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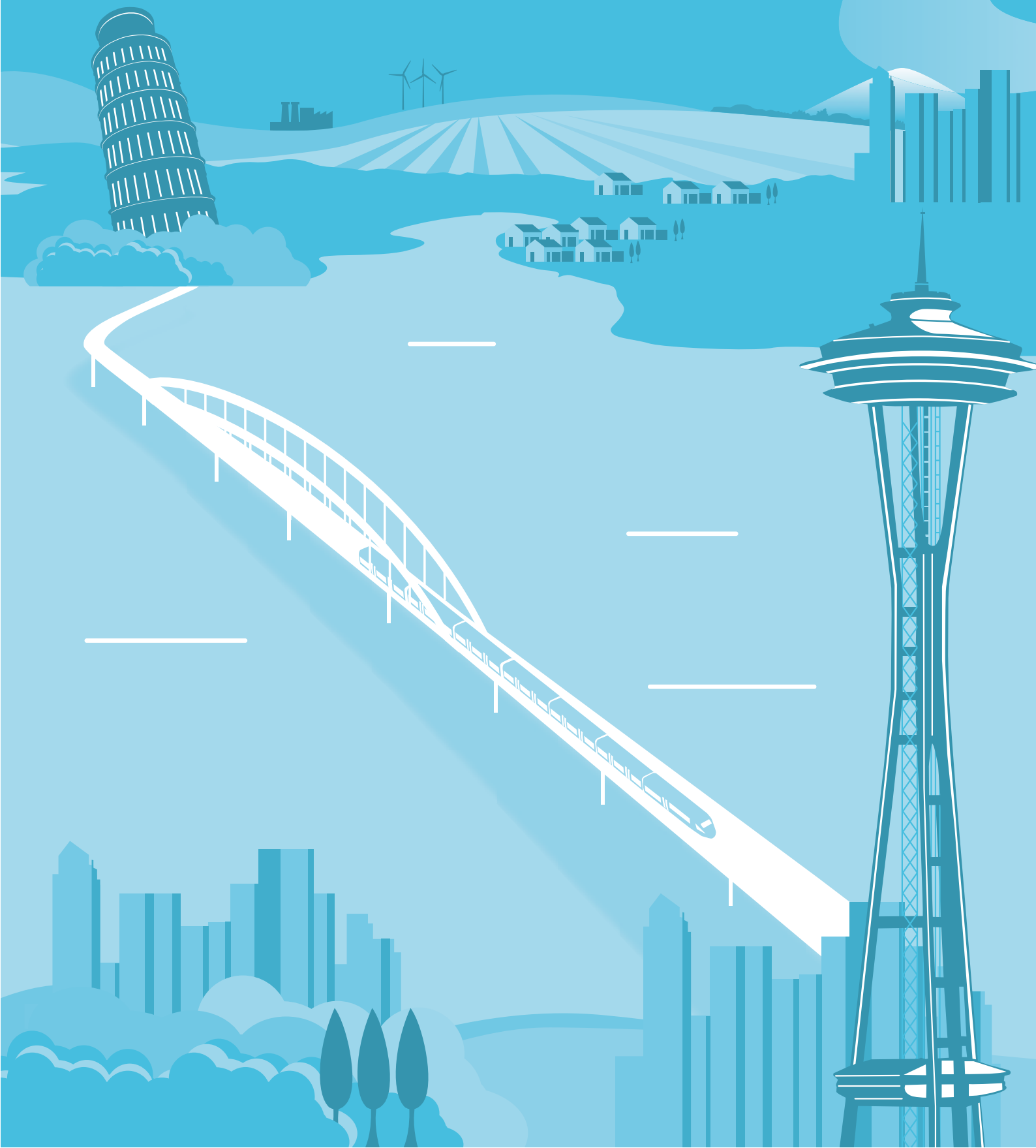
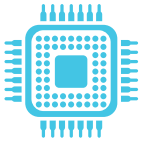
Shifting Dependencies: Rethinking Russia, China, and Global Supply Chains



