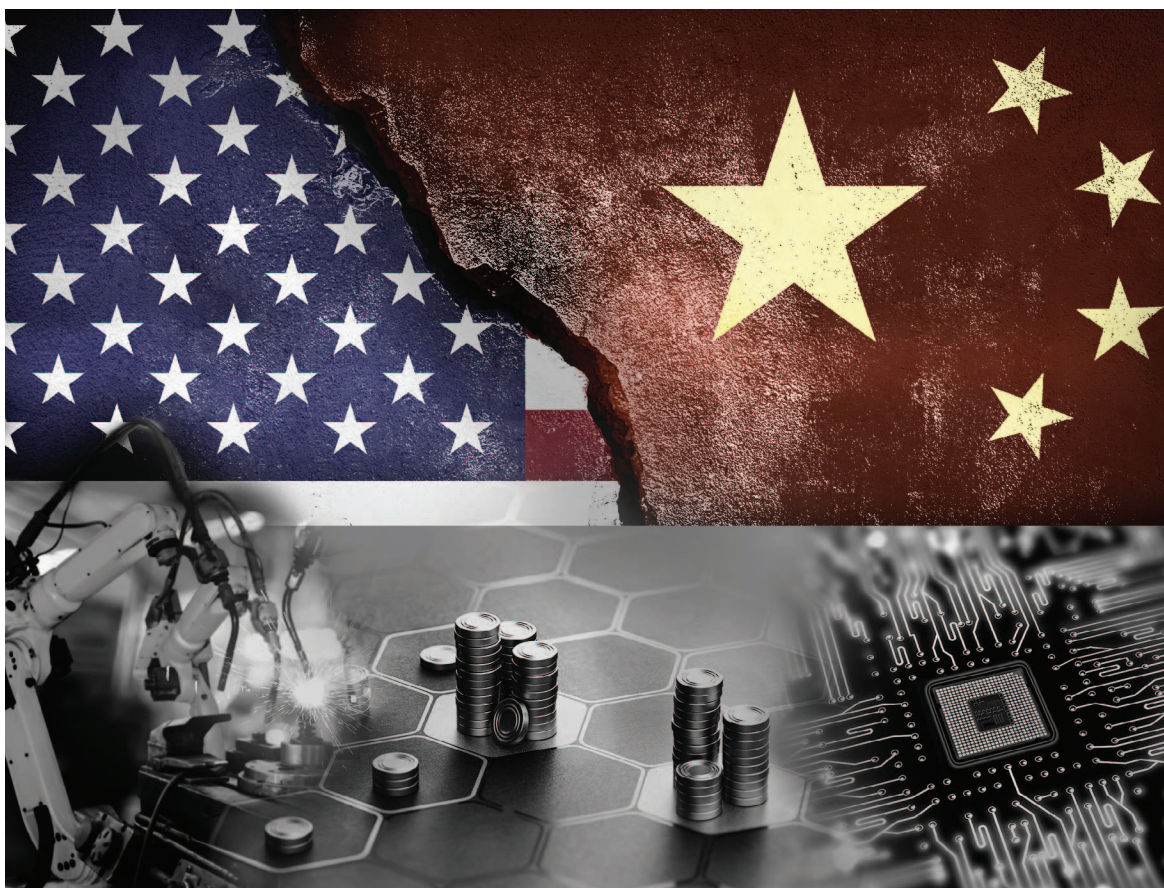


BONNY LIN, HOWARD J. SHATZ, NATHAN CHANDLER, CRISTINA L. GARAFOLA, EUGENIU HAN,
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Bridging the Gap

Assessing U.S. Business Community Support for
U.S.-China Competition



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About This Report

Starting with the administration of President Donald Trump and continuing into the administration of President Joseph Biden, the United States has placed increasing restrictions on economic exchange with China. How does the U.S. business community view these policies, and does it broadly support increased efforts to counter problematic Chinese economic behavior? If not, how could the U.S. government implement policy to better incorporate business interests, address corporate concerns, and gain greater cooperation from the U.S. business community? In this report, we attempt to answer these questions that are central to whether the U.S. government has crafted an overall economic strategy or approach to China that is sustainable and feasible. The views of the U.S. business community on how the United States should deal with China are an overlooked and underappreciated topic. The United States may find it difficult to compete against China without support from the U.S. business community.

This report should be of value to the national security community and interested members of the general public—especially those with an interest in U.S.-China dynamics. The research was conducted during fiscal year 2020 and prior to the 2020 U.S. presidential election.

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Summary

During its four years, the administration of President Donald Trump pursued an enhanced—and, in some ways, novel—set of policies to confront China over its economic policies, including China’s theft of technology and intellectual property (IP), limitations to market access for U.S. businesses, and other anticompetitive behaviors. How did the U.S. business community view the Trump administration’s economic policies focused on the People’s Republic of China (PRC), and did it broadly support increased U.S. efforts to counter problematic PRC economic behavior? If not, how could the U.S. government implement policy to better achieve policy goals and at the same time address corporate concerns? In this report we attempt to answer these questions that are central to whether the U.S. government has crafted an overall economic strategy or approach to China that is sustainable and feasible. The views of the business community on how the United States should deal with China are an overlooked and underappreciated topic, and the United States may find it difficult to compete against China without support from the business community.

This report analyzes how the U.S. business community—specifically, the manufacturing, technology, and financial sectors—viewed the Trump administration’s China policies through several different lenses: (1) from the perspective of individuals working in different industries, (2) from the perspective of different firms over time, and (3) from the perspective of specific industry sectors and subsectors. The analysis focuses on Trump administration actions toward China from 2017 through the fall of 2020. The RAND Corporation team concluded the majority of the research for this report in October 2020 and before the November 2020 presidential elections.

National Survey of Views on China

We conducted a national survey of U.S. adults from March to April 2020 to assess individual-level views on China. We find that the U.S. public generally views China as both a military or security threat and an economic opportunity (Table S.1). The U.S. public is generally supportive of restricting U.S. corporate products or services to China and boycotting problematic PRC products, suggesting a willingness to curb potential economic gains from China to protect U.S. interests and values. At the same time, the majority of U.S. survey respondents did not support limiting Chinese workers and students in the United States. This suggests that any U.S. government effort to limit PRC student and worker visas is likely to be met by public resistance. There is little evidence that individual views on China are linked to an industry of employment, although we did find some evidence to suggest that those in the financial sector were less likely to support limits on PRC nationals studying or working in the United States.

