3. How Will Trend Growth in China Impact the Rest of Asia?[1]

China's importance in the global economy has increased dramatically over the past few decades, and its insertion into global value chains (GVCs) has underpinned its rise. China has been a crucial driver of trade integration for Asia and has also, more recently, become a key supplier of inputs to production. Major forces such as convergence and demographics will partly determine China's future growth, but key structural policy drivers, including domestic reform momentum and international geoeconomic developments, may alter this path significantly. Given China's importance for the region, different paths may carry sizable spillovers for Asia. This chapter uses a macroeconomic model with GVC production to assess the potential spillovers from an upside scenario of domestic reforms in China and a downside scenario from de-risking between China and Organisation for Economic Co-operation and Development (OECD) economies. Productivity-enhancing reforms in China can lift growth in Asia, especially in smaller and more open economies with strong GVC links with the country. Non-OECD Asian countries can benefit from the trade diversion effects of "friend-shoring" by both China and the OECD, though those benefits largely dissipate once one accounts for the global slowdown caused by friend-shoring trends and the "reshoring" dimension involved in de-risking strategies. In the specific case of export restrictions aimed at curtailing access to high-quality inputs, staff analysis finds empirically significant potential losses in both the aggregate and critical areas such as environmental goods, because the quality frontier is highly product-specific.

3.1. China's Growing Importance and the Role of GVCs

China's growing importance: China's weight in the global economy has increased dramatically over the past few decades. Starting in the mid-1990s and accelerating in the 2000s, China's above-average growth made it the second largest economy in the world by the late 2010s, measured at market US dollar exchange rates (Figure 3.1, panel 1). China's importance in global trade grew accordingly, its share rising from less than 2½ percent in 1997 to 12 percent in 2022 (Figure 3.1, panel 2), making it one of the largest trading nations. As with other economies as they developed, China's rise has also been accompanied by an increasing role in innovation. As of 2019, total research and development expenditures in China, when measured in purchasing power parity terms, was second only to the United States (Figure 3.1, panel 3).

The role of GVCs in China's rise: China's rise in global importance was underpinned by its insertion into GVCs. China's share of global GVC exports, defined as exports that either use inputs from other countries or become inputs into other countries' exports, increased fivefold since the early 1990s (Figure 3.1, panel 4). China's assembly of other countries' inputs drove this rise initially. Starting in the mid-2000s, however, China has increasingly become a supplier of inputs to other countries (Figure 3.1, panel 5): sourcing of intermediate inputs from China has increased significantly across countries, both as a share of total inputs (that is, including domestic trade) and as a share of foreign inputs (Figure 3.1, panel 6).

China's rising role in Asia: Trade with China has been a driver of trade integration in Asia over the past few decades, with Chinese trade as a share of GDP increasing by 9 percentage points between 2000 and 2022 (Figure 3.2, panel 1). GVC trade links have also been crucial in Asia as Chinese inputs used for exports have become increasingly important over time (Figure 3.2, panel 2). However, although trade in intermediates has

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Figure 3.1. China's Growing Importance and the Role of Global Value Chains

China's above-average growth has made it the second largest economy in the world ...

1. Weight in Global GDP
(Percent, GDP in US dollars)
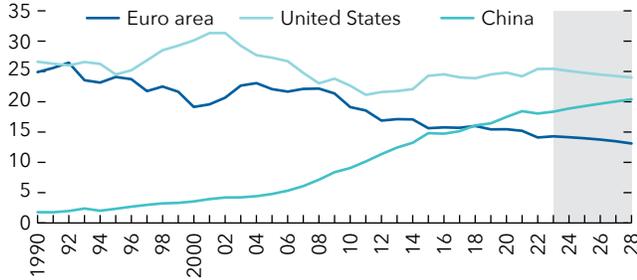
Sources: Direction of Trade Statistics; and IMF staff calculations.

... with its importance in global trade growing accordingly ...

