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The Reconfiguration of Foreign Direct Investment in ASEAN+3

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Abstract

Global FDI patterns are changing and warrant close attention given its critical role in driving economic growth and development. This paper analyzes the reconfiguration of FDI in ASEAN+3 from both immediate- and ultimate-investor perspectives; data are also adjusted for both "phantom" FDI and "round-tripping" to obtain a clearer picture of evolving FDI stocks and flows. The information shows that ASEAN+3 has emerged as a leading destination for FDI, outperforming other regions in its ability to continue attracting long-term business financing. There are strong signs of FDI reconfiguration between the United States and China, with both scaling back investments in each other's markets, more so from the latter to the former. Meanwhile, ASEAN has overtaken China as the leading recipient of FDI in certain strategic sectors, likely attributable to global efforts to diversify supply chains. More generally, ASEAN+3 economies will need to be continuously proactive in implementing targeted and sound policies to ensure it remains a strong draw for global FDI amid rising geoeconomic fragmentation.

JEL classification: F21, F23, F43, C23

Keywords: Asia, foreign direct investment (FDI), FDI hub, genuine FDI, immediate investor, phantom FDI, round-tripping, ultimate investor

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[2] The authors would like to thank Abdurohman and colleagues at Bank Indonesia and Bangko Sentral ng Pilipinas for useful comments. All remaining mistakes are the responsibility of the authors.

Abbreviations

AE	advanced economy
ASEAN	Association of Southeast Asian Nations comprising Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
ASEAN-5	Indonesia, Malaysia, Philippines, Singapore, Thailand
ASEAN+3	ASEAN plus China (including Hong Kong, China, hereafter “Hong Kong” for brevity) Japan, Korea
BCLMV	Brunei Darussalam, Cambodia, Lao PDR, Myanmar, Vietnam
BOPS	Balance of Payments Statistics
BRICS	Brazil, Russia, India, China, South Africa
CDIS	Coordinated Direct Investment Survey
COVID-19	coronavirus disease of 2019
EMDEs	emerging market and developing economies
EU	European Union
FDI	foreign direct investment
GFC	global financial crisis
ICT	information and communication technology
LIDC	low income developing country
M&A	mergers and acquisitions
MINT	Mexico, Indonesia, Nigeria, Turkey
MNE	multi-national enterprise
OCI	Orbis Crossborder Investment
OECD	Organisation for Economic Co-operation and Development
OFS	OECD FDI Statistics
ROW	rest of the world
SPE	special purpose entity
ULI	Urban Land Institute
USD	US dollar
UNCTAD	United Nations Trade and Development

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"Investing should be more like watching paint dry or watching grass grow. If you want excitement, take $800 and go to Las Vegas."

~ Paul Samuelson (1915–2009)
Nobel Memorial Prize in Economics, 1970

I. Introduction

Foreign direct investment (FDI) is an important catalyst for economic growth and development. Traditionally, considered the less glamorous counterpart of the more mercurial foreign portfolio investment, FDI is attractive to recipient countries for several reasons: It generates employment by creating new productive capacity and jobs; contributes to infrastructure development; involves the transfer of foreign technology and managerial expertise; and improves processes, products, and organizational technologies (Strazicich, Co, and Lee 2001; Ho and Rashid 2011). FDI is also more stable compared to other forms of foreign investment owing to its longer-term nature—in the wake of the Asian Financial Crisis, studies on capital flows show that FDI tended to be less volatile compared to foreign portfolio flows and commercial bank loans in the period leading up to the crisis (Fernandez-Arias and Hausman 2000; Soto 2000).

However, FDI alone may not be sufficient to spur and sustain growth. The existing literature suggests that FDI typically requires the presence of other factors in order to be effective.[3] For instance, there is evidence that the strong positive interaction between FDI and trade in promoting economic growth is enhanced by human capital, sound economic policies, and institutional stability (Bengoa and Sanchez-Robles 2003; Makki and Somwaru 2004). While FDI is an important vehicle for technology transfer in developing countries, research shows that there needs to be a minimum threshold stock of human capital to absorb advanced technologies in order to achieve higher productivity and growth (Borensztein, Gregorio, and Lee 1998; Li and Liu 2005). Additionally, countries with well-developed financial systems are found to be able to utilize FDI more efficiently (Hermes and Lensink 2003; Alfaro and others 2004).

Moreover, FDI may not necessarily have a positive impact throughout an economy. The evidence suggests that its benefits vary significantly across sectors—while investment in manufacturing consistently shows positive effects on growth, investment in the service and primary sectors has often had negligible or even negative impact in part because of limited potential linkages with local firms (UNCTAD 2001; Alfaro 2003; Emako, Nuru, and Menza 2022). Alfaro (2003) argues that this finding is not surprising given that the oft-mentioned FDI benefits, such as technology transfers, managerial expertise, and improved processes typically relate to the manufacturing sector rather than the agricultural or mining sectors. Alfaro and Charlton (2007) subsequently examines the "quality" of FDI, and finds it to be more effective for industries with higher skill requirements and those that are more reliant on external capital. Separately, Vu and Noy (2009) finds that FDI has significant, positive effects on growth but that they are not equally distributed across countries and sectors.

[3] See Almfraji, Amin, and Almsafir (2014) for a review of the literature on foreign direct investment and economic growth.

From the investor's perspective, FDI may have different motivations. It can be incentivized by either resource-seeking or market-seeking behavior, or both:

- ***FDI boost to manufacturing capacity in ASEAN+3 has largely been driven by the "manufacturing for exports" strategy, with foreign firms setting up export-oriented production bases in the region.*** This focus on trade has positively impacted growth through improvements to overall productivity in the beneficiary economies, which have propelled upward income convergence. Within ASEAN+3, China's Belt and Road Initiative (BRI) is aimed at fostering FDI flows between China and ASEAN to benefit investment and trade (Poonpatpibul and others 2018).

- ***For economies with the added advantage of large populations, inward FDI aims to capitalize on growing domestic consumer demand as incomes grow over time.*** Indeed, Jadhav (2012) finds that most of the FDI in the BRICS economies is largely motivated by their market size. As an extension, Asongu, Akpan and Isihak (2018) demonstrates that market size, infrastructure availability and trade openness are significant factors in attracting FDI to BRICS and MINT countries, arguing that those countries must offer political stability and a level playing field for investors, and invest more in human capital, in order to remain attractive destinations.

This paper analyzes FDI in the ASEAN+3 region amid a rapidly evolving international environment. In recent years, geoeconomic fragmentation arising from the COVID-19 pandemic and geopolitical events have led to a reconfiguration of FDI (IMF 2023). Our aim is to distill possible policy recommendations to take advantage of changes in FDI patterns that would benefit the region. We show that global FDI patterns are changing, with ASEAN+3 emerging as a leading destination ahead of other regions. The region has been diversifying its FDI sources, with ASEAN recently overtaking China as the leading recipient of FDI in certain strategic sectors. Finally, we argue that ASEAN+3 economies will need to proactively implement targeted and sound policies to ensure it remains a strong draw for global FDI in an environment of rising geoeconomic fragmentation.

The rest of this paper is structured as follows. Section II discusses the changing economic and political developments that influence FDI. Section III describes the myriad of data sources and related transformations used in our analysis. Sections IV and V cover recent trends in global and regional FDI stocks and flows, respectively, including immediate versus ultimate and phantom versus genuine investments. Section VI extends the analyses by identifying regional FDI hubs. Section VII concludes with several policy suggestions.

II. An Evolving Environment for FDI

The digital economy is increasingly becoming a core driver of economic activity. It helps to boost competitiveness across sectors, provide new business opportunities, and open up new avenues for accessing overseas markets and participating in global e-value chains (UNCTAD 2017). The importance of information and communication technology (ICT) multi-national enterprises (MNEs) in international production has risen sharply, with the number of tech companies in the top 100 MNEs more than doubling between 2010–15, while digital MNEs are also expanding rapidly. For ASEAN+3, building capacity and connectivity will be a priority for the next phase of economic activity. AMRO (2019) argues that **underinvestment** in these areas, if not addressed, will have negative consequences for regional growth.

The literature suggests that there is significant correlation between FDI and the level of ICT development. The relationship is stronger when FDI is in the high-tech sector rather than in labor-intensive sectors (Veljanoska, Axhiu and Husejni 2013); countries with liberalized ICT sectors, notably in the Asia-Pacific region, are able to reduce the digital gap with developed countries and also expand their operations both locally and globally (Shirazi 2008). Castelli and Castellani (2013) finds that China and India were the most important global destinations for technology projects between 2003–13, for both applied and basic research. Separately, Chaminade and Gomez (2016) shows that technology-related FDI was dominated by investments in ICT between 2003–14, both globally and for South-South transactions.

The restrictions on physical movement and in-person interactions during the COVID-19 pandemic accelerated the flight to digital for businesses and consumers, with attendant implications for FDI in the region. AMRO (2021) notes that the outlook for digital consumption thus remains highly positive, including in the ASEAN+3 region, given that the shift is unlikely to be reversed. However, it argues that further deployment of new technologies will require the region to develop and install the necessary hard and soft infrastructures, especially for ICT. And to attract future investment, the region would need to focus on improving the quality of its institutions and developing human capital, among other considerations.

FDI is also playing an increasingly critical role in the green economy, with growing interest in investments in sustainable energy, green technologies, and environmentally-responsible industrial practices. This trend is crucial for ASEAN+3 economies as they seek to meet global climate targets while ensuring long-term economic resilience. She and Mabrouk (2023) and Famanta, Randhawa, and Jiang (2024) find that FDI linked to green innovation and energy significantly contributes to environmental quality and sustainable growth in emerging market and developing economies.

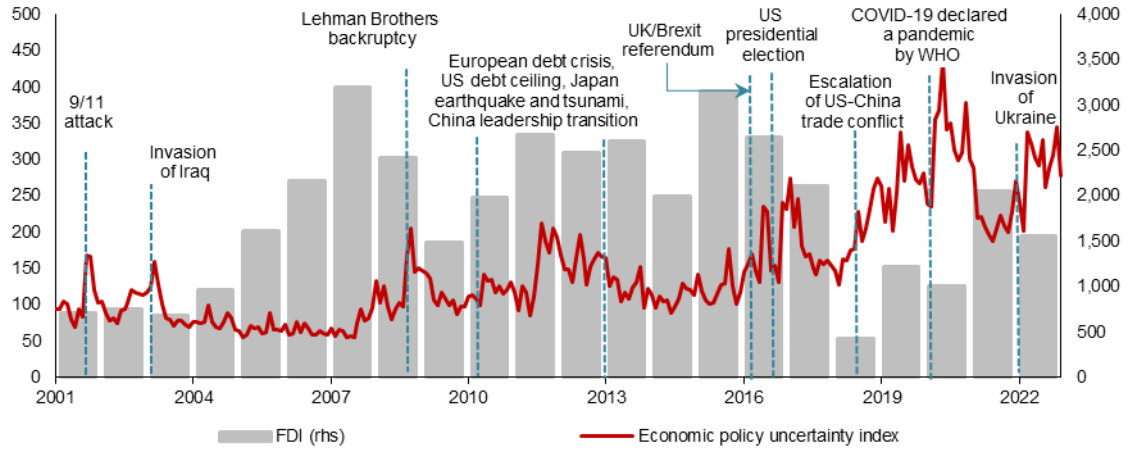
Meanwhile, China's strategy of industrial upgrading to focus on medium- and high-skill sectors also has spillover implications for FDI in the region. Zhao and Ho (2023) observes that China's comparative advantage has diminished in certain, mainly labor-intensive sectors and that it is deliberately offshoring labor-intensive production to mitigate escalating costs. For those sectors in which China's shares of global exports have fallen, the authors find that ASEAN has substituted for a small fraction, with more than half of the share increase concentrated in labor-intensive sectors. ASEAN has also benefited from China's ascendant sectors, with exports in these sectors expanding between 2015 and 2022. Sectors characterized as non-labor-intensive have grown even more rapidly.

Over the past decade, multiple geopolitical shocks have amplified global policy uncertainty and dampened appetite for FDI more generally. Unexpected outcomes from major political events such as the UK Brexit referendum and 2016 US presidential election, followed by the escalation of US-China trade tensions in 2018—all of which reflected political populism arising from widespread discontent with globalization—and the Russia-Ukraine geopolitical crisis in 2022, caused shocks to business confidence beyond specific countries or region (Figure 1). The near total shutdown in global supply chains and economic standstill during the COVID-19 pandemic in 2020–21 forced a rethink of the physical importance of diversifying supply chain dependency and investments (IMF 2022).

Unsurprisingly, both governments and firms are increasingly prioritizing the resilience of their supply chains to shocks, with concepts such as "reshoring," "nearshoring," and

"friendshoring" increasingly being used in economic lexicon. Everett (2021) argues that the recent proliferation of FDI restrictions is attributable in part to rising geopolitical tensions. Aiyar and others (2023) observes that while supply chain reconfigurations are largely driven by legitimate concerns about security and logistical risks, production location decisions in some cases may by be driven by government policies rather than economic efficiency considerations—part of the reversal of the global economic integration process that the authors have coined as "geoeconomic fragmentation." Indeed, Gopinath and others (2024) finds significant declines in FDI flows between economies in geopolitically distant blocs in the wake of the Russia-Ukraine geopolitical crisis, findings that are corroborated specifically for the ASEAN+3 and euro area regions in Hudecz and others (2024).

Figure 1. World: Economic Policy Uncertainty Index and FDI Flows
(1997–2015 = 100; billions of US dollars)



Sources: IMF via Haver Analytics; policyuncertainty.com; and authors' calculations.
Note: The chart above presents the world Economic Policy Uncertainty (EPU) index in monthly frequency and world FDI flows in annual frequency. Baker, Bloom, and Davis (2016) constructs the world EPU index with a mean of 100 over the 1997 to 2015 period and comprising a GDP-weighted average of 21 national EPU indices; GDP is adjusted for purchasing power parity.

Rising geoeconomic fragmentation may have also increased the importance of financial hubs in redistributing FDI flows. Even prior to the intensification in the US-China trade conflict in 2018, the evidence pointed to a decoupling between FDI and real economic activity, with some smaller economies playing a very important role for global FDI. Damgaard and Elkjaer (2017) observes that these economies host many foreign-owned special purpose entities (SPEs) and MNEs that carry out their FDI through SPEs, which may have no or very limited real economic activity in their domicile economy. MNEs also invest through complex ownership structures such that the immediate counterpart economy may be different from that of the ultimate economy, that is, the end destination of the FDI.

These FDI hubs tend to have large gross foreign positions but very small net foreign positions in their role as pure financial intermediaries. Blanchard and Acalin (2016) finds that FDI inflows and outflows are highly correlated, and that in many countries, a large proportion of inflows are just flows going in and out of the country on their way to their final destination, in part because of favorable corporate tax conditions in the transit country. Separately, Lane and Milesi-Ferretti (2017) show that FDI positions that continued to grow following the global financial crisis (GFC) were largely attributable to the use of financial centers/investment hubs and increasingly complex structure of large MNEs. In the current era of geoeconomic fragmentation, Gopinath and others (2024) find evidence that direct FDI (and trade) links

between the United States and China are simply being replaced by indirect links through "connector" countries.

