



ASIAN ECONOMIC INTEGRATION REPORT 2024

DECARBONIZING GLOBAL VALUE CHAINS

HIGHLIGHTS



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Note:

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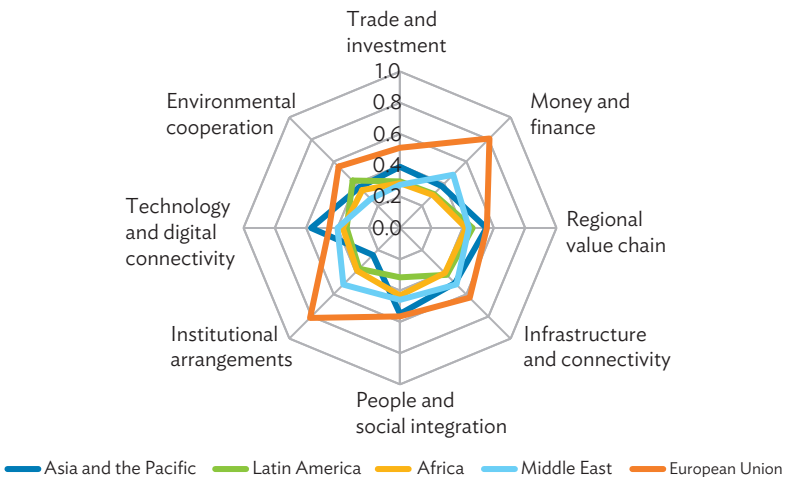
HIGHLIGHTS



Regional integration has grown steadily since the mid-2000s with variations across dimensions and subregions. Based on the Asia-Pacific Regional Cooperation and Integration Index (ARCII), the region shows integration comparable to the European Union (EU) in regional value chains, along with people and social integration. The most significant progress is observed in Asia and the Pacific’s technology and digital connectivity dimension, driven by adoption of digital transformation policies by many economies, the pace of which went up during the coronavirus disease (COVID-19) pandemic. However, integration in trade and investment has slowed somewhat since 2019. While intrasubregional integration grew faster than intersubregional integration in Southeast Asia, East Asia, and Central Asia, South Asia showed deeper integration with other subregions within Asia as of 2021. Regional integration has become a crucial buffer against global shocks and helps mitigate their negative effects. While rising protectionism and the risks of global fragmentation compound economic challenges, increased cooperation and investment in connectivity—both “soft” (regulatory) and “hard” infrastructure—can strengthen economic resilience and provide mutual benefits. Closer dialogue and discussion on regional policies will help Asian economies better meet the challenges and risks of supply chain vulnerability and climate change.

Regional integration in Asia is steadily increasing, with some differences between dimensions and subregions

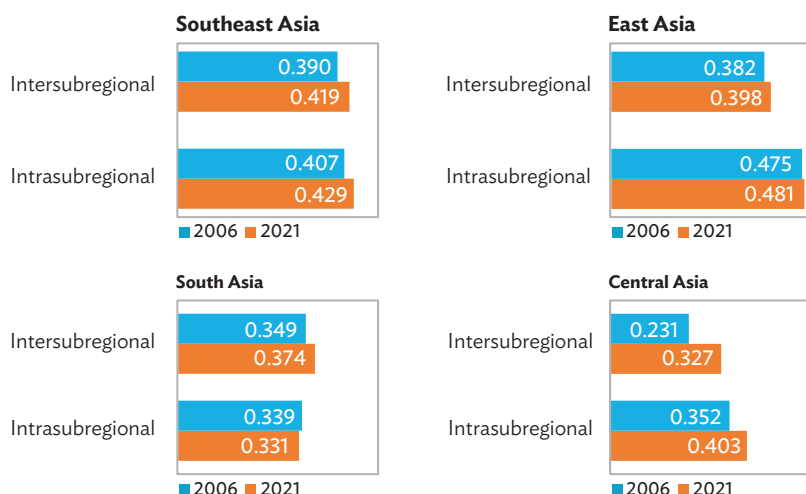
Intraregional Integration by Region, 2021



Note: Higher values denote greater regional integration.
Source: ADB, Asia-Pacific Regional Cooperation and Integration Index Database.

Almost all Asian subregions had shown stronger integration among their members

Integration within Subregions and with Other Asian Subregions



Note: Higher values denote greater regional integration.

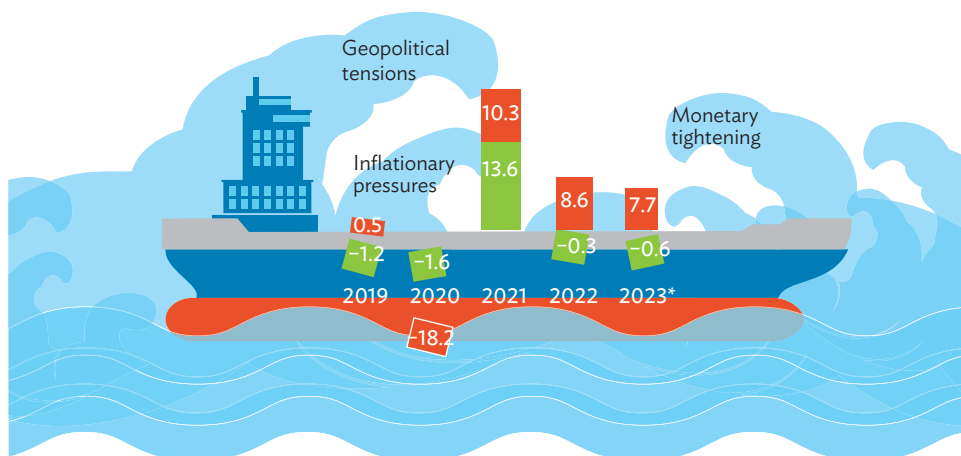
Source: ADB, Asia-Pacific Regional Cooperation and Integration Index Database.