Strategic sectors with vulnerable supply chains for both the U.S. and the EU



Semiconductors

Pharmaceuticals

Batteries

Critical materials

One consequence of the war in Ukraine is renewed attention to strategic dependencies. While the United States has limited exposure to the Russian economy, Europe is far more reliant on flows of energy and other commodities. This was a major reason why the EU preferred to exclude energy from the tough initial array of sanctions it leveled against Moscow. At the same time, the war has generated a new-found determination among Europeans to end their reliance on Russian energy over the medium-term, by identifying alternative supplies, turbo-charging renewables and clean tech development, prolonging indigenous fossil-fuel and nuclear power output, and improving energy efficiency measures. This will not be easy.

Beyond energy, the war in Ukraine has further scrambled regional and global supply chains already disrupted by the pandemic. When Covid-19 struck in 2020, many countries and companies were stunned to realize how dependent they had become on other countries for critical pharmaceutical and health care supplies. In 2021, as economies sputtered to restart after widespread lockdowns, the world's ability to deliver goods and services through extended supplier networks was further whipsawed by soaring demand, port disruptions, material shortages, and Covid-related factory closures. And now in 2022, flows of commodities and manufacturing components have been further upended. The upshot: heightened anxieties about excessive dependencies, unprecedented global supply and price shocks, surges in inflationary pressures, and drags on growth.

These shocks are forcing U.S. and European companies to reconsider how they organize their regional and global supplier networks. While Russia's war is creating headline disruptions, the deeper rethink centers around China, given U.S. and European concerns about inordinate dependencies on another potent strategic rival, and the country's far greater importance as a critical node in global supply chains.

How Dependent Are Europe and the United States on China?

In 2021, the European Commission and the United States published reviews of their respective supply chains, identifying dependencies and policies that could mitigate potential vulnerabilities.[1] Each identified semiconductors, pharmaceuticals, batteries and critical materials as strategic sectors with vulnerable supply chains due to highly concentrated reliance on a small number of suppliers. The EU report identified heightened import dependencies on China (52%), Vietnam (11%), and Brazil (5%); the U.S. report highlighted heavy reliance on China, in terms of both supply and demand.

Both the EU and the United States have important common dependencies vis-à-vis China, particularly regarding various COVID-related goods and active pharmaceutical ingredients (APIs, including vitamins, antibiotics, and hormones), critical materials, and products needed for the green and digital transitions, such as permanent magnets, electric accumulators,

Table 1 EU and U.S. Dependencies on China and the Rest of the World

	Number of Dependent products	Potential for Diversification				Share in Total Import Value
		Low	*Medium*	*Medium-High*	*High*	
U.S./EU Dependencies on China	20	61%	9%	9%	21%	EU: 2.8% U.S.: 4.1%
U.S./EU Dependencies on Rest of the World	70	25%	8%	22%	45%	EU: 4.6% U.S.: 5.1%

Sources: European Commission; United States Government; Ganyi Zhang, "EU-US: Public policies take up the challenges of the supply chain," Upply, July 23 2021, https://market-insights.upply.com/en/eu-us-public-policies-take-up-the-challenges-of-the-supply-chain.

Table 2 EU and U.S. Mutual Dependencies on China and the Rest of the World: Examples by Sector

	Health	Critical Materials	Renewables	Digital/ICT
U.S./EU Dependencies on China	APIs; Covid-19 related goods (face masks, gloves)	Tungstates, ferro-alloys, etc.	Permanent magnets	Laptops, cell phones, radio-broadcast receivers
U.S./EU Dependencies on Rest of the World	APIs; Covid-19 related goods (face masks, gloves)	Various	Permanent magnets, Type electric accumulators	Laptops, cell phones, radio-broadcast receivers

Source: European Commission; United States Government; Zhang.

cell phones, and radio broadcast receivers. Tables 1 and 2 track common U.S./EU dependencies vis-à-vis the rest of the world and China in particular.

