



# What's at Stake If the US and China Really Decouple

By Raj Varadarajan, Antonio Varas, Marc Gilbert, Michael McAdoo, Fang Ruan, and Gary Wang

**If the world's biggest trading relationship unwinds, US companies will have more to lose than Chinese firms in terms of revenue and access to critical supplies.**

Despite the “phase one” trade deal of January 2020, economic and geopolitical tensions between the US and China have continued to escalate. Chinese media have reported that, in response to US restrictions on several Chinese technology companies, the government is considering blacklisting foreign companies regarded as national security threats and has raised the possibility of restricting sales to US manufacturers of vital raw materials such as rare earths.<sup>1</sup> In a September 7 news conference, President Donald Trump said the US “will end our reliance on China” through “decoupling” or “massive tariffs.”

Caught in the middle are US and Chinese companies with around \$550 billion in revenues at stake in each other's markets. In many cases, these enterprises are also intimately interconnected through industrial supply chains. Unwinding commercial ties that took decades to build would be costly and pose significant risk to both US and Chinese companies. But our analysis suggests that US companies, because of their strong push over the years to source and sell in China, collectively have far more to lose

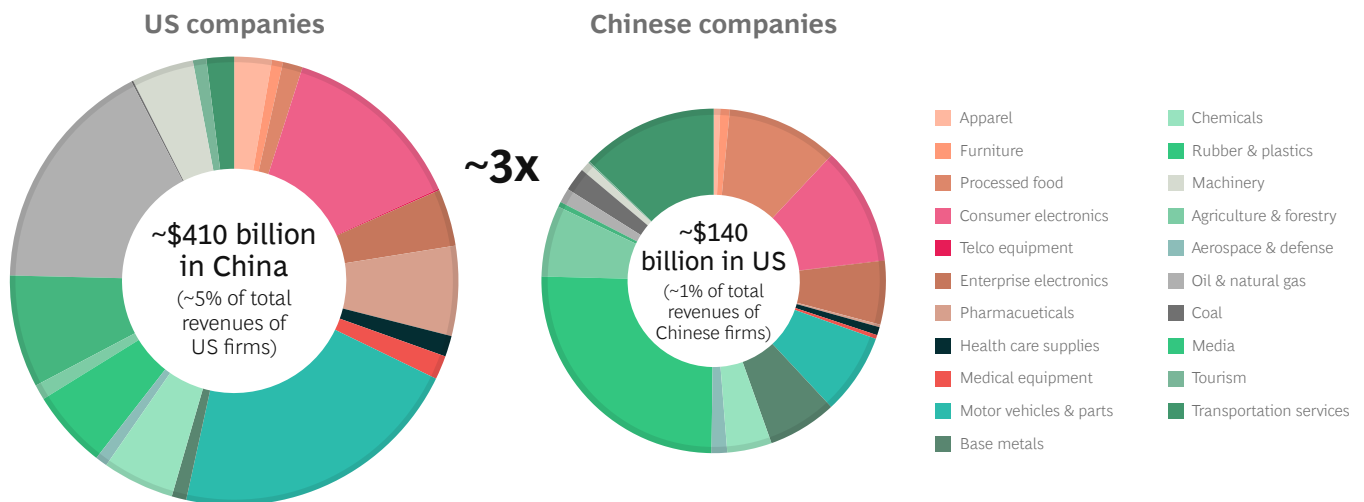
in the near term—with respect to both revenue and access to critical components and materials.

US companies have around \$400 billion of revenue at risk in China. (See Exhibit 1.) While that represents only 5% of their total revenues, its loss would translate into around 15% of their market capitalization, or about \$2.5 trillion in value.<sup>2</sup> We found that seven major US industrial sectors—consumer electronics, motor vehicles and parts, aerospace, medical supplies, medical equipment, machinery, and enterprise hardware—derive 7% to 16% of their global revenue from China.<sup>3</sup> Overall, Chinese firms have three to five times less revenue exposure to the US market; only the consumer electronics, enterprise electronics, and machinery sectors rely on the US for at least 7% of revenue.

Moreover, the share of US industrial sectors that would find it hard to replace China as a finished- and intermediate-goods supplier is larger than the share of Chinese sectors that would find it hard to replace US suppliers. And more than half of the 16 US manufacturing sectors we

1. Rare earths are a set of 17 metallic elements with electronic and magnetic properties needed in electronic products.
2. The estimate of market capitalization risk is calculated on the basis of the average 2019 profit margin structure (49% gross margin) for S&P 500 companies and EV/EBIDTA valuation multiples that historically range from 11 to 14.
3. In our assessment of risk, we defined industry sectors on the basis of the commonly accepted Harmonized System trade codes. Enterprise hardware includes servers and networking equipment.