Trade and Global Value Chains

A drop in external demand and the risk of global fragmentation have weakened Asia's trade environment. After a strong rebound in global demand in 2021, Asia's trade began losing steam in 2022, with merchandise trade volume falling by 0.3%. Stagnant trade growth persisted in 2023 with tighter global monetary policy to contain inflation, geopolitical tensions, and a downturn in the semiconductor cycle. Nevertheless, the overall picture masks divergent trends across economies. For example, negative trade growth in 2022 came largely from the People's Republic of China (PRC) and Hong Kong, China; while the economies of the Association of Southeast Asian Nations (ASEAN), Japan, and the Republic of Korea saw trade expand. Given the lackluster growth forecast for the world economy in 2024, the region's economies must try to reinvigorate trade growth momentum through more liberal and freer trade regimes while forging economic cooperation with trade partners both within and outside the region. Developing new trading partners and diversifying the range of imported products can boost an economy's resilience to local shocks and intraregional and international supply disruptions, allowing greater flexibility in sourcing raw materials and intermediate goods.

Asia's merchandise trade contracted in 2022, with an expectation of continued weak trade growth

Asia and the Pacific Trade Volume Growth Rate (%)



*While Asian trade recovered strongly in 2021, merchandise trade fell in 2022 and is expected to fall further in 2023. Services trade in Asia has shown more resilience, however, expanding by **8.6%** in 2022*

* The growth rates for 2023 are computed using forecasts from the International Monetary Fund (IMF) World Economic Outlook October 2023 Database.

Notes: Red crates represent services trade while green crates represent merchandise trade.

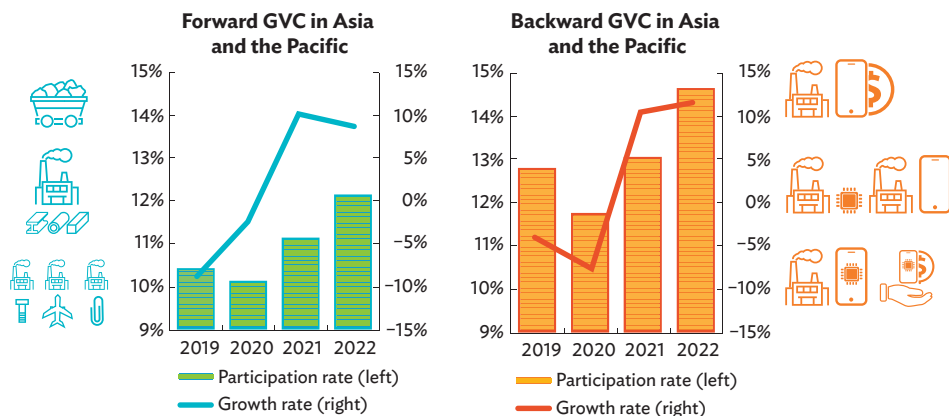
Sources: ADB calculations using data from IMF, World Economic Outlook October 2023 Database; IMF, Direction of Trade Statistics; and World Trade Organization–Organisation for Economic Co-operation and Development Balanced Trade in Services Dataset (BaTIS).

Asia's participation in global value chains (GVCs) rebounded relatively strongly, with a reorientation toward more regional value chains.

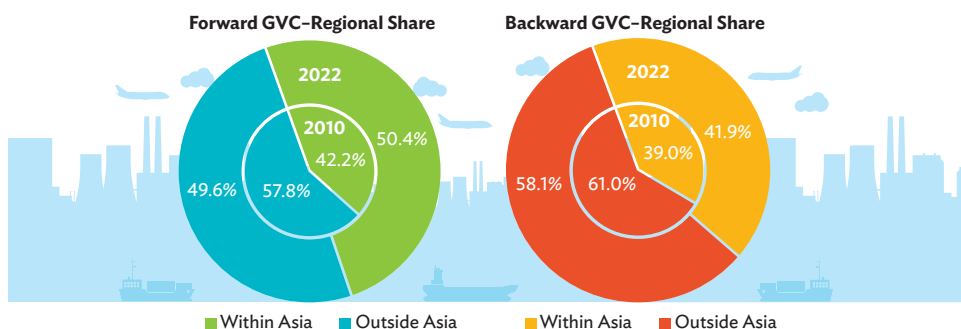
In 2020, as the COVID-19 pandemic spread, Asia experienced a larger decline in GVC activity (–5.8%) than the rest of the world (–4.8%), with backward linkages more strongly affected. While the 2021 recovery was similar for Asia and the world generally, GVC activity in 2022 grew more strongly in Asia (10.7%) than the rest of the world (7.7%), with backward GVC linkages growing stronger. Historically, Asia's backward GVC linkages outpaced forward linkages, given the region's prominent role as an assembler along the supply chain, particularly in medium- to high-tech sectors. However, with Asia's backward linkages less diversified than in other regions—with diversification levels falling since the pandemic—there is the risk that any disruption in upstream supply chains could hamper GVC production and resilience. Conversely, Asia's forward GVC linkages have diversified since the pandemic. Recently, Asia's GVC integration has become more regional, especially in forward linkages. On the other hand, there are few signs of reshoring in the region. There is little evidence of increased sourcing of intermediates domestically or an increasing share of domestic value-added serving domestic demand.

Global Value Chain Activity in Asia and the Pacific

Asia's backward linkages in GVCs declined more rapidly (-8.3%) than forward linkages (-2.6%) during the COVID-19 pandemic, but also recovered more rapidly in 2021 and 2022



Asia's GVC integration has also become more regional, especially in forward linkages, with evidence of a geographic shortening of GVCs in Asia



GVC = global value chain.