III. Data Sources and Transformations

The analyses in this paper use standard FDI statistics published by national authorities and additionally, granular information from third party databases. The IMF's Balance of Payments Statistics and the Coordinated Direct Investment Survey are the main sources on FDI stock and flow, respectively. They are supplemented with sectoral information from the OECD FDI Statistics, Moody's Orbis corporate database and Orbis Crossborder Investment database. Specifically, these databases cover the following:

- The **IMF Coordinated Direct Investment Survey (CDIS)** presents annual bilateral FDI position information for 129 economies starting in 2009. The IMF conducts annual worldwide statistical surveys to collect data on the stock of inward and outward FDI by economy, on an immediate investor basis. However, the information is not as timely in that published data lag by more than a year—the latest available data points used in this paper are as of the end of 2022:

    - Inward FDI positions on an immediate investor basis for 110 economies are used, plus adjusted mirror data on outward FDI positions for the other 124 economies that do not report the former.

    - An adjustment factor per Damgaard, Elkjaer, and Johannesen (2024) is applied to the mirror data to ensure that they are consistent with the inward FDI positions, which tend to be higher because the former is available only to a subset of reporting counterpart economies.

- The **IMF Balance of Payments Statistics (BOPS)** records the flow of goods, services, and finance across economies. They contain both annual and quarterly time series data for more than 200 economies, with many extending back to the mid-1970s up to the latest available quarter or year. This paper utilizes full-year data for 2023 where available, and otherwise includes data up to the third quarter of 2023.

- The **OECD FDI Statistics (OFS)** provide an alternative compilation of FDI statistics for OECD-member countries. In addition to annual FDI positions, the database includes information on FDI channeled through SPEs that have little or no physical presence in an economy but whose main purpose is to facilitate the internal financing of multinational corporations. Additionally, the database provides FDI statistics based on the economy of the ultimate investor—not just those of the immediate investor—to identify the economy of the investor who ultimately controls the investment. Annual data are available from 2005 to 2023, while the quarterly data start from 2013 and are available up to Q4 2023, as of the May 2024 data release.

- The **Moody's Orbis** database provides detailed accounting and ownership information for more than 500 million corporate entities globally, comprising both private and publicly-listed firms. Its detailed coverage of firm information allows the identification of immediate and ultimate shareholders. Although Orbis does not fully capture standard FDI statistics and hence does not reconcile with reported FDI amounts at the economy level, it is useful for gauging investment ownership patterns.

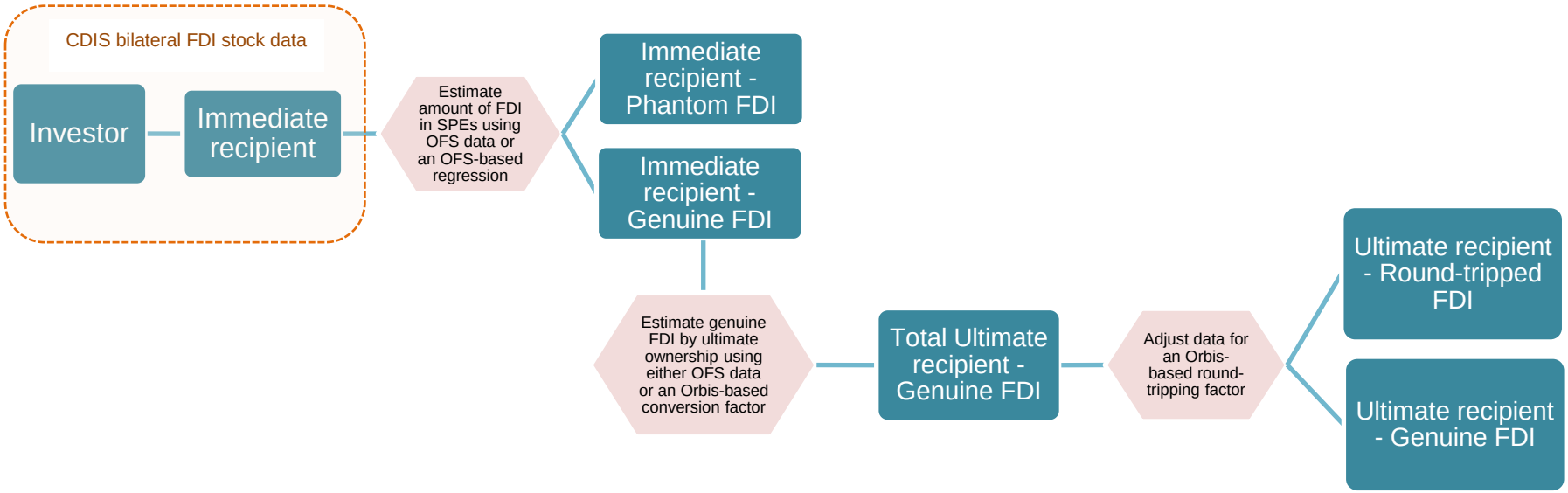
This study uses data up to July 30, 2024 to estimate FDI by ultimate investor economies, particularly for those not covered by the OFS.

- The **Orbis Crossborder Investment (OCI)** database, also by Moody's, enables the tracking of firm-level greenfield FDI and cross-border mergers and acquisitions (M&A) globally, on a daily basis from 2015. It provides detailed insights into cross-border projects and deals, covering information such as project type and status, motivation, and target market, thereby complementing analyses of standard FDI statistics. This study refers to full-year 2023 data to complement FDI information from the IMF BOPS.

Other macroeconomic data used in this paper are obtained from various official sources. They include the IMF's World Economic Outlook database and the World Bank's World Development Indicators. The relationships between genuine versus "phantom" FDI, and ultimate versus immediate FDI are analyzed (Figure 2),[4] and estimates are derived for a broader set of economies (Box 1). Finally, although this study focuses on the ASEAN+3 economies, it also takes into consideration the broader global context—in this regard, regional groupings are typically aligned with IMF definitions unless specified otherwise (Appendix I).

[4] The ultimate investor is the enterprise that has control over the investment decision to have an FDI position in the direct investment enterprise, and hence controls the immediate direct investor (OECD 2009).

Figure 2. Schematic: Adjustments Applied to Official FDI Position for a Given Investor-Recipient Pair



Source: Authors' visualization.
Note: Orbis in this exercise refers to the Moody's Orbis database which provides detailed accounting and ownership information for corporates in a given economy. Phantom FDI refers to investment in shell companies in offshore financial centers, typically motivated by favorable tax regimes in host jurisdictions but without real links to the local economy. Hence, phantom FDI is filtered out from standard FDI statistics to extract genuine FDI so that actual links across economies may be more accurately assessed.

Box 1. Disentangling Genuine and Phantom Investment from Standard FDI Statistics

Offshore financial centers (OFCs) mask the ability of standard FDI statistics to capture long-term strategic investment relationships. Investments through OFCs count as FDI in the host economies, although they rarely involve the deployment of productive assets there. To address this issue, bilateral FDI position data from the IMF CDIS are adjusted following Damgaard, Elkjaer, and Johannesen (2024) to distinguish genuine from "phantom" FDI, and designate the former to ultimate investor economies.[1/] The methodology is summarized in the following sequential steps:

(1) ***Decomposition of genuine and phantom FDI from total FDI.*** The OFS serves as a starting point, reporting the amount of inward FDI by counterpart economies that goes into SPEs (phantom FDI) and non-SPEs (genuine FDI). Such SPE-related information is available for 19 OECD-member economies according to the May 2024 data vintage. As for the rest of the economies without SPE information, the amount of genuine FDI is inferred after estimating the following regression equation:

$$\log\left(\frac{genuine\ FDI_{ht}}{total\ FDI_{ht}}\right) = \alpha + \beta \log\left(\frac{total\ FDI_{ht}}{GDP_{ht}}\right) + \gamma D_{t>2017} + \delta \log\left(\frac{total\ FDI_{ht}}{GDP_{ht}}\right) D_{t>2017} + \epsilon_{ht},$$

where $genuine\ FDI_{ht}$ is the inward genuine FDI in non-SPEs, derived from OECD data; and $total\ FDI_{ht}$ and GDP_{ht} are total inward FDI and GDP, respectively, in economy h in year t. The above equation differs slightly from Damgaard, Elkjaer, and Johannesen (2024) with the incorporation of a dummy variable $D_{t>2017}$ covering the period 2018–22. This adjustment improves the model's fit when accounting for new data points beyond the initial 2013–17 period.[2/] The model's coefficients, $\alpha, \beta, \gamma,$ and δ, are estimated using data from 19 OECD economies for the period 2013–22. The estimated equation is then used to predict the ratio of genuine to total FDI for all other economies with available total FDI-to-GDP ratio data.

(2) ***Identification of genuine FDI by economy of ultimate investor.*** Genuine inward FDI derived from the first step is based on immediate counterparty investor. However, the economy of the immediate investor differs from that of the ultimate investor in cases where investment is channeled through other economies that typically have favorable tax environments, strong governance, and other characteristics conducive to investment (Section VI). In this regard, self-reported data on FDI by ultimate investor economy from the latest OFS are adopted for 14 economies in our sample. For all other economies, we use corporate-level balance sheet and ownership information from Moody's Orbis to estimate conversion factors that translate genuine FDI by immediate to ultimate ownership in the same host economy.

(3) ***Adjustments for round-tripping.*** Round-tripping occurs when the ultimate investor economy is the same as the FDI host economy, typically motivated by tax purposes or other reasons. A round-tripping factor is derived from firm level data in the Moody's Orbis corporate database and applied to the economy's total inward FDI position, in order to estimate the host economy's aggregate round-tripping FDI.

(4) ***Adjustments for internal consistency.*** An adjustment factor is applied to ensure that the economy-level sum of genuine FDI by immediate investors matches the sum of FDI by ultimate investors and the round-tripping amount. Discrepancies arise because the Orbis corporate sample used in the second and third steps are not fully representative of the actual population of firms underpinning standard FDI statistics.

1*/* Genuine FDI refers to active and substantial business investment in another economy, while "phantom" FDI involves investments in SPEs.

2*/* Damgaard, Elkjaer, and Johannesen (2024) reported an R-squared of 84 percent from a pooled OLS regression for the period 2013–17, in line with our adjusted R-squared of 81 percent for the same period. However, our adjusted R-squared falls to 65 percent when data coverage is extended to 2022. Incorporating a dummy variable for 2018–22 in the model equation improves the adjusted R-squared to 76 percent.

IV. Patterns in Global FDI Stock

A. FDI on Immediate Investor Basis

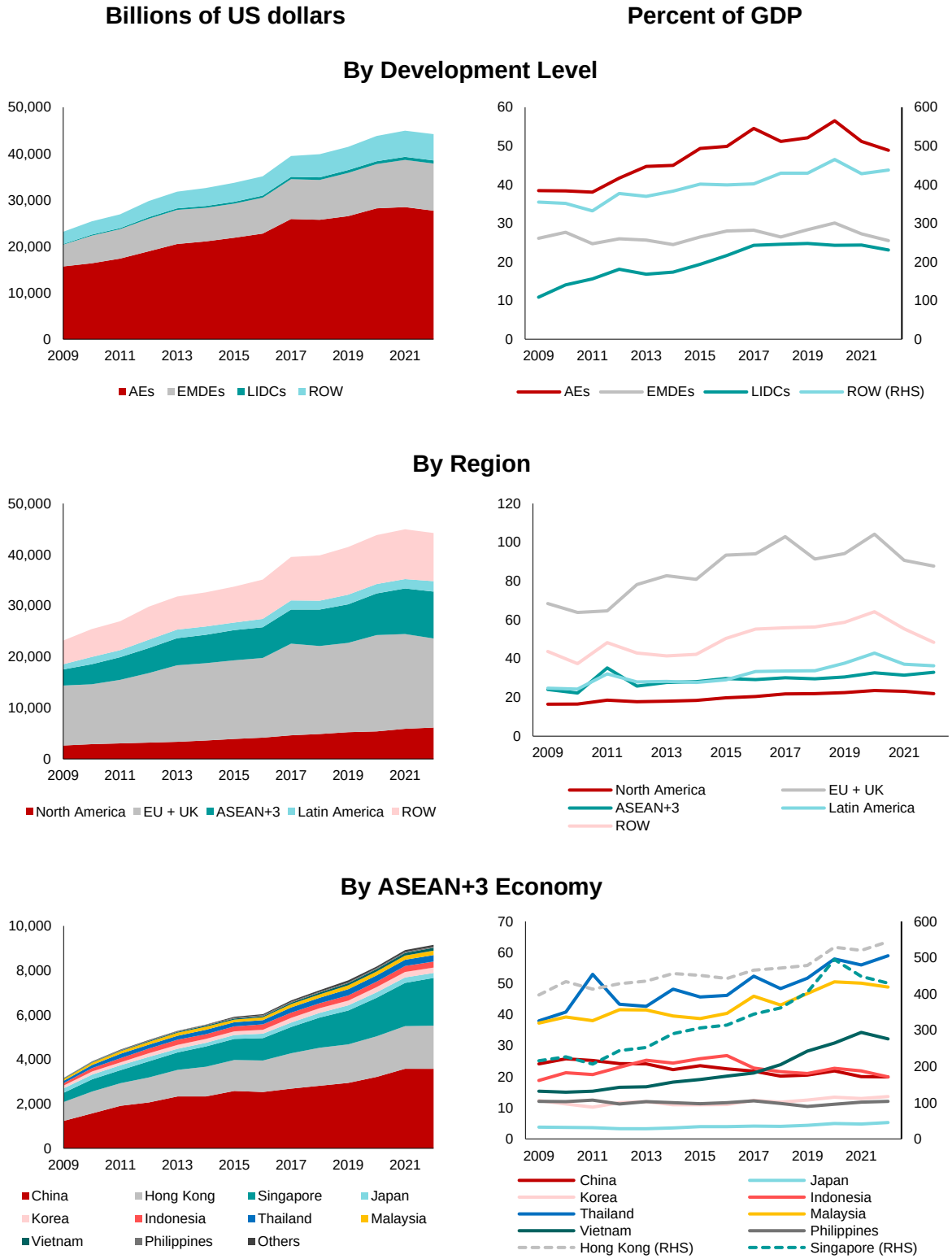
According to IMF CDIS data, the global stock of FDI has nearly doubled since the GFC. Total global FDI grew from USD 23 trillion in 2009 to USD 44 trillion as of the end of 2022, climbing from 38 percent to 44 percent of global GDP during this period (Figure 3).[5] Advanced economies (AEs) have received the bulk of global FDI, although their share has fallen steadily from 68 percent in 2009 to 63 percent in 2022 (Figure 4). Emerging market and developing economies (EMDEs) have largely compensated for the decline in investments in AEs, with their collective share rising from 20 percent in 2009 to 23 percent in 2022. However, the pace of growth in global FDI has moderated in recent years, from an annual average of 7 percent over 2010–17 to 2 percent over 2018–22. This slowdown is mainly due to muted FDI flows to AEs, attributable in part to US taxation reforms in late-2017—which led to large-scale repatriations of accumulated foreign earnings by US MNEs (UNCTAD 2017, 2018)—as well as the intensification in the US-China trade conflict.