2. Share of Global Trade
(Percent, exports plus imports in US dollars)
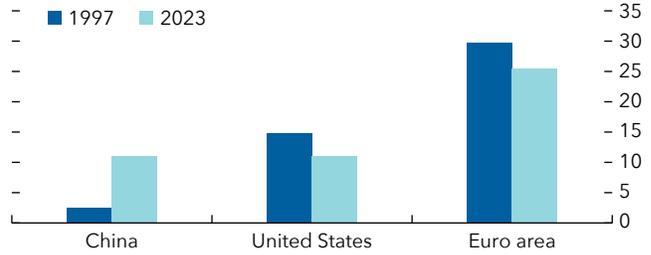
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

... and also becoming an innovation hub.

3. Gross Research and Development Expenditure
(Trillions of US dollars, constant PPP)
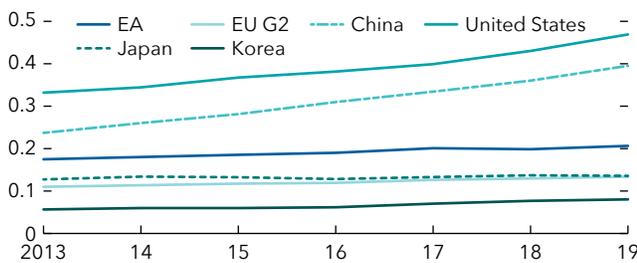
Sources: Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: Data for France are missing after 2018. It is assumed that expenditures in research and development in this country grow at the same rate as in Germany. EA = euro area; EU = European Union; EU G2 = Germany and France.

China's rise was underpinned by its insertion into GVCs ...

4. GVC-Related Exports
(Percent of world GVC exports)
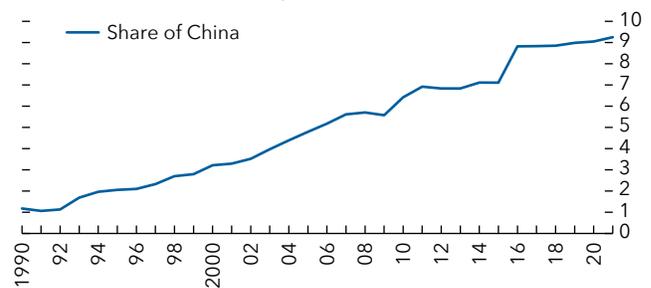
Sources: Eora Global Supply China Database; and IMF staff calculations.
Note: GVC = global value chain.

... increasingly becoming a supplier of inputs to other countries, both for exports ...

5. China's GVC-Related Exports
(Trillions of US dollars)
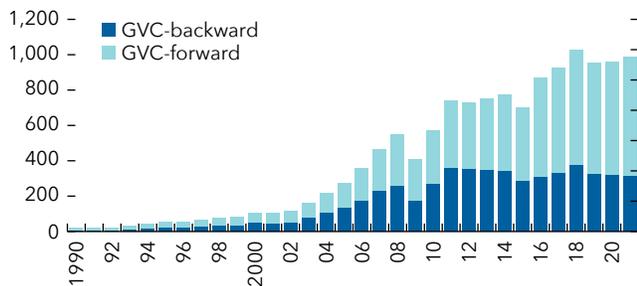
Sources: Eora Global Supply Chain Database; and IMF staff calculations.
Note: Backward linkages refer to the use of imported value added as inputs in the production of exports. Forward linkages refer to the export of value. GVC = global value chain.

... and for production more generally.

6. China's Share in Intermediate Inputs
(Percent of total input purchases, median and interquartile range across countries)
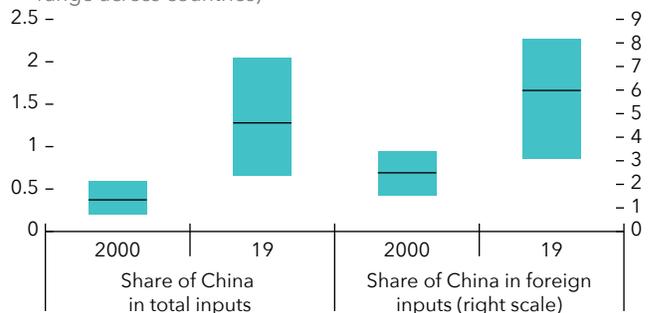
Sources: Eora Global Supply Chain Database; and IMF staff calculations.

Figure 3.2. China's Growing Importance for Asia

Trade with China has been a driver of trade integration in Asia over the past two decades ...