Note: Forward GVC participation rate is the share of forward GVC activities to total production, while backward GVC participation rate is the share of backward GVC activities to total final demand.

Sources: ADB calculations using data from ADB Multiregional Input–Output Database; and methodology by Z. Wang, S.-J. Wei, X. Yu, and K. Zhu. 2017. Measures of Participation in Global Value Chains and Global Business Cycles. *NBER Working Paper*. No. 23222. Cambridge, MA: National Bureau of Economic Research.

Asia's trade policy landscape is evolving rapidly, embracing broad, modern trade and digital agreements, although trade restrictions persist. In 2023, the region saw five agreements entering into force and 17 new agreements signed. These included strategic trade partnerships and initiatives reflecting the changing dynamics of international trade cooperation. Nonetheless, restrictive measures in response to global events, particularly those affecting energy and food, remain a concern. Asia plays a significant role in global agricultural and food trade, accounting for nearly 25% of world exports and 27% of world imports. However, economic uncertainties and geopolitical tensions continue to threaten food security in the region. Economies heavily reliant on food imports and lacking diversity in trading partners and imported food products are particularly vulnerable to external and global shocks. This supply chain vulnerability

extends to several of Asia’s least developed economies, especially in critical commodities such as sugar, rice, milk, onions, garlic, and pork, among others. Trade cooperation between importing economies and prospective regional exporters remains limited, and restrictive trade measures—including tariffs, quotas, and bans—led by regional economies affect approximately 2.7% of all food trade in Asia from 2021 to 2023. Efforts to deepen trade relationships and enhance regional cooperation on food security should be accompanied by measures aiming to eliminate these restrictions.

Asia’s trade landscape is rapidly evolving, with an emphasis on broader, more modern and digital agreements

Newer Forms of Cooperation and Partnerships, 2023



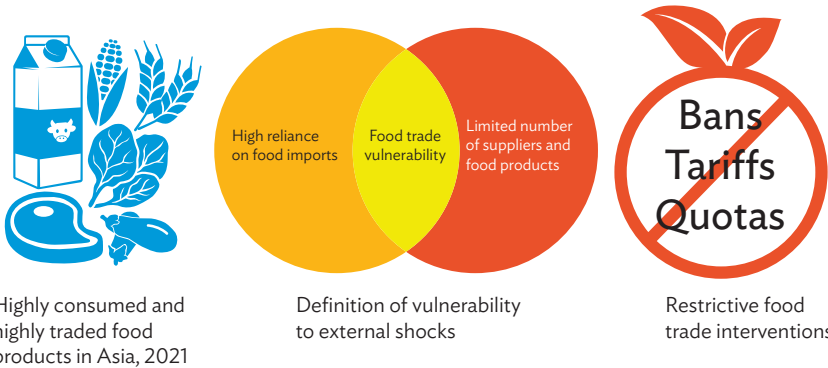
- Indo-Pacific Economic Framework
- Thailand Mini Free Trade Agreements
- Digital Partnership Agreement
- United States–Taipei,China 21st Century Agreement

The region continues to be a significant player in global agriculture and food trade

Share of Asia to World Food Trade, 2021 (%)



The region’s reliance on food imports and lack of diversification in trade suppliers and commodities, alongside restrictive trade interventions, makes it vulnerable to external shocks



Sources: ADB compilation based on available information as of December 2023; and calculations using data from the United Nations Commodity Trade Database and Food and Agriculture Organization Supply Utilization Accounts Database.

Cross-Border Investment

Despite sluggish global investment in 2022, foreign direct investment (FDI) inflows to Asia were relatively robust. Global cross-border investment inflows slid by 12% from \$1.5 trillion in 2021 to \$1.3 trillion in 2022, with a similar decline in global outflows. Geopolitical tensions, high interest rates, and inward-looking industrial policies in strategic sectors weighed on cross-border investment. Despite weaker global trends, FDI to and from Asia remained resilient, as inflows grew by 8% with outflows rising by 18%. Firm-level data show a mixed landscape, with greenfield investment expanding almost 80%—driven by megaproject investments above \$1 billion—in semiconductors and renewable energy—while mergers and acquisitions (M&As) fell by 30%. By sector, tertiary industries attracted almost three-fifths of Asia’s total inbound FDI. Significant greenfield outlays for renewable energy projects—including solar, electric power, and e-transport—highlight the dynamism of climate-related investments in Asia. Information and communication technology-related sectors, such as data processing and hosting services, were prominent for M&As. Meanwhile, as the network of investment treaties gradually modernizes, international investment agreements signed in Asia since 2020 featured stronger provisions to safeguard an economy’s right to regulate issues on the environment and labor standards, and transparency in investor–state arbitration.

Foreign direct investment in Asia and the Pacific remained resilient in 2022 despite sluggish global flows



However, headwinds loom over FDI in 2023 globally and in Asia

FDI = foreign direct investment.

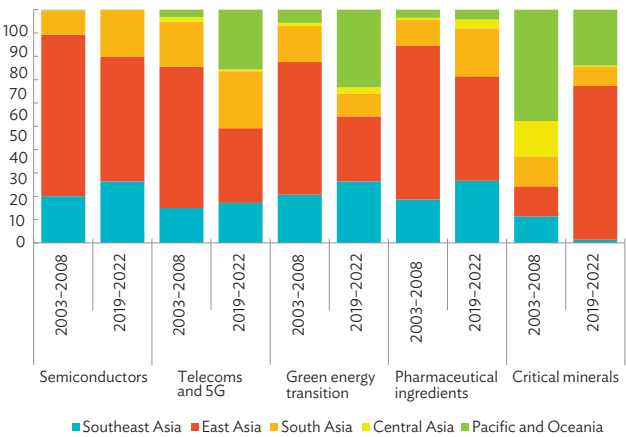
Source: ADB calculations using data from United Nations Conference on Trade and Development. World Investment Report Statistical Annex Tables. Geneva.