Earnings Calls to Analyze Business “Sentiment” Toward China

We also examined how different industries and subsectors responded to the Trump administration’s actions against China by analyzing the transcripts of quarterly corporate earnings calls from companies in the Standard & Poor’s (S&P) 500 Index and the Russell 2000 Index. We assessed what the corporate earnings calls conveyed about the company’s views about China or its business prospects with or in China. Figure S.1 shows the results for the S&P 500 companies.

We find that manufacturing and technology firms had earnings calls that voiced more concern with (had decreasing sentiment regarding) China-related operations from 2018 to late 2019. This suggests that manufacturing and technology firms may have faced more difficulties and costs from the policies the Trump

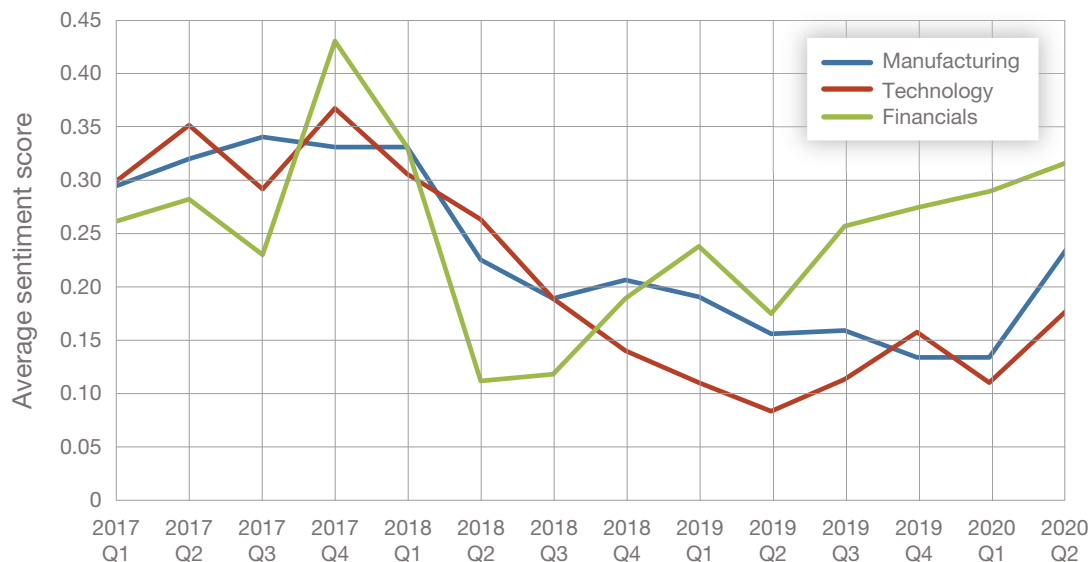
TABLE S.1
Survey Results for Individual Views of China

Questions	Answers (%)	
	Yes	No
Question 1. Do you see China as a security or economic threat to or opportunity for the U.S.?		
<i>China is a security threat</i>	75.2	
<i>China is an economic threat</i>	36.2	
<i>China is an economic opportunity</i>	48.9	
Question 2. Should the U.S. government stop U.S. companies from providing services or goods to Chinese actors that undermine U.S. interests or values even if it weakens the U.S. economy? (Example: The U.S. government should stop U.S. companies from selling to Chinese companies that provide technology to censor the Chinese internet.)	59.7	39.6
Question 3. Foreign workers and students are important contributors to U.S. innovation, but a small portion may illegally take innovation back to their home country, and others may return to their home country with new skills and compete against the United States. Should the United States limit Chinese workers and students even if it weakens the U.S. economy because of less innovation?	35.1	64.2
Question 4. The U.S. government has said that Huawei, a Chinese telephone company, could be collecting user information and intelligence on behalf of the Chinese military. Huawei has disputed such allegations and many countries use Huawei phones. Are you willing to buy a phone produced by a Chinese technology company with potential links to the Chinese military?	17.1	82.6

SOURCE: Authors' calculations from the RAND Corporation, "RAND American Life Panel," webpage, undated.

administration implemented with respect to China. In contrast, large financial companies listed in the S&P 500 saw a dip in sentiment in early 2018 (compared with late 2017) and subsequent increase in positive sentiment from 2018 to mid-2020. This suggests that financial firms could have viewed the actions taken by the Trump administration as providing them with slightly more opportunities or benefits compared with costs. We do not find any significant difference between how large U.S. firms and small U.S. firms (based on

FIGURE S.1
Average China-Related Sentiment by S&P Sector, 2017–2020



SOURCE: Authors' analysis of earnings calls from LexisNexis's Fair Disclosure Wire.

the Russell 2000 Index) viewed China-related activities. Furthermore, we note that there are large standard deviations to our estimates, and so while the point estimates differ, there may have been little difference in sentiment by sector.

How Sectors Viewed the Trump Administration’s China Policies and Their Impact

Finally, we assessed how each sector viewed the Trump administration’s China policies and whether the policies had a generally positive or negative impact on the sector. Our research involved looking across different business functions and interviewing nearly 30 industry experts. We find that while companies and industry experts were broadly supportive of the Trump administration’s goals to level the playing field for American companies and counter problematic PRC practices, there were significant concerns about the unilateral and seemingly ad hoc tactics that the administration took with limited consultation with businesses. The manufacturing sector was negatively affected the most by the Trump administration’s actions while the technology sector—both on the hardware and software sides—also felt largely negative impacts. The effects of the Trump administration’s policies were more mixed (and overall neutral) with respect to the financial sector, and there is debate as to whether the Trump administration successfully encouraged China to accelerate the opening of its financial markets or if Beijing was already on track to do so to support its own domestic agenda anyway. Table S.2 summarizes the findings.