The EU and the United States approach supply chain resiliency in similar ways. Both have identified roughly comparable sectors of high dependencies, and both emphasize the need to increase domestic capacity in those areas. Each has underscored the importance of transatlantic cooperation, and the need to modernize and strengthen international trade rules. In 2021, they created a Trade and Technology Council (TTC) to engage with each other, and with the private sector, to enhance the resiliency and robustness of their respective supply chains, especially in highly-vulnerable ecosystems.

Pharmaceuticals are an area of shared acute concern. Pharmaceutical supply chains have entangled countries around the world in a web of opaque and asymmetric interdependencies. The United States and Europe are each extraordinarily dependent on imports of APIs, the key ingredients for antibiotics and many other common medicines. The Covid-19 pandemic exposed stunning dependencies on drugs and medical supplies. Through the TTC the two parties could improve transparency throughout the pharmaceuticals supply chain; encourage industry to introduce quality management systems; facilitate advanced manufacturing techniques that promise to enhance diversification and redundancy; accelerate capacity for on-demand manufacturing capabilities for APIs and finished drug products; and establish virtual stockpiles and rapid-reaction mechanisms.[2]

Additional TTC priority themes are semiconductors, ICT and cloud technologies, artificial intelligence, clean tech and critical materials. Each is treated in an individual box in Chapter One.

Shifting Supply Chains

Even before the pandemic, concerns had been growing about supply chain resiliency and the asymmetric dependencies that had built up in the deeply intertwined supply chains linking the United States, Europe, and China. Before the pandemic hit, many companies were already shifting production out of China or diversifying their production. Some didn't want to become inordinately dependent on any one particular link in their supply chain. Several feared data security and privacy risks. Others wanted to avoid being caught in a U.S.-China trade war. And many decided that rising labor costs in China made other locales more attractive.[3] Footwear, accessories, toy and furniture manufacturers began moving out of China more than a decade ago. More than 83% of North American businesses and about 90% of European firms have announced plans to relocate at least part of their supply chains away from China.[4]

As a result, phrases like "regionalization," "near-shoring," and "on-shoring" are commonplace today as companies consider diversifying and simplifying their supply chains. The mantra of "just-in-time" has been replaced by "just-in-case," with more multinationals creating redundancies and safeguards in their supply chains. The rise in economic nationalism has contributed to this rethink as well, as more and more U.S. and European firms find themselves caught between the political pressures and incentives to build/invest locally versus the competitive advantages of leveraging resources from all over the world. How firms remain competitive and profitable while reducing the vulnerabilities and fragilities of their global supply chains is a critical task for firms over the near-term. Their survival will depend on it.

Given the high fixed costs that come with offshoring or setting up foreign operations, global supply chains are rather "sticky" in nature. "Reshoring" can be expensive, entailing significant additional fixed costs. That said, many companies are reconsidering the nature of their supply chains. While most are reluctant to fully "reshore" back to their home markets, some are rethinking the geography of their supply chains to ensure greater reliability, and to take advantage of changing cost calculations. A major 2021 joint report by the Asian Development Bank (ADB), the WTO and other institutions has offered evidence that global supply chains are shortening and that both the United States and China's participation rates are falling, even as the integration of some European and East Asian countries in cross-border supply chains continues to rise.[5] McKinsey estimates that 15-25% of global goods trade could shift to different countries over the next five years in a scenario where value chains become more regionally oriented.[6]

Rethinking China's Role in Commercial Flows

Most Western companies are in China because they seek to expand their presence in the Chinese domestic market, not because China is a cog in their extended global supply chains. Nonetheless, about 20% of global trade in manufacturing intermediate products used in supply chains now originates in China, up from 4% in 2002.[7]