More fragmented FDI poses both risks and opportunities for Asian economies.

Global investment activity is showing signs of fragmentation, as the pandemic highlighted the need for more diversified and resilient supply chains and production bases. Ambitious industrial policies in developed economies have also contributed to the relocation of foreign investment, notably in strategic sectors—including semiconductors, telecommunications and 5G, equipment for green energy transition, pharmaceutical ingredients, and critical minerals. Globally and in Asia, the average FDI in strategic sectors from 2010–2014 to 2020–2022 doubled, with target destinations expanding from East Asia to Southeast Asia, South Asia, and the Pacific and Oceania. Decarbonization policies are driving investments supporting the green energy transition, while semiconductor investments have become prominent in the region and tripled over the same period. Efficiency-seeking FDI in Asia, mostly concentrated in medium- and high-tech manufacturing, has been key to the region’s GVC participation, contributing to job creation and knowledge transfer. To maximize the potential for industrial development, economies should adopt market-friendly FDI policies that enforce investment protection, support technology transfer and innovation, and target high productivity sectors, particularly in technology-related manufacturing and services. While the risk of global fragmentation cloud the FDI landscape, the region can improve the environment for market-seeking FDI by building on its growing purchasing power, strengthened by rising income levels and an expanding middle class.

Asia can leverage FDI in strategic sectors to weather the challenging landscape

Subregional Composition of Investment in Strategic Sectors—Asia and the Pacific (%)

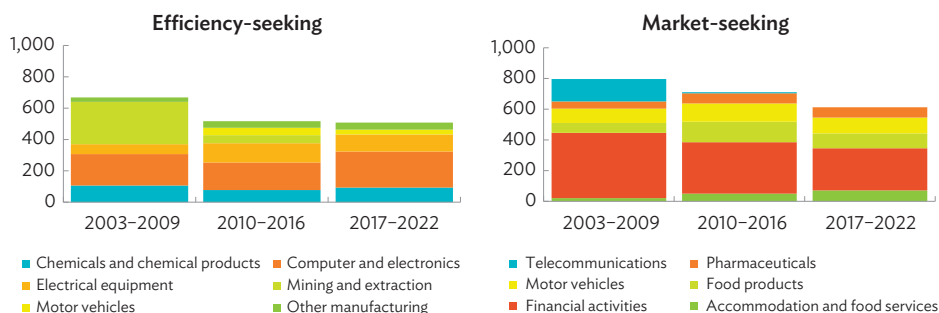


FDI inflows to strategic sectors have diversified among subregions in recent years

FDI = foreign direct investment.
Sources: ADB calculations based on Bureau van Dijk, Zephyr M&A Database; and Financial Times. fDi Markets.

Efficiency- and market-seeking FDI can help Asia support green growth and participate further in the global economy

Cumulative FDI to Asia and the Pacific, Efficiency- and Market-Seeking Motives (\$ billion)



Efficiency-seeking FDI has made Asia a leading assembler in global value chains, while market-seeking FDI has been critical for services

FDI = foreign direct investment.

Note: Classification based on Organisation for Economic Co-operation and Development. AMNE Database - Activity of Multinational Enterprises

Sources: ADB calculations based on Bureau van Dijk. Zephyr M&A Database; and Financial Times. fDi Markets.

Financial Integration

Asia's global financial integration has advanced steadily, increasing its exposure to financial shocks. The region's financial integration with the world economy increased access to foreign capital, supplemented domestic investment, and smoothed consumption. It also improved finance sector competitiveness and the development of regional capital markets. However, the region's financial openness also makes the region prone to external shocks and capital flow volatility, notably emanating from the United States (US) and the EU. In 2022, the start of monetary policy tightening led to an increase in capital outflows from the region, partially recovering in 2023. Over 2014–2022, cross-border assets and liabilities as a share of regional gross domestic product increased by 16 and 5 percentage points, respectively. Asia's equity and bond markets are already more sensitive to global financial factors than regional ones, with regional bond market sensitivity to global factors on the rise since 2021. Regional financial integration also advanced, with the share of the intraregional inward portfolio debt stock rising from 28% in 2021 to 30% in 2022, while the inward equity ratio rose from 21% to 22% over the same period.

US dollar dependence amplifies capital flow volatility in Asia and the Pacific

Many of the region's transactions are largely denominated in US dollars



4/5 of the region's exports and imports



1/2 of bank assets, liabilities, and portfolio debt



2/3 of foreign exchange reserves



Asia's dependence on the US dollar can amplify capital flow reversals

Asian economies can mitigate exposure by enacting policies to address these vulnerabilities



Strengthen bank balance sheet resilience



Develop local currency bond markets



Formulate appropriate policy interventions



Reinforce regional financial safety nets

US = United States.

Sources: ADB calculations using data from Bank for International Settlements. Locational Banking Statistics; Bloomberg L.P.; Boz et al. 2020; International Monetary Fund (2023); International Monetary Fund (IMF). Balance of Payments and International Investment Position Statistics; IMF. Coordinated Direct Investment Survey; IMF. Coordinated Portfolio Investment Survey; IMF. Currency Composition of Official Foreign Exchange Reserves; IMF. Direction of Trade Statistics; IMF. International Foreign Reserves and Foreign Currency Liquidity; World Bank. World Bank Open Data; and national data sources; and methodology by Lane and Shambaugh (2007).