Comparing across regions, Europe has consistently accounted for the largest share of global FDI, while ASEAN+3 has grown significantly in prominence as an FDI destination. The EU and United Kingdom together accounted for 40 percent of global FDI as of the end of 2022, followed by the ASEAN+3 region with 21 percent (Figure 4). While Europe's share has decreased relative to 2009 levels, that of ASEAN+3 has risen substantially from its 14 percent share that year. Indeed, as FDI in Europe has contracted, growth in global FDI since 2018 has largely been driven by investor interest in ASEAN+3, and secondarily, in North America, Latin America, and the rest of the world (ROW). In GDP terms, ASEAN+3 has recorded steady increases over the years, with its share rising from 24 percent of GDP in 2009 to 33 percent in 2022 (Figure 3). It has also defied the drop in FDI-to-GDP ratios recorded by other regions since 2021.

China and Hong Kong have been key growth drivers of ASEAN+3 FDI for over a decade, although ASEAN has also emerged as a significant recipient in recent years. China and Hong Kong have accounted for more than 50 percent of ASEAN+3 FDI growth since 2010. However, when FDI flows to China and Hong Kong moderated during the 2017–22 period relative to the 2010–16 period, ASEAN economies—led by Singapore, Malaysia, Vietnam, and Lao PDR—saw accelerated growth (Figure 5). The observed shift was prompted by China's softer economic growth outlook and increased regulatory scrutiny, exacerbated by the escalation of the US-China trade conflict (Hanemann, Witzke and Yu 2022; Fang 2023). Overall, ASEAN's contribution to the growth in FDI in ASEAN+3 rose from an average 33 percent over 2010–16 to 46 percent over 2017–22. Japan and Korea have also seen stronger FDI inflows more recently.

[5] Our computed world total of USD 44 trillion as of end-2022 incorporates adjusted mirror data, as described in Section III, for economies that do not report inward FDI to the IMF CDIS. It is 13.7 percent higher than the world total reported in CDIS for the same period—amounting to USD 39 trillion—which is based solely on the sum of reporting economies' inward FDI position.

Figure 2. World: FDI Stock, 2009–22



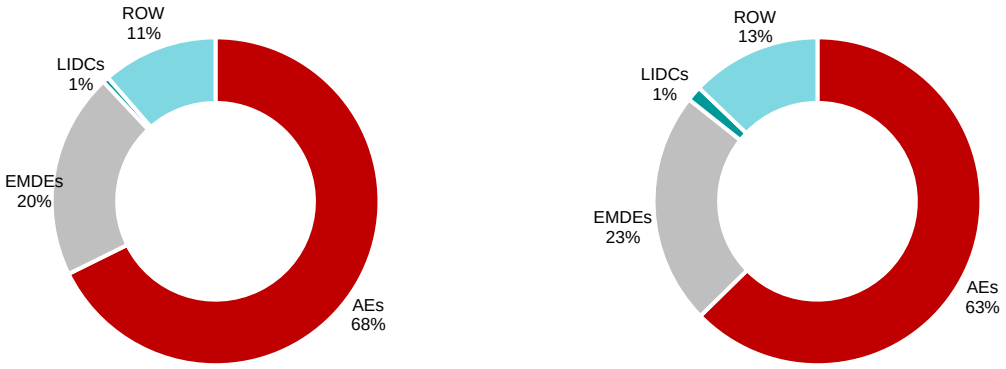
Sources: IMF CDIS via Haver Analytics; and authors' calculations.

Figure 3. World: Share of FDI Stock, 2009 and 2022

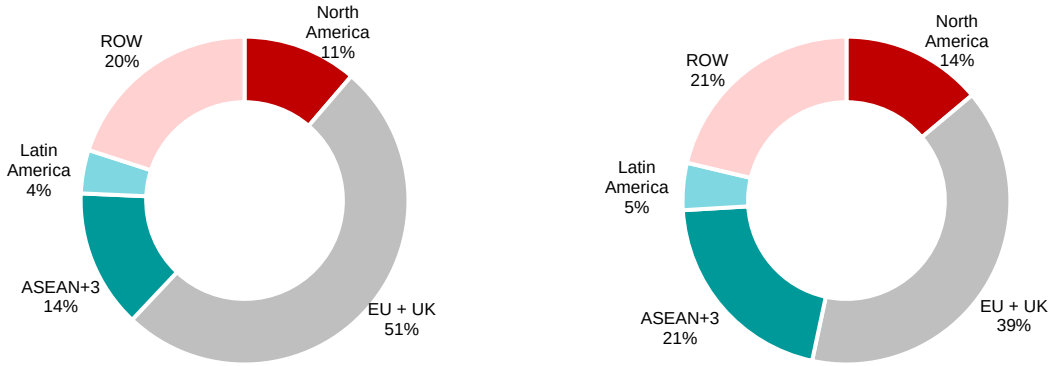
(Percent of total)

2009 **2022**

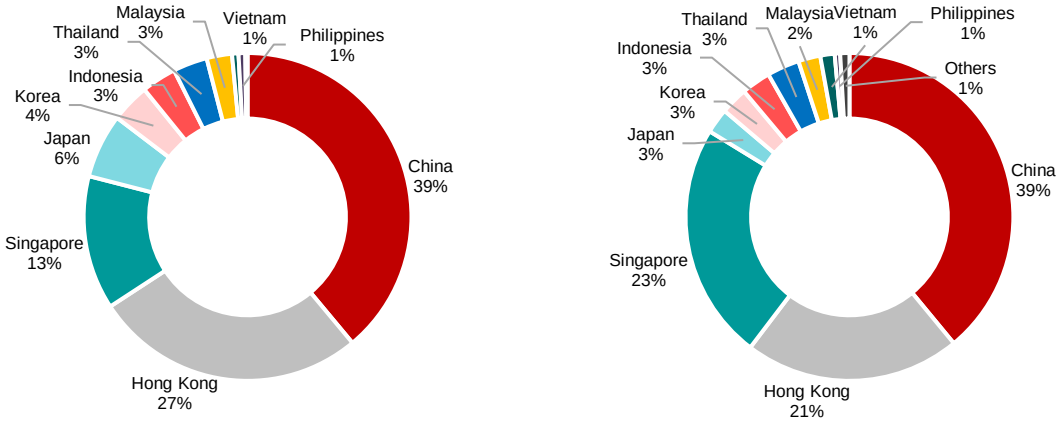
By Development Level



By Region

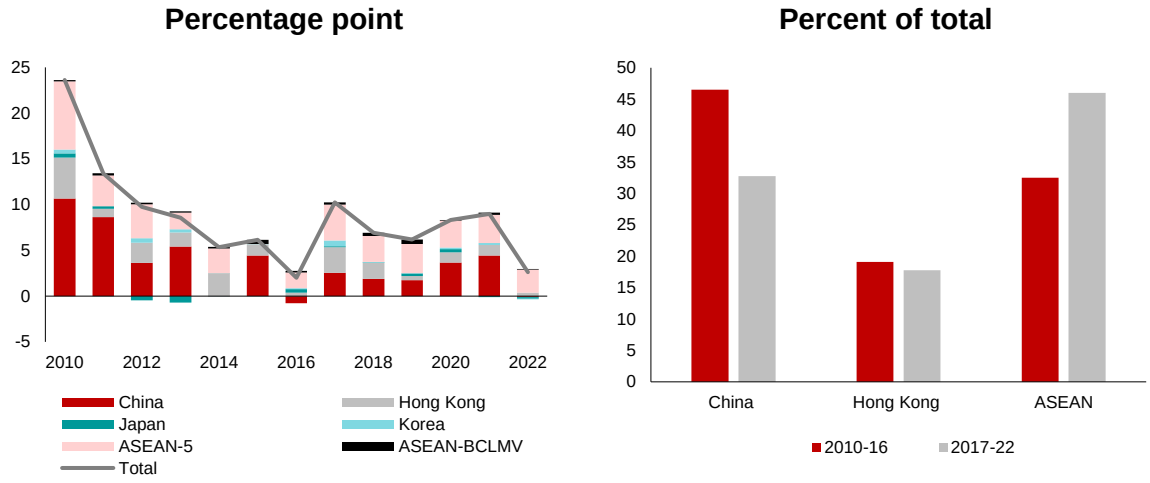


By ASEAN+3 Economy



Sources: IMF CDIS via Haver Analytics; and authors' calculations.

Figure 4. ASEAN+3: Contributions to Growth in Recipients' FDI Stock



Sources: IMF CDIS via Haver Analytics; and authors' estimates.
Note: ASEAN-5 comprises Indonesia, Malaysia, Philippines, Singapore, and Thailand. ASEAN-BCLMV comprises Brunei Darussalam, Cambodia, Myanmar, Lao PDR, and Vietnam. ASEAN refers to ASEAN-5 and ASEAN-BCLMV.

B. Genuine versus Phantom FDI

When FDI stock data are refined to exclude phantom FDI, the AEs and China collectively emerge as the largest source of genuine FDI globally, with a considerable proportion of these investments being routed through conduits. But even though genuine FDI has grown since 2017, phantom FDI remains substantial. When “phantom” FDI is distinguished from genuine FDI, the adjusted data reveal that:

- ***Global phantom FDI made up almost one-fifth of global FDI stock in 2022.*** It represented 18 percent or an estimated USD 8 trillion out of the global total of USD 44 trillion at that point (Figure 6). However, this proportion marked a sharp drop from the peak of 32 percent in 2017, reflecting the trend decline in FDI channeled to SPEs, as reported by the 19 OECD-member economies. The fall also reflects an increase in genuine FDI that is likely motivated by intensified efforts to diversify global supply chains following pandemic-related disruptions and heightened geopolitical tensions. Within the ASEAN+3 region, phantom FDI accounted for an estimated 20 percent of the region’s total in 2022; the remaining 80 percent of genuine FDI amounted to nearly USD 15 trillion.

- ***The stock of genuine global FDI has increased moderately, with the AEs and China responsible for the lion’s share.*** After netting out phantom FDI, the balance of USD 36 trillion in global genuine FDI represented an average 6 percent increase between 2017 and 2022. The AEs—particularly, euro area, United States, United Kingdom, and Japan—and China were the top five sources of the global stock of genuine FDI, collectively accounting for 62 percent of the global total in 2022 on an immediate-investor basis (Figure 7). Following adjustments to the data to estimate ultimate ownership, these economies are estimated to hold at 66 percent of the global stock of genuine FDI.

- ***An important share of genuine FDI globally comes from low-tax jurisdictions on an immediate-investor basis.*** Estimates based on immediate counterparty data

show that approximately one-third of the global stock of genuine FDI was invested from low-tax jurisdictions, such as the Cayman Islands, Hong Kong, and Switzerland as of 2022. That said, only half that amount represented genuine FDI from entities that are actually based in these low-tax areas. The balance originated from other locations, with these low-tax jurisdictions serving as conduits. The euro area—the world's leading genuine FDI source—hosts many of these low-tax jurisdictions (such as Luxembourg, Cyprus, and Ireland) that function as conduits for third-party investments. In 2022, the euro area's share of global genuine FDI stood at 33 percent on an immediate-investor basis and 22 percent on an ultimate-investor basis.

- ***China and the United States channel some of their global genuine FDI through third countries, including low-tax jurisdictions.*** China was the ultimate investor of an estimated 16 percent of global genuine FDI as of 2022, while its share based on immediate-investor data was only 3 percent. After accounting for another 3 percent that is attributable to round-tripping—investments that originate from China itself that are then reinvested back in China—the remaining 10 percentage points between the ultimate- and immediate-investor estimates reflect the portion of China's global genuine FDI that were routed through conduits (Figure 7). During the same period, the United States held 20 percent of global genuine FDI, with approximately 7 percentage points channeled through other jurisdictions.

- ***Among the largest FDI investors, round-tripping constitutes the largest proportion of China's outward genuine FDI.*** China's round-tripped FDI of 3 percent of global genuine FDI represented nearly two-fifths of its total outward genuine FDI in 2022.[6] By comparison, the euro area has a much smaller proportion of round-tripped FDI, amounting to 1 percent of global genuine FDI or the equivalent of 5 percent of the euro area's total outward genuine FDI. Other major FDI sources, such as Canada, Japan, and the United Kingdom, have even smaller proportions of round-tripped FDI.

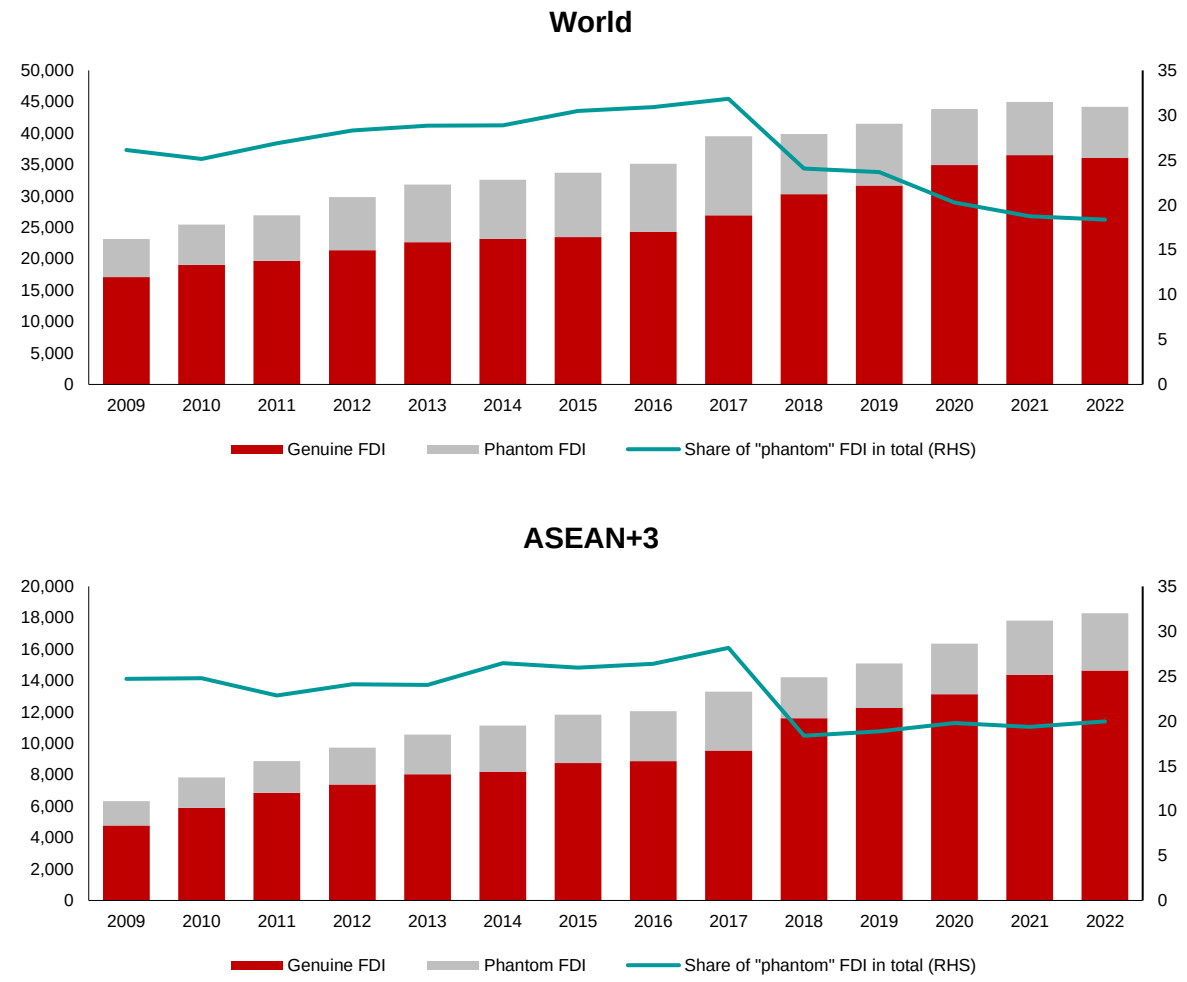
- ***In ASEAN+3, immediate-investor data mask China's dominant role as a genuine FDI source for the region, even after accounting for round-tripping activity.*** While China accounted for only 6 percent of ASEAN+3 genuine FDI on an immediate-counterparty basis, it is ultimately responsible for an estimated 37 percent of the region's stock of genuine FDI at the end of 2022 (Figure 8). Even after adjusting for round-tripping, China's share remains elevated at 22 percent. Hong Kong, the euro area, Japan, and the United States round out the top five sources of genuine FDI into ASEAN+3, with a combined share of 34 percent on an ultimate-investor basis in 2022.

