Executive Summary

The Resilience and Rewiring of Global Value Chains

This report finds that global value chains (GVCs) remain the backbone of the world economy, even as their structure and logic evolve in response to economic, technological, and geopolitical change. Over the past quarter century, trade in intermediate goods and services has linked nearly every economy into a dense network of production relationships. These networks have proved remarkably durable through successive crises – the global financial shock of 2008-09, the pandemic, and the recent surge in geopolitical and climate-related disruptions. Measured in value-added terms, cross-border production continues to account for almost half of world trade, and the nominal volume of trade in intermediates has reached record highs according to the latest ADB GVC data. The evidence collected for this report confirms that globalization is being reconfigured rather than reversed: supply chains are adapting through regionalization, digitalization, and diversification. These adjustments revolve around three core dimensions that structure the report: building resilience to shocks, broadening inclusion across economies and firms, and advancing sustainability through technological and policy innovation.

Between the mid-1990s and the late 2000s, globalization entered a phase of rapid expansion driven by falling transport costs, trade liberalization, and the integration of large emerging markets. The period from 2011 to 2019 brought slower growth in global trade, but also the emergence of new forms of specialization based on services and knowledge flows. Since 2020, a third phase has taken shape. Firms now balance efficiency with resilience, re-examining supplier concentration and investing in digital coordination tools that allow them to operate more flexibly. Although the global ratio of trade to GDP has plateaued and recent data from OECD TiVA show that backward participation – the share of imported inputs used in exports – has stabilized near 47% of total exports, the intensity of regional linkages has strengthened, particularly within Asia and North America. This shows continuity in international production but a change in its geography.

Using updated value-added trade and network measures, the report finds that regional hubs in Asia, Europe, and North America still account for the majority of GVC trade, while emerging nodes in Latin America and Africa remain mainly on the periphery of investment and trade integration compared to the main regional hubs. Digital trade and data flows have become the connective tissue allowing networks to adapt without fragmenting and these are key challenges for many least developed and developing countries. However, despite this, the current configuration of value chains is more multipolar than at any time in the past two decades. The People's Republic of China (PRC) remains a central hub for manufacturing and assembly, yet its share of world manufacturing value added has leveled off, and production capabilities are diffusing to a wider set of economies. Viet Nam, Mexico, Poland, and Türkiye have expanded their roles in electronics, machinery, and transport equipment. India, the Philippines, and several African economies have strengthened their positions in business-process and digital-service exports. These shifts reflect both market forces and deliberate policy choices to diversify risk and attract new investment. Services value added now represents more than one-third of the content embedded in manufacturing exports, underscoring the centrality of design, logistics, and digital functions in modern competitiveness.

Opportunities for New Players if Structural and Policy Gaps are Addressed

The reorganization of GVCs also has a social and developmental dimension. The distribution of participation remains uneven, with Latin America and Africa together accounting for less than five percent of complex manufacturing trade. Their integration into higher-value segments is constrained by logistics gaps, limited digital infrastructure, and shortages of skilled labor. Nonetheless, opportunities are expanding as firms seek new regional bases for supply security. In Latin America, proximity to North American markets has generated interest in near-shoring, while in Africa, growth in demand for critical minerals and light manufacturing is opening new avenues for inclusion. Economies that pair openness with institutional reform – modern customs, improved transport corridors, and investment in skills – recover more quickly from shocks and attract more sustainable investment. Regional analysis shows renewed interest in Latin America as a near-shoring destination given proximity to North American markets, though shallow integration and fragmented logistics still constrain deeper participation. In Africa, modest gains in manufacturing GVCs are accompanied by rapid growth in trade of green minerals and processing activities. Readiness indicators highlight that customs efficiency, broadband access, and skills shortages remain decisive factors determining who benefits from diversification.