US dollar funding shocks are behind much of Asia's capital flow volatility. Asia's rising global financial integration makes the region prone to spillovers from the US financial system—in particular centered around the US dollar's key role as the leading global currency. Asia is especially susceptible to US dollar funding shocks due to its high US dollar dependence. About four-fifths of Asia's exports and imports, over half of bank assets and liabilities, half of issued debt, and two-thirds of foreign exchange reserves are denominated in US dollars. It is an exchange rate anchor for 18 Asian economies. Also, the US dollar dominates global payment and currency trades. High US dollar dependence puts capital flows to the region at risk, as it amplifies any reversals driven by US dollar funding shocks. An empirical analysis covering a

broad sample of developing economies and emerging markets in Asia shows that a one standard deviation increase in US dollar funding costs raises medium-term portfolio debt outflows from the region as a share of gross domestic product by up to 0.25%. In addition, an economy with a one standard deviation higher US dollar dependence is likely to experience outflows up to 0.3 of a percentage point higher. Policies that help mitigate risks from Asia's exposure to US dollar funding shocks include (i) strengthening bank balance sheet resilience, (ii) developing local currency bond markets, (iii) implementing macroprudential policies and temporary capital flow management measures, and (iv) reinforcing the regional financial safety net.

Movement of People

Migration outflows from Asia are recovering as major host economies seek greater access to skilled labor in the wake of worker shortages. The rebound in migrant outflows is also due in part to changes in migration policies of host economies such as Australia, Canada, Japan, New Zealand, the United Kingdom, and the US. They are designed to attract skilled workers to fill labor shortages and fuel the post-pandemic recovery. Increasing investment in human capital and strengthening international skills partnerships—along with bilateral labor arrangements—could help meet the growing needs of host economies, while ensuring long-term continuity of labor market access.

Remittance inflows to Asia remained strong. In 2022, remittances totaled \$356.0 billion, 10.7% higher than in 2021, and are estimated to rise by 4.4% to \$371.5 billion in 2023. Except for East Asia, inflows to all subregions increased in 2022—with notable growth in Central Asia (69.4%) and a robust rise in inflows that continued well into 2023 for Oceania (17.4% and 21.2%) and South Asia (12.2% and 7.2%). They stemmed from large transfers out of the Russian Federation, higher oil incomes in major host economies in the Middle East, and a robust job market in the US. The average cost of sending \$200 to Asia was 5.2% as of the first quarter (Q1) of 2023, down from 6.1% in Q1 2020 but still above the Sustainable Development Goal target of 3.0% by 2030. Digital remittances have accelerated since the pandemic, but remain less than 20% of the total, even though digital remittance channels cost just 4.4% in Asia and globally. Policies that would help expand migrant worker access to banking services and digital infrastructure include adopting mobile services, standardizing data collection and reporting, and removing barriers to cross-border payments such as non-interoperable payment systems and regulations. Such policies could help the region achieve higher digital remittance uptake and deepen financial inclusion.

International tourism in Asia is recovering, yet still lags when compared to other regions. In 2023, Asia reached 73.2% of its pre-pandemic (2019) arrivals and 77.1% of its receipts. The recovery was much faster than in 2022, when tourist arrivals reached 28.8% and receipts 36.5% of 2019 levels. Yet, Asia's tourism recovery remains

slower than other regions—the Middle East recovered 108.7% of its tourist arrivals while Europe earned 117.6% of pre-pandemic tourism receipts in 2023. There are several reasons for the gap: Asian economies implemented some of the tightest travel restrictions from 2020 to 2022; and high airfares along with global macroeconomic and political conditions made potential tourists think twice before traveling. Also, the anticipated boost in tourists from the PRC has, so far, only been partially realized.

Migrant outflows from Asia and the Pacific recover as major host economies expand access to address labor shortages



Remittance inflows to the region stayed resilient in 2022, bolstered by digitalization



*Inflows to the region grew **11%**; while globally, digital remittances increased by **17%** to around **\$140 billion** in 2022*

Sources: ADB calculations using data from the Global System for Mobile communications Association, Statista, and World Bank-Global Knowledge Partnership on Migration and Development (KNOMAD).

Digital technology could help the tourism industry build back better; the region needs to embrace policies that unlock the great potential of the digital economy. Governments in Asia have been setting policies that support digital technology use—to entice investments and induce behavioral changes that build resilience against future shocks. For example, the Philippines began using its eTravel system to digitize arrival cards in May 2023, Malaysia launched its Malaysia Digital Arrival Card, and Singapore now uses a biometrics system in place of traditional passports for its citizens to clear immigration. Some Asian economies formed partnerships with digital platforms to facilitate transactions between local merchants and international tourists. For instance, Malaysia and the PRC collaborated to allow Alipay+ supported wallets from seven economies to use PayNet’s DuitNow QR codes in Malaysia. As Asia continues to leverage digital technology, closer regional cooperation can help narrow gaps in information and communication technology infrastructure and digital regulations. Enhancing digital skills among people and firms could ensure safe, seamless cross-border travel while helping make the region’s tourism industry smarter, more resilient, and sustainable.

International tourism in Asia recovers lost ground, as digital technology begins to lead the region on the path to smart and sustainable tourism



*In 2023, the region recovered **73.2%** of arrivals and **77.1%** of receipts compared to the same period in 2019*

Source: United Nations World Tourism Organization. Tourism Dashboard.