- ***On an immediate counterparty basis, 59 percent of genuine FDI in ASEAN+3 involved entities registered in low-tax jurisdictions as of end-2022.*** However, only 24 percent of the region's genuine FDI stock originated from these low-tax areas (e.g., the Cayman Islands, Hong Kong, Singapore), while another 33 percent were

[6] Round-tripping by domestic investors often stems from preferential treatment for foreign capital, tax benefits, and governance concerns in their home countries (Aykut, Sanghi, and Kosmidou 2017). For instance, these factors have prompted many Chinese investors to channel their domestic investments through Hong Kong and other OFCs. As a result, some of these investments have been classified as FDI rather than portfolio investment (Hanemann, Witzke, and Yu 2022).

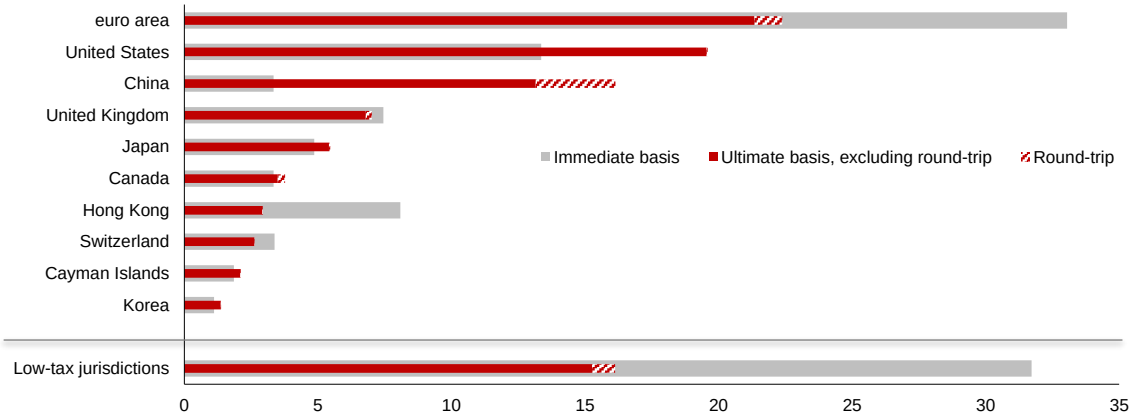
channeled through these jurisdictions by third-party economies. For example, genuine FDI from Hong Kong in ASEAN+3 would fall by 60 percent to an estimated 12 percent of the regional total in 2022, when calculated on an ultimate-investor basis.

Figure 6. World and ASEAN+3: Genuine and "Phantom" FDI Stock
(Billions of US dollar; percent of total)



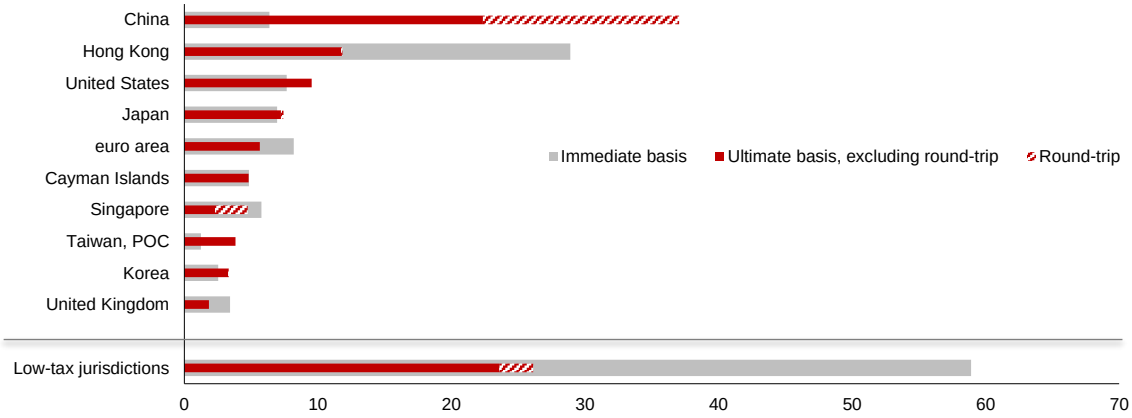
Sources: IMF CDIS and OECD FDI Statistics via Haver Analytics; and authors' esitmates.

Figure 7. World: Top 10 Genuine FDI Sources by Ultimate Investor, 2022
(Percent of global total)



Sources: IMF CDIS and OECD FDI Statistics via Haver Analytics; Moody's Orbis; and authors' estimates.
Note: Low-tax jurisdictions include Hong Kong, Cayman Islands, and Switzerland as well as Luxembourg, Cyprus, Ireland, Latvia, and Malta in the euro area. Kindly refer to Damgaard and Elkjaer (2017) for an exhaustive list.

Figure 8. ASEAN+3: Top 10 Genuine FDI Sources by Ultimate Investor, 2022
(Percent of regional total)



Sources: IMF CDIS and OECD FDI Statistics via Haver Analytics; Moody's Orbis; and authors' estimates.
Note: Low-tax jurisdictions include Hong Kong, Cayman Islands, and Switzerland as well as Luxembourg, Cyprus, Ireland, Latvia, and Malta in the euro area. Kindly refer to Damgaard and Elkjaer (2017) for an exhaustive list.

V. Reconfiguration of Global FDI Flows

A. Recent Trends in Immediate-Investor FDI Flows

Global FDI flows, based on the IMF BOPs, rebounded following the GFC-induced slump in 2009, but have generally trended downward since 2015. In the post-GFC period, the AEs led a strong resurgence in global FDI, which peaked at USD 3.2 trillion in 2015 (Figure 9).[7] However, this recovery momentum proved short-lived as global FDI flows declined from an annual average USD 2.6 trillion over 2011–15 to USD 1.6 trillion over 2016–22. FDI flows, in particular, hit a post-GFC low in 2018, largely attributable to declines in inflows to Europe amid repatriations of accumulated foreign earnings by US multinational enterprises. Global FDI flows subsequently experienced a partial recovery, anchored by increased inflows to EMDEs and, to a lesser extent, low-income developing countries (LIDC)s.

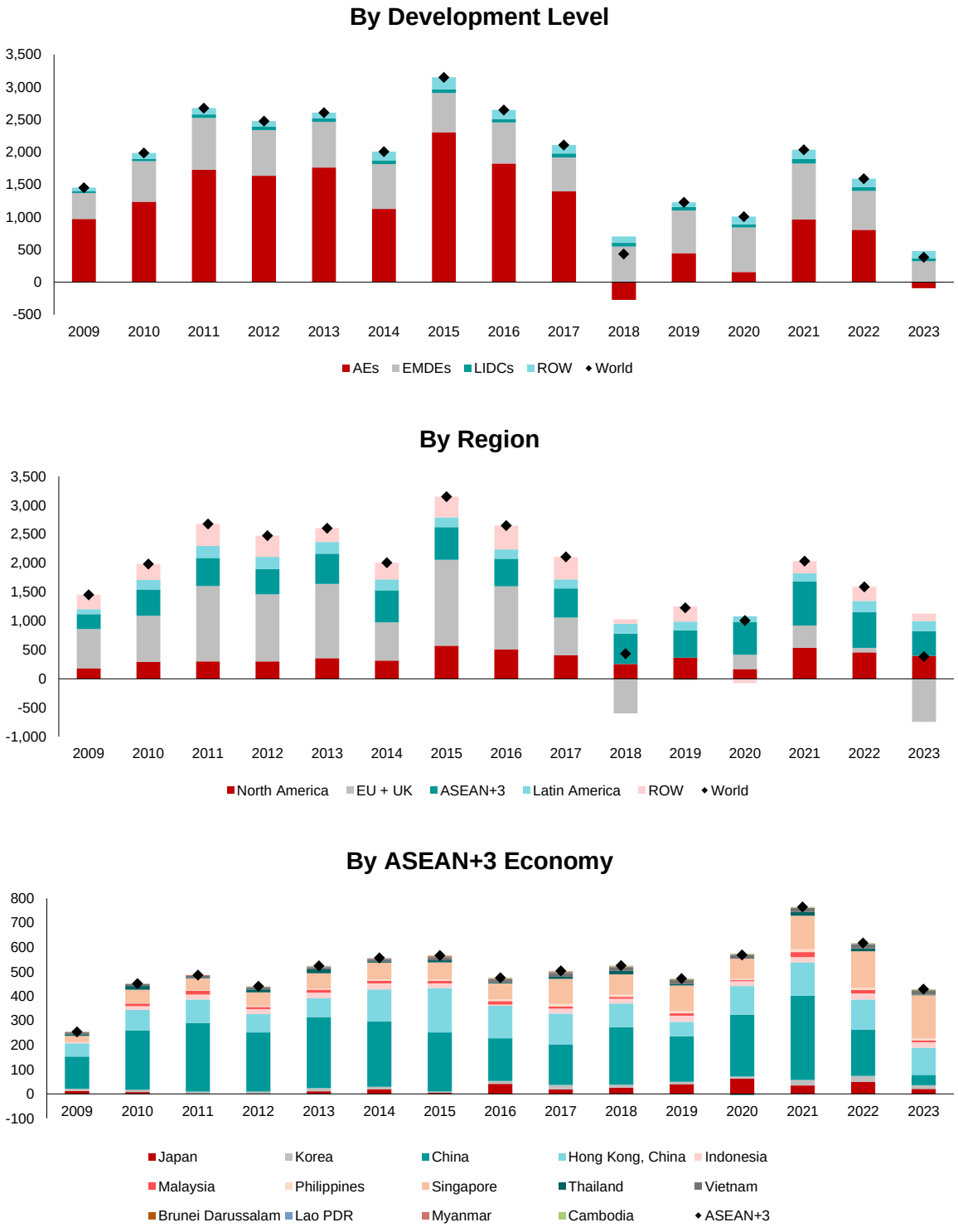
The ASEAN+3 region has outpaced other regions globally in attracting FDI and establishing itself as a leading FDI destination. The region's share of global FDI flows increased substantially from an average 20 percent over 2015–17 to 60 percent over 2018–19 and 45 percent over 2021–23, surpassing those of other regions (Figure 10). The region's ascent has come at the expense of Europe, which has been recording FDI reversals since 2018. Since 2015, North America and Latin America have also attracted greater FDI compared to earlier periods, albeit not as much as the ASEAN+3 region.

China is the leading FDI recipient among ASEAN+3, but several ASEAN economies have also recorded stronger FDI inflows since 2015. China has consistently received the largest share of FDI among ASEAN+3, although it has declined from an average 38 percent over 2015–17 to 32 percent over 2021–23 (Figure 10). Correspondingly, FDI into Hong Kong has fallen relative to the regional total since 2015. In contrast, FDI flows into Singapore have surged, from an average 15 percent over 2015–17 to 26 percent in the last three years—bringing the city-state's regional share to nearly as much as China's. FDI inflows have likewise increased in the rest of ASEAN-5, Cambodia, and Vietnam, while Japan and Korea have observed steady increases in inflows since 2015, with their combined shares rising from an average 17 percent over 2015–17 to 22 percent over 2021–23.

FDI inflows to ASEAN+3 over the past decade have outpaced economic growth rates. Notably, Cambodia and Singapore have seen substantial increases in their FDI-flow-to-GDP ratios, rising by an average 8 percentage points over 2015–17 to 19 percent and 32 percent, respectively, over the 2021–23 period (Figure 11). Japan, Korea, and Thailand have experienced modest increases in their FDI-flow-to-GDP ratios during the same timeframe, while the FDI-flow-to-GDP ratios of Indonesia, Malaysia, the Philippines, and Vietnam have remained relatively stable. In contrast, FDI inflows as a share of GDP have declined in China, Hong Kong, and Lao PDR during the 2021–23 period compared to their respective average 2015–17 levels.

[7] The global FDI totals cited above are from the IMF and differ from those of UNCTAD, which reports a 37 percent decline in global FDI from USD 2.1 trillion in 2015 to USD 1.3 trillion in 2022 (UNCTAD 2023). The IMF compiles FDI using the *asset/liability approach* in the Balance of Payments and International Investment Position Manual, 6th edition (*BPM6*), while UNCTAD presents FDI on a *directional basis* following *BPM5* (5th edition).

Figure 9. World: FDI Flows, 2009–23
(Billions of US dollars)

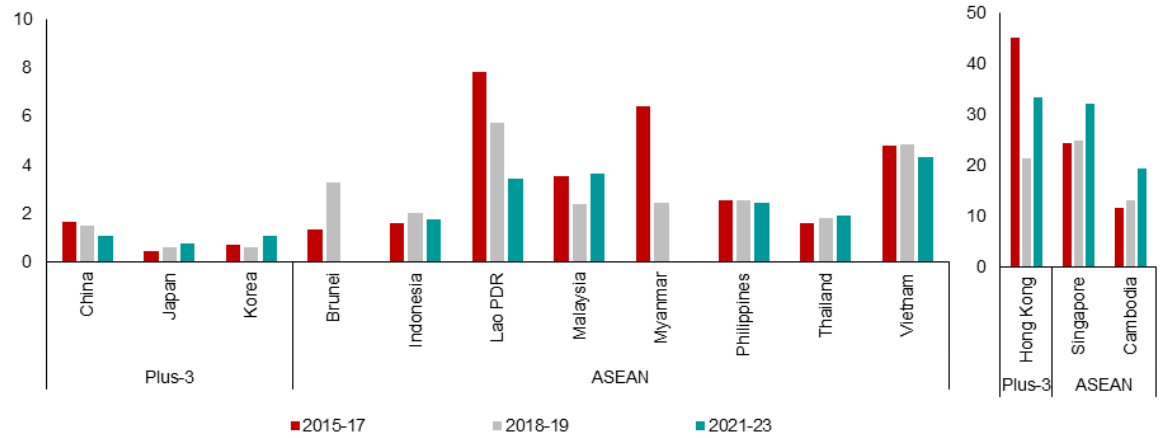


Sources: IMF BOPS via Haver Analytics; and authors' calculations.
Note: Data are derived from the direct investment liabilities item in the balance of payments. Data for 2023 are the sum of the first three quarters of the year for most economies.