1. Increase in Trade with China 2000-22
   (Percentage points, exports plus imports as a share of GDP)
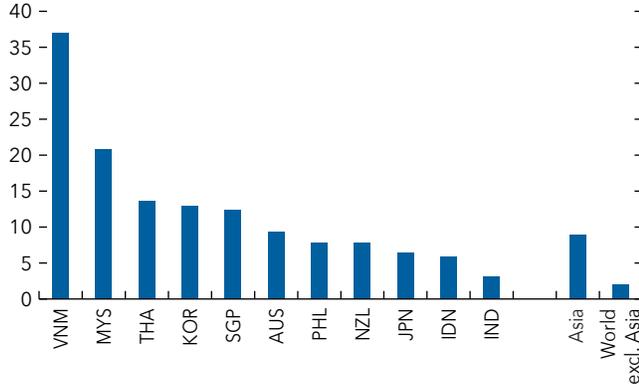
Sources: IMF, Direction of Trade Statistics database; and IMF staff calculations.
Note: Country abbreviations are International Organization for Standardization (ISO) country codes.

... and Chinese inputs used for exports have become increasingly important over time ...

2. Forward GVC Exports from China to Asia
   (Percentage points)
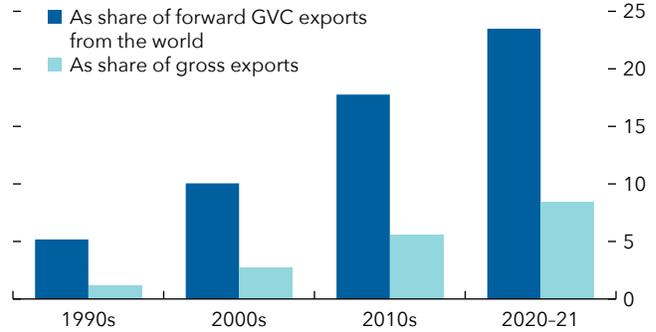
■ As share of forward GVC exports from the world
■ As share of gross exports

Sources: Eora Global Supply Chain Database; and IMF staff calculations.
Note: GVC = global value chain.

... although the region also plays an important role in serving Chinese final demand, particularly investment ...

3. Asia's Value Added Embedded in China's Demand
   (Percentage points, share of regional GDP)

■ Investment
■ Consumption
■ Exports

Sources: Aslam, Novta, and Rodrigues-Bastos (2017); Eora Global Supply Chain Database; and IMF staff calculations.

... with Korea and ASEAN countries being particularly dependent on Chinese final demand.

4. Value Added Embedded in China's Final Demand
   (Share of GDP)
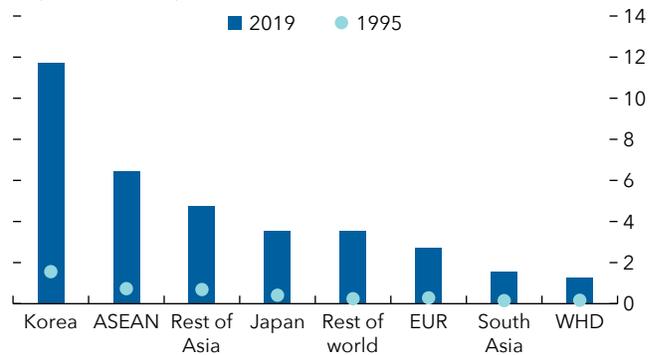
■ 2019   ● 1995

Sources: Aslam, Novta, and Rodrigues-Bastos (2017); Eora Global Supply Chain Database; and IMF staff calculations.
Note: "Final demand" denotes final absorption and thus excludes value added embedded in Chinese exports. ASEAN = Association of Southeast Asian Nations; EUR = European department; WHD = Western Hemisphere department.

become a key aspect of trade integration with China, the region also plays an important role in serving Chinese final demand and investment specifically (Figure 3.2, panel 3). This is especially the case for Korea and the Association of Southeast Asian Nations countries (Figure 3.2, panel 4).