# Exhibit 1 - US Companies Have More Revenue at Risk in China Than Chinese Companies Have in the US



Sources: BCG Global Advantage Trade Atlas; Oxford Economics; Euromonitor; USTR; Capital IQ, BCG analysis.

Note: US and Chinese companies' at-risk revenue based on BCG estimates of each sector's US or Chinese and global revenue.

studied, particularly engineering-intensive ones such as aerospace and telecom equipment, rely on China for critical components or raw materials. With the exception of sectors like consumer electronics and telecom equipment, Chinese industries are more self-sufficient in critical inputs.

To mitigate these demand and supply chain risks, companies in both nations must prepare now to build resilience in their manufacturing and supply networks and explore new markets. Although the emerging framework of the future US–China commercial relationship remains ill-defined, the general direction seems clear. Current trends in bilateral relations indicate that the rhetoric of decoupling could become reality.

## An Increasingly Fraught Relationship

For much of the period following China's opening to the rest of the world in the late 1970s—and particularly after China entered the World Trade Organization in 2001—the relationship between the US and China was characterized by strategic engagement and expanding economic ties. In recent years, it has shifted to a phase of escalating friction if not open confrontation.

The bilateral tensions go well beyond trade and are unlikely to be resolved by the outcome of the US presidential election. Relations are strained by issues such as cybersecurity, allegations of technology theft and unfair economic

competition, and—more fundamentally—strategic rivalry as China rises as an economic and geopolitical superpower. Technology products are central to this competition because they account for a significant share of the annual US trade gap with China and are regarded as critical to economic competitiveness and national security. Owing to national security concerns, there has been bipartisan support in the US for restricting sales of semiconductors and other technology products to leading Chinese entities. For its part, China's government has published a draft law that would enable the government to restrict exports of “emerging” and “foundational technologies,” as well as of critical inputs such as rare earths.

Long before the COVID-19 crisis, companies had been growing increasingly concerned about the resilience of global supply chains that depend heavily on a handful of countries. The pandemic has heightened those concerns, especially with respect to critical components and medical supplies. The percentage of US citizens expressing a negative view of China rose from 47% in 2018 to 66% in 2020, according to Pew Research Center polls, while in China, negative opinions about the US have increased from 17% to 28% over the past year. Hostile public opinion could lead consumers in both countries to shun each other's products. In a 2019 survey by Brunswick Group, 56% of Chinese respondents said they had boycotted US products “to show support for China.”

## Assessing Exposure to Demand Risk

To gain an understanding of the potential impact of worsening trade relations, we analyzed demand risk and supply chain risk for 16 broad industrial sectors in the US and China. The industries that are most exposed to potential decoupling are those in which both demand and supply risk are high.

Our metric for demand risk is the percentage of companies' global revenue, in every sector, that comes from selling to the other country. Direct revenue more accurately measures demand exposure than trade (exports and imports). China has a perennially lopsided trade surplus with the US. But trade statistics include goods that are built in China on behalf of US companies and are then sold in the US market. Also, trade statistics don't capture goods that US companies build in Chinese factories for sale in the domestic market, such as Buick compact cars, Otis elevators, and Apple iPhones.

If the commercial relationship deteriorates to the point that US companies cannot sell in China or become targets of consumer boycotts, our analysis indicates that US industries would stand to lose far more revenue than their Chinese counterparts. This is not surprising: US companies earn three times as much revenue from direct sales in China—around \$410 billion in 2019—as Chinese companies record in the US.

The US consumer electronics sector is the most exposed to demand risk. US consumer electronics companies sold around \$60 billion worth of smartphones, notebook computers, and other devices in China in 2019—16% of US global revenue in this sector. The US motor vehicle and parts sector is close behind, with China accounting for 14% (\$80 billion) of its global revenue. What's more, China has been a larger growth market than the US for cars and trucks as more households enter the middle class. The US aerospace sector relies on China, now the world's biggest aircraft market, for approximately 10% of its revenue, and the medical supply, medical equipment, enterprise electronics, and machinery sectors rely on China for 7% to 8% of their revenue.

The consumer electronics sector has the greatest revenue risk exposure among China's manufacturing industries as well. Chinese consumer electronics companies' \$20 billion in direct sales in the US in 2019 represented 17% of their global revenue. Other than that, only China's machinery, enterprise electronics, and medical-supplies sectors rely on the US for 6% to 8% of their revenue. And even that exposure can be narrow: intubation equipment, such as catheters and bougies, accounts for 80% of the \$16 billion in sales of medical supplies by Chinese companies in the US.