TABLE S.2
Impact of the Trump Administration’s China Policies on U.S. Business Sectors

Business Functions	Manufacturing	Technology		Finance
		Hardware	Software	
Operations	Negative	Negative	Neutral	Neutral/positive?
Sales and marketing	Negative	Negative	Negative	Neutral/positive?
Finance	Negative	Negative	Negative	(Not applicable)
Research and development	Negative	Neutral	Neutral	Neutral
Employment and human resources	Negative	Negative	Negative	Negative
Overall	Negative	Negative	Negative	Neutral

Recommendations

China is intertwined with the U.S. and global economies. The United States does not have unlimited leverage on its own, and any policy is likely to have costs. While the Trump administration’s policies can certainly be criticized, arriving at effective alternatives is not a simple task. With that in mind, our research suggests a number of recommendations for how the administration of President Joseph Biden could improve its ability to work with the U.S. business community to advance U.S. economic interests and counter problematic PRC economic behavior:

- **Adopt an economic strategy that balances efforts to counter China with investments in strengthening and sustaining U.S. economic and technological leadership.** The Trump administration’s eco-

nomic approach to compete with China was largely focused on countering China via imposing unilateral tariffs on Chinese trade, preventing Chinese control of sensitive U.S. technology, and limiting transfers of U.S. technology to China. The Trump administration sought to invest domestically to strengthen U.S. technology leadership in select areas, such as artificial intelligence and quantum physics, and not in basic science. There are a large number of measures the new U.S. administration could embrace to help the United States and U.S. companies compete with China. In general terms, for example, the administration could increase funding for science, technology, engineering, and mathematics education and research or provide tax incentives for companies to invest more in research and development. More specifically, U.S. policy development could be directed toward providing new methods of skill building beyond traditional educational programs, exploring programs to improve labor market matching to make better use of human capital, and creating programs or facilities, such as shared design or production centers, to accelerate the diffusion of advanced manufacturing techniques.

- **Embrace the full range of trade and economic tools to counter China and expand those tools.** The new U.S. administration could also do more to employ a fuller range of tools to counter problematic PRC behavior. The United States, for example, could more fully embrace existing trade enforcement tools and reinvigorate the World Trade Organization's trade dispute mechanism to help address China's unfair trade practices. The United States currently seizes counterfeit and pirated goods and has a process to block imports of items that use stolen IP; this could be broadened to block any import from a company that uses stolen IP. Other policies could include measures involving more reciprocal treatment for market access, especially for Chinese investment in the United States. In combination, these tools could help U.S. companies compete on a more level playing field and obtain more market access in China without necessarily requiring U.S. companies to incur the costs of tariffs or limits on their activities in China.
- **Work with allies and partners to embrace multilateral measures against problematic PRC activities.** The Biden administration should consult allies and partners prior to embracing major economic actions and, if possible, adopt multilateral instead of unilateral economic actions. Unilateral U.S. political or economic pressure against problematic PRC economic behavior is unlikely to change that behavior and may hurt U.S. businesses instead of benefiting them. Unilateral restrictions on economic activity with China also risk larger geopolitical ramifications beyond the U.S.-China relationship and could influence other countries to adopt similar protectionist measures to protect their manufacturing or technology sectors. This could challenge existing global economic rules that support open markets and free trade. The European Union, the United States, and their Western market-economy partners are the primary import markets for Chinese goods, and China relies on selling those goods for employment and growth. Accordingly, the combined Western economies have far more leverage together than any one of them individually, even the United States.
- **Consult U.S. business leaders regularly in advance of major policy changes.** Business leaders have significant information and experience dealing with the Chinese government and competing against Chinese firms and can provide valuable input into potential major economic U.S. policy changes or actions targeting China. According to our interviews, this was one of the biggest gaps in Trump administration policy implementation. Even if U.S. corporate leaders disagree with a proposed policy change, consultations and advance notice will allow them to better plan and adapt business operations accordingly.
- **Avoid U.S. government actions that target the Chinese people.** There is little public support in the United States for limiting PRC nationals from studying or working in the United States. Chinese students and workers also contribute significantly to the U.S. economy and companies as valuable colleagues and business leaders.

- **Adopt an information strategy to better inform the public about the risks of, or problems associated with, PRC products.** Our survey results showed that when informed of the potential risks of a Chinese-made telephone, a majority of the U.S. public declined to purchase the technology. This suggests that the United States could invest in efforts to publicize information regarding the operations and relationships of problematic Chinese companies and allow U.S. customers to make informed decisions on which products to purchase. Such information activities could be conducted in place of or in conjunction with U.S. government measures to limit the activities of select PRC companies.

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Introduction

In the final weeks of the administration of President Donald Trump, the U.S. government pushed out a series of measures against Chinese companies. These included allowing U.S. authorities to delist Chinese and other foreign firms from U.S. stock exchanges if they do not comply with U.S. audit rules; banning U.S. firms from investing in Chinese companies linked to the People's Liberation Army (PLA); restricting U.S. companies from engaging in transactions with select Chinese software companies; and adding more Chinese firms to the U.S. Department of Commerce (DOC) Entity List, which limits the ability of these firms to trade with U.S. companies.¹ These measures added to the already tense economic relationship between the two countries and built on the tariffs that the United States and the People's Republic of China (PRC) have levied on each other since 2018—the “tariff tit-for-tat” that many experts call the U.S.-China trade war.

Although the administration of President Joseph Biden acted immediately to roll back a number of domestic and foreign policy measures set by the Trump administration, there was little movement on the economic side. The new U.S. administration initially largely maintained the previous one's economic approach toward China.² This continued at least through September 2021. The Biden administration nominee for U.S. Trade Representative (USTR), Katherine Tai, pointed out the need to hold China accountable and appeared to share concerns the Trump administration had regarding problematic PRC economic behavior. When asked about specific measures the previous administration took—including whether the United States should reshore critical supply chains back to the United States—Tai commented that she sought to achieve “similar goals but in a more process-driven manner,” and the Biden administration would engage in a “holistic review” of China policy.³

This report analyzes the Trump administration's economic approach toward China from the perspective of the U.S. business community. It addresses the central question of whether the U.S. business community supported and benefited from confronting China using the range of economic and other tools the Trump administration embraced. The views of the U.S. business community, including how the community may align with, resist, or circumvent U.S. government policies toward China, are relatively underexamined and less transparent, particularly since U.S. firms may be reluctant to publicly oppose or criticize U.S. (or Chinese) government economic actions. Given the central role U.S. companies play in driving U.S. economic growth and technological leadership, support from the business community is critical for the U.S. government if Washington seeks to develop an effective economic approach toward China. The Biden adminis-

¹ “Factbox—Trump Administration Measures Against Chinese Companies,” Reuters, January 7, 2021.