Benefits from greater trade links with China: Given China's unprecedented growth over the last three decades, looking back at how growth patterns in other countries have been associated with the extent of trade integration with China can give an initial sense of spillovers from China to Asia and elsewhere. To that end, Figure 3.3 uses a simple panel growth regression to show the extent to which greater trade links with China were associated with higher GDP growth, after controlling for overall trade openness of the country. Interestingly, while greater gross

trade links with China were associated with higher growth on average, the effect is significantly larger when looking at GVC linkages, particularly backward linkages. For example, going from the average backward linkages of non-Asian countries to the Asian average is associated with higher growth of about 0.5 percentage point. Consistent with earlier literature (see, for example, Constantinescu, Mattoo, and Ruta [2019] and its references), this suggests that in addition to direct demand channels, GVC trade can also have other benefits, such as greater specialization to exploit comparative advantages, technology transfers, and knowledge diffusion.

3.2. China's Baseline, Catching-Up Potential, and Fragmentation Risks

China's baseline: IMF staff expect growth in China to slow over the coming years, reaching 3.4 percent by 2028, with more declines further into the future (Oeking, Novta, and Zhang 2022). This represents a slower growth path compared with earlier projections and is underpinned (as in other major economies) by demographic headwinds with

Figure 3.3. Impact of Greater Linkages with China on Growth
(Percentage points impact on growth of moving from non–Asia and Pacific to Asia and Pacific level exposure for each variable)

Sources: Eora Global Supply Chain Database; IMF, World Economic Outlook database; and IMF staff calculations.
Note: The figure is based on a panel regression of growth on lagged purchasing power parity GDP per capita, aggregate trade openness, and a measure of trade linkages with China. Each bar multiplies the coefficient on the trade linkage variable with the difference in the median level of the variable in Asia and Pacific and non–Asia and Pacific countries. The first bar is based on gross trade of the country with China as a share of total gross trade; the second and third bar are based on backward and forward linkages of the country with China as a share of total backward and forward linkages, respectively; and the fourth bar is based on share of a countries' value added that is absorbed by Chinese demand.

the working-age population shrinking, and declining productivity growth, including from a slowdown in reform momentum (Figure 3.4, panel 1).

Although various developments and policies can potentially affect growth in China in the near term, the chapter's focus is on spillovers from changes in China's trend growth.[2] From a medium- to long-term point of view, two upside and downside scenarios stand out: the potential for further catching-up, and the risks from fragmentation.

Further catching-up potential: A standard convergence regression estimated over a panel of 162 economies and 29 years suggests that China's growth in the past three decades was significantly higher than average, considering its per capital income levels (Figure 3.4, panel 2). The overperformance was of 5.5 percent on average and with a gradual decline in the 2010s—a period that was also characterized by excessive investment and debt accumulation. The IMF baseline forecast implies that this excess growth gradually fades into the medium term. Although medium-term growth could plausibly fall short of latest staff projections, the current productivity gaps with the frontier remain very large, with the GVC-intensive sector having larger gaps (Figure 3.4, panel 3), suggesting scope for faster convergence if reform momentum is rebuilt.[3,4]

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[2] For an analysis of short-term growth spillovers, see Box 1.1 in the October 2022 *Regional Economic Outlook: Asia and Pacific*.

[3] In fact, specific policy levers can help boost productivity in China: reforms that would close productivity gaps between state-owned enterprises and private firms could lift total factor productivity by about 6 percent (Jurzyk and Ruane 2021), with further gains possible as market-oriented reforms improve productivity via higher firm entry and exit (Brandt and others 2020; Cerdeiro and Ruane 2022).

[4] In the medium to long term, in addition to reigniting productivity, reforms in China should also aim to rebalance the economy toward consumption. This is explored in Online Annex: Chapter 3, where analysis finds small negative spillovers.

Figure 3.4. China's Baseline, Catching-Up Potential, and Fragmentation Risks

Growth in China is expected to be slower than earlier projections ...

1. China's Baseline Medium-Term Growth Projection
(Percent)
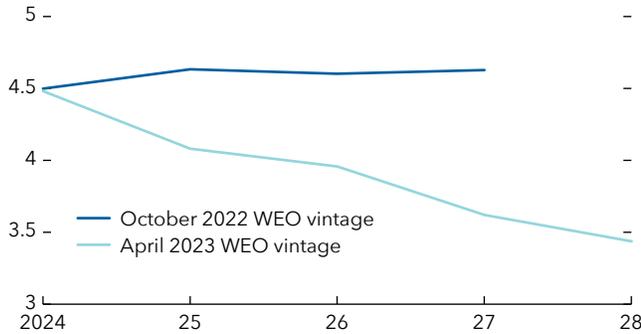
Source: IMF, World Economic Outlook database.
Note: WEO = *World Economic Outlook*.