Figure 10. World and ASEAN+3: Proportion of FDI Flows
(Percent of respective group total)

Sources: IMF BOPS via Haver Analytics; and authors' calculations.
Note: Data are derived from the direct investment liabilities item in the balance of payments. Data for 2023 are the sum of the first three quarters of the year for most economies.

Figure 11. ASEAN+3: FDI Flows Relative to Economic Size
(Percent of GDP)



Sources: IMF BOPS via Haver Analytics; and authors' calculations.

B. Genuine FDI Flows on an Ultimate-Investor Basis

Both Europe and ASEAN+3 have emerged as primary recipients of genuine FDI flows, despite broader trends showing gross FDI— comprising both phantom and genuine FDI— moving away from Europe. Gross FDI flows appear to have shifted away from Europe toward ASEAN+3, North America, and Latin America post-GFC, including during the US-China trade conflict period starting in 2018. However, AEs—especially Europe (euro area and the United Kingdom)—have continued to attract genuine FDI flows from most regions, with annual inflows amounting to an average 4 percent of Europe's GDP over 2018–22 (Tables 1 and 2). Similarly, ASEAN+3 recorded a 2.3 percentage-point increase in genuine FDI received between 2017 and 2022, with inflows amounting to an annual average of 1.6 percent of the region's GDP. The higher FDI allocations to Europe and ASEAN+3 appear to have come at the expense of reductions to Latin America and North America.

Within the ASEAN+3 region, genuine FDI has predominantly flowed into ASEAN and Hong Kong in recent years. Among ASEAN, allocations to Singapore from the world's largest FDI sources increased between 2017 and 2022, with genuine FDI inflows amounting to an annual average of 34 percent of its GDP (Appendix Tables 2.1 and 2.2). Vietnam also saw a boost in FDI, particularly from China, with genuine FDI amounting to an annual average of almost 4 percent of GDP over 2018–22. Among the Plus-3 economies, Hong Kong was the only jurisdiction to have received increased allocations in genuine FDI, notably from the United Kingdom; however, these amounts were relatively small compared to the overall investment by China in Hong Kong. With the exception of Myanmar, other ASEAN+3 economies continued to record inflows over the 2018–22 period, albeit at lower or unchanged FDI shares.

The intensification in the US-China trade conflict in 2018 saw the two major economies scaling back on genuine FDI in each other. However, China reduced its share of FDI allocation to the United States much more substantially. The United States accounted for 19 percent of China's total outward FDI position in 2017; but it had fallen to less than 6 percent by the end of 2022. In contrast, US allocation of genuine FDI to China declined by just 0.3 percentage point of its total holdings from 2017 to 2022, down to 2.6 percent. US allocation to Hong Kong was minimal and largely unchanged, at less than 0.2 percent of the US total as of the end of 2022.

Table 1. ASEAN+3 and Selected Economies: Change in Investor Share of Genuine FDI on Ultimate-Investor Basis Excluding Round-Tripping, 2017 to 2022
(Percentage points)

Recipient / Investor	Plus-3				ASEAN			AEs		Other EMDEs		
	China	Hong Kong	Japan	Korea	ASEAN-5	BCLMV	Euro Area	United Kingdom	United States	Brazil	India	Mexico
Euro Area	0.58	-0.03	-0.28	0.01	0.31	-0.02	5.79	-1.09	2.17	-0.73	0.11	0.37
United States	-0.29	0.01	-0.28	-0.33	1.74	-0.01	10.09	5.80		-1.00	-0.08	-0.79
China		-3.92	-0.19	-1.19	-1.88	0.63	-3.22	-1.30	-13.60	-0.88	0.02	-0.10
United Kingdom	-0.08	1.06	-0.23	-0.17	0.18	-0.05	5.63		-2.09	-0.74	-0.37	-0.21
Japan	0.07	0.01		-0.31	-1.08	-0.12	2.36	-0.71	2.33	-0.68	-1.10	-0.01
Canada	0.04	0.36	0.27	0.02	1.43	0.03	8.38	-0.03	-2.70	-0.01	0.17	0.30
Hong Kong	26.76		0.02	0.12	0.75	0.10	0.94	-0.61	-0.11	0.11	-0.01	0.01
Switzerland	0.58	0.05	0.42	0.05	1.43	0.01	-6.22	2.89	0.49	-1.22	0.82	-0.04
Cayman Islands	5.19	0.68	-0.54	-0.94	7.07	0.00	4.70	-4.15	-10.10	0.57	0.42	-0.02
Korea	1.07	0.16	0.10		2.17	-2.55	-0.99	-0.56	-0.84	-0.99	-0.80	0.01
ROW	-3.75	0.09	0.06	0.05	2.10	0.06	6.72	0.90	2.99	0.03	0.37	0.08
TOTAL	-0.33	1.18	-0.12	-0.11	1.49	0.14	3.14	0.68	-0.92	-0.67	-0.03	-0.06

Sources: IMF CDIS and OECD FDI Statistics via Haver Analytics; Moody's Orbis; and authors' estimates.
Note: The investor column lists the top 10 FDI sources as shown in Figure 7. Figures refer to the changes in bilateral FDI shares between 2022 and 2017. The bilateral FDI share for any given year is calculated as the economy's FDI stock relative to the source economy's total outward FDI. ROW = rest of the world.

Table 2. ASEAN+3 and Selected Economies: Genuine FDI Flows on Ultimate-Investor Basis Excluding Round-Tripping, 2018–22 Average
(Percent of Recipient GDP)

Recipient / Investor	Plus-3				ASEAN			AEs		Other EMDEs		
	China	Hong Kong	Japan	Korea	ASEAN-5	BCLMV	Euro Area	United Kingdom	United States	Brazil	India	Mexico
Euro Area	0.08	-0.11	-0.07	0.04	0.22	-0.04	1.05	-0.29	0.27	-0.35	0.11	0.62
United States	0.05	0.23	0.05	-0.01	1.43	0.01	1.77	4.12		0.22	0.39	0.84
China		28.25	0.03	0.22	1.96	3.18	0.00	-0.14	-0.07	-0.10	0.06	0.06
United Kingdom	0.01	1.51	-0.01	-0.01	0.12	0.01	0.54		0.12	-0.09	0.12	0.02
Japan	0.09	0.08		0.09	0.19	0.09	0.14	0.06	0.20	-0.05	-0.01	0.04
Canada	0.01	0.28	0.02	0.01	0.15	0.02	0.18	0.07	0.15	0.06	0.02	0.22
Hong Kong	0.45		0.00	0.02	0.07	0.05	0.02	-0.04	0.00	0.01	0.00	0.00
Switzerland	0.01	0.03	0.02	0.01	0.11	0.01	-0.02	0.20	0.02	-0.11	0.07	0.01
Cayman Islands	0.11	0.96	0.02	-0.04	0.58	0.00	0.12	-0.05	0.00	0.11	0.03	0.00
Korea	0.06	0.04	0.01		0.12	-0.05	0.00	-0.01	0.02	-0.02	0.01	0.02
ROW	-0.19	0.43	0.02	0.05	0.97	0.21	0.65	0.49	0.18	0.09	0.18	0.09
TOTAL	0.69	31.70	0.09	0.40	5.93	3.49	4.45	4.41	0.89	-0.22	0.98	1.93

Sources: IMF CDIS and OECD FDI Statistics via Haver Analytics; Moody's Orbis; and authors' estimates.
Note: Figures represent average FDI flows relative to the host entity's GDP for a given period. The investor column lists the top FDI sources as shown in Figure 7. ROW = rest of the world.

C. ASEAN+3 Greenfield FDI at the Firm Level

Cross-border investment data at the firm level reported by OCI show that ASEAN is capturing an increasing share of greenfield investments directed to the ASEAN+3 region.[8] While cross-border greenfield projects from OCI do not fully capture all FDI flows, they correlate reasonably well for ASEAN+3 after accounting for the typical one- to three-year timeframe from project announcement to completion (Figure 12). There appears to be a shift in investor focus post-COVID-19 pandemic, which may have been prompted, in part, by the escalation of the US-China trade conflict in 2018, as well as the supply disruptions experienced during the pandemic. Since China's greenfield project announcements peaked in 2018, investor interest in ASEAN has driven the broader recovery in the ASEAN+3 region (Figure 13). This trend has raised ASEAN's share from a low of 38 percent of the region's total by value in 2018 to more than 60 percent in 2023.

New investments dominate greenfield FDI in both ASEAN and China, with observed shifts in investment strategies. Nearly 70 percent of the announced greenfield FDI in ASEAN and China involve new operations (Figure 14).[9] Co-location projects gained traction in both regions from 2017–19. Since 2020, ASEAN has recorded an increase in expansion projects, likely driven by efforts to diversify supply chains. ASEAN has consistently attracted diverse greenfield investors, including from China, Japan, Korea, the United States, and fellow ASEAN members. In contrast, recent greenfield FDI in China has increasingly been concentrated around European investors, following a decline in investments by the United States (Figure 15). Unlike ASEAN, where FDI is primarily geared toward global markets, FDI in China has become more domestically-oriented, possibly signaling China's potential detachment from global production networks (Figure 16).

Manufacturing projects have consistently made up the bulk of greenfield investments in China, while ASEAN has a more diverse sectoral mix. Projects in the manufacturing sector have traditionally made up at least 60 percent of greenfield investments in the former, while investments in ASEAN manufacturing only reached this relative magnitude in 2020 (Figure 17). The recent increase in manufacturing FDI in ASEAN is mainly in key markets: Malaysia (particularly, semiconductors), Indonesia (electrical equipment, motor vehicles, and commodities), Singapore (semiconductors and pharmaceuticals), and Vietnam (semiconductors and motor vehicles).[10] Beyond manufacturing, ASEAN has also seen a post-pandemic resurgence in FDI in the mining and quarrying sector, led by Indonesia, and in transportation and storage, driven by Singapore.

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[8] Greenfield FDI refers to a company setting up, or expanding, a physical presence in a foreign market. Greenfied FDI can be considered a component of genuine FDI, in addition to crossborder M&A deals which refer to projects that have an over 10 percent foreign ownership, and include acquisitions, mergers, demergers, joint ventures and minority stakes.

[9] Greenfield FDI can come in the form of new operation, co-location, expansion, and relocation. Co-location projects refer to existing foreign companies investing in different business activities within the same country. Expansion projects are those involving additional capital spending or job creation within an existing project. Relocation refers to a project that has been relocated from one location to another.

[10] In the case of Vietnam, the country's cost-competitive and abundant labor force, stable political environment, and attractive tax and non-tax FDI incentives—along with its proximity to China amid global efforts to diversify supply chains—have made it an appealing FDI destination, particularly in the manufacturing sector (del Rosario and Zhao 2023).

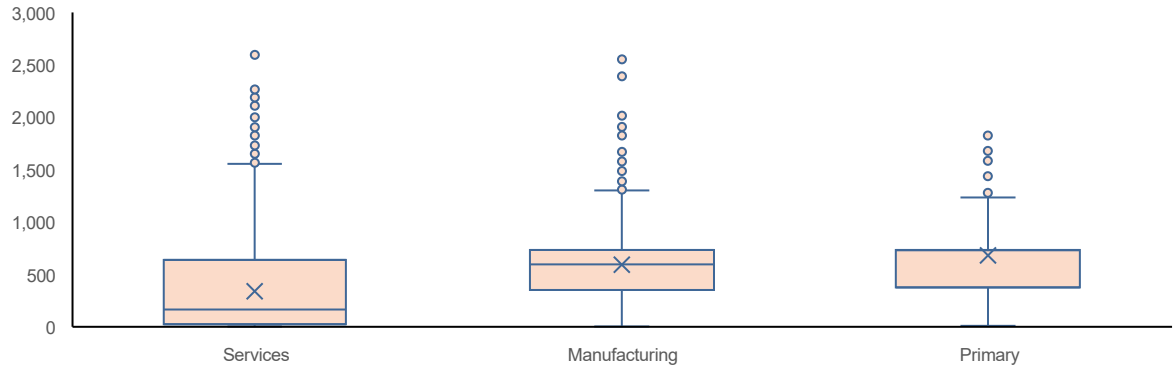
A growing proportion of greenfield FDI in ASEAN+3 is flowing into strategic sectors, with ASEAN leading the sharp increase.[11] Despite a broader decline in FDI activity across the region during the COVID-19 pandemic, greenfield FDI in strategic sectors in ASEAN remained steady and then surged in 2023 (Figure 18). Moody's Orbis data show that announced greenfield FDI in strategic sectors in ASEAN+3 reached nearly USD 90 billion in 2023, accounting for 40 percent of the region's total, wherein:

- ASEAN attracted over two-thirds of these strategic investments, collectively surpassing China, which had been the dominant recipient previously. Japan and Korea have also recorded greater FDI in strategic sectors in recent years.

- The bulk of the increase in ASEAN+3 FDI in 2023 was to semiconductors (in Malaysia and Vietnam), as well as to sectors such as chemical and motor vehicle manufacturing (in Korea, Indonesia, Malaysia, Thailand, and Vietnam) (Table 3).

The evidence is consistent with Tan (2024), which finds that fragmentation in global FDI has occurred only for certain industries that likely have strategic value, and more pronounced for outward FDI from the US, shifting from China to advanced Europe and the rest of Asia.

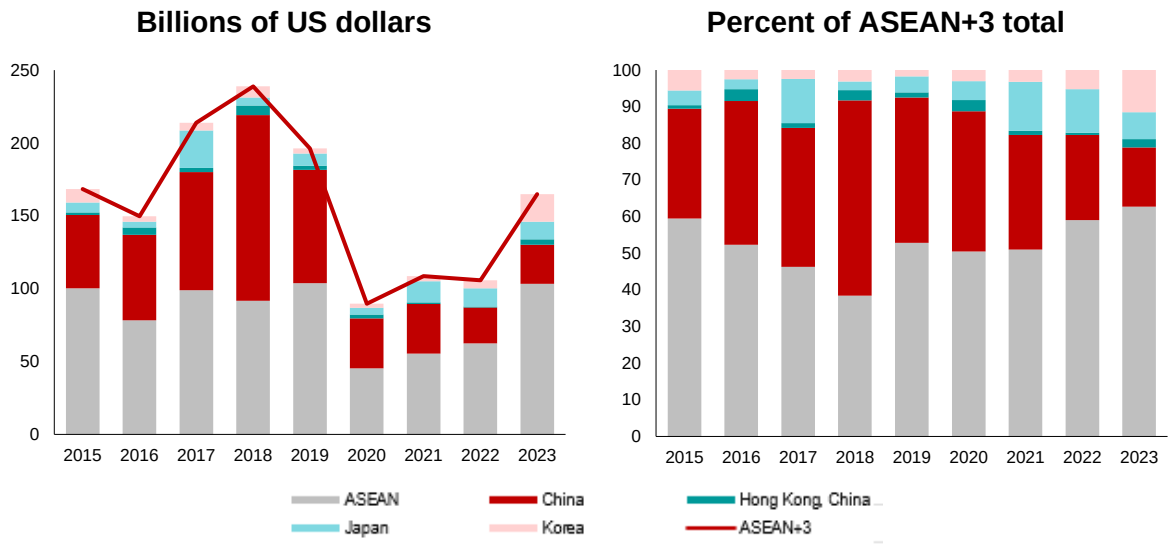
Figure 12. ASEAN+3: Timeframe from Announcement to Completion of Cross-border Greenfield Projects, 2015 to 2024
(Number of days)



Sources: Orbis Crossborder Investment; and authors' estimates.
Note: The figure illustrates the duration, in days, between the announcement of a project and its reported completion across ASEAN+3 economies, covering the period from 2015 to 2024.