² As of the end of February 2021, there has been some reconsidering of Trump administration economic actions against China, including a delay on banning U.S. investment in PLA-linked Chinese firms. However, the tariffs and other economic measures that the Trump administration implemented against China remain in place. See Demetri Sevastopulo, “Biden Administration Delays Chinese Military Investment Ban,” *Financial Times*, January 27, 2021; and Joe McDonald and Paul Wiseman, “Under Biden, China Faces Renewed Trade Pressure,” AP, January 25, 2021.

³ Eric Martin and Jenny Leonard, “Biden Trade Pick Says China Must Deliver on Phase-One Pact,” Bloomberg, February 25, 2021.

tration and subsequent administrations would benefit from understanding where the business community stands with respect to economic measures the United States has already implemented and “tested” in the previous administration.

Causes and Consequences of the Trade War

In this report we discuss aspects of the trade war and related policies in great detail, but before doing so, we summarize the road to the trade war and its consequences. This will provide context for the actions that took place starting in 2017, detailed in Chapter Three.

China has experienced remarkable economic growth since it changed its economic policy to one of reform and opening up in the late 1970s. Between 1980 and 2020, China’s real gross domestic product (GDP) grew an annual average of almost 9.3 percent per year—the fastest growth rate among all major economies and the second fastest overall among economies with available data. And its per capita real GDP grew almost 8.3 percent per year—the fastest rate among all economies with available data.⁴

Much of this growth came from the same sources of growth behind the success of any major economy. These include more reliance on market mechanisms to allocate resources, increased education levels and better human capital, achieving greater efficiencies and larger markets through the use of imported inputs and a focus on exports, and increased levels of investment. China’s integration into the world economy achieved a milestone when the country joined the World Trade Organization (WTO) in 2001.

But there has been a darker side to this growth as well. Among these are technology and intellectual property (IP) theft, markedly differential treatment of foreign companies in China versus Chinese companies in China including use of regulatory powers to favor domestic companies, and often opaque subsidies that provide advantages to Chinese companies worldwide. Regarding IP theft, one analysis found that China and Hong Kong account for 87 percent of identified counterfeit goods seized by the United States.⁵ A separate estimate valued China’s theft of U.S. IP in the high tens of billions of dollars.⁶ Regulatory actions are used to assist with this theft, such as the execution of antitrust actions or other regulatory investigations to threaten a company or by seizing technologies.⁷ Subsidies can include direct subsidies, but also state financing at favorable rates, assistance with raising capital through mandated equity purchases, indirect subsidies through subsidies to inputs, barriers to competition by foreign firms, and use of IP stolen with state assistance.⁸

These policies have provided some benefits to China. There has been significant technology upgrading of Chinese industry. Tracing specific cases of U.S. technology fueling this is difficult because companies doing business in China are generally reluctant to speak out publicly, but there have been revelations in court cases, such as accusations that the Chinese telecommunications firm Huawei stole internet router source code and

⁴ Data are from World Bank, “World Development Indicators,” online database, last updated September 15, 2021. GDP growth variables are GDP (constant 2020 US\$), series code NY.GDP.MKTP.KD; and GDP per capita (in constant 2010 dollars), series code NY.GDP.PCAP.KD. There were 128 economies with available data.

⁵ Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report: The Theft of American Intellectual Property; Reassessments of the Challenge and United States Policy*, Washington, D.C.: National Bureau of Asian Research, 2017, p. 3.

⁶ Derek Scissors, “Some US-China Economic and Trade Facts,” American Enterprise Institute, October 2020, p. 5.

⁷ Lingling Wei and Bob Davis, “How China Systematically Pries Technology from U.S. Companies,” *Wall Street Journal*, September 26, 2018.

⁸ Jude Blanchette, Jonathan E. Hillman, Maesea McCalpin, and Mingda Qiu, *Hidden Harbors: China’s State-Backed Shipping Industry*, Washington, D.C.: Center for Strategic and International Studies, July 8, 2020.

designs for network circuitry.⁹ By 2020 Huawei was the world's biggest smartphone seller and was a leading information and communications technology networking company.¹⁰

However, it is not clear how essential these malign behaviors have been to China's growth. A variety of Asian countries have also grown rapidly following policies of export- and investment-led growth without the benefit of a large internal market, such as the one China has, and without the benefit of technology theft. Even if they have benefited China, the policies have also created international animosity. Furthermore, they have been overridden by China's reliance on exports and investment, which has led to high levels of debt financing unproductive investments and to underconsumption, potentially stalling future growth.¹¹ Chinese leaders appear to be fully aware of the risks to the Chinese economy caused by unproductive investment and rising debt, but have as of mid-2021 been unable to solve this problem without causing large declines in GDP and increases in joblessness.¹²

China's economic policies have had both positive and negative consequences for its trade partners. The most positive consequence is that it has served as a new source of lower-cost inputs and products, leading to global efficiencies in production and increased average consumption. The efficiencies gained, and the large manufacturing economy in China, have kept companies there despite the difficulties of operating and of such malign activities as technology theft. Indeed, more than 95 percent of respondents to the 2021 U.S.-China Business Council survey reported that their China operations were profitable, and most companies said their investments in China would remain the same or increase through 2021.¹³

There have been negative consequences—some quite dramatic. Among these, the most noticeable and politically salient have been declines in U.S. manufacturing production and manufacturing employment and the concomitant rise in social problems as workers have had difficulty finding jobs that pay as well as the jobs they lost.¹⁴ China's strategy of high savings and suppression of consumption has also contributed to global imbalances in the form of large trade deficits, as measured by what is known as the current account, in some countries.¹⁵ Finally, the theft of IP and the edge it has given Chinese companies in some cases has made global competition more difficult for U.S. and Western companies, with that difficulty arising from malign activities rather than standard business competition based on price and quality.

The United States has not previously taken such invasive steps as the sizable tariff increases, described in Chapter Three, to change China's *economic policies*. Rather, it has used various economic measures and other forms of sanctions to either express displeasure at China's actions or to change them. In particular, the United States has instituted sanctions and various kinds of economic pressure regarding the massacre of Chinese citizens in Tiananmen Square in 1989, other human rights abuses, and weapons proliferation. It has also sanctioned Chinese individuals for weapons proliferation, terrorism, and narcotics trafficking.¹⁶ In general,

⁹ Kiran Stacey, "U.S. Accuses Huawei of Stealing Technology from Six Companies," *Financial Times*, February 13, 2020.

