. Second, firms' ability to adapt is constrained by resource limitations, information gaps, and the complexity of multiple and overlapping uncertainties. Third, firms recognise the importance of co-ordinated policy responses in addressing systemic challenges that cannot be resolved through firm-level actions alone.

While firms play an active role in adapting their operations, their capacity to respond effectively depends on both internal capabilities and the external business environment. This underscores the importance of viewing resilience not only as a firm-level outcome but also as a collective and systemic process. Taken together, these findings suggest that strengthening supply chain resilience requires co-ordinated action by firms and policymakers. The resulting policy implications are summarised in Table 4.

Table 4. Policy Implications for Supply Chain Resilience under Multiple Uncertainties

Timeframe	Policy Focus and Measures	Examples
Short term	Responding to US trade policy uncertainty	
	Regional measures to prevent illicit transshipment	• Development of ASEAN-wide rules for transshipment monitoring
	Strengthening regional compliance with rules of origin	• Harmonised rules of origin and enhanced verification procedures
	Trade facilitation and expedited customs procedures	• Upgrading the ASEAN Single Window
	Providing overseas risk information to MSMEs	• Geopolitical intelligence and practical firm-level information services
Medium term	Deepening ASEAN integration and diversifying markets	
	Reducing non-tariff barriers	• Harmonisation of standards and certification systems • Faster customs clearance and streamlined documentation requirements
	Strengthening connectivity within and beyond ASEAN	• Leveraging the ASEAN Economic Community (AEC), the Regional Comprehensive Economic Partnership (RCEP), and ASEAN+ FTAs • Exploring co-operation with emerging markets through ASEAN frameworks
	Enhancing regional responses to geopolitical risks and supply shocks	• ASEAN-wide contingency planning for maritime transport disruptions • Strengthening collective frameworks for managing supply shocks and sharing critical materials • Establishing early warning and cross-border risk information-sharing systems
Long term	Enhancing competitiveness and advancing industrial upgrading	

Timeframe	Policy Focus and Measures	Examples
	Developing ASEAN-based suppliers and industrial capabilities	• Supplier upgrading programmes targeting MSMEs • ASEAN-wide road maps for sector-specific industrial development
	Advancing decarbonisation in supply chains	• Green finance • Capacity-building for MSMEs on sustainability reporting and green supply chain standards • Expansion of renewable energy development and supply
	Advancing digitalisation	• Digitalisation support for MSMEs • Strengthening digital infrastructure • Developing shared platforms to enhance supply chain visibility • Developing digital talent • Advancing the DEFA agenda

Source: Authors.

6. Conclusions and Policy Implications

The findings demonstrate that supply chains in ASEAN are simultaneously exposed to diverse and overlapping uncertainties, compelling firms to address multiple risk factors concurrently. Under these circumstances, firms are seeking to reduce their dependence on specific countries or locations and mitigate supply chain vulnerabilities through strategies such as diversifying procurement sources and production sites, expanding local sourcing, and broadening their markets. The ongoing production shifts by MNCs from China to ASEAN is clearly reflected in FDI trends.

However, the firm surveys and interviews also reveal a range of constraints. Firms face high costs when diversifying procurement and difficulties in meeting sustainability requirements. Chinese components remain indispensable for many firms because of their competitive cost and quality. Market diversification is further constrained by tariffs and differing regulatory requirements across countries. Small and medium-sized enterprises face particular challenges, including limited access to information, especially on overseas risks. Another common constraint is limited visibility across supply chains. Firms' decarbonisation efforts remain uneven, gradual, and fragmented, while the adoption of digital technologies varies considerably across firms and supply chains. These findings point to the need for policy interventions that extend beyond firm-level strategies to address systemic challenges within the regional supply chain environment. From this perspective,

policy responses at both the national and ASEAN levels can be considered over the short, medium, and long term.

In the short term, policy efforts should focus on managing risks arising from U.S. trade policy by strengthening enforcement of rules of origin and enhancing monitoring to prevent illicit transshipment. At the same time, improving customs efficiency will help firms cope with higher tariff burdens. Providing MSMEs with timely risk information and practical guidance will also be critical, given their limited resources and greater vulnerability to external shocks.