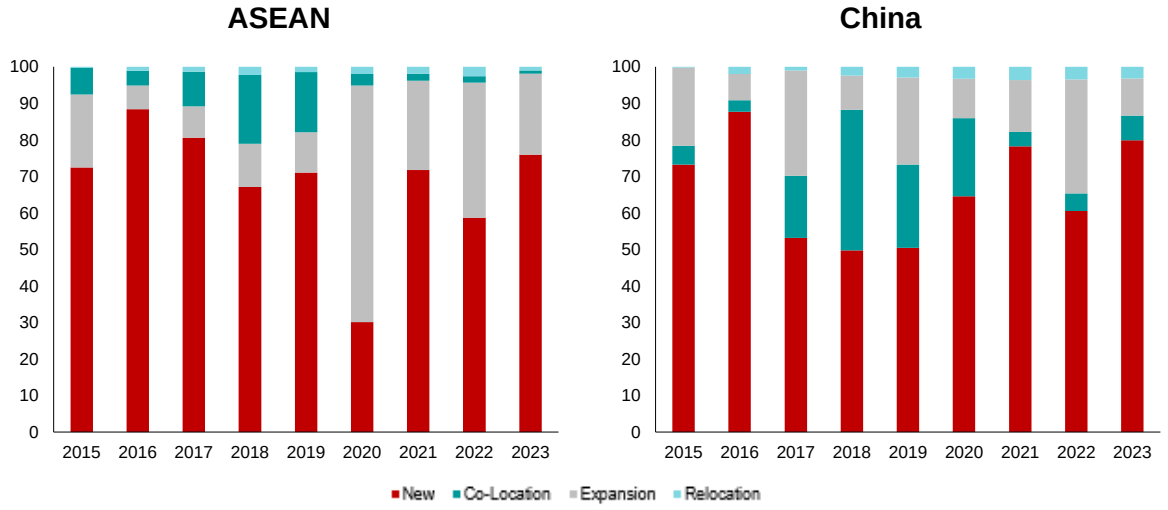
[11] Strategic sectors refer to critical minerals, semiconductors, pharmaceutical ingredients, and others that are deemed essential for national and economic security (Appendix III).

Figure 13. ASEAN+3: Announced Greenfield FDI in Member Economies



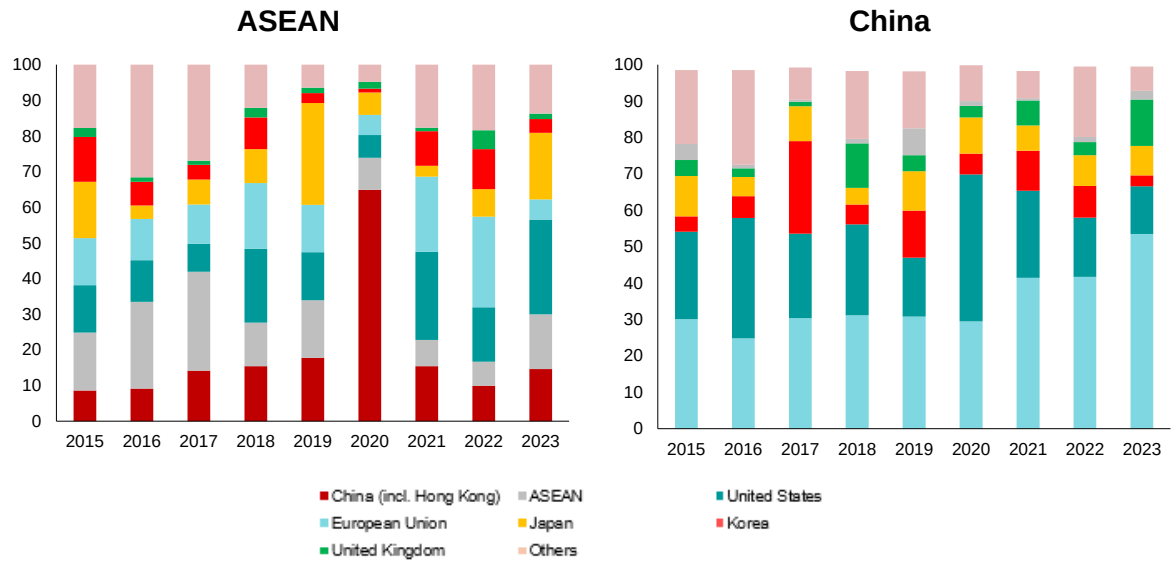
Sources: Orbis Crossborder Investment; and authors' estimates.

Figure 14. ASEAN and China: Announced Greenfield FDI by Type
(Percent of group or entity total)



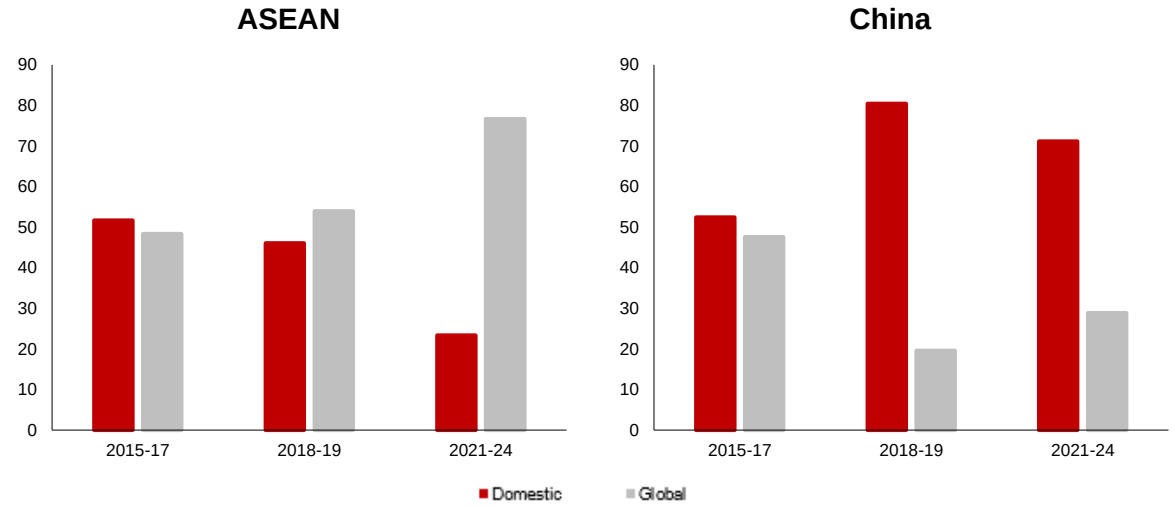
Sources: Orbis Crossborder Investment; and authors' estimates.

Figure 15. ASEAN and China: Announced Greenfield FDI by Investor Economy
(Percent of group or entity total)



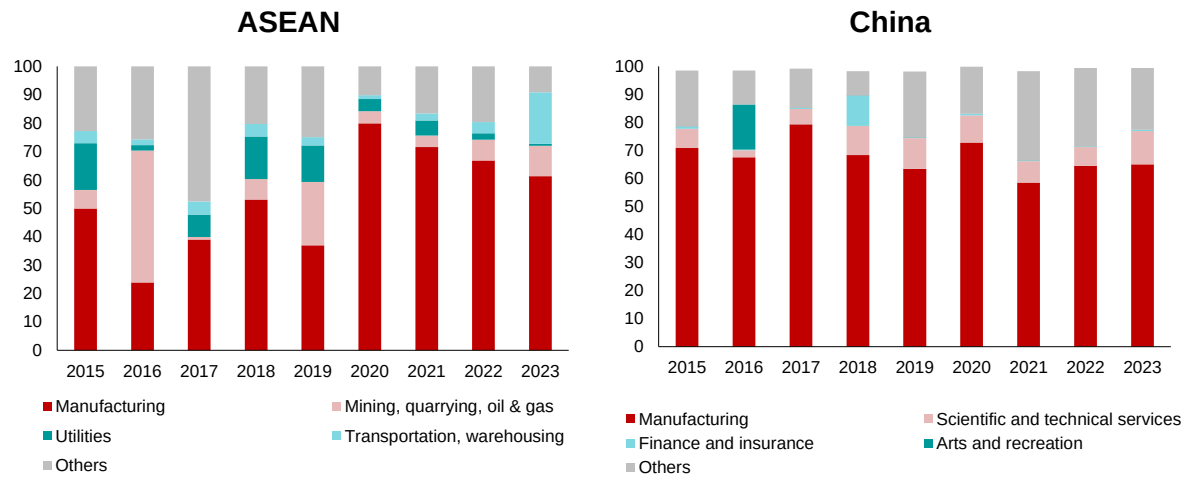
Sources: Orbis Crossborder Investment; and authors' estimates.

Figure 16. ASEAN and China: Announced Greenfield FDI by Market Served
(Percent of group or entity total)



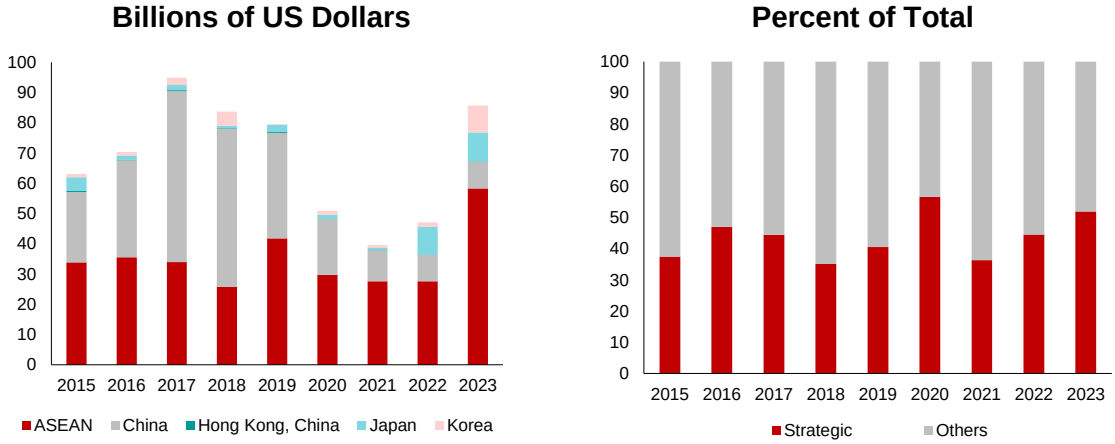
Sources: Orbis Crossborder Investment; and authors' estimates.

Figure 17. ASEAN and China: Announced Greenfield FDI by Sector
(Percent of total)



Sources: Orbis Crossborder Investment; and authors' estimates.

Figure 18. ASEAN+3: Announced Greenfield FDI in Strategic Sectors



Sources: Orbis Crossborder Investment; and authors' estimates.

VI. Extension: Identifying ASEAN+3 FDI Hubs

Investment hubs play a crucial role as conduits for FDI across countries and regions. Although capital is mobile, capital flows are subject to market frictions in the form of information and transactions costs, as well as from internationally diverging tax and legal systems (Hers and others 2018). Investment hubs that have well-developed and trustworthy financial systems and corporate service providers (CSPs) improve the allocation of international capital by facilitating risk management and intermediation; providing economies of scale on information acquisition costs; offering a well-functioning legal system and reliable legal services, strong corporate governance and attractive tax benefits, and hence reducing overall transaction costs (Hers and others 2018; Levine 1997; Merton and Bodie 1995).

Several ASEAN+3 jurisdictions rank highly across key metrics that make for attractive FDI hubs or final destinations. Economies such as Singapore, Korea, Malaysia, and Japan, in particular, score well in important areas such as human capital, manufacturing ecosystem, innovativeness, infrastructure, and governance (Table 4), per the framework applied in Walsh and Yu (2010). A 2020 global survey showed that Singapore, Seoul, Tokyo, and Hong Kong were considered among the world's top business districts (EY-ULI 2020). For 2024, The World Bank's Business Ready (B-READY) rates Hong Kong and Singapore in the second quintile in terms of their regulatory framework; Singapore in the top quintile for public services, with Hong Kong and Indonesia in the second quintile; and Singapore, Hong Kong, and Vietnam in the top quintile for operational efficiency (The World Bank 2024).[12] Meanwhile, the latest IMD World Competitiveness Rankings places Singapore first and Hong Kong fifth, with seven ASEAN+3 economies in the top fiftieth percentile in the sample of 67.

Distance also matters for FDI even though investments are able to flow anywhere in the world. Proximity to an investment hub has been found to have a positive effect on FDI, arguably because these hubs have developed regional networks and expertise in regional practices, procedures and regulations (Hines 2010). Analysis by Hudecz and others (2024) using minimum spanning trees for FDI on an immediate-investor basis shows that Japan was a hub for FDI in Asia during the 2013–17 period, while Singapore became an important hub between the US and other Asian countries over 2018–22 (Figure 19). When the data are refined to deduce FDI on an ultimate-investor basis, we see that Japan was also an important final destination for FDI during 2013-17, while it is clear that investors used Singapore as an Asian FDI base (Figure 20).

[12] The World Bank's new flagship report, launched on October 3, 2024, assesses the regulatory framework and public services directed at firms, and the efficiency with which regulatory framework and public services are combined in practice for 50 selected economies. B-READY is organized according to topics essential for private sector development that correspond to various stages of the life cycle of a firm and its participation in the market while opening, operating (or expanding), and closing (or reorganizing) a business. The 10 topics are Business Entry, Business Location, Utility Services, Labor, Financial Services, International Trade, Taxation, Dispute Resolution, Market Competition, and Business Insolvency. For each topic, B-READY considers three pillars: Pillar I, Regulatory Framework; Pillar II, Public Services; and Pillar III, Operational Efficiency.