The report emphasizes that resilience and inclusiveness reinforce each other. Economies with diversified export bases and sound financial systems absorb external shocks more effectively than those dependent on a narrow range of commodities or buyers. Near-shoring and regional supply networks can broaden participation, but only when supported by complementary domestic policies. Without such reforms, diversification risks producing enclaves with limited spillovers. Regional initiatives such as the African Continental Free Trade Area and the Pacific Alliance can enhance both scale and policy coordination if implementation keeps pace with ambition.

Opportunities for Green GVCs

Zooming in on one sector, electric vehicles (EVs), the report highlights how structural shifts in GVCs provide new opportunities. The rapid rise of EVs is reshaping traditional global automotive supply chains. In 2023, China accounted for 76.9% of global EV production – far surpassing the United States, Germany, and Japan. This stands in sharp contrast to internal combustion engine vehicles (ICEVs), which have traditionally been dominated by these three economies. As the core component of EVs, batteries depend heavily on mineral inputs. In 2023, global battery manufacturing consumed 85% of the world's lithium, 70% of its cobalt, and more than 10% of its nickel. While this creates new opportunities for resource-rich developing economies to upgrade within the EV supply chain, the extreme concentration of mineral resources in specific economies exposes upstream segments to significant vulnerabilities. Diversifying sources of critical minerals may therefore become an urgent strategic priority for major battery- and vehicle-producing economies.

EVs play a pivotal role in global transport decarbonization. Life-cycle assessment results based on a newly developed inter-country input-output model – one that separates EVs and ICEVs from the broader auto sector – show that each EV emits 2–4 more tons of CO_2 during production than an ICEV because of battery manufacturing. However, EVs yield substantial reductions in emissions over their full life cycle. The carbon payback period varies considerably across economies: 1.7 years in the United States, 5.7 years in China, and 7.6 years in Japan. Simulation results indicate that a 15% increase in renewable electricity and electric-drive efficiency would shorten these payback periods to 1.4, 4.5, and 5.9 years, respectively, underscoring the critical role of policy interventions in accelerating the climate mitigation benefits of EVs.

Product space analysis, a method that maps how easily economies might, in principle, shift from the products they already make to more complex, related ones, suggests that countries tend to develop new EV capabilities through three broad patterns. Some make "breakthrough" moves into activities far from their current strengths, a pathway common among large developing or resource-rich economies entering battery processing or upstream minerals. Others follow "cluster" pathways by adding EV components that are closely related to existing capabilities, while "chain" pathways involve step-by-step upgrading into adjacent functions along the supply chain. Advanced economies such as the United States and the Republic of Korea mostly expand through cluster and chain pathways, deepening established competencies, whereas emerging and resource-rich economies more often rely on breakthrough and early chain upgrading as they seek to build new competitive advantages in EVs.

The environmental implications of global production extend well beyond the EV sector. Using a new GVC-based emissions accounting framework, this report finds that advanced economies have achieved a clear and broad decline in both production-based and consumption-based CO_2 emissions during 2000-2023. These reductions appear not only in production for domestic final demands but also for exports. Importantly, this progress has continued even though these economies already operate at relatively low levels of carbon intensity, reflecting steady improvements in emissions efficiency. Middle- and lower-income economies, however, follow a different trajectory. Their reductions in carbon intensity have been limited – their pace of decline between 2000 and 2023 was only about 60% of that of advanced economies. The carbon cost of GVC participation is particularly striking: for every additional US dollar of value-added generated through GVC participation via trade and FDI, middle- and lower-income economies emit about 3.6-4.7 times more CO_2 than advanced economies in 2023. This gap largely reflects the rapid growth of South-South trade in energy-intensive intermediates and the structural position of developing economies in GVCs, where they are concentrated in upstream, manufacturing-heavy, and carbon-intensive activities. This widening emissions disparity raises great concerns for achieving the UN Sustainable Development Goals and meeting the IPCC target of limiting global warming to 1.5°C.

Building on analytical results from GVC-based emissions accounting, the report also shows that global value chains are deeply embedded in domestic production systems while also relying on cross-border production sharing. This dual structure means that effective emissions reduction must target both domestic and international segments of GVCs; meaningful climate mitigation requires coordinated action across all nodes of the chain.