¹⁰ "Huawei Tops Samsung as the World's Biggest Smartphone Seller," DW, July 30, 2020.

¹¹ For a detailed description of China's economic policies and the problems they are likely to create, see Matthew C. Klein and Michael Pettis, *Trade Wars Are Class Wars: How Rising Inequality Distorts the Global Economy and Threatens International Peace*, New Haven, Conn.: Yale University Press, 2020.

¹² Michael Pettis, "What Does Evergrande Meltdown Mean for China?" Carnegie Endowment for International Peace, September 20, 2021.

¹³ U.S.-China Business Council, *Member Survey 2021*, Washington, D.C.: U.S.-China Business Council, August 2021.

¹⁴ David H. Autor, David Dorn, and Gordon H. Hanson, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review*, Vol. 103, No. 6, October 2013.

¹⁵ Klein and Pettis, 2020.

¹⁶ Dianne E. Rennack, *China: Economic Sanctions*, Washington, D.C.: Congressional Research Service, R44605, August 22, 2016.

sanctions aimed at human rights issues have not achieved their goals, whereas sanctions aimed at weapons proliferation have sometimes had positive effect.¹⁷

The wave of policies instituted since 2017 is more directly aimed at changing Chinese economic policy. These policies, and the Phase One trade deal signed on January 15, 2020, are discussed in Chapter Three. Here it is sufficient to note that the overall economic consequences of these policies have been negative for the United States. For example, one study has found that tariffs instituted in 2018 and 2019 ended up being paid largely by U.S. importers and consumers, raising costs in the U.S. economy.¹⁸ Another analysis found the tariffs cost U.S. exporters on average \$900 per worker and ended up lowering export growth by making imported inputs more expensive.¹⁹

The fact that most of these policies have been retained through September 2021, despite their costs, suggests that policymakers either find value in them despite the costs or that they are uncertain of other policies they can adopt to achieve the same goals. However, many of these costs have fallen on businesses that either import from, sell to, or invest in China. Their views and the actions they can take will be relevant to the success of these policies and the development of alternative policies.

Views from the U.S. Business Community

This report analyzes how the U.S. business community—specifically the manufacturing, technology, and financial sectors—viewed the Trump administration’s China policies through several different lenses: (1) from the perspective of individuals, (2) from the perspective of representatives of different firms over time, and (3) from the perspective of the consequences for specific industry sectors and subsectors.

Our analysis of business community views is based on Trump administration actions toward China from 2017 to the fall of 2020. The RAND Corporation team concluded the majority of the research for this report in October 2020 and prior to the November presidential elections in hopes of informing the subsequent administration regarding economic policies toward China without biasing our study based on the outcome of the election.²⁰

We conducted a national survey of U.S. adults from March to April 2020 to assess individual-level views on China. We find that the U.S. public generally views China as a military or security threat and an economic opportunity. The public is generally supportive of restricting U.S. corporate products or services to China and boycotting problematic PRC products, suggesting a willingness to curb potential economic gains from China to protect U.S. interests and values. At the same time, the majority of U.S. survey respondents did not support limiting Chinese workers and students in the United States. This suggests that any U.S. government effort to limit PRC student and worker visas is likely to be met by public resistance or at least skepticism. There is little evidence that individual views on China are linked to a person’s industry of employment,

¹⁷ Jing-dong Yuan, “Assessing Chinese Nonproliferation Policy: Progress, Problems and Issues for the United States,” October 12, 2001, posted January 4, 2002, by the Middlebury Institute of International Studies at Monterey.

¹⁸ Mary Amity, Stephen J. Redding, and David E. Weinstein, “Who’s Paying for the U.S. Tariffs?” Cambridge, Mass.: National Bureau of Economic Research, NBER Working Paper 26610, January 2020.

¹⁹ Kyle Handley, Fariha Kamal, and Ryan Monarch, “Rising Import Tariffs, Falling Export Growth: When Modern Supply Chains Meet Old-Style Protectionism,” Cambridge, Mass.: National Bureau of Economic Research, NBER Working Paper 26611, January 2020, revised August 2020.

²⁰ While the Trump administration implemented a number of actions against China in its final weeks in office, we believe that analyzing U.S. business views of the administration’s actions from January 2017 to October 2020 is sufficient to capture most of the concerns and perspectives of the U.S. business community.

although we did find some evidence to suggest that those in the financial sector were less likely to support limits on PRC nationals studying or working in the United States.

We also examined how different industries and subsectors responded to the Trump administration's actions against China by analyzing the transcripts of quarterly corporate earnings calls and what these conveyed about a company's views regarding China or its business prospects with or in China. Although large standard deviations in our statistical analysis make it difficult to assess our results with confidence, we find that manufacturing and technology firms had earnings calls that voiced more concern (in technical terms, had decreasing sentiment) about their China-related operations from 2018 to late 2019. This suggests that manufacturing and technology firms may have faced more difficulties and costs from the policies the Trump administration implemented with respect to China. In contrast, large financial companies listed in the Standard & Poor's (S&P) 500 saw a dip in sentiment in early 2018 (compared with late 2017) but a subsequent increase in positive sentiment from 2018 to mid-2020. This suggests that financial firms could have viewed the actions taken by the Trump administration—or China's reaction—as providing them with slightly more opportunities or benefits compared with costs. We do not find any statistically significant difference between how large and small U.S. firms (based on the Russell 2000 Index) viewed China-related activities.

Finally, we assessed how each sector viewed the Trump administration's China policies and whether the policies had a generally positive or negative influence on the sector. Our research involved looking across different business functions and interviewing nearly 30 industry experts. We found that while companies and industry experts were broadly supportive of the Trump administration's goals to level the playing field for American companies and counter problematic PRC practices, there were significant concerns about the unilateral and seemingly ad hoc tactics the administration took for limited consultation with businesses. The manufacturing sector was negatively affected the most by the Trump administration's actions, while the technology sector—both on the hardware and software side—also felt largely negative effects. The effects of the Trump administration policies were more mixed (and overall neutral) with respect to the financial sector, and there is debate as to whether the Trump administration successfully encouraged China to accelerate the opening of its financial markets or if Beijing was already on track to do so to support its own domestic agenda anyway.