When it comes to services, which account for around 10% of the value of bilateral trade, Chinese industries generally have more exposure to demand risk. Although far more Chinese tourists visit the US than US citizens travel to China, most arrive on Chinese airlines. If travel between China and the US were to halt, Chinese airlines would stand to lose up to \$8 billion in revenue, given pre-COVID levels. The US tourism industry, by contrast, has \$4 billion in annual revenue at stake, primarily in travel and accommodations. China's maritime sector, which transports most of the goods exported to the US, has \$10 billion at risk.

## Assessing Supply Chain Risk

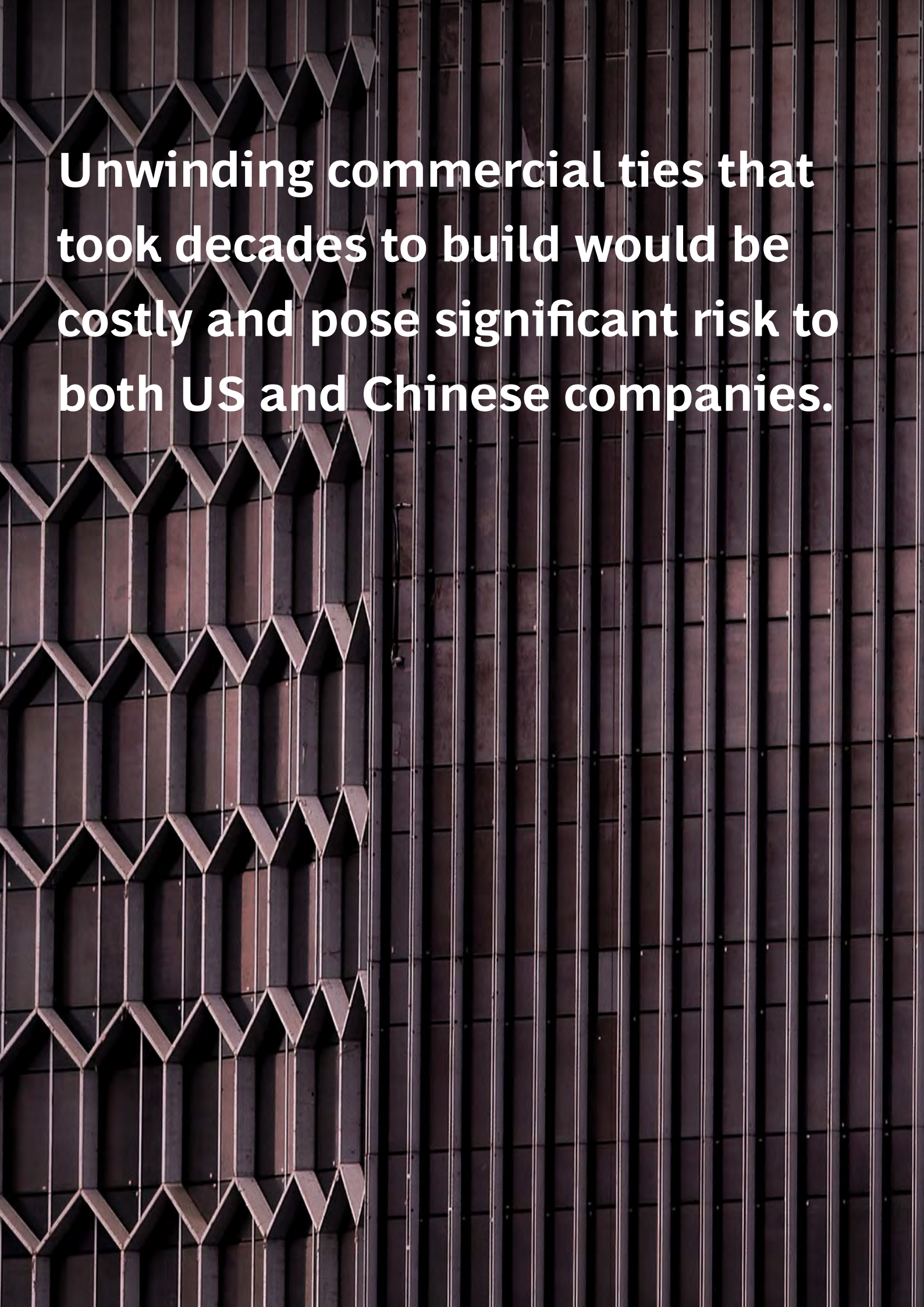
In terms of supply, decades of trade and investment have fostered a high degree of interdependency between the US and China in many industrial sectors, not only for certain finished goods but also for key intermediate goods and raw materials. Trade tensions therefore affect not only what companies can sell in China or the US but also what they can export from either country to the rest of the world.