Governments have begun responding with a range of carbon-pricing instruments – including carbon taxes, emissions trading systems (ETSs), and carbon border adjustment mechanisms (CBAMs) – as well as other trade-related environmental policies. The report highlights that well-designed national ETSs can play a pivotal role in GVC decarbonization. Evidence from China's case study suggests that expanding carbon pricing to cover more firms and improving equitable financial access can enhance emissions efficiency while keeping GDP losses relatively low.

Using GVC-based CGE modeling that explicitly distinguishes the production functions of multinationals and domestic firms, the report finds that CBAMs can mitigate carbon leakage and create positive spillovers by encouraging trading partners to adopt or strengthen domestic carbon pricing, provided they are implemented with sufficient sectoral coverage and transparency. At the same time, the report also shows that EU CBAM can generate uneven impacts across economies and across firms with different ownership structures. The report cautions that fragmented policy landscapes might introduce regulatory frictions in GVCs. When economies adopt different environmental regulations, this can introduce border adjustment complexities, disrupt economies of scale for firms operating across multiple jurisdictions and create a need for "regulatory hedging" strategies, where firms adjust production to serve specific regulatory markets.

Trade-related environmental policies also shape GVCs by influencing green innovation and technological change. Policies that incentivize green innovation – such as R&D subsidies, intellectual property reforms, and market-based instruments that reward low-emission technologies – can accelerate the shift of firms and sectors toward the green technological frontier. Drawing on the WTO Environmental Database, which includes more than 13,000 environment-related measures, the report shows that such policies can induce structural shifts in competitiveness over time, enabling some countries to move into higher-value segments of environmental goods production.

Finance and technology are also essential for supporting green GVCs. Firms integrated into GVCs adopt cleaner and more efficient processes more rapidly when they have access to capital and reliable market signals. Yet access to green finance remains uneven. Global demand for trade finance exceeds available supply by over $2.5 trillion according to the ADB, with small and medium-sized enterprises facing the largest gaps. Expanding digital trade finance platforms, blended finance vehicles, and credit guarantee schemes can help close this deficit. Stronger verification standards and clearer taxonomies can direct more of this capital toward emission-reducing projects in developing regions.

Financing and Investing in the Rewiring of GVCs Amid Technological Change

Financial and investment linkages underpin the adaptability of global value chains. Firms with reliable access to finance recover faster from shocks, and economies attracting diversified foreign direct investment experience quicker technological diffusion. Yet the global trade finance gap remains substantial, and FDI inflows are still 15% below their 2015 peak. These disparities highlight that resilience depends as much on financial intermediation and investment climate as on physical supply chain configuration.

More broadly, financial intermediation and investment allocation shape who participates in global value chains and how resilient these networks are when shocks occur. Firms with strong access to finance are more likely to export, adopt new technologies, and recover quickly from disruptions. Yet financing conditions remain highly uneven across economies and sectors. In many developing economies fewer than one in five firms report access to formal credit, while the persistent trade-finance gap constrains exporters of intermediate goods. The pandemic widened that gap as global banks cut exposure and supply-chain disruptions increased risk aversion. Digital verification platforms and guarantee facilities supported by development banks have since begun to close it, but progress is uneven. Expanding digital trade-finance ecosystems and blended finance instruments is therefore essential for inclusive reorganization of globalization.

Empirical evidence links access to external finance directly to productivity growth and export participation. Firms with better credit access are 40% more likely to enter export markets and adopt new technology. Yet financing remains concentrated: less than one in five firms in developing economies report access to formal credit.