Theme Chapter: Decarbonizing Global Value Chains

The impact of human-induced climate change on the natural environment, economies, and societies will likely be wide and far-reaching, with Asian economies highly affected. The list is long—higher temperatures, drought, water scarcity, severe fires, rising sea levels, ocean warming and acidification, flooding, storms, and declining biodiversity, among others. These will all have severe consequences for human health, food production, access to fresh water and ocean resources, productivity, and critical infrastructure. Developing economies in Asia and the Pacific are particularly vulnerable to the impact of climate change, despite having contributed less historically to greenhouse gas emissions. Climate change is expected to disproportionately affect the region's economies due to their exposure to natural hazards, extreme weather events, and limited resources for mitigation and adaptation.

Despite a slowdown in the rate of growth, anthropogenic greenhouse gas (GHG) emissions continue to rise, with Asian economies contributing substantially to the increase. The primary cause of human-induced climate change is the burning of fossil fuels, which increases GHG concentrations in the atmosphere. Carbon dioxide (CO₂) emissions from fossil fuels and industry cause most of the increase. Developing Asia accounts for a large and growing share of CO₂ emissions as global production structures are influenced by the rise of GVCs, population dynamics, and technological change. Mitigating climate change requires a fundamental shift in human behavior and rapid decarbonization of production. Reducing CO₂ emissions associated with GVCs raises specific challenges, with the global nature of emissions making them difficult to regulate through domestic policies alone.

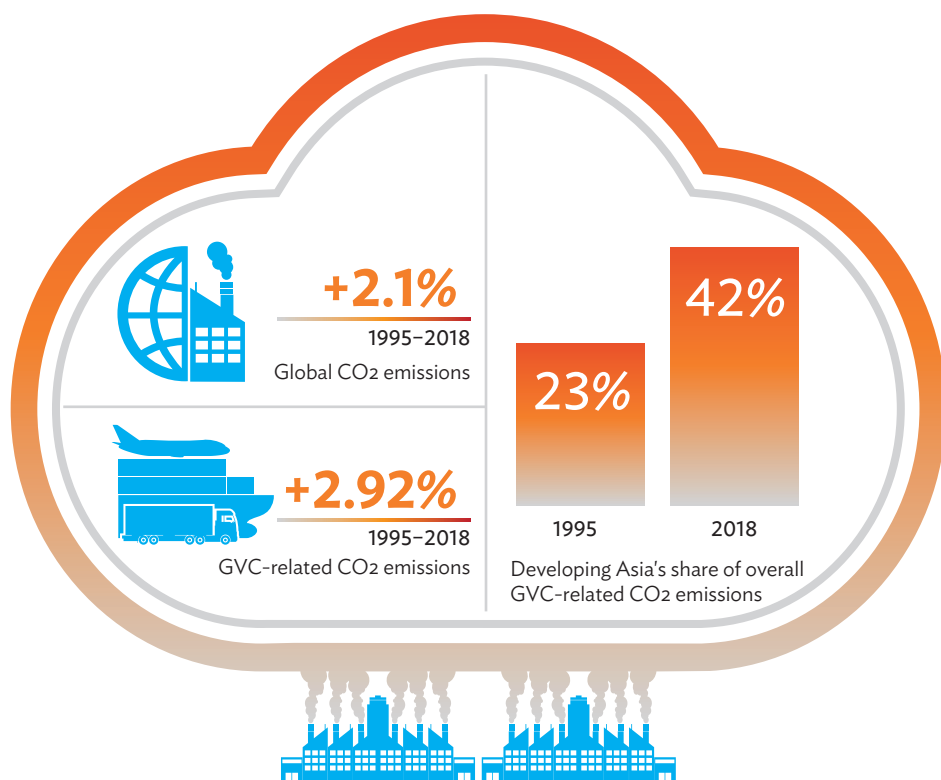
CO₂ emissions can be considered to reflect both a scale and an intensity effect, with developments in these two effects working in opposite directions in recent years. CO₂ emissions in developing Asia increased rapidly during 1995–2018, with emissions increasing by 114% over the period. This was despite a significant reduction in CO₂ intensity of production, which was not large enough to offset the increase in CO₂ emissions resulting from the rapid expansion in the scale of production. CO₂ intensities vary widely across both economies and sectors. Across a broad range of sectors they fell rapidly during 1995–2018, reflecting technological advances, improved efficiency, and a reallocation of production within sectors through GVCs. Within developing Asia, structural change has played a limited role in lowering aggregate emissions intensities, with reductions primarily driven by changes within sectors rather than shifts toward less emissions-intensive sectors. GVCs have an important impact on both the scale and intensity of producing CO₂ emissions. While increases in the level of GVC production are associated with similar increases in CO₂ emissions, the share of CO₂ emissions due to GVCs tends to be larger than their

share in value added—indicating that GVC activity plays an outsized role in emissions production. Sectors involved in GVCs tend to be relatively emissions-intensive, with a higher share of GVC activity shown to be positively associated with higher aggregate emissions intensities. These associations differ between developed and developing economies, with GVC activity in developing economies tending to be more emissions-intensive than in developed economies.

There is an intricate relationship between international trade, GVCs, and GHG emissions. While international trade remains both an essential conduit linking global production networks and a significant source of GHG emissions, it also holds the potential to contribute to climate change mitigation and adaptation—by facilitating the exchange of low-emission goods, green technologies, and increasing production efficiency. Expanding GVCs are generally considered to offer opportunities for developing economies to integrate into the global economy and industrialize. But it also creates challenges for mitigating climate change. The decoupling of consumption from production within GVCs raises concerns about firms relocating production to areas with weaker environmental regulations (the pollution haven hypothesis), potentially leading to higher emissions. Policymakers are increasingly concerned over GVCs' carbon footprint and potential carbon leakage to regions with weaker regulations. Climate change mitigation requires a shift away from carbon-based production, posing a potential risk to the existing GVC model that has contributed to economic development in many economies, but also increased energy consumption, emissions, and waste.