To identify which sectors' supply chains are most at risk from a halt in trade, we estimated how much of each sector's domestic demand and exports to the rest of the world depend on imports from the other country. In the US motor vehicles and parts sector, for example, we calculated US firms' total import volumes from China and divided that by the size of the US auto market and US exports to the rest of the world, excluding China.<sup>4</sup> This percentage indicates how reliant US automotive OEMs and US parts suppliers are on their China supply chain.

The magnitude of dependency is only part of the picture, however. We next analyzed how difficult it would be for manufacturers in the US and China to shift their entire supply chains out of the other country if bilateral trade were to end. Some sectors, such as apparel manufacturing, today depend on China, but—with effort—supply chains could be diversified to other countries. We used the dollar value of global export volumes as a proxy for manufacturing capacity in the rest of the world. If Chinese exports to the US in a given sector are equal to more than 20% of the remaining export capacity in the rest of the world, for example, we regard that sector as highly dependent on China. This is because the scale of the Chinese supply base is likely so large that it would be very difficult to completely replace it by shifting manufacturing to other countries, where available production capacity is limited. If, on the other hand, Chinese exports to the US are equal to or less than 10% of the rest of the world's available export capacity, we regard the difficulty of substitution as low.

Furthermore, as the COVID-19 crisis has illustrated, supply chains in many industries rely on inputs that are vulnera-

4. We adjusted the domestic market size by gross margin in order to capture the true sector-level dependency on imports. In many sectors, the dollar values of imported intermediate components are low, but these components are used in the production of high-margin end products. Drug compounds imported by pharmaceutical manufacturers, for example, account for a small portion of the value of medications.



**Unwinding commercial ties that took decades to build would be costly and pose significant risk to both US and Chinese companies.**

ble to supply chain disruption. We therefore also assessed how heavily industries in the US and China rely on the other country for imports of critical components and raw materials. Although many of these inputs account for a small portion of overall production costs, they are key building blocks in the earliest stages of the manufacturing value chain, particularly for highly engineered goods such as electronics, telecommunication equipment, automotive parts, and machinery. (See the sidebar, pages 6 to 7.)

As one might expect, US companies bear significantly more supply chain risk across a range of industries than do Chinese companies. (See Exhibit 2.) The consumer electronics sector is particularly dependent on Chinese factories, which supply more than 70% of devices sold in the US. In fact, China accounts for around 75% of the entire world’s consumer electronics export capacity, making that country extremely difficult to replace. China is also a crucial supplier of such components as the lithium-ion batteries used in cellphones and electric vehicles.

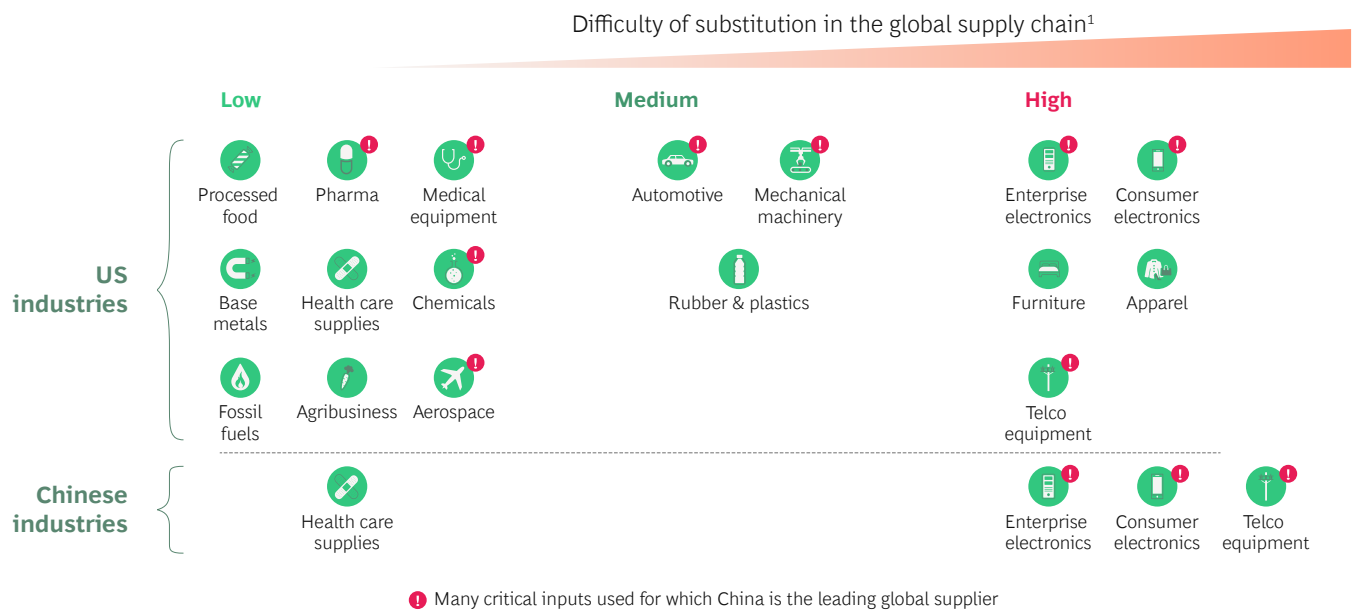
The difficulty of import substitution would also be high for the US apparel, furniture, machinery, motor vehicle, telecom equipment, and enterprise electronics sectors. While