Foreign direct investment remains the primary conduit for technology transfer and integration into global production systems, though its structure is shifting. Global

FDI inflows in 2023 were still about 15% below their 2015 peak, yet greenfield projects in digital and clean-energy sectors now account for more than half of new announcements. These flows mirror policy incentives in major economies but also the pull of large emerging markets with growing domestic demand. The benefits of FDI depend heavily on absorptive capacity. Where infrastructure, human capital, and governance are strong, spillovers to domestic firms are measurable; where they are weak, investment can create isolated enclaves. Supplier development programs, training partnerships, and regional investment compacts can magnify the developmental impact of foreign capital.

Sustainable finance markets are beginning to link investment decisions directly to environmental outcomes. Green and sustainability-linked bonds have surpassed $5 trillion in cumulative issuance, and ESG-oriented funds account for nearly a quarter of global assets under management. However, most of this financing remains concentrated in advanced economies, with less than five percent reaching low-income regions. Divergent taxonomies and disclosure rules impede cross-border flows. Coordinated standards and transparency are therefore crucial for mobilizing private finance in support of the climate transition. Multilateral development banks and export credit agencies can reinforce these efforts by de-risking projects and standardizing reporting practices. Finance, investment, and trade policy thus form an integrated triad: each affects the scale, direction, and sustainability of value chain participation.

Technology and intangible capital are reshaping productivity dynamics within global value chains. Participation in GVCs remains one of the most powerful mechanisms for knowledge diffusion and learning-by-doing. Firm-level data confirm that backward participation boosts productivity by two to five percentage points per year relative to non-participants, with the strongest effects in technology-intensive industries. Investments in software, data, and organizational know-how now exceed spending on physical capital in many sectors, shifting the geography of value creation toward knowledge-rich activities. Programs linking vocational education and SME mentoring to multinational networks in East Asia and Eastern Europe demonstrate how domestic capability building converts openness into broad-based gains. Firms that combine imported technology with domestic capabilities achieve faster growth in output and wages. These benefits, however, are unevenly distributed. In economies with poor digital connectivity or limited access to finance, many small and medium-sized enterprises remain trapped in low-productivity segments. Strengthening broadband infrastructure, expanding digital-skills training, and facilitating SME access to finance can convert participation into productivity gains.

Intangible capital – software, data, intellectual property, and organizational know-how – has become the main source of competitive advantage. In manufacturing, intangible investment now exceeds spending on machinery and structures in many advanced economies. Firms with high intangible-to-tangible asset ratios exhibit greater adaptability and resilience because these assets enable rapid reconfiguration when shocks occur. This shift challenges conventional trade statistics, since much of the value now crosses borders through intellectual-property royalties and digital services rather than physical goods. Accurate measurement of intangible flows will be essential for understanding future competitiveness.

Technological upgrading also influences labor markets and inclusion. Globalization has created millions of better-paid jobs in export sectors, but automation and digitalization are altering the composition of work. Routine tasks are declining while demand grows for technical, managerial, and service-oriented skills. Without complementary education and training policies, the digital transition can widen inequalities both within and across economies. The report highlights programs in East Asia and Eastern Europe where vocational training, SME mentoring, and innovation hubs have successfully linked local firms to international production networks. These examples show that openness combined with domestic capability building remains the most effective path to inclusive growth.

Adapting Governance Approaches to the Rewiring of GVCs

The institutional architecture of globalization is reorganizing alongside production and finance, driven by two complementary but distinct governance shifts: the resurgence of industrial policy and the proliferation of targeted trade deals. Both reflect governments' efforts to navigate the same structural forces – climate imperatives, technological competition, and geopolitical tensions – while maintaining the benefits of economic openness. Understanding how these instruments interact, and ensuring their transparency and coherence, has become central to the management of global value chains.

Industrial policy has re-emerged as a defining feature of the new global economy. Governments are using subsidies, tax incentives, regulatory mandates, and public procurement to accelerate technological transformation and strengthen domestic capacity in strategic sectors. Since 2020, announced programs across major economies exceed US$2 trillion, concentrated in semiconductors, clean energy, digital infrastructure, and the upstream inputs – such as critical minerals and battery components – needed to support them. These interventions aim to enhance resilience, meet climate objectives, and secure technological leadership, but they also blur the line between domestic and international policy. Three forces underpin this resurgence: climate commitments and technology rivalry that push governments to shape innovation systems directly; security concerns that encourage 'de-risking' of critical supply chains; and renewed domestic pressure to sustain manufacturing employment.