Road Map

This report is divided into nine chapters. We first discuss our research methodology in Chapter Two. Chapter Three reviews the Trump administration's policies to counter China and Chinese responses. Chapter Four details how we conducted our national survey of adults in the spring of 2020 and what our survey findings showed about U.S. public attitudes toward China. Chapter Five presents our analysis of how companies viewed China by examining quarterly corporate earnings calls from hundreds of companies from the first quarter (Q1) of 2017 to the second quarter (Q2) of 2020. The following three chapters examine general trends and consequences of the Trump administration's China policies on the manufacturing sector (Chapter Six), technology sector (Chapter Seven), and financial sector (Chapter Eight). Chapter Nine concludes by providing recommendations for the U.S. government and business community. Five appendixes provide further technical details.

Research Methodology and Approach

This report uses several methods to assess how the U.S. business community reacted to the Trump administration's approach to countering problematic PRC economic practices. This chapter first defines what a U.S. business is and then provides an overview of how the subsequent chapters use survey results, analysis of U.S. corporate earnings calls, interviews with corporate leaders, and qualitative analysis of publicly available information to understand business community views.

Definition of the U.S. Business Community

To analyze views of the U.S. business community, it is important to first define what the community includes. The DOC defines a U.S. business or U.S. entity as

a firm incorporated in the United States (or an unincorporated U.S. firm with its principal place of business in the United States) that is controlled by U.S. citizens or by another U.S. entity. An entity is not a U.S. entity if 50 percent plus one share of its stock (if a corporation, or a similar ownership interest of an unincorporated entity) is controlled, directly or indirectly, by non-U.S. citizens or non-U.S. entities.¹

The DOC also notes that “an entity is not a U.S. entity if more than 50 percent of its Board of Directors or membership is made up of non-U.S. citizens.”² The Internal Revenue Service attempts to further clarify things by noting that a “United States person” is a partnership or a corporation “created or organized in the United States or under the law of the United States or of any State, or the District of Columbia,” and “any estate or trust other than a foreign estate or foreign trust.”³ The U.S. Department of the Treasury's Office of Investment Security uses a broader definition, defining a U.S. business as “any entity, irrespective of nationality of the persons that control it, engaged in interstate commerce in the United States”; it provides examples of what counts as U.S. businesses and includes subsidiaries of hypothetical Corporation A that is “organized under the laws of a foreign state and is wholly owned and controlled by a foreign national” as long as the subsidiaries engage in interstate commerce in the United States.⁴ Corporation A, however, would not count as a U.S. business.

Although there is some variation in how different U.S. government agencies define a U.S. business, we draw from the underlying, basic agreement and define a U.S. business as a company with headquarters in the United States that conducts business in the United States.

¹ U.S. International Trade Administration, “Become an Advisor,” webpage, undated a.

² U.S. International Trade Administration, undated a.

³ Internal Revenue Service, “Foreign Persons,” webpage, undated.

⁴ U.S. Department of the Treasury, Office of Investment Security, “Provisions Pertaining to Certain Investments in the United States by Foreign Persons,” *Federal Register*, Vol. 85, No. 12, January 17, 2020a, p. 3135.

Methodology for Assessing U.S. Business Sector Views

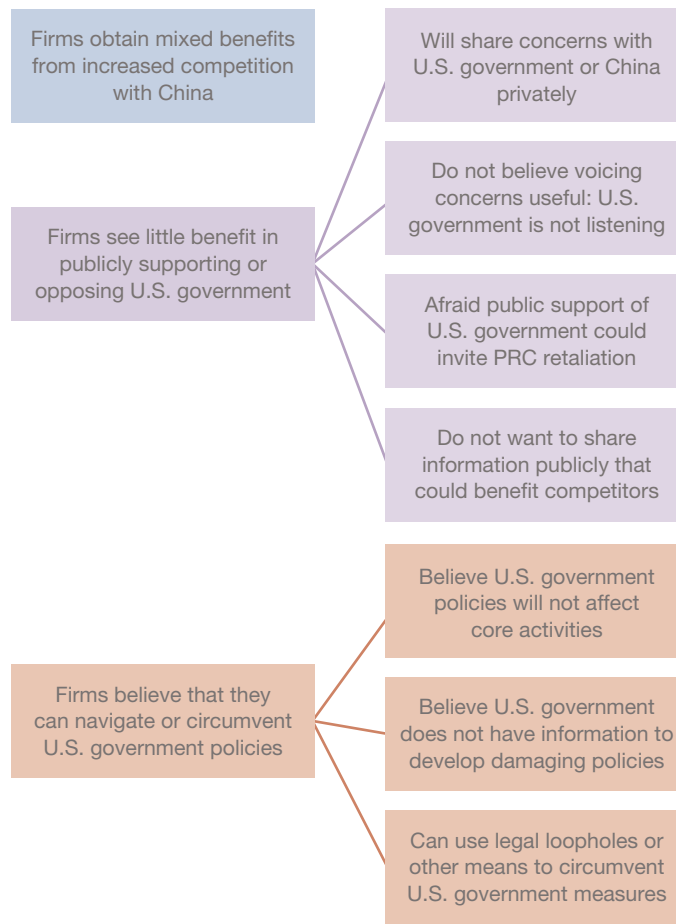
Several things make it difficult to assess where the U.S. business community stands with respect to intensified U.S.-China competition. As displayed in Figure 2.1, U.S. companies might obtain mixed benefits from the range of geopolitical and economic measures the Trump administration took against China. Some sectors may benefit, while others may suffer losses. It is also possible that U.S. businesses may see little benefit in publicly sharing views regarding U.S. government measures. They may also believe that they can navigate or find ways to circumvent U.S. policies.