the EU, South Korea, and other nations could supply some of these industries’ needs, they lack the capacity to fully replace China. A cutoff in supplies, therefore, could result in higher costs and manufacturing disruptions.

By contrast, in only 2 of the 16 sectors in our study—consumer electronics and medical supplies—do Chinese imports of US goods account for at least 10% of global capacity. China imports around 15% of its consumer electronics products from the US, primarily intermediate goods. Even if the entire consumer electronics export capacity of South Korea and Japan were devoted to the China market, it would supply less than 40% of the products currently imported from the US.

Chinese aerospace manufacturers, however, could find alternative tier-one suppliers in the EU, Japan, South Korea, and Canada. Chinese processed-food importers could turn to the EU and nations such as Brazil and Malaysia. China could switch from US to Japanese companies for medical equipment, medical supplies, motor vehicle parts, and all electronics hardware. Malaysia could help replace the US as a supplier of enterprise electronics, machinery, and medical supplies.

## Exhibit 2 - More US Than Chinese Industries Are Highly Exposed to Supply Risk



Sources: BCG Global Advantage Trade Atlas; Oxford Economics; Euromonitor; USTR; Capital IQ, BCG analysis.

Note: Network equipment is split between enterprise electronics and telco equipment.

<sup>1</sup>Substitution analysis addresses only intermediate goods as defined by Harmonized System codes. Low difficulty = imports from the other country are <10% of the rest of the world’s (ROW) export capacity; medium difficulty = imports from the other country are 10% to 20% of ROW export capacity; high difficulty = imports from the other country are >20% of ROW export capacity.



## Critical Inputs and Supply Chain Risk

We have identified 19 critical inputs, used in the earliest stages of the manufacturing value chain, for which there are no known substitutes in the near to medium term. These inputs include semiconductors and lithium-ion batteries, as well as raw materials that are currently available from only one or two nations, including beryllium, cobalt, lithium, graphite, tungsten, and a set of metallic elements collectively known as rare earths. Although these materials account for only a small portion of overall production costs, they are the building blocks of key components in cars, computers, and many other high-value products—and they represent an often overlooked vulnerability in global supply chains.

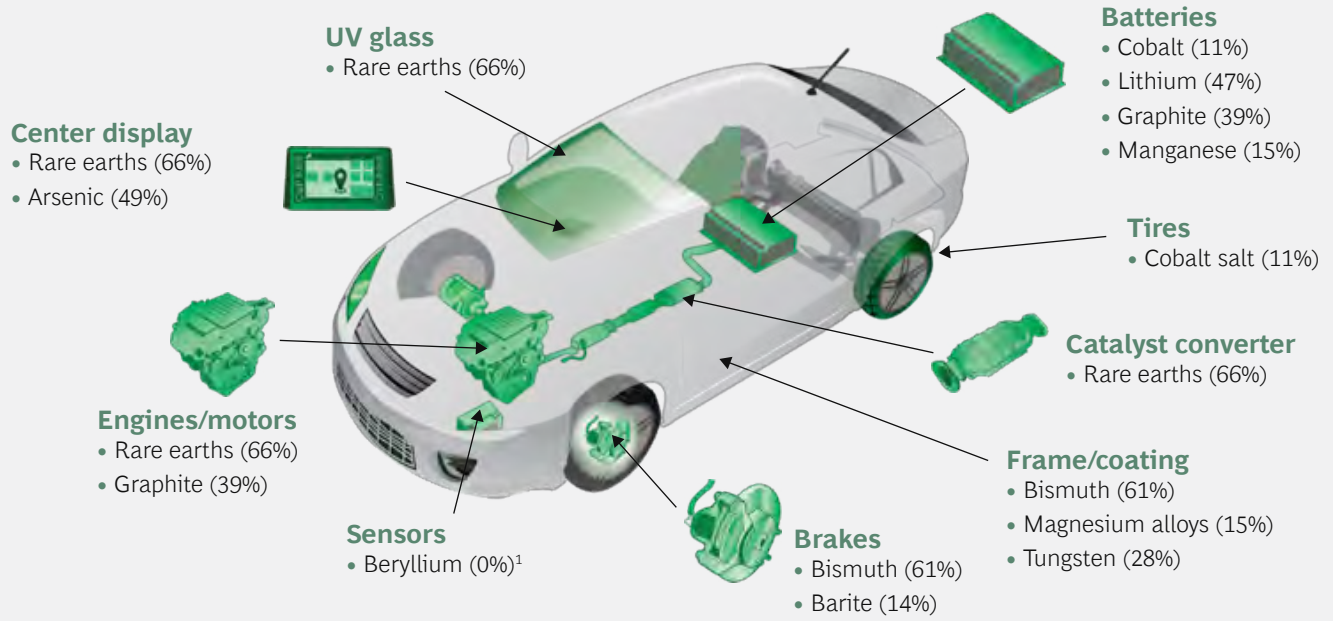
Consider motor vehicles, which require 16 of those critical inputs. Rare earths, which have important magnetic and electronic properties, are needed in the dashboard display, catalytic converter, engine, and ultraviolet windshield.