Empirical evidence shows that most subsidies target upstream inputs in green-technology sectors – batteries, renewable components, advanced semiconductors, and clean hydrogen – where public support determines location decisions and shapes global investment allocation. The diffusion of industrial policies across both advanced and emerging economies signals a structural shift toward more active state involvement in shaping production. Yet poorly coordinated interventions risk duplication and subsidy races that erode efficiency. Overlapping measures already contribute to investment races and rising costs. The report proposes a transparency framework assessing industrial-policy instruments by intent, scale, and cross-border impact. Greater notification and peer review through international institutions could align national programs with collective goals such as decarbonization and inclusive growth, while distinguishing legitimate public-goods objectives – such as climate mitigation and supply chain resilience – from protectionist distortions.

Traditional multilateral negotiations have slowed, prompting governments to experiment with more flexible instruments. The rise of targeted trade deals (TTDs) – agreements that are typically sectoral or otherwise limited in scope and focused on addressing regulatory barriers – represents a complementary governance response to the same structural pressures driving industrial policy. More than 185 TTDs were signed by the end of 2024 in the areas of digital trade and critical minerals alone. The number of economy pairs linked by digital-trade TTDs has increased more than thirtyfold since 2019, while 80% of all mineral-related deals have been concluded since 2022. These instruments allow rapid, issue-specific cooperation in areas where multilateral rules are incomplete or outdated, such as data flows, digital services, AI governance, and access to critical raw materials. Unlike traditional trade agreements, TTDs emphasize regulatory cooperation through consultative mechanisms, knowledge sharing, and joint standards development, reflecting the shift from tariff liberalization to managing non-tariff regulatory frictions.

The interaction between industrial policy and targeted trade deals is becoming increasingly important for shaping how supply chains evolve. Industrial subsidies, local-content rules, and regulatory incentives often intersect with targeted trade frameworks, jointly determining investment locations, technology transfer patterns, and sourcing strategies. For example, critical minerals TTDs signed to secure access to lithium, cobalt, and rare earths directly interact with industrial policies that subsidize battery manufacturing and electric vehicle assembly. Similarly, digital TTDs establishing data governance frameworks interact with industrial policies supporting domestic cloud infrastructure, semiconductor production, and AI development. This overlapping policy space creates both opportunities for coherent strategies and risks of fragmentation if measures are poorly aligned.

Transparency in both domains is essential for trust and effective coordination. Because most TTDs are negotiated outside legislative oversight and rarely notified to the WTO, public scrutiny is limited. Industrial subsidies similarly suffer from notification gaps and incomplete disclosure, making it difficult for trading partners to assess their scale, intent, and competitive effects. Establishing a central repository for targeted trade deals and improving comparability of industrial policy data would strengthen accountability and help distinguish cooperative measures from those that distort competition.

Enhanced data collection by international institutions – building on initiatives such as the Joint Subsidy Platform and WTO thematic mapping efforts – could facilitate peer review and reduce tensions arising from perceived unfairness. Better information on the intent and magnitude of support measures would help countries evaluate whether interventions serve shared objectives like decarbonization and resilience, or whether they risk triggering retaliatory cycles.

Initial evidence suggests that TTDs can influence trade flows and investment decisions even when non-binding. Bilateral arrangements on critical minerals have raised trade volumes between partners by an estimated 12%, while digital trade frameworks with interoperability provisions have expanded cross-border services in participating economies. The flexibility of TTDs thus brings both benefits and risks. If left uncoordinated, overlapping rules could fragment the global trading system; if embedded within transparent reporting and dialogue mechanisms, they can complement the multilateral framework. The same principle applies to industrial policy: when transparent and coordinated, subsidies can address market failures and accelerate green transitions; when opaque and duplicative, they risk subsidy competition that weakens collective welfare.