In the medium term, ASEAN should deepen regional economic integration by reducing non-tariff barriers and harmonising standards across member states. Promoting market diversification and strengthening connectivity – through the ASEAN Economic Community (AEC), the Regional Comprehensive Economic Partnership (RCEP), and ASEAN+ free trade agreements (FTAs) – will be vital for enhancing resilience. In addition, ASEAN should strengthen regional risk-response mechanisms, including contingency planning for supply disruptions and maritime transport challenges.

In the long term, the region should prioritise industrial upgrading and supplier development, particularly for MSMEs. Advancing decarbonisation through expanded renewable energy deployment, green finance, and capacity-building for sustainability reporting and green supply chain standards will also be essential. Digital transformation should be accelerated by improving digital infrastructure, developing shared platforms to enhance supply chain visibility, and cultivating digital talent across the region. The timely implementation of the Digital Economy Framework Agreement (DEFA) will be critical to reducing barriers, strengthening regulatory coherence, and enabling greater MSME participation in the regional digital economy.

The co-ordinated implementation of these policy measures will be critical to reducing fragmentation, enhancing supply chain transparency, and strengthening the capacity of firms, particularly MSMEs, to adapt to multiple and overlapping uncertainties. Reinforcing these systemic foundations will not only improve resilience but also strengthen ASEAN's position as a competitive and reliable hub in global supply chains.

References

- Aitken, B.J. and A.E. Harrison (1999), 'Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela', *American Economic Review*, 89(3), pp.605–18.
- ADB, IDE-JETRO, UIBE, WTO (2023), Global Value Chain Development Report 2023: Resilient and Sustainable GVCs in Turbulent Times. World Trade Organization.
- ADB and UNDP (2025), Building Supply Chain Resilience: Insights into Greening Value Chains for ASEAN-A Collective Intelligence Playbook.

- Anbumozhi V., F Kimura, and S.M. Thangavelu (2020), *Supply chain Resilience: Reducing Vulnerabilities to Economic Shocks, Financial Crisis and Natural Disasters*. ERIA and Springer.
- Ando, M. and K. Hayakawa (2022), 'Does the import diversity of inputs mitigate the negative impact of COVID-19 on global value chains?', *The Journal of International Trade & Economic Development*, 31(2), pp.299–320.
- ASEAN-BAC, CSIS Indonesia, JETRO Jakarta (2026), *The ASEAN Business Barometer Survey*, ASEAN Business Advisory Council (ASEAN-BAC).
- ASEAN Secretariat and UNCTAD (2023), *ASEAN Investment Report 2023*, Jakarta.
- ASEAN Secretariat and UNCTAD (2025), *ASEAN Investment Report 2025*, Jakarta.
- Bak, O., S. Shaw, C. Colicchia, and V. Kumar (2020), 'A systematic literature review of supply chain resilience in small–medium enterprises (SMEs): A call for further research', *IEEE Transactions on Engineering Management*, 70(1), pp.328–41.
- Baldwin, R.E. (2012), 'Global Supply Chains: Why They Emerged, Why They Matter, and Where They are Going', *CEPR Discussion Paper* No. DP9103.
- Bednarski, L., S. Roscoe, C. Blome, and M.C. Schleper (2025), 'Geopolitical disruptions in global supply chains: A state-of-the-art literature review', *Production Planning & Control*, 36(4), pp.536–62.
- Fajgelbaum, P., P. Goldberg, P. Kennedy, A. Khandelwal, and D. Taglioni (2024), 'The US–China trade war and global reallocations', *American Economic Review: Insights*, 6(2), pp.295–312.
- Freund, C., A. Mattoo, A. Mulabdic, and M. Ruta (2024), 'Is US trade policy reshaping global supply chains?' *Journal of International Economics*, 152, 104011.
- Hayakawa, K. (2022), 'The trade impact of US–China conflict in Southeast Asia,' *IDE Discussion Papers* 873, Institute of Developing Economies, Japan External Trade Organization (JETRO).
- Hettler, M. and L. Graf-Vlachy (2024), 'Corporate scope 3 carbon emission reporting as an enabler of supply chain decarbonization: A systematic review and comprehensive research agenda', *Business Strategy and the Environment*, 33(2), pp.263–82. <https://doi.org/10.1002/bse.3486>
- Isano I (2026). *Impactsof US Traiffs on Asian economies – Results of IDE-JETRO simulations*, Background paper prepared for ERIA-IDE study on supply chain resilience.
- JETRO (2025), *Survey on Business Conditions of Japanese Companies Operating Overseas: Asia and Oceania*. Japan External Organization (JETRO).
- Kimura, F. and K. Oikawa (2022), 'The Conceptual Framework of New Development Strategies', in ERIA (eds.) *The Comprehensive Asia Development Plan 3.0 (CADP 3.0)*:

Towards an Integrative, Innovation and Sustainable Economy. Jakarta: ERIA

- Liew, M. and J. Cao (2025), 'Accounting for Carbon Emissions Through Green Supply Chain Management: A Systematic Literature Review', 34(7), pp.8281–304. <https://doi.org/10.1002/bse.70021>.
- Miroudot, S. and H. Nordström (2020), 'Made in the World? Global Value Chains in the Midst of Rising Protectionism', *Review of Industrial Organization*, 57, pp.195–222. <https://doi.org/10.1007/s11151-020-09781-z>
- Nikookar, E., D. Gligor, and I. Russo (2024), 'Supply chain resilience: When the recipe is more important than the ingredients for managing supply chain disruptions', *International Journal of Production Economics*, pp.272–81.
- OECD (2025), OECD Supply Chain Resilience Review: Navigating Risks. Paris: OECD Publishing. <https://doi.org/10.1787/94e3a8ea-en>.
- Ouhrir, G. and N. Bahha (2025). A Systematic Review of the Relationship Between Digitalization and Supply Chain Resilience. In 2025 16th International Conference on Logistics and Supply Chain Management (LOGISTIQUA) (pp.1–6). IEEE.
- Phan, V.-D.-V., Y.-F. Huang, T.-T. Hoang, and M.-H. Do (2023), Evaluating Barriers to Supply Chain Resilience in Vietnamese SMEs: The Fuzzy VIKOR Approach. *Systems*, 11(3), p.121. <https://doi.org/10.3390/systems11030121>
- Stadtfeld G.M. and T. Gruchmann (2024), 'Dynamic capabilities for supply chain resilience: a meta-review', *The International Journal of Logistics Management*, 35(2), pp.623–48, doi: <https://doi.org/10.1108/IJLM-09-2022-0373>
- Suvannaphakdy, S. and P.T.P. Thao (2023), GVC Reconfiguration: Risks and Opportunities for ASEAN Members, Trends in Southeast Asia, ISEAS. Yusof Ishak Institute
- Tan, K.H. (2023), 'Building Supply Chain Resilience with Digitalization', *ADB Working Paper No.1389*. Tokyo: Asian Development Bank Institute.
- Todo, Y., K. Oikawa, M. Ambashi, F. Kimura, and S. Urata (2023), 'Robustness and resilience of supply chains during the COVID-19 pandemic', *The World Economy*, 46, pp.1843–72. <https://doi.org/10.1111/twec.13372>
- Tortorella, G.L., T.A. Saurin, M. Godinho Filho, R. Alfalla-Luque, and A. Trianni (2025), 'Are we truly ready for what is coming? A reflection on supply chain resilience in face of megatrends', *International Journal of Production Economics*, 283, 109585.
- UNCTAD (2020), World Investment Report 2020. Geneva: United Nations.
- UNCTAD (2021), World Investment Report 2021. Geneva: United Nations.
- Zahoor, N., J. Wu, H. Khan et al. (2023), 'De-globalization, International Trade Protectionism, and the Reconfigurations of Global Value Chains', *Management International Review*, 63, pp.823–59 (2023). <https://doi.org/10.1007/s11575-023-00522-4>