Bismuth is used in the frame, coating, and brakes. Beryllium is needed for sensors, and cobalt, lithium, graphite, and manganese are used in the batteries. (See the exhibit.) Indeed, most sectors with highly engineered end products—including consumer electronics, aerospace, medical equipment, and machinery—contain an equally large number of such critical inputs. The average pharmaceutical product contains 9 and the average chemical product 13.

Because China is self-reliant in most critical raw-material inputs—and a dominant supplier to the rest of the world—its manufacturing industries have some strategic advantages in terms of supply chain resilience. China not only has the largest economically viable reserves of many of these materials but also leads across the entire value chain—mining, refining, processing, and manufacturing. For example, China is the prime source of mined antimony and the

# Multiple Auto Components Rely on Critical Inputs

US IMPORTS FROM CHINA (% OF TOTAL FOR EACH INPUT)



Sources: BCG Global Advantage Trade Atlas; Oxford Economics; Euromonitor; USTR; USGS; Gartner; News reports; Market reports; BCG Analysis

<sup>1</sup>China is more dependent on the US for beryllium (6% of imports).

dominant refiner of antimony ore into trioxide—a key ingredient of fire retardants—and the diodes used in electronics. In fact, China leads in the extraction of 9 of the 17 critical raw-material inputs and in the refining of 14 of them.

The US, by contrast, is self-sufficient only in depleted uranium, which has applications in radiography cameras and

aerospace components, and in refined zirconium. Its manufacturers rely on imports, particularly from China, for all others. The implications: companies will need to carefully analyze their supply chain to identify single points of failure and mitigate risk through diversification of suppliers and products.

Semiconductors represent the most serious supply risk for Chinese industries. China’s consumer electronics, telecommunications equipment, and computer hardware sectors all rely heavily on US semiconductors. In May and August 2020, the US imposed new restrictions on exports of semiconductors to a number of Chinese entities. The restrictions apply to chips made overseas by non-US companies using semiconductor design tools and manufacturing equipment supplied by US companies. These moves could thus effectively block other countries’ companies from supplying Chinese companies with semiconductors.

It must be noted that the substitution challenges would differ widely among products within these broad industrial categories. Consider pharmaceuticals. China imports 20% of its antibiotics from the US, and because China accounts for around one-quarter of US antibiotics production capacity, it could be challenging for Chinese importers to find alternative suppliers. But Chinese imports from the US of other pharmaceuticals are negligible, and alternatives are available. Companies will need to take a product line-to-product line approach to assessing and mitigating risk.