Focus on Three Key Business Sectors

To account for the possibility that different types of U.S. firms might have varied views of the Trump administration's policies toward China, our report divides the U.S. business community into sectors. We focus on three critical sectors: manufacturing, technology, and finance. We have selected the manufacturing sector because President Trump campaigned on the promise to rebuild American factories and restore U.S. manufacturing.⁵ The technology sector has increasingly taken center stage and has driven some of the arguments

FIGURE 2.1

Potential Explanations for Why It May Be Difficult to Understand U.S. Business Sector Perspectives on U.S.-China Economic Competition



⁵ Thomas Dueterberg, "Has Trump Delivered on His Promise to Revive U.S. Manufacturing?" *Forbes*, October 23, 2019.

for economic decoupling as China and the United States each seek technological leadership.⁶ The U.S. financial sector has a different relationship with China than do the other two sectors. Unlike companies in the manufacturing and technology sectors that rely on supply chains located in China, the financial sector is less dependent on China and sought increased market access to China during the Trump administration.⁷ Taken together, these three sectors represented 22 percent of real U.S. GDP in 2019 and approximately 14 percent of total U.S. nonfarm employment.⁸

We define the manufacturing and financial sectors largely in line with U.S. government categories and using the North American Industry Classification System (NAICS) and define the technology sector as having components from the manufacturing and information sectors:

- The **manufacturing sector** includes companies that “are engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products.”⁹ This includes producing durable and nondurable goods. We exclude companies that produce computer and electronic products from the manufacturing sector and include them in the technology sector.¹⁰
- The **technology sector** is a broad sector, ranging from genomics to materials. For technology, we narrow this and focus on companies that produce computer and electronic products and firms engaged in telecommunications, data processing, hosting and related services, and other information services. In the U.S. industry classification system, these companies come from the manufacturing and information sectors.¹¹
- The **financial sector** includes companies that provide finance and insurance services. We exclude firms involved in real estate and rental and leasing.¹²

Individual-Level Analysis: Survey of Public Views of China

Chapter Four begins by examining the business community through individuals and their perspectives on China. Individuals are the executives and employees of U.S. firms. Aggregating individual attitudes toward China by business occupation provides a way to examine if there are detectable differences in views based on economic characteristics, including what industry people work in. How the majority of people within a sector regard China could drive whether the sector supports more U.S. measures to confront problematic PRC behavior.

For this analysis, we commissioned a national public opinion survey of U.S. adults and examined their attitudes to identify factors that may be driving individual perceptions of China. Our survey included four questions that focused on the intersection and tensions between views of China as a security threat or oppor-

⁶ China Strategy Group, *Asymmetric Competition: A Strategy for China & Technology; Actionable Insights for American Leadership*, Fall 2020.

⁷ Michelle Price, “U.S. Senators Urge Trump Admin to Raise Pressure over China Financial Market Access,” Reuters, September 5, 2017.

⁸ U.S. Bureau of Economic Analysis (BEA), *Gross Domestic Product by Industry: First Quarter 2020*, Washington, D.C.: DOC, July 6, 2020b; U.S. Bureau of Labor Statistics (BLS), “Data Retrieval: Employment, Hours, and Earnings,” webpage, last modified February 2, 2018.

⁹ BLS, “Manufacturing: NAICS 31–33,” webpage, February 18, 2021c.

¹⁰ Our definition of the manufacturing sector thus includes NAICS 31–33 but excludes NAICS 335.

¹¹ We define the technology sector to include companies coded as under NAICS 334, 517, 518, and 519. See BLS, 2021c; and BLS, “Information: NAICS 51,” webpage, February 18, 2021b.

¹² We include the financial and insurance sectors (NAICS 52) as part of the financial sector. See BLS, “Financial Activities,” webpage, February 18, 2021a.

tunity versus views of China as an economic threat or opportunity. The survey was conducted from March 3, 2020, to April 24, 2020, and we received responses from nearly 2,500 individuals. Chapter Four presents the detailed survey method and findings.

Firm- and Sector-Level Analysis: Earnings Calls Analysis and Sector-Wide Trends

In addition to individual-level analysis, we engaged in firm- and sector-level analysis in two different ways: (1) through conducting sentiment analysis on quarterly corporate earnings calls and (2) by assessing sector wide trends complemented by interviews with executives and experts from each sector.

Sentiment Analysis of Corporate Earnings calls

Chapter Five engages in sentiment analysis of publicly available earnings calls to examine if U.S. companies have more positive or negative views of China-related developments. We downloaded all quarterly earnings calls from selected companies from Q1 2017 to the Q2 2020. For each earnings call, we assessed every sentence in which the term *China* or three related terms (*geopolitical*, *tariff*, or *trade war*) appeared and coded for whether the sentence conveyed a positive or negative sentiment. A more positive sentiment score suggests that a firm is relatively optimistic about its transactions or opportunities related to China, whereas a more negative sentiment reflects concern or pessimism with regard to the company's China-related operations.

We selected U.S. companies from the S&P 500 Index and the Russell 2000 Index. The S&P 500 Index includes the 500 largest U.S. publicly traded companies; S&P 500 companies have a median total market capitalization of \$26 billion, and the company with the smallest total market capitalization included in the index is valued at \$3 billion.¹³ In order to capture the possibility that there may be differences in how firms view U.S. economic measures against China depending on their size—whether they are large global, multinational firms or small and medium sized enterprises—we also included a sample of the smallest firms by market capitalization from the Russell 2000 Index. The median market capitalization of firms on the Russell 2000 Index is \$0.9 billion, significantly less than the median for firms from S&P 500.¹⁴

For both indexes, we categorized U.S. companies into our three sectors based on the definitions we provided above and using each company's Global Industry Classification Standard (GICS) classification.¹⁵ The GICS codes do not map perfectly with the NAICS codes, and we include four GICS codes as manufacturing (the consumer discretionary sector, consumer staples, industrials, and materials), two GICS subsectors for technology (information technology [IT] and communications), and one GICS subsector for finance (financials).¹⁶

Sector-Wide Trends

Chapters Six, Seven, and Eight cover sector-wide trends for the manufacturing, technology, and financial sectors, respectively. In each chapter, we examine how U.S. businesses responded to U.S. or PRC measures (discussed in Chapter Three) by looking at changes across five different business functions: operations (particularly supply chain management), sales and marketing, finance, research and development (R&D), and

¹³ S&P Global, *S&P 500*, factsheet, New York: S&P Global, January 29, 2021.

¹⁴ FTSE Russell, *Russell 2000 Index*, factsheet, January 31, 2021.

¹⁵ GICS is an industry classification developed by MSCI and S&P that is used by the financial community. S&P has categorized each S&P 500 firm into 11 sectors, 69 industries, and 158 subindustries. S&P Global and MSCI, *GICS Global Industry Classification Standard*, New York: S&P Global and MSCI, 2018.

¹⁶ For the consumer discretionary sector, we did not include all firms as part of manufacturing; we excluded restaurants, casinos, and hotels. We also do not include health care as part of manufacturing.

employment and human resources. We assess if the effect was largely positive, mixed, or negative for each business function and aggregate the assessments across all five business functions to assess the overall consequences per sector.