Table 3. ASEAN+3: Change in Amount of Announced Greenfield FDI in Strategic Sectors, 2022 to 2023
(Millions of US dollars)

Recipient / Sector	Plus-3			Selected ASEAN								ASEAN+3
	China	Hong Kong	Japan	Korea	Cambodia	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam	
Critical minerals	46.14	0.00	0.00	203.62	210.14	0.00	-123.70	0.00	0.00	0.00	0.00	336.20
Green energy	0.00	0.00	10.62	0.00	0.00	0.00	386.84	-1,304.35	-4.29	442.22	4.40	-464.55
Pharmaceutical ingredients	-510.56	4.36	0.00	0.00	0.00	227.58	-4.22	218.55	-770.21	82.45	-10.71	-762.75
Semiconductors	1,632.12	0.00	578.09	-1,054.57	0.00	0.00	13,030.73	-56.55	-1,631.86	-551.02	4,021.56	15,968.49
Telecoms and 5G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Others*	-957.17	-4.25	-166.22	8,146.46	583.82	7,727.42	1,691.32	-4.13	-249.92	2,977.93	2,395.85	22,132.81
TOTAL	210.53	0.11	422.48	7,295.50	793.97	7,955.00	14,980.98	-1,146.48	-2,656.27	2,951.58	6,411.09	37,210.19

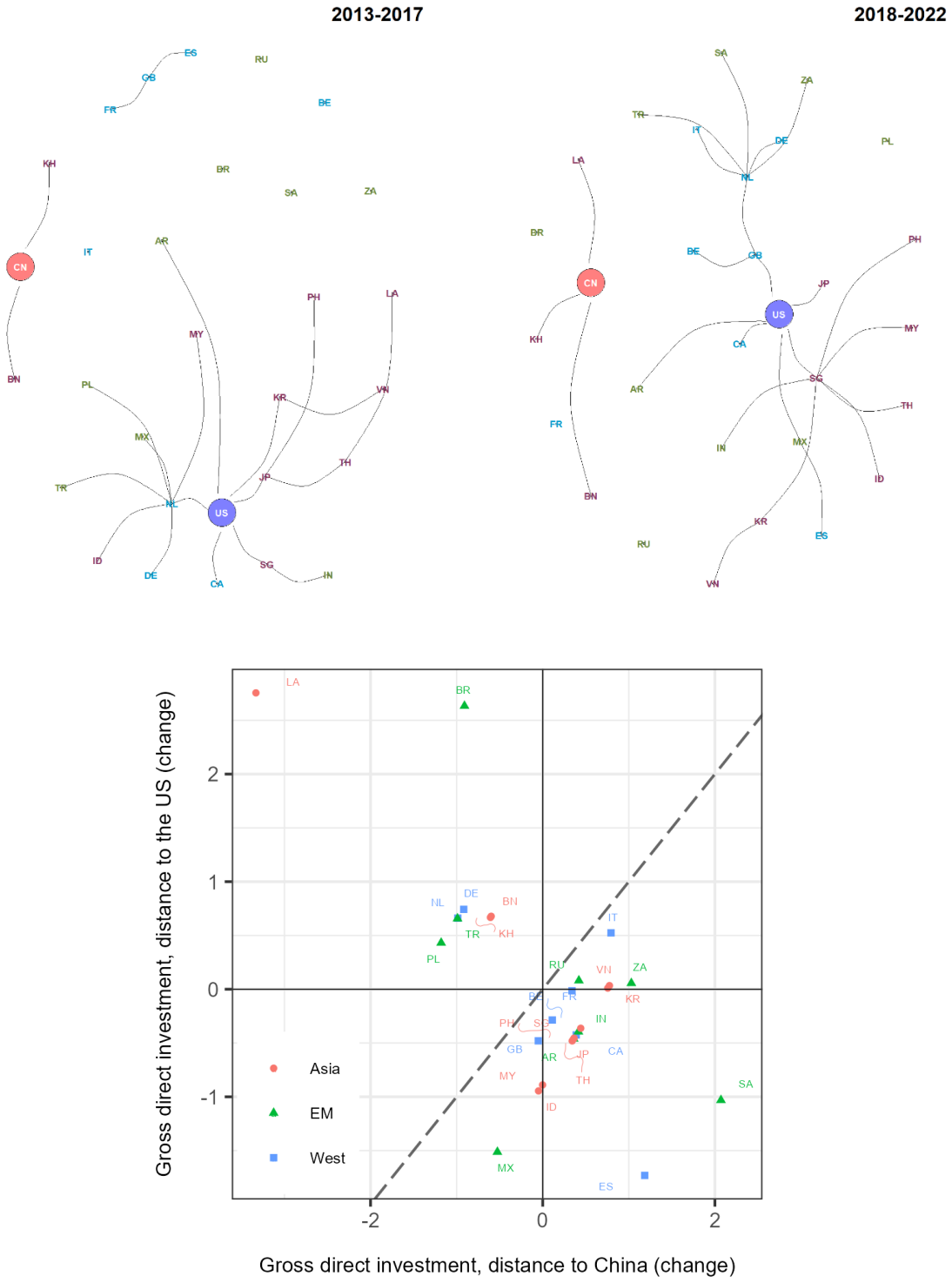
Sources: Orbis Crossborder Investment; and authors' estimates.
Note: *Others may refer to chemical and motor vehicle manufacturing, crude petroleum extraction, and non-ferrous metal processing. Only ASEAN+3 economies with non-zero entries for all identified strategic sectors are presented.

Table 4. Rankings of Attractiveness Factors for FDI
(Percentile)

Region	Economy	Indicator							
		Market Prospects	Human Capital	Manufacturing Ecosystem	Innovation Ecosystem	Infrastructure	Governance	Natural Resources	Overall
Plus-3	Korea	58	79	86	91	90	84	16	72
	Japan	43	45	61	77	89	92	44	64
	China	48	57	57	96	80	46	34	60
	Hong Kong	80	76	14	68	94	88	00	60
ASEAN-5	Singapore	86	93	91	95	93	97	03	80
	Malaysia	69	67	88	72	76	71	32	68
	Thailand	61	55	77	57	77	50	25	58
	Indonesia	45	54	50	56	45	50	57	51
	Philippines	46	40	65	50	57	40	35	47
BCLMV	Vietnam	77	51	93	61	68	46	58	65
	Brunei Darussalam	63	86	78	46	67	88	28	65
	Cambodia	58	39	68	24	26	32	85	47
	Lao PDR	51	42	24	42	19	36	95	44
	Myanmar	33	49	55	50	26	06	00	31
Latin America	Brazil	34	60	31	46	59	36	97	52
	Mexico	47	57	69	50	47	32	46	50
Oceania	Australia	40	72	20	75	80	92	61	63
	New Zealand	42	66	23	56	80	94	67	61
South Asia	India	47	50	42	34	47	49	38	44

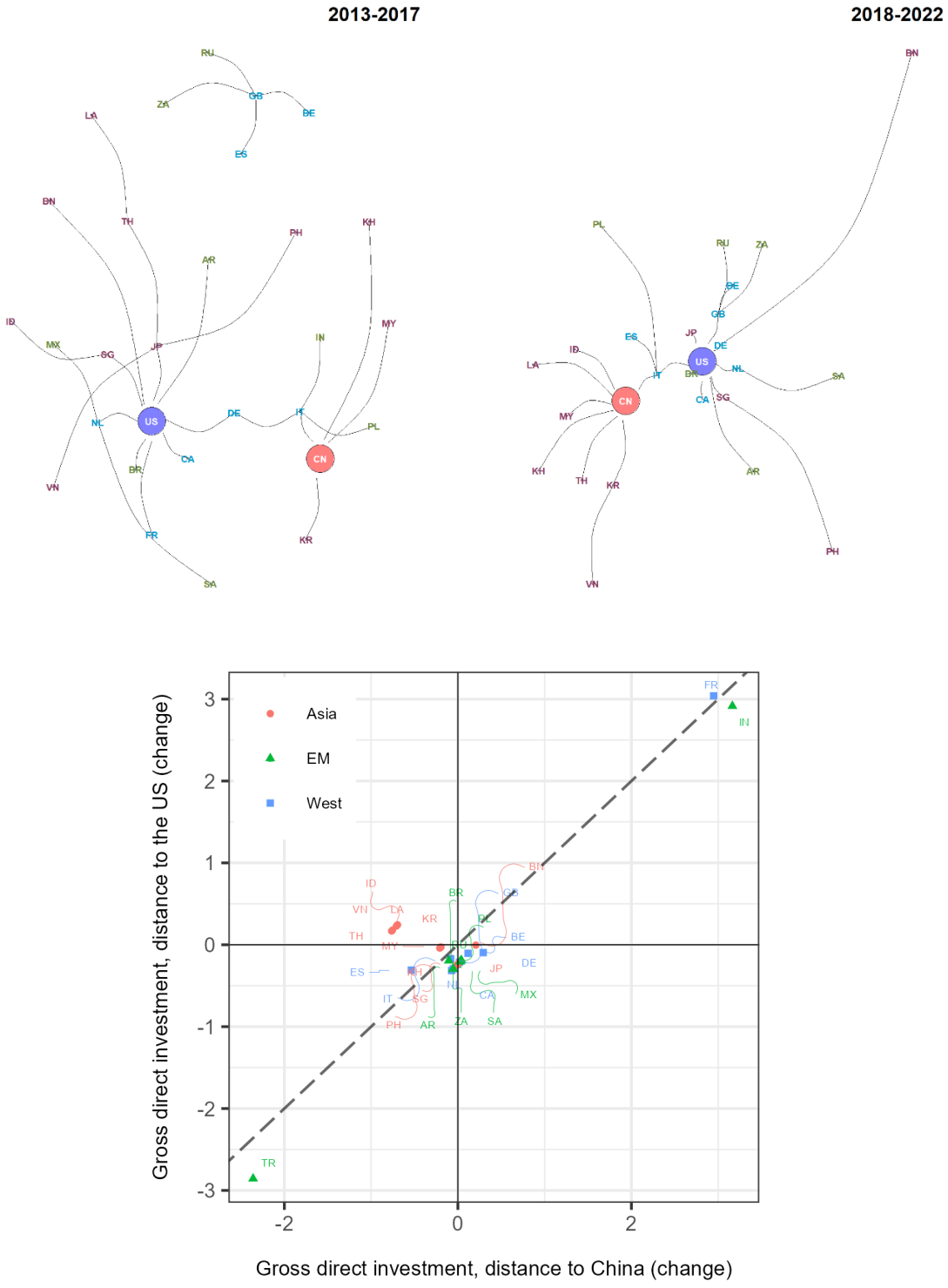
Sources: Various data sources; authors' compilation and estimates.
Notes: Estimates are based on data as of 2022 or latest. See Appendix IV for a detailed data description.

Figure 19. Key Nodes in Global Network of Foreign Direct Investment, Immediate Investor Basis



Source: Hudecz and others (2024).
Notes: The top two charts show the MSTs in years 2017 and 2022, and the bottom chart plot the change in countries' distances to China and the United States. Distances in the MST in the top two charts are not in the same scale as the layouts are normalized to fit the [-1,1] range. The MSTs have been pruned to improve the charts' clarity, but all countries are connected. The absence of edges implies countries are connected through other countries. The bottom chart shows standardized distances. Red markers represent Asian economies, light blue markers represent Western advanced economies, and green markers represent economies from other emerging markets. AR = Argentina; BE = Belgium; BR = Brazil; BN = Brunei; KH = Cambodia; CA = Canada; FR = France; DE = Germany; IN = India; ID = Indonesia; IT = Italy; JP = Japan; KR = Korea; LA = Lao PDR; MY = Malaysia; MX = Mexico; NL = Netherlands; PH = the Philippines; PL = Poland; RU = Russia; SA = Saudi Arabia; SG = Singapore; ZA = South Africa; ES = Spain; TH = Thailand; TR = Türkiye; UK = United Kingdom; VN = Vietnam.

Figure 20. Key Nodes in Global Network of Foreign Direct Investment, Ultimate Investor Basis



Source: Hudecz and others (2024).
Notes: The top two charts show the MSTs in years 2017 and 2022, and the bottom chart plot the change in countries' distances to China and the United States. Distances in the MST in the top two charts are not in the same scale as the layouts are normalized to fit the [-1,1] range. The MSTs have been pruned to improve the charts' clarity, but all countries are connected. The absence of edges implies countries are connected through other countries. The bottom chart shows standardized distances. Red markers represent Asian economies, light blue markers represent Western advanced economies, and green markers represent economies from other emerging markets. AR = Argentina; BE = Belgium; BR = Brazil; BN = Brunei; KH = Cambodia; CA = Canada; FR = France; DE = Germany; IN = India; ID = Indonesia; IT = Italy; JP = Japan; KR = Korea; LA = Lao PDR; MY = Malaysia; MX = Mexico; NL = Netherlands; PH = the Philippines; PL = Poland; RU = Russia; SA = Saudi Arabia; SG = Singapore; ZA = South Africa; ES = Spain; TH = Thailand; TR = Türkiye; UK = United Kingdom; VN = Vietnam.

VII. Conclusion

The pattern of global FDI flows is changing and warrants close attention given the critical role of FDI in driving economic growth and development. Rising geopolitical tensions, COVID-19 pandemic disruptions, and widespread anti-globalization sentiment are reshaping global supply chains and FDI flows as governments and private sector players act to protect national and economic interests. Additionally, the rise of digital economies is transforming the global FDI landscape, creating potential winners and losers. These shifts have significant implications particularly for the ASEAN+3 region, which has thrived on globalization to become a key production hub (AMRO 2020). This paper examines recent global FDI trends, with a particular focus on this region.

ASEAN+3 has emerged as a leading destination for FDI flows, outperforming other regions globally. Its FDI stock position has increased steadily, rising from 24 percent of the region's GDP in 2009 to 33 percent in 2022, defying the decline in FDI-to-GDP ratios observed elsewhere since 2021. The region's share of annual global FDI flows increased substantially from an average of 20 percent over 2015–17 to 45 percent over 2021–23, surpassing all other regions. Within ASEAN+3, FDI is increasingly shifting toward ASEAN economies, while China's share has decreased somewhat. This shift is particularly evident in greenfield FDI, where ASEAN's share rose from 38 percent of the ASEAN+3 total in 2018 to over 60 percent in 2023 as inflows to China declined.

The broader trend of FDI diversification within ASEAN+3 is prompted in part by the desire to ensure supply chain resilience. Such efforts are evident in the contrast between FDI in ASEAN and China. Greenfield FDI to ASEAN and China have been primarily in new manufacturing operations, although ASEAN has also seen a rise in expansion projects since 2020. However, ASEAN has benefited from a more diversified FDI investor base, while China's FDI has increasingly been concentrated around European investors. Separately, FDI in China has become more domestically-oriented, whereas ASEAN FDI is primarily export-focused. In recent years, ASEAN has overtaken China as the leading recipient of FDI in strategic sectors, particularly in semiconductors, chemicals, and motor vehicle manufacturing.

There are also signs of FDI reconfiguration between the world's two largest economies—the United States and China—with both scaling back investments in each other's markets. Since the intensification of the US-China trade conflict in 2018, genuine FDI flows—i.e., the deployment of actual productive assets in the host economy—between the two nations have weakened. China significantly cut its share of FDI to the United States, from 19 percent of its outward total in 2017 to less than 6 percent in 2022, while share of US FDI to China fell modestly, from 2.9 percent to 2.6 percent during the same period.

Investment and finance hubs have played an important role in redistributing FDI flows throughout ASEAN+3. Nearly 60 percent of the region's genuine FDI stock, on an immediate-counterparty basis, is estimated to come from low-tax jurisdictions. However, more than half of this amount is channeled through these jurisdictions from third parties. Our network analysis shows that Singapore became an important FDI conduit between the United States and other Asian countries, and vice-versa during the 2018–22 period. Singapore's position as an FDI hub is supported by its strong performance across a myriad of economic, social, and governance indicators.