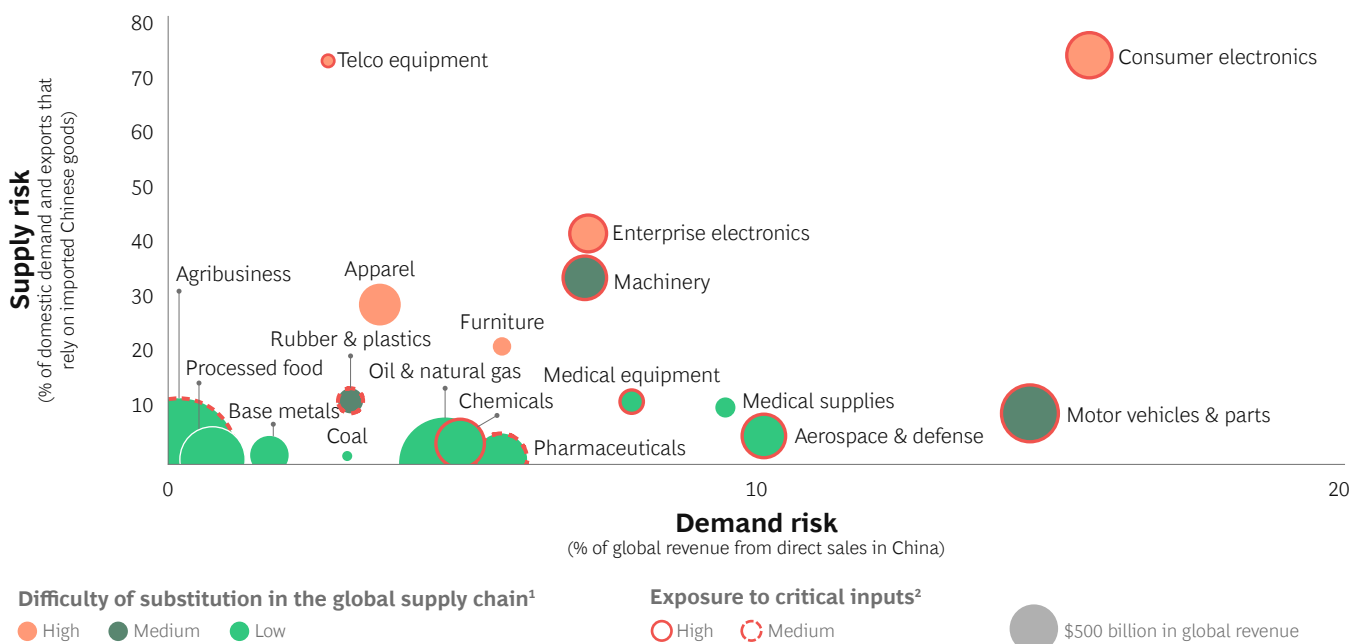
### Sectors with Both High Demand and High Supply Risk

When it comes to both demand and supply risk, once again many more US than Chinese industrial sectors have high exposure to deteriorating trade relations.

The US consumer electronics industry faces the highest combined risk. And when reliance on critical inputs and the difficulty of finding substitutes for imported inputs are taken into account, enterprise electronics, machinery, motor vehicles and parts, telecom equipment, and aerospace also fall into this category. (See Exhibit 3.)

By contrast, only China’s consumer electronics sector faces both high demand and high supply risk from a potential decoupling. (See Exhibit 4.)

## Exhibit 3 - US Sectors Like Telco Equipment and Electronics Face Both High Demand and High Supply Risk



Sources: BCG Global Advantage Trade Atlas; Oxford Economics; Euromonitor; Office of US Trade Representative, US Geological Survey, Gartner, media reports, BCG analysis.

<sup>1</sup>Supply risk addresses only intermediate inputs as defined by Harmonized System codes. Low difficulty = imports from the other country are <10% of the rest of the world’s (ROW) export capacity; medium difficulty = imports from the other country are 10% to 20% of ROW export capacity; high difficulty = imports from the other country are >20% of ROW export capacity.

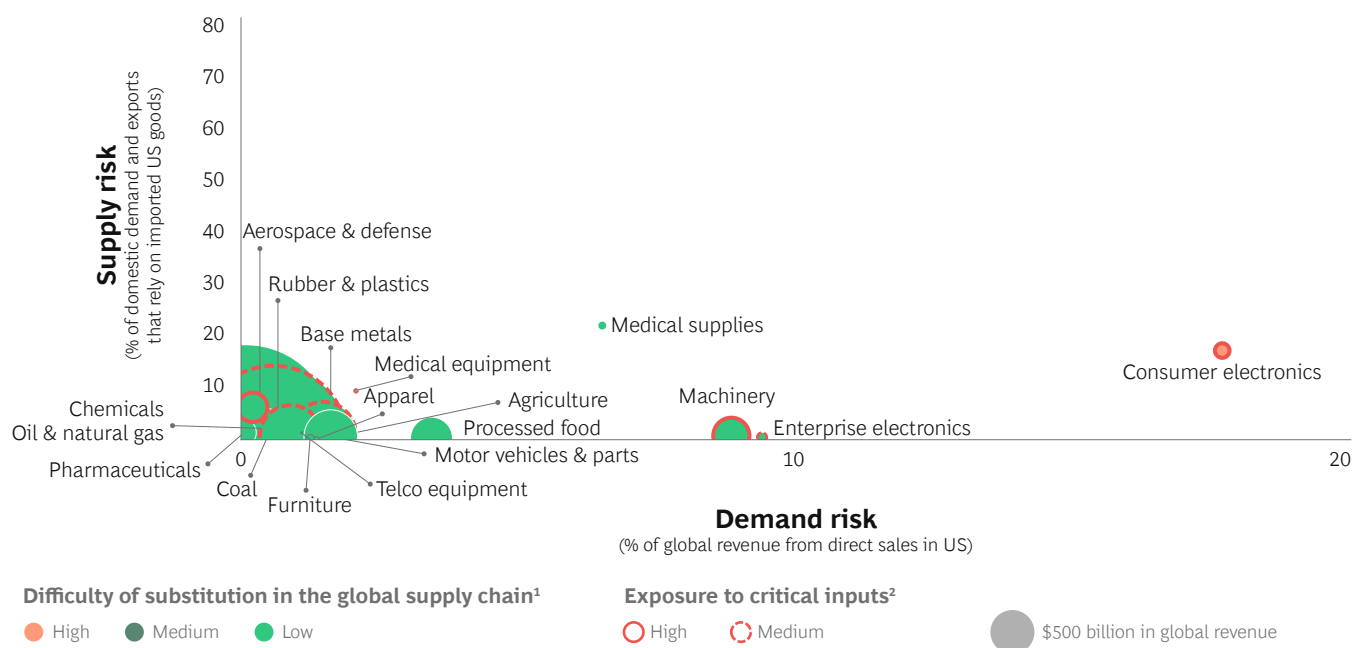
<sup>2</sup>High exposure = >10 critical inputs; medium exposure = 5 to 9 critical inputs.