Viewed together, the resurgence of industrial policy and the proliferation of targeted trade deals represent a reconfiguration of global economic governance rather than its breakdown. Both tools reflect pragmatic efforts to address urgent challenges – climate change, technological competition, supply-chain vulnerabilities – within a more contested and multipolar world. Success will depend on managing the complementarities and tensions between them. Governments must balance national objectives with the benefits of policy coordination. Transparency, comparability of measures, peer review, and inclusive dialogue are the institutional foundations needed to ensure that this new governance architecture supports rather than undermines the reorganization of globalization. Multilateral forums remain indispensable for sharing evidence, resolving differences, and ensuring that flexibility does not become fragmentation. Regional and plurilateral initiatives can serve as laboratories for new rules, provided that their lessons feed back into a coherent global framework.

The Three Main Takeaways

Viewed together, the report's findings show that globalization is entering a new structural equilibrium rather than disintegrating. Regionalization, digitalization, and sustainability are its defining features. Production remains global in scope but is increasingly organized through overlapping regional networks and governed by a more diverse set of rules and institutions. Success in this environment depends on the capacity of economies to adapt, innovate, and cooperate. Policies that expand participation, manage risk, and reduce environmental impact form the foundation of what this report terms reorganization of globalization.

The policy implications are threefold. First, globalization must become more inclusive. Expanding access to finance, technology, and markets for developing economies and small firms is essential. Digital trade platforms, trade finance initiatives, and regional integration programs can lower entry barriers. Capacity-building support from multilateral agencies should focus on logistics, customs modernization, and digital infrastructure, which together determine readiness for GVC participation.

Second, globalization must become more resilient. Diversified sourcing, transparent supply chain mapping, and sound macro-financial frameworks help economies withstand shocks. Governments should encourage information sharing between public and private sectors to anticipate disruptions. Regional contingency arrangements, including cooperative stockpiles or mutual-assistance frameworks for essential goods, could add further stability. Financial resilience is equally important: maintaining stable capital flows and prudent debt management prevents abrupt reversals that undermine trade and investment.

Third, globalization must become sustainable. Climate and trade policies need to be aligned so that emission reductions and competitiveness reinforce each other. Carbon accounting standards, investment in renewable energy, and support for circular economy practices can reduce environmental pressure without curbing growth. International coordination on carbon pricing and border adjustments will be critical to prevent fragmentation. Developing economies require access to climate finance and technology to participate on equal terms in this green transition.

Beyond these priorities lies the task of rebuilding trust in global economic cooperation. Transparency in industrial and climate policy, comparability of data across economies, and consistent communication between governments and international institutions are necessary to maintain confidence in open markets. Multilateral forums remain indispensable for sharing evidence and resolving differences, even as the landscape of agreements becomes more varied. Regional and plurilateral initiatives can serve as laboratories for new rules, provided that their lessons feed back into a coherent global framework.

The data and evidence collected for this report mainly covers the period until the end of 2024 while 2025 has been another challenging year for global trade co-operation. Average tariffs and other trade-restrictive measures reached levels not seen in decades, with potentially even more distortive effects resulting from heightened trade policy uncertainty. And yet, forecasts by the World Trade Organization suggest that trade growth remained robust. This confirms the key findings of this report. Supply chains are resilient thanks to firm agility and creative policy approaches to managing disruptions. However, 2025 also underlines that the task of rebuilding trust in global economic co-operation has become even more pressing to sustain the benefits of international trade.

The *Global Value Chain Development Report 2025* continues a series that began in 2017 on GVCs and development, followed by volumes on technology, resilience, and inclusion. This edition situates those themes within a post-pandemic, digitally connected, and climate-constrained world. Its central message is pragmatic optimism: global production is reorganizing, not retreating. The task for policymakers is to harness interdependence for inclusive, resilient, and sustainable prosperity.