Although the ASEAN+3 region has successfully attracted FDI amid expanding geoeconomic fragmentation, uneven gains across individual economies underscore the need for continuing proactive policies. Economies in this region should implement strategies that enhance their attractiveness to long-term investors, with particular focus on sectors of strategic importance and in which they have comparative advantage. Specific measures could include investing in human capital to align with industry needs; streamlining regulatory frameworks to facilitate business operations; and improving digital infrastructure to capitalize on technology-driven FDI. Diversifying FDI sources would also reduce reliance on any single economy or region. Ultimately, strategies for attracting FDI must be supported by strong economic fundamentals and good governance.

Environmental sustainability is becoming an increasingly critical factor in shaping global FDI flows. The shift toward greener, more sustainable economic practices requires ASEAN+3 economies to strategically position themselves within global value chains by developing competitive advantages in sustainable sectors aligned with global environmental priorities. Identifying niche areas where they can act as first movers in clean energy technologies, or as cost-efficient providers in industries prioritizing low carbon emissions, could yield significant economic benefits. For example, economies that invest early in renewable energy production or green manufacturing could not only attract eco-conscious investors but also become leaders in the global transition to sustainable economic growth.

Finally, deepening regional cooperation is essential to maximizing the FDI potential of ASEAN+3. By aligning regulatory frameworks, streamlining trade policies, and fostering intra-regional investment opportunities, ASEAN+3 economies can create synergies that boost global competitiveness. At the same time, regional cooperation, alongside coordination with international partners, could play a vital role in closing policy loopholes and fostering fair tax practices to mitigate distortionary phantom and round-tripped FDI flows. A more cohesive and transparent investment environment will not only elevate the region's standing as a key production and innovation hub but also position it to better respond to shifts in global economic dynamics and ensure sustainable long-term growth.

Appendix I. Economy Groupings

IMF data on direct investment liabilities cover 199 economies worldwide. These economies are categorized by development levels: 31 as Advanced Economies, 82 as Emerging and Developing Economies, and 72 as Low-Income Developing Economies. We also group them by geographical regions: 14 in ASEAN+3, 27 in the European Union (EU), 20 in Latin America, and 2 in North America (excluding Mexico). The remaining countries in each classification are grouped under "rest of the world" (ROW).

Appendix Table 1.1. Economy Groupings by Development Levels

Advanced Economies		
Australia	Iceland	Norway
Austria	Ireland	Portugal
Belgium	Israel	Singapore
Canada	Italy	Slovak Republic
Cyprus	Japan	Slovenia
Czech Republic	Republic of Korea	Spain
Denmark	Luxembourg	Sweden
Finland	Malta	Switzerland
France	Netherlands	United Kingdom
Germany	New Zealand	United States
Greece		
Emerging Market and Developing Economies		
Albania	Fiji	Palau
Algeria	Gabon	Panama
Angola	Guatemala	Paraguay
Antigua and Barbuda	Hungary	Peru
Argentina	India	Philippines
Azerbaijan	Indonesia	Poland
The Bahamas	Iran	Qatar
Bahrain	Iraq	Romania
Barbados	Jamaica	Russia
Belarus	Jordan	Saudi Arabia
Belize	Kazakhstan	Serbia
Bosnia and Herzegovina	Kuwait	Seychelles
Botswana	Latvia	South Africa
Brazil	Lebanon	Sri Lanka
Brunei Darussalam	Libya	St Kitts and Nevis
Bulgaria	Lithuania	Suriname
Chile	Macedonia	Swaziland
China	Malaysia	Syrian Arab Republic
Colombia	Marshall Islands	Thailand
Costa Rica	Mauritius	Trinidad and Tobago
Croatia	Mexico	Tunisia
Dominican Republic	Federated States of Micronesia	Turkey
Ecuador	Montenegro	Turkmenistan
Egypt	Morocco	Ukraine
El Salvador	Namibia	United Arab Emirates
Equatorial Guinea	Oman	Uruguay
Estonia	Pakistan	Venezuela
		Zimbabwe

Low-Income Developing Economies		
Afghanistan	Grenada	Nigeria
Armenia	Guinea	Papua New Guinea
Bangladesh	Guinea-Bissau	Rwanda
Benin	Guyana	Samoa
Bhutan	Haiti	São Tomé and Principe
Bolivia	Honduras	Senegal
Burkina Faso	Kenya	Sierra Leone
Burundi	Kiribati	Solomon Islands
Cambodia	Kyrgyz Republic	Somalia
Cameroon	Lao PDR	St Lucia
Cape Verde	Lesotho	St Vincent and the Grenadines
Central African Republic	Liberia	Sudan
Chad	Madagascar	South Sudan
Comoros	Malawi	Tajikistan
DR Congo	Maldives	Tanzania
Republic of Congo	Mali	Timor-Leste
Côte d'Ivoire	Mauritania	Togo
Djibouti	Moldova	Tonga
Dominica	Mongolia	Uganda
Eritrea	Mozambique	Uzbekistan
Ethiopia	Myanmar	Vanuatu
The Gambia	Nepal	Vietnam
Georgia	Nicaragua	Yemen
Ghana	Niger	Zambia

Source: IMF.

Appendix Table 1.2. Economy Groupings by Region

ASEAN+3		
Brunei Darussalam	Indonesia	Myanmar
Cambodia	Japan	Philippines
China	Korea	Singapore
Hong Kong, China	Lao PDF	Thailand
	Malaysia	Vietnam
European Union		
Austria	France	Malta
Belgium	Germany	Netherlands
Bulgaria	Greece	Poland
Croatia	Hungary	Portugal
Cyprus	Ireland	Romania
Czech Republic	Italy	Slovakia
Denmark	Latvia	Slovenia
Estonia	Lithuania	Spain
Finland	Luxembourg	Sweden
Latin America		
Argentina	Ecuador	Panama
Belize	El Salvador	Paraguay
Bolivia	Guatemala	Peru
Brazil	Guyana	Suriname
Chile	Honduras	Uruguay
Colombia	Mexico	Venezuela
Costa Rica	Nicaragua	
North America		
Canada	United States	

Sources: AMRO and IMF.

Appendix II. Bilateral FDI Trends—ASEAN

Appendix Table 2.1. ASEAN: Change in Investor Share of Genuine FDI on Ultimate-Investor Basis Excluding Round-Tripping, 2017 to 2022

(Percentage points)

Recipient / Investor	ASEAN									
	Indonesia	Malaysia	Philippines	Singapore	Thailand	Brunei	Cambodia	Lao PDR	Myanmar	Vietnam
Euro Area	-0.16	-0.02	0.00	0.49	0.01	0.00	0.00	0.00	0.00	-0.02
United States	-0.36	0.19	0.01	1.99	-0.09	0.00	0.00	0.00	0.00	-0.01
China	-0.49	-0.84	-0.03	0.16	-0.68	0.00	-0.13	0.25	-0.71	1.22
United Kingdom	-0.47	-0.02	-0.02	0.81	-0.12	-0.06	0.01	0.00	-0.03	0.04
Japan	-0.63	-0.23	-0.11	1.32	-1.43	-0.01	0.01	0.00	-0.07	-0.06
Canada	-0.12	0.00	-0.01	1.66	-0.10	0.00	0.01	0.00	0.00	0.02
Hong Kong	0.10	0.09	-0.03	0.53	0.06	0.07	0.01	0.00	-0.07	0.09
Switzerland	-0.17	0.02	-0.07	1.56	0.07	0.00	0.00	0.00	0.00	0.01
Cayman Islands	0.07	-0.24	-0.31	7.94	-0.37	0.00	0.00	0.00	0.00	0.00
Korea	0.36	-0.15	-0.06	2.18	-0.15	0.00	0.23	-0.04	0.19	-2.93
ROW	-0.20	0.06	0.06	2.12	0.06	0.00	0.03	-0.06	-0.05	0.14
TOTAL	-0.13	0.01	-0.01	1.69	-0.06	0.00	0.04	0.02	-0.05	0.14

Sources: IMF CDIS via Haver Analytics; and authors' calculations.
Note: The investor column lists down the top 10 FDI sources as shown in Figure 7. Figures refer to the change in the bilateral FDI shares between 2022 and 2017. The bilateral FDI shares for a given year are calculated from an economy's FDI stock relative to the source economy's total outward FDI. ROW = rest of the world.

Appendix Table 2.2. ASEAN: Genuine FDI Flows on Ultimate-Investor Basis Excluding Round-Tripping, 2018–22 Average
(Percent of Recipient GDP)

Recipient / Investor	ASEAN									
	Indonesia	Malaysia	Philippines	Singapore	Thailand	Brunei	Cambodia	Lao PDR	Myanmar	Vietnam
Euro Area	-0.18	-0.01	0.04	1.93	0.07	0.08	0.02	-0.19	-0.02	-0.05
United States	-0.12	0.99	0.20	8.98	0.10	0.05	0.07	0.00	-0.01	0.01
China	1.08	0.81	0.01	7.74	1.62	0.00	8.14	13.45	-1.96	3.29
United Kingdom	-0.12	0.05	-0.02	1.18	-0.04	-0.62	0.10	0.00	-0.13	0.05
Japan	-0.07	0.05	0.11	1.56	-0.14	0.05	0.18	0.00	-0.31	0.16
Canada	0.00	0.00	0.00	1.10	-0.03	0.00	0.11	0.00	0.00	0.02
Hong Kong	0.02	0.08	-0.01	0.30	0.05	1.09	0.09	0.00	-0.20	0.05
Switzerland	-0.02	0.04	-0.02	0.75	0.04	0.00	0.00	0.00	0.00	0.01
Cayman Islands	0.01	0.04	-0.06	4.00	-0.01	0.00	0.02	0.00	0.00	0.00
Korea	0.06	0.05	0.02	0.60	0.03	0.00	0.69	-0.14	0.34	-0.20
ROW	-0.09	0.35	0.20	6.12	0.24	0.40	0.96	-3.16	-0.75	0.49
TOTAL	0.56	2.45	0.45	34.27	1.93	1.05	10.39	9.96	-3.06	3.83

Sources: IMF Coordinated Direct Investment Survey; and authors' calculations.
Note: Figures represent average FDI flows relative to the host entity's GDP for a given period. The investor column lists down the top FDI sources as shown in Figure 7. ROW = rest of the world.

Appendix III. Strategic Sectors

The list of strategic sectors was built by adopting the methodology described in Tran (2022) and IMF (2023) to map the 2022 NAICS codes.

Appendix Table 3.1. List of Industry Sectors

NAICS Code	Sector
3251	Basic Chemical Manufacturing
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing
3261	Plastics Product Manufacturing
3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing
3262	Rubber Product Manufacturing
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers
4492	Electronics and Appliance Retailers
3352	Household Appliance Manufacturing
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
3328	Coating, Engraving, Heat Treating, and Allied Activities
3329	Other Fabricated Metal Product Manufacturing
3331	Agriculture, Construction, and Mining Machinery Manufacturing
3332	Industrial Machinery Manufacturing
3333	Commercial and Service Industry Machinery Manufacturing
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing
3335	Metalworking Machinery Manufacturing
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing
3339	Other General Purpose Machinery Manufacturing
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
3361	Motor Vehicle Manufacturing
3362	Motor Vehicle Body and Trailer Manufacturing
3363	Motor Vehicle Parts Manufacturing
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers
2123	Nonmetallic Mineral Mining and Quarrying
3279	Other Nonmetallic Mineral Product Manufacturing
3254	Pharmaceutical and Medicine Manufacturing
3314	Nonferrous Metal (except Aluminum) Production and Processing
2212	Natural Gas Distribution
4861	Pipeline Transportation of Crude Oil
4862	Pipeline Transportation of Natural Gas
3344	Semiconductor and Other Electronic Component Manufacturing
5171	Wired and Wireless Telecommunications (except Satellite)
5174	Satellite Telecommunications
5178	All Other Telecommunications
211120	Crude Petroleum Extraction
211130	Natural Gas Extraction
486910	Pipeline Transportation of Refined Petroleum Products
335910	Battery Manufacturing
532210	Consumer Electronics and Appliances Rental
449210	Electronics and Appliance Retailers
221114	Solar Electric Power Generation
221115	Wind Electric Power Generation
221116	Geothermal Electric Power Generation
221117	Biomass Electric Power Generation
221118	Other Electric Power Generation
213115	Support Activities for Nonmetallic Minerals (except Fuels) Mining

Source: NAICS.

Appendix Table 3.2. List of Strategic Industry Sectors

Strategic Sector Category	NAICS Code	Sector
Semiconductors	3344	Semiconductor and other electronic component manufacturing
Telecoms and 5G	517	Telecommunications
Pharmaceutical ingredients	3254	Pharmaceutical and medicine manufacturing
Green energy	221114	Solar electric power generation
	221115	Wind electric power generation
	221116	Geothermal electric power generation
	221117	Biomass electric power generation
	221118	Other electric power generation
Critical minerals	2123	Non-metallic mineral mining and quarrying
	3279	Other non-metallic mineral product manufacturing
	213115	Support activities for non-metallic minerals (except fuels) mining

Sources: NAICS; and authors' estimates.

Appendix IV. Framework for Determining FDI Attractiveness

Appendix Table 4.1. Matrix of FDI Attractiveness Indicators

Area	Sub-area	Indicator	Source	Latest Update
Market prospects	Market size	GDP (PPP, 2017) per capita	WB	2022
		GDP (PPP, 2017) per capita growth (10-year CAGR)	WB	2022
		Population	WB	2022
	Market access	Sum of exports and imports (% of GDP)	WB	2022
Human capital	Labor productivity	GDP (PPP, 2017) per hour worked	ILO	2023
	Labor availability	Working-age population (% of total population)	UN	2023
Manufacturing ecosystem	GVC participation	Sum of forward and backward GVC participation rates	TiVA	2020
	Size of manufacturing sector	Manufacturing value-added as share of GDP (5-year average)	WB	2022
Innovation ecosystem	Knowledge-intensive employment	Employment in knowledge-intensive services (% of workforce, 15+ years old)	WIPO GII	2023
	R&D expenditure	R&D expenditure (% of GDP)	WIPO GII	2023
	High-tech exports	High-technology exports (% of total trade)	WIPO GII	2023
	University-industry R&D collaboration	The extent to which businesses and universities collaborate on R&D (average answer to survey question)	WIPO GII	2023
	Cluster development	How widespread clusters are (average answer to survey question)	WIPO GII	2023
Infrastructure	Physical	World Bank's Logistic Performance Index	WB LPI	2023
	Digital	Number of fixed broadbands per 100	WB	2022
		Number of mobile cellular subscriptions per 100	WB	2022
		Share of individuals using the internet over population	WB	2022
Governance	Government effectiveness	Index	WB WGI	2022
	Political stability	Index	WB WGI	2022
	Regulatory quality	Index	WB WGI	2022
	Rule of law	Index	WB WGI	2022
Natural resources	Natural capital	Index	GSCI	2023

Source: Authors' compilation.
Note: Matrix areas and sub-areas are based on AMRO (2021) and Walsh and Yu (2010). For each indicator, we estimate the z-score and the percentile assuming normal distribution. The score for each sub-area is the equally-weighted average of the percentiles of the corresponding indicators; and the score for each area is the simple average of the scores for its corresponding sub-areas.
1/ High-technology exports and imports contain technical products with a high intensity of R&D, defined by the Eurostat classification, which is based on Standard International Trade Classification (SITC) Revision 4 and the OECD definition (see http://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an5.pdf).
2/ Clusters refers to geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field.

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