... ending more than three decades of economic overperformance.

2. China: Residuals from Unconditional Convergence Regression
(Percentage points)
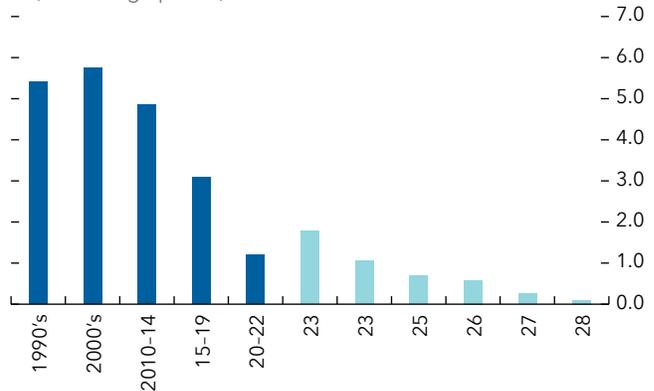
Sources: IMF, World Economic Outlook database; Penn World Tables; and IMF staff calculations.
Note: For 1991 to 2019, the chart plots the residual for China for a standard unconditional convergence growth regression where real GDP growth rate is regressed on lagged per capita GDP purchasing power parity (log). For 2020 to 2028, the chart plots out of sample residuals based on latest *World Economic Outlook* projections for GDP growth.

Ample room for catch up remains, suggesting upside potential if reforms are implemented ...

3. China: Sectoral Labor Productivity Relative to the United States
(Percent of US labor productivity)
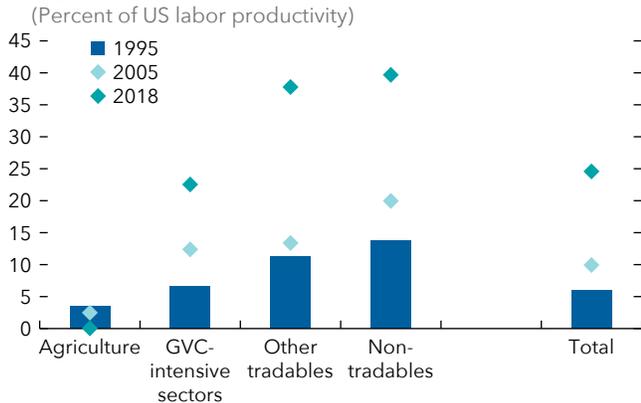
Sources: EU KLEMS; Productivity Level's Database; Structural Transformation Database; and IMF staff calculations.
Note: Sector-level labor productivity is adjusted for 2005 sector-level purchasing power parity from Groningen Productivity Level's Database. GVC = global value chain.

... while rising de-risking sentiments globally are a key downside risk.

4. Mentions of Key Terms in Corporate Presentations
(Number of mentions)
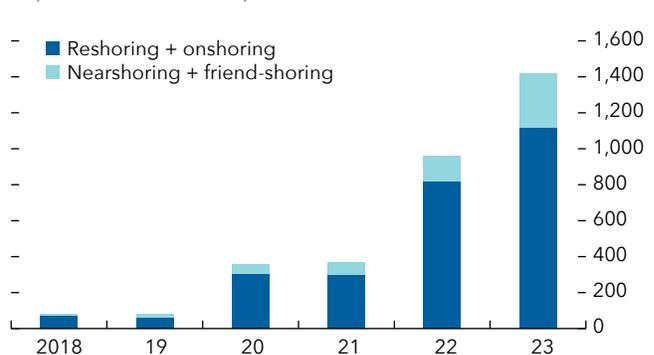
Sources: Bloomberg Finance L.P.; document search and analytics tool; and IMF staff calculations.
Note: The panel shows the number of times specific terms are mentioned in transcripts from corporate presentations. For 2023, numbers are rescaled to account for the availability of data only through July.