**US companies, because of their strong push over the years to source and sell in China, have far more to lose in the near term.**

## Exhibit 4 - With Few Exceptions, Chinese Industries Are Not Highly Exposed to Demand and Supply Risk



**Sources:** BCG Global Advantage Trade Atlas; Oxford Economics; Euromonitor; Office of US Trade Representative, US Geological Survey, Gartner, media reports, BCG analysis.

<sup>1</sup>Supply risk addresses only intermediate inputs as defined by Harmonized System codes. Low difficulty = imports from the other country are <10% of the rest of the world's (ROW) export capacity; medium difficulty = imports from the other country are 10% to 20% ROW export capacity; high difficulty = imports from the other country are >20% ROW export capacity.

<sup>2</sup>High exposure = >10 critical inputs; medium exposure = 5 to 9 critical inputs.

### How Companies Can Prepare for Decoupling

Although US–China trade tensions have been rising for several years, thus far most companies in both countries have made only moderate, tactical adjustments to their supply chains. In part, this reflects the hope that trade peace will break out as a result of either a further “deal” between the US and China or changes in political leadership. The most likely scenario, however, is that commercial frictions will worsen. A decoupling, particularly in strategic industries, is no longer implausible.

As our research found, decoupling could be very disruptive to companies in both the US and China over the near and medium terms. Revenues could drop significantly in some industries, and the strong interdependencies among supply chains will be very hard to circumvent any time soon. From an economic point of view, therefore, decoupling would damage both sides. Given the intensifying strategic competition between the US and China, however, national security concerns could supersede economic logic.

Companies in the US and China must prepare now by building more resilience into their businesses, manufacturing footprints, and supply networks. They should build a fact base that will clarify their exposure to a loss of demand and the impact on their supply chains under various scenarios. To prepare for the uncertain new environment, companies should prepare a playbook of potential actions, such as identifying potential new markets and regionalizing their manufacturing and supplier footprints. Many international enterprises, for example, are increasingly making their factories in China concentrate on serving the important, still-growing domestic market and nearby countries, while those in North America and Europe focus on supplying their own regions.

Companies can also make their supply chains more resilient by diversifying their supply base and identifying potential alternative sources of critical components and materials—or even by redesigning products. Some automakers, for example, are exploring the possibility of replacing magnet motors that require rare earths with inductive motors

that use more widely available copper or steel. One Chinese consumer electronics company is preparing for the potential loss of access to US semiconductors by turning to suppliers in South Korea, Japan, or Europe.

Organizations in the US and China could also mitigate risk by diversifying their product portfolios, marketing resources, and investments to other global growth markets. Meanwhile, companies based in Europe, Japan, and Brazil could find new opportunities in the US and China—or renegotiate contracts to seek better terms. A European apparel company, for example, might explore entering new market segments in China if support for US brands declines. Or it could revisit arrangements with factories in China to seek

better prices and timelines. The withdrawal of US or Chinese competitors from their domestic markets could also create new opportunities in those countries.

The deep and complex linkages between US and Chinese markets and industries took decades to build. These ties will be costly and disruptive to transform, even in a gradual and phased manner. But companies that begin adapting now will mitigate the risks and be in the strongest position to capture competitive advantage however the US–China commercial relationship plays out.

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