The production of CO₂ emissions continues to grow rapidly, with GVCs in developing Asian economies responsible for an increasing share. During 1995–2018, global CO₂ emissions increased by an average of 2.1% per year. While the growth rate after 2010 (1.8%) was lower than before (2.2%), emissions continue to grow rapidly. Domestic production for domestic consumption remains the largest contributor to emissions, accounting for almost two-thirds of emissions production—GVCs accounted for 14% of CO₂ emissions in 2018, up from 12% in 1995. While playing a relatively small role in overall emissions production, GVCs' increasing contribution to aggregate CO₂ emissions come from the rapid growth in their emissions production. The share of developing Asia in global GVC-related emissions significantly increased over 1995–2018, reaching 42% in 2018. While population growth is a factor, CO₂ emissions per capita have also increased across developing Asia, in contrast with other regions. The increasing role developing Asia plays in GVC-related emissions is partly due to GVC positioning, sectoral structure, and the technological level of its GVC integration. Developing Asia is now a net supplier, exporting more CO₂ emissions embodied in intermediates than it imports. In contrast, developed regions like North America, the EU plus the United Kingdom, and developed Asia import more embodied CO₂ emissions through intermediates than they export in GVCs.

Carbon dioxide emissions due to global value chains have grown rapidly, with developing Asia responsible for an increasing share



Sources: ADB calculations using data from Organisation for Economic Co-operation and Development (OECD). Inter-Country Input-Output Tables; and OECD. Carbon dioxide emissions embodied in international trade (TECO₂) data set.

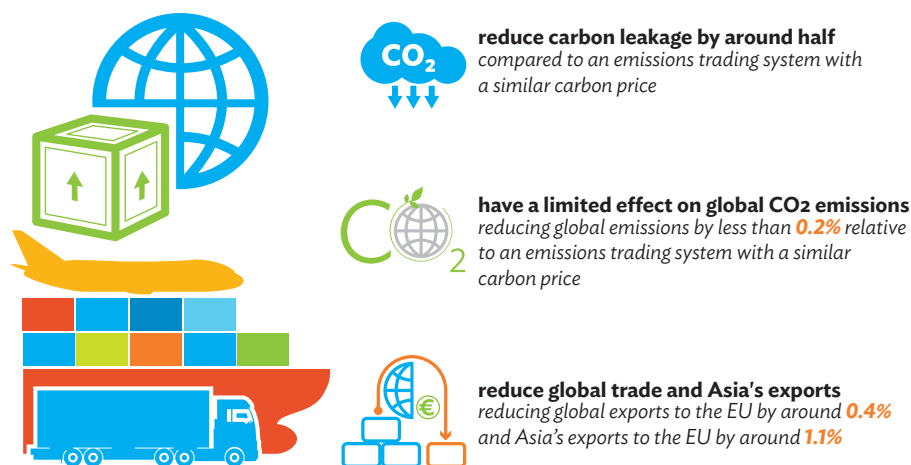
International cooperation is crucial to effectively address the challenge of climate change. Despite national and subnational efforts to implement carbon pricing, the climate crisis worldwide and increased economic interdependence call for increased global coordination. Enhanced global cooperation can create a more coherent and predictable policy environment, increase transparency, and mobilize financial and technical resources to overcome capacity constraints and promote the spread of green technologies, especially to developing and emerging economies. Nonetheless, global coordination in climate mitigation remains weak. Major challenges to global coordination in carbon pricing arise from issues of free-riding and fairness. The possibility of free-riding makes coordination difficult, as economies may choose not to participate in carbon pricing while still reaping the benefits of carbon production. The fairness issue stems from historical contributions to global emissions, with developed economies historically emitting more. The principle of common but differentiated responsibilities recognizes these differences but complicates finding a common global carbon price.

Carbon pricing is generally considered the key mechanism for addressing the problem of CO₂ and GHG emissions during production. Carbon pricing, through either carbon taxes or emissions trading system (ETS), aims to internalize the social costs of emissions, encouraging firms to reduce carbon intensity and transition to cleaner production methods. Despite efforts in various jurisdictions to implement carbon pricing policies, concerns remain over the speed and extent of the global response to the climate crisis. While numerous carbon pricing policies have been adopted globally, just a small percentage of emissions are covered at levels deemed necessary to prevent a 2°C temperature increase, the upper end of the limit in the Paris Agreement. The fragmented nature of carbon pricing across different jurisdictions raises the risk of carbon leakage. To address this, border carbon adjustment (BCA) mechanism have been suggested as a way of leveling the playing field, ensuring that foreign producers face equivalent carbon prices in export markets. However, BCAs raise concerns over fairness and equity, potentially impacting exporters, particularly in GVC supplier economies and developing economies.

The EU's Carbon Border Adjustment Mechanism (CBAM) should reduce carbon leakage, but it will have a limited impact on global emission reductions while significantly reducing exports into the EU from some Asian subregions. Concerns over competitiveness, carbon leakage, and shortcomings of the EU's ETS led to CBAM, the first border adjustment mechanism. Initially targeting carbon-intensive products like cement, steel, and aluminum, the EU sees CBAM as a tool to align global carbon prices and accelerate emission reductions worldwide. For developing Asian economies, with high CO₂ intensities in sectors like ferrous metals, CBAM can create challenges—for example, the value-added tax equivalent of a €100 per metric ton of CO₂ price ranges between 3% and 12%. Estimations using computable general equilibrium (CGE) modeling suggest CBAM might reduce carbon leakage by around half compared to an ETS scheme with a similar carbon price. While the EU's ETS and CBAM may have a limited direct impact on emissions—reducing emissions globally by around 1.3% at €100 per metric ton of CO₂ and by 2.2% at €200 per metric ton of CO₂—it could significantly affect exports to the EU. A shift to a €100 per metric ton of CO₂ price could lead to significant declines in exports for some Asian regions, particularly Central and West Asia, which has a relatively high share of CBAM-covered exports to the EU. At the same time, reductions in EU production from CBAM could spread to many sectors, such as computer, electric and optical equipment, and motor vehicles and parts within the EU through industrial input–output linkages.