Fragmentation risks: The baseline forecast for China (as for other economies) currently assumes that fragmentation pressures remain contained to specific products and sectors, without rising to a macro-critical level. However, trade-restrictive measures continue to creep up (see Figure 1.10 in Chapter 1 of this report), with a resurgence in export controls having the potential for large drops in input quality for major economies because they are blocked from importing specific cutting-edge technologies and products (Online Box 3.1). Policies that distort trade and investment—such as certain components of recent legislation in the United States, the

European Union's Green Deal Industrial Plan, and export restrictions of minerals (China, Indonesia)—are prolif-erating, increasing the risk of fragmentation (IMF 2023; October 2023 *World Economic Outlook*). There is also growing evidence that companies are exploring options to reshape their supply chains (Figure 3.4, panel 4), echoing data on greenfield foreign direct investment showing signs of fragmentation (April 2023 *World Economic Outlook*, Chapter 4). In all, the downside risk coming into focus is not of extreme fragmentation (as in, for example, the October 2022 *Regional Economic Outlook: Asia and Pacific* and Cerdeiro and others 2023) but of a global de-risking, whereby countries reshore production home more generally and friend-shore away from certain partners.

3.3. Model-Based Spillovers

To quantify the spillovers from potential upside and downside scenarios, this section uses the IMF's multire-gion dynamic stochastic general equilibrium model, GIMF (Global Integrated Monetary and Fiscal Model), additionally featuring GVCs. The model has three sectors: a standard tradables and nontradables sector with value-added production functions, and a third GVC sector, which is based on roundabout production: imported and domestic GVC inputs along with capital and labor are used to produce GVC goods, which are subsequently sold domestically and exported (see Online Annex: Chapter 3 for details).[5] This allows us to capture the key role that GVCs have played in China's rise.

Upside: spillovers from further catching-up. An upside scenario is considered first, in which reforms in China reignite faster convergence, with aggregate annual productivity growing about 1 percentage point higher than in the baseline for 15 years. Given the larger produc-tivity gaps relative to the frontier in the GVC sector in China, GVC sector productivity is assumed to grow twice as fast as nontradables productivity. As in Oeking, Novta, and Zhang (2022), broad-based reforms such as closing productivity gaps for state-owned enterprises, opening domestic markets to foreign competi-tion, and other market-oriented reforms could deliver such an upside.

Figure 3.5 shows the long-term effects. The level of GDP in China is about 21 percent higher in the new steady state. The higher GDP level 15 years out is equivalent to about 1.3 percentage points higher annualized growth. Assuming that spillovers in the model occur only through trade channels (light blue bars), GDP in the rest of the world increases by about 1.4 percent or 0.1

Figure 3.5. Spillovers from Upside Scenarios: Long-Term Spillovers from Reigniting Convergence in China
(GDP level, percent deviation from baseline)
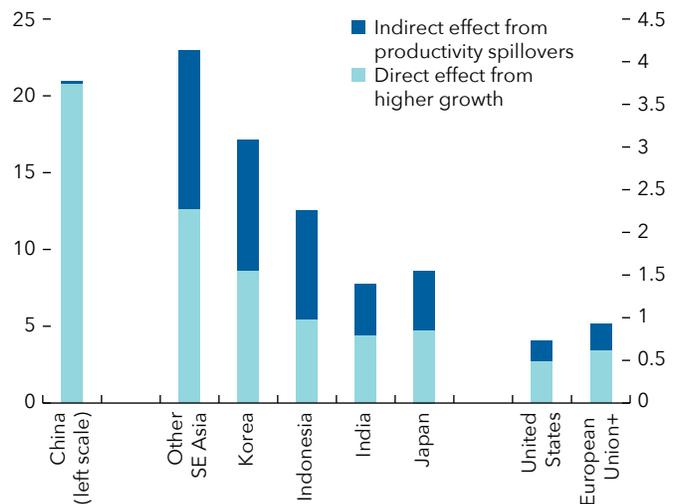
Source: IMF staff calculations.
Note: European Union+ = European Union and Switzerland; SE = southeast.

percentage point higher annualized growth (about 7 percent of the size of the impact on China), though with significant heterogeneity across regions. Spillovers are largest in other southeast Asian economies (southeast Asia excluding Indonesia), where GDP increases by about 2.3 percent in the long term (about 11 percent of the size of the impact on China), reflecting the fact that these are relatively open economies that also trade