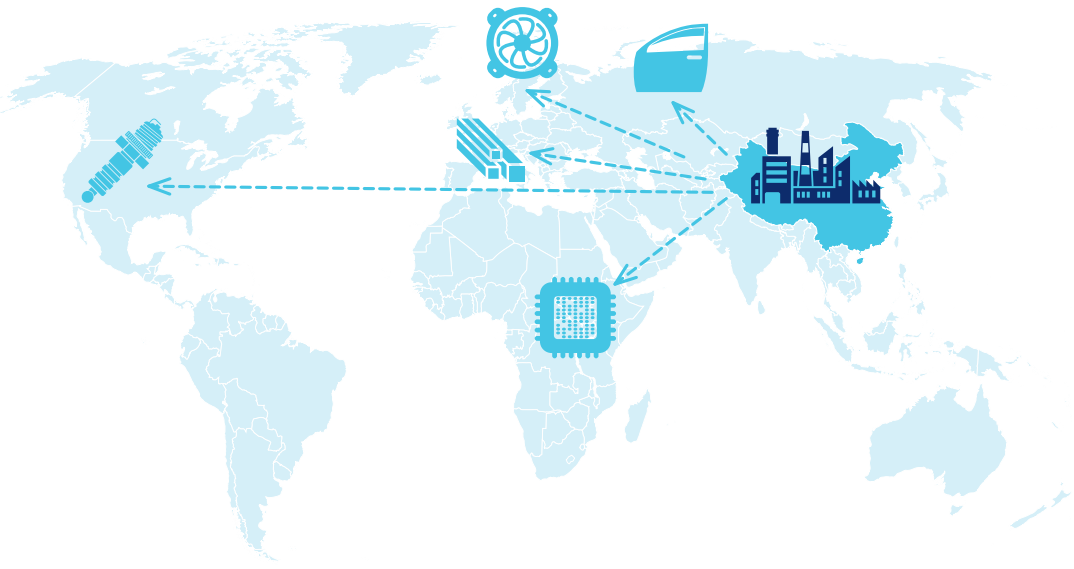
China's rise has translated into burgeoning trade in goods with the United States and Europe. U.S.-China goods trade has grown at an impressive 8.6% compound annual growth rate since 2000. EU27 goods exports to China expanded at a compounded annual rate of 12.6% between 2000 and 2020, compared to 4.3% annual growth in exports to the United States , according to data from the IMF. EU27 goods imports from China, meanwhile, rose at a 10.9% compound annual growth rate over the same time period, while goods imports from the United States expanded at a 2.4% rate.

These numbers have reinforced a fairly widespread – yet incorrect – view that China has become the top commercial partner of the United States and of Europe. Most such analysis equates international commerce only with trade in goods. Eurostat, the EU's statistical agency, reports that EU27 goods trade with China in 2021 totaled €695 billion, compared to €631 billion in EU27 goods trade with the United States.[8] That was a significant change from two years ago, when EU27 goods trade with the United States (€620 billion), exceeded EU27 goods trade with China (€562 billion). This shift was likely due to disruptions generated by the Covid-19 pandemic.

Trade between countries, however, doesn't just consist of trade in goods. It also includes trade in services, which the Eurostat report did not include. Services trade has been growing faster than goods trade. More European and American jobs depend on services than on goods, and the United States remains the EU's top services trade partner.

While final numbers for trade in services are not yet available for the full year 2021, we do have data for the first three quarters of the year. Trade in services between the EU27 and the United States during that period was €361.8 billion – 5.6 times more than the trade in services between the EU and China, which totaled €64.6 billion.[9]

20% of global trade in manufacturing intermediate products used in supply chains originates in China, up from 4% in 2002



Trade in goods and services (2021 estimate)

If we annualize those figures to estimate total trade in goods and services of the EU for 2021, we find that EU27-China trade in goods and services likely totaled €782 billion in 2021, while EU27-U.S. trade was €1.1 trillion – 42% higher than EU27-China trade.

In short, if you look at overall trade flows and not just one kind of flow, it is clear that the largest trading partner for the EU is actually the United States, and the largest trading partner for the United States is the EU, as it has been for decades.

The Two-Lane Highway vs. the Twelve-Lane *Autobahn*

Moreover, just as trade is more than just flows of goods, international commerce is more than just trade. Reducing complex commercial ties to just trade in goods and services ignores the importance of a host of additional economic ties that bind the EU and the United States in far deeper ways than those that bind either to China.[10]

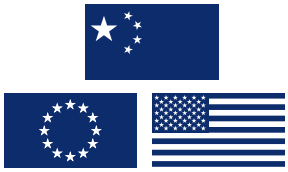
U.S. and European commercial ties with China are akin to a two-lane highway, whereas their commercial ties with each other are more like a twelve-lane *Autobahn*.