Extending CBAM to regions outside the EU could significantly reduce CO₂ emissions. Considering scenarios where other economies of the Organisation for Economic Co-operation and Development (OECD) and regional members of the Asian Development Bank (ADB) implement both ETS and BCA, modeling suggests that global CO₂ emissions could be reduced by around 8.7% at €100 per metric ton of CO₂ and by 15% at €200 per metric ton of CO₂. How much emissions are reduced

Based on computable general equilibrium modeling, the European Union's Carbon Border Adjustment Mechanism is estimated to



Source: ADB calculations using data from Global Trade Analysis Project 11 and International Energy Agency.

depends on coverage and carbon price, emphasizing the need to carefully consider these factors in designing and implementing these mechanisms. Extending these policies is also predicted to lead to a significant decline in global trade, highlighting the potential trade-off between emissions reduction and global integration. Extending CBAM to cover other OECD economies, for example, is estimated to reduce average developing Asian exports by 1.9% at a €100 per metric ton of CO₂ price and by 3.7% at €200 per metric ton of CO₂. The expected distributional and negative economic impact on ADB developing members in the extended model (OECD plus ADB regional members) suggests the need for proper compensation mechanisms internationally to draw ADB developing members into carbon pricing and BCA structures.

Existing accounting frameworks that measure embodied emissions are underdeveloped, limiting the effectiveness of climate policies. Accurately measuring emissions embodied in goods and services is crucial for an effective approach to the net-zero transition, such as carbon pricing and BCAs. Yet existing frameworks are underdeveloped, with the measurement challenge more pronounced when considering indirect emissions, such as Scope 2 and Scope 3 emissions. While estimates of an economy's CO₂ emissions are generally reliable, measuring emissions embedded in products is more complex and varies across economies, firms, and time. Public embedded emissions accounting frameworks (EEFs) can play a vital role in decarbonizing GVCs in both developed and developing economies. They facilitate measurement, reporting, verification, and regulation, and support efforts to avoid carbon leakage globally and domestically in the context of trade-related climate policies. To be successful, EEFs need to be carefully designed to align with domestic and international frameworks and those of major trading partners, as global

cooperation is crucial to establish a basic, common approach. In doing this, it is important to avoid an overly complex regime that disadvantages smaller producers and resource-constrained economies.

Trade policies can play a crucial role in climate change mitigation and

adaptation. Trade and trade policy hold the potential to be a force for CO₂ emissions reductions. It can influence the global movement of climate-friendly products and services, facilitate the transfer of green technologies, encourage higher environmental standards, and act as an external force for regulatory enhancement. Current trade policies, however, often favor carbon-intensive imports, with lower barriers on high carbon-intensive goods. This bias, largely influenced by factors unrelated to trade policy, has been estimated to be equivalent to a negative carbon price of \$90 per ton of CO₂, potentially hindering efforts to reduce global emissions. Preferential trade agreements (PTAs) can also help decarbonize GVCs, with the number and breadth of PTAs and the number of PTAs with environmental provisions increasing rapidly in recent years. Evidence suggests that the breadth of a PTA between economies is associated with slightly lower CO₂ emissions intensity traded in GVCs, while the scale effect of a PTA leads to greater overall CO₂ emissions. Including environmental provisions in PTAs, especially provisions restricting trade in dirty goods, can lower emissions traded in PTAs. A one standard deviation increase in the share of trade restricting environmental provisions in PTAs is associated with a reduction in CO₂ emissions in GVCs of 1.2%, with the scale effect accounting for 0.34 percentage points and the intensity effect 0.90 percentage points.

Beyond carbon pricing and regional integration, a variety of other steps

can be taken to decarbonize GVCs. The decreasing cost of green technologies, especially in energy production, can promote their widespread adoption. With recent policy initiatives, including the US Inflation Reduction Act and the EU's mission-oriented approach to innovation, further encouraging research and development in renewable energy, opportunities for enhanced competition in green technologies and for providing new climate-related technologies are strong. For maximum impact on emissions reductions, these technologies need to be diffused widely, especially from developed to developing economies. Technology diffusion to developing economies can be facilitated by GVCs and multinational enterprises, potentially enabling these economies to leapfrog into green technologies while avoiding carbon-based production. Technology and technology diffusion can potentially remove any trade-off that exists between CO₂ reduction efforts and GVC production, reducing emissions while encouraging production, trade, and GVCs. Multilateral development banks can play an important role by supporting green infrastructure and technology diffusion while facilitating sustainable investments along value chains, and ensuring transparency and traceability of CO₂ emissions in GVCs.

Trade policies can play a crucial role in climate change mitigation and adaptation



Source: ADB.

Asian Economic Integration Report 2024

Decarbonizing Global Value Chains—Highlights

This publication highlights key findings of the *Asian Economic Integration Report 2024* and provides insights on decarbonizing global value chains in Asia and the Pacific. It presents an overview of changes in trade and global value chains, cross-border investment, financial integration, and the movement of people, and includes updates on the Asia-Pacific Regional Cooperation and Integration Index. The Asian Economic Integration Report involves the annual review of regional cooperation and integration covering the 49 regional members of the Asian Development Bank.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



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