[5] See Kumhof and others (2010) and Anderson and others (2013) for a detailed exposition of the model and its properties.

intensively with China. Korea also sees sizable benefits (about 7.5 percent of the size of the impact on China). The spillovers are generally smaller in larger advanced economies (Japan, the United States, Europe), which tend to be more closed and have smaller links to China.[6]

The positive spillovers from reforms in China can be significantly larger if they also result in direct productivity gains in other regions (Figure 3.5, dark blue bars). The spillover structure captures both the direct effects of technology spillovers from technology embodied in imports and the indirect effects of the dissemination of technological advances.[7] All regions see larger spillovers, though the amplification from productivity spillovers is larger for countries that are further from the technological frontier and that have stronger trade links with China. In other Southeast Asia economies, GDP in the long term is about 4 percent higher—as high as one-quarter percentage point in annualized growth terms (and about one-fifth the effect within China).

Downside: growth and spillovers under de-risking. The chapter defines "de-risking" as countries changing how they source goods and services along two dimensions. A "friend-shoring" dimension measures how much countries want to change between different foreign sources while minimizing the change to overall dependence on foreign sourcing. A reshoring dimension measures how much more countries seek to rely on domestic sourcing versus foreign sourcing, beyond the already-high home bias in domestic sourcing as documented in the April 2022 *World Economic Outlook*, Chapter 4. The downside focuses on the relationship between China and the OECD regions (which in the model includes the European Union plus Switzerland, Japan, Korea, the United States, and the other advanced economies region—see Online Annex: Chapter 3 for details). Other economies do not actively seek to reshore or friend-shore.

Panel 1 in Figure 3.6 summarizes the scenarios' assumptions. For reshoring, the OECD and China reduce reliance on imports from all countries. For friend-shoring, China reduces its reliance on OECD sources, and the OECD reduces its reliance on China sources. This reduction dials back the observed changes in foreign sourcing that took place between the years 2000 and 2021.

An example can be helpful to fix ideas. In 2000, global input-output data from Eora Global Supply Chain Database show that OECD countries procured about 10 percent of their investment goods from abroad (both from other OECD economies and from non-OECD economies). As of 2021, the same data source suggests that this figure had risen to about 13 percent (see Online Annex Figure 3.2.2 for more details). In the reshoring simulations, we therefore increase nontariff barriers of OECD countries to reduce (dial back) this reliance on foreign sourcing for each OECD economy by 3 percentage points.[8] In the friend-shoring simulation, we adjust nontariff barriers to alter this mix between foreign sources (in the case of OECD economies, against China and in favor of other non-OECD economies) by doing the same comparison of shares in the data between the years 2000 and 2021.

In the friend-shoring scenario, the OECD and China impose nontariff trade barriers (NTBs) on each other to reduce mutual interdependence but do not restrict trade with other countries. Global GDP declines by 1.8 percent, with the economic losses being the largest for China (6.8 percent of GDP in the long term) because of reduced demand for Chinese goods by key trading partners and amplification through GVCs as higher input costs cascade through the supply chain (Figure 3.6, panel 2, dark blue bars).

GDP losses are also large for OECD countries, with the extent of losses depending on the countries' dependence on Chinese inputs, which become more costly.

---

[6] In addition to this general convergence scenario, Online Annex: Chapter 3 also considers a specific policy scenario in which China closes the productivity gap between state-owned enterprises and private firms. In this case, GDP increases by about 8.5 percent in China, and the spillovers are smaller (about 2 to 5 percent of the size of the impact on China for the other regions), as the state-owned enterprises reforms affect the GVC sector and the nontradables sector more symmetrically, and the nontradables sector in China has smaller spillovers to the rest of the world.

[7] The productivity spillover calculations are based on the methodology found in the IMF model, FSGM (Flexible System of Global Models; Andrle and others 2015), drawing on Franco, Montresor, and Marzetti (2011) and Lumenga-Neso, Olarreaga, and Schiff (2005).

[8] Because changes were considered through 2021, changes were effectively considered along these margins that largely go beyond the changes that took place between the years 2017 and 2022, as documented in Alfaro and Chor (2023) for the case of the United States.