The highways to and from China are full of goods. They are busy, and they are crowded. Any type of accident on a two-lane highway can really snarl traffic – as we saw when supply chains were disrupted by the pandemic and by the U.S.-China tariff war. Alongside the highway are narrow bike lanes for services and investments.

At the end of 2020, the EU and China announced their intent to construct a new lane on their highway – an investment path that they believed could unsnarl some of that traffic and add to their overall connections. Despite the EU-China Comprehensive Agreement on Investment (CAI) inked in December 2020, however, that investment lane remains a construction site, after the EU joined the United States in sanctioning China for human rights abuses, in return for which China sanctioned a number of institutions and individuals in the EU, including leading members of the European Parliament – the body that needs to ratify the CAI. As a result, CAI is DOA – dead on arrival. While Chinese FDI in Europe rose in 2021, it did so from a very low level.[11]

The upshot is that both the EU-China and U.S.-China investment lanes face multiple roadblocks, as regulators voice security concerns about Chinese investments, as both sides tighten investment screening and export control procedures, and as each unveils bills aimed at boosting its respective competitiveness with China. China's onerous restrictions on foreign ownership, forced technology transfer rules, and opaque and politically-influenced regulatory procedures further dampen inward investment flows. Low Chinese FDI generates relatively few U.S. and European jobs.

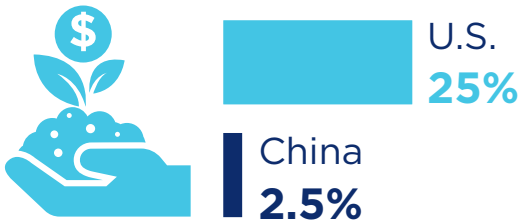
U.S-European investment lanes, in contrast, drive a huge amount of transatlantic commerce. The U.S. accounted for almost 25% of the EU27's total outward FDI position globally in 2019 – 10 times more than the



The ties that bind the EU to the United States are much thicker and far deeper than those that bind either to China

Share of the EU's total outward FDI position globally

(2019)



EU's investment position in China, which accounted for less than 2.5% of the total. Total European stock in the United States of $2.9 trillion in 2020 was more than three times the level of comparable investment from all of Asia. Germany's FDI stock in the United States totaled $411 billion in 2020. Chinese FDI stock in the United States was less than one-tenth of that total ($38 billion).

Europe's role vis-à-vis the United States is very similar. Measured on an historic cost basis, the total stock of U.S. FDI in Europe was $3.7 trillion in 2020 – almost 60% of America's total global investment position and 3.8 times U.S. investment in the Asia-Pacific region. U.S. FDI in the UK in 2020 was seven times more than such investment in China.

When flows from holding companies are removed, Europe still accounted for over half of total U.S. FDI outflows globally and more than double the share to Asia from 2009 through 2020.

In the first three quarters of 2021, U.S. companies invested $190 billion in Europe – 37 times more than what U.S. firms invested in China ($5 billion). And despite the pandemic-induced recession, U.S. companies in 2021 earned an estimated $300 billion from their operations in Europe – 23 times what they earned from operations in China.

Chinese FDI in Europe rose by 25% to $12.8 billion in 2021, while it fell by 34% in North America to just $5.8 billion.[12]

Moreover, these bustling transatlantic investment lanes are joined by innovation lanes hosting research and development flows that are the most intense between any two international partners. Jobs lanes provide employment for 16 million Europeans and Americans. And transatlantic digital lanes carry the vast majority of global digital content. In short, the commercial highway connecting Europe with the United States looks less like a two-way road than a twelve-lane *Autobahn*, with busier traffic and fewer speed limits.