Figure 3.6. De-Risking Scenarios

Scenarios assume a dialing back of foreign sourcing in production either from all partners (reshoring) or from specific competitors (friend-shoring) ...

... with potentially large GDP losses for China and the Organisation for Economic Co-operation and Development.

1. Assumed Increase in Friend-Shoring and Reshoring as Share of Total Sourcing
(Percentage points by type of goods and services trade)

2. GDP Losses from Friend-Shoring and Reshoring Scenarios
(GDP levels, percent deviation from baseline)
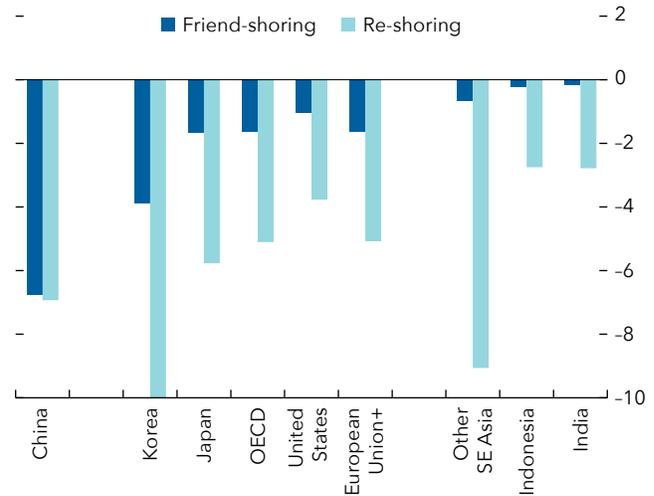
Sources: Eora Global Supply Chain Database; and IMF staff calculations.
Note: GVC = global value chain.

Sources: Eora Global Supply Chain Database; and IMF staff calculations.
Note: European Union+ = European Union and Switzerland; OECD = Organisation for Economic Co-operation and Development; SE = southeast.

The economic effects are small for the rest of the world, with two offsetting forces as play. Higher NTBs between China and the OECD result in trade being diverted to other countries, increasing demand for their exports, which rise above the baseline in the short term. However, the large economic losses in China and the OECD notably lower their demand from the rest of the world, dampening the positive effects from trade diversion. Therefore, GDP and exports in the rest of world decline marginally in the long term (in the range of –0.2 to –0.7 percent for GDP).[9]

A reshoring scenario, in which China and the OECD increase NTBs on all countries to reduce dependence on foreign inputs, results in significantly larger global output losses of about 4.5 percent in the long term, as the additional distortions from NTBs lead to less-efficient resource allocation and higher input costs that are amplified through GVC linkages (Figure 3.6, panel 2, light blue bars). China experiences a 6.9 percent loss as the OECD regions are reducing their demand for their goods. For the OECD regions, losses range from 3.8 percent to up to 10.2 percent of GDP, with larger losses for more open economies with stronger China linkages. For the rest of the world, the positive trade diversion effects of the friend-shoring scenario are no longer present because they also face higher NTBs from China and the OECD. For example, the other Southeast Asia region experiences a large loss of 9.1 percent because it is highly open with strong trade links with China and the OECD economies (particularly in the GVC sector in relation to China). Therefore, the demand for its exports is falling enough to induce a large GDP contraction, with significant negative spillovers on the domestic economy.

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[9] Given the distortive nature of friend-shoring policies, the preferred calibration of friend-shoring is one where the changes between foreign suppliers is achieved by introducing higher barriers on the opposing bloc. Still, the robustness of the results were checked if friend-shoring is achieved via a revenue-neutral combination of taxes on the use of goods of the opposing bloc and subsidies on all other economies. Even under this calibration, non-OECD Asian economies gain only marginally, in the range of 1 percent level gains in the long term.

In summary, for each percentage point of reshoring and friend-shoring, long-term global GDP losses are about 1.5 percent and 0.25 percent, respectively, while specifically dialing back these two margins to 2000 levels translates into global GDP losses of 4.5 percent and 1.8 percent, respectively. While (by definition) these are smaller than potential losses from extreme fragmentation, these estimates underscore how de-risking can still present a nontrivial drag on growth in Asia and beyond.

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