Rethinking Global Supply Chains: Lies, Damn Lies, and Statistics

Conventional trade statistics also overplay China's role and underplay the role of the United States and Europe in other ways. For instance, standard metrics do not capture the value of intangibles in global value chains. Intangible assets include intellectual property, patents, trademarks, copyrights, brand names, product designs, software, databases, and certain types of business organization structures.[13] Failure to account for these intangibles in global supply chains substantially underestimates the nature and value of developed country exports and distorts trade balances between developed and emerging economies.

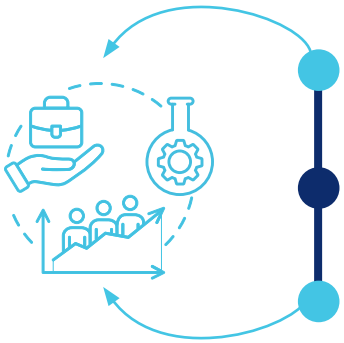
Extended supply chains have turned trade in goods into trade in tasks. Companies fragment their production processes and their services activities into a number of intermediate tasks, which are undertaken in many different places to exploit the specific comparative advantage of each location. These intermediate or indirect linkages now account for at least 70% of all global trade flows.[14]

Global supply chain tasks, in turn, can be broken down into three types: pre-production; production; and post-production. Pre-production tasks include research and development, product design, and branding. Post-production tasks include marketing, distribution, and retailing. Conventional trade measures only take into account one of these tasks: manufacturing production. They ignore both pre- and post-production, the two tasks that on average add twice as much value, and account for more jobs, than production tasks. Moreover, the firms that specialize in pre- and post-production also determine where these tasks take place – and those firms by and large tend to be in developed economies, including the United States and in Europe.[15]

The concept of trade in factor income basically adds in what is missing from conventional metrics. Doing so results in new ways of looking at global trade flows. To take an example, Apple reaps 59% of its iPhone X's value added from pre- and post-production tasks.[16] The least value-added is derived

Extended supply chains have turned trade in goods into trade in tasks

They add twice as much value and account for more jobs than production tasks



Intermediate tasks in global supply chains

Pre-production
(R&D, product development and branding)

Production

Post-production
(marketing, distribution and retailing)

from its production tasks, which are located in China. Nonetheless, when those phones are exported to the United States and Europe, they are recorded as goods exports from China, even though most of the value accrues to a U.S. company. Moreover, Apple's additional billions in sales in China do not turn up in U.S. trade statistics. The trade-in-factor-income approach adds Apple's profits from within China to U.S. exports to China, because, as a recent Asian Development Bank (ADB)/WTO report puts it, "that is the underlying economic reality, not the accounting fiction." Doing so across all U.S. companies cuts the U.S.-China goods trade deficit by one-third.[17]

This underscores the importance of intellectual property as a driver of both supply chains and investment flows. It also highlights its value as a source of income for developed economies such as the United States and Europe: 90% of the value of firms in the S&P 500 corresponds to intellectual property, which contributes twice as much to the value of trade as does physical capital.[18]

An additional lens through which we can understand the role of the United States and European companies in global supply chains is through indirect trade, which is the amount of trade conducted through intermediates instead of a simple direct exchange between two parties. According to the ADB/WTO, Germany, the United States, France and the Netherlands account for four of the top five indirect exporters (Table 3). And while conventional trade statistics portray China as the world's leading exporter, it ranks third in terms of indirect exports. Moreover, its share is falling – due to rising labor costs and the declining share of trade in China's economy. At the same time, the integration of various European and East Asian countries in cross-border supply chains is rising.

Table 3 Top 5 Economies with Major Indirect Exports ($Millions)

Economy	Gross Exports		Indirect Exports	
	2010	2019	2010	2019
Germany	1,385,309	1,810,593	631,683	949,316
United States	1,552,490	2,514,751	559,297	948,578
China	1,697,752	2,664,103	595,559	903,902
Netherlands	481,024	755,817	269,426	448,621
France	649,302	862,767	295,172	424,097

Source: Asian Development Bank, WTO et al., Global Value Chain Development Report 2021: Beyond Production, November 2021, https://www.adb.org/sites/default/files/publication/747966/global-value-chain-development-report-2021.pdf.

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