We draw from a variety of sources for our research. Where possible, we use existing U.S. government statistics for the three sectors. When such sector-wide U.S. government statistics are not available, we use S&P 500 companies to proxy for their broader sector at large, as a great deal of information is available for those companies (e.g., financial statements and public statements). Because S&P 500 companies include the largest U.S. firms, these firms are likely to have more influence on U.S. government policy than smaller firms with fewer resources for lobbying or smaller companies that employ fewer workers.¹⁷

Finally, we complement publicly available information on business sectors and specific companies with interviews with U.S. government officials, U.S. industry and company representatives (representatives from business associations and from individual companies), and academics and industry experts. We conducted 30 such interviews, of which eight represented the manufacturing sector, seven represented the technology sector, nine represented the financial sector, and six were cross-sector. Most of these interviews were of single people, although one of the manufacturing interviews included two people and one of the finance interviews included three people. We interviewed each person or organization only once, and identify their remarks in a footnote by the date of the interview. This protects their identities but still provides the reader with information about the range of inputs and beliefs communicated.

¹⁷ Our interviews with business executives leading small firms suggest that smaller firms are generally more resource and personnel constrained. While some may join larger industry-wide associations, others may not see the utility of investing significant resources in lobbying or trying to change U.S. government policy. Some smaller firm executives doubt that even if they lobbied the U.S. government, the government would place much weight on concerns of small firms, because those firms employ fewer workers or have less revenue, profit, or sales than larger firms and thus less influence over the economy.

The U.S. Approach Toward China During the Trump Administration

Following the establishment of diplomatic relations between the United States and the PRC in 1979, the bilateral economic relationship has grown in size and complexity as China has risen to become the world's second-largest economy.¹ Facilitated by U.S. support for China's entry into the WTO in 2001, each country became the other's largest single-nation trading partner until the trade war led to a sharp decline in bilateral trade in 2019.² Along with trade, foreign direct investment (FDI), research, tourism, education, and other linkages also connect the U.S. and Chinese economies. Since 1979, U.S. businesses have generally viewed strong and expanding U.S.-China bilateral ties as beneficial to their bottom line.³ Some U.S. businesses have pursued operating in China or developing Chinese supply chains to take advantage of low labor costs and China's growing manufacturing capacity, while some have sought to expand revenues and market share by attracting consumers in the world's most populous nation.

In recent years, U.S. policymakers have become increasingly concerned with assertive and problematic Chinese behavior, manifesting in the Trump administration's characterization of China as a "revisionist power" with which the United States is engaged in strategic competition in the political, economic, and security domains.⁴ This view is fueled by the perception that China has not played by the rules upheld by international trade and financial organizations and has taken actions that could undermine the U.S. economy and the international economic system as it now operates.

The discussion in Chapter One on causes and consequences of the trade war details some of the ways in which China has broken generally accepted international rules, but some of China's actions that have stayed within the rules have also fueled international displeasure. One example is China's participation in the WTO. When China joined, other members were allowed to treat it not as a market economy for purposes of certain actions to counter impermissible trade actions. China insisted that its accession protocol required all members to treat it as a market economy by December 11, 2016, and this would have made it more diffi-

¹ This assessment is based on market exchange rates. Using purchasing power parity to estimate China's economy results in China being the world's largest economy. For more on this topic, see Tim Callen, "Purchasing Power Parity: Weights Matter," International Monetary Fund, February 24, 2020.

² Paul Kiernan and Anthony DeBarros, "Top U.S. Trading Partner Is No Longer China, Thanks to Tariff," *Wall Street Journal*, August 4, 2019; BEA, "International Trade in Goods and Services," webpage, last modified August 11, 2018.

³ For example, the U.S. Chamber of Commerce's guiding principles for its policy and advocacy regarding China state, "The Chamber's policy and advocacy efforts are guided by the belief that commercial engagement and the expansion of trade and investment ties between the United States and China benefit both countries and their business communities." U.S. Chamber of Commerce, "Policy and Advocacy," webpage, undated.

⁴ Executive Office of the President, *National Security Strategy of the United States of America*, Washington, D.C.: The White House, 2017c, p. 25. See also Office of the Secretary of State, Policy Planning Staff, *Elements of the China Challenge*, Washington, D.C.: U.S. Department of State, December 2020, p. 1.

cult to counter those impermissible actions. Other WTO members said this was not required.⁵ Based on the high levels of state-directed economic activity and subsidies in the Chinese economy, there was a case to be made that China was not a market economy, and the European Union (EU), Japan, and the United States all objected to the change of China's status. China entered WTO dispute resolution, but withdrew from the case when it appeared that the ruling would be strongly against its position.⁶

U.S. policymakers have linked bilateral economic issues to broader national security arguments about the need to compete with China at a whole-of-government, or even whole-of-society, level. During the Trump administration, U.S. policymakers took a number of actions with the stated goal of strengthening economic competitiveness vis-à-vis China and bringing it into conformance with international rules. China has countered some of these actions through both direct and indirect responses.

The following sections summarize the Trump administration's overall approach and economic policy toward China, and China's responses to increased competition with the United States. These sections outline the range of U.S. and PRC efforts and activities that affect U.S. businesses, particularly U.S. businesses operating in China or dependent on trade with China.

China as a Long-Term Strategic Competitor

Released in December 2017, the Trump administration's National Security Strategy (NSS) stated that economic security is a key element of U.S. overall national security and identified China as a long-term strategic competitor due in part to its activities in the economic domain.⁷ President Trump noted in his remarks on the NSS that "a nation that does not protect prosperity at home cannot protect its interests abroad,"⁸ pointing to "past . . . failures" that he characterized as unfavorable trade agreements that had sent American jobs overseas. In the NSS, U.S. leaders framed the challenge as "growing political, economic, and military competitions we face around the world."⁹ To compete more effectively with China, the NSS prescribed a change in the U.S. approach that involved "upgrad[ing] our political and economic instruments to operate across these environments."¹⁰ The U.S. Department of Defense's (DOD's) unclassified summary of the classified National Defense Strategy, released in January 2018, similarly reflects the emphasis on its interconnected approach to economic and national security.¹¹

Senior Trump administration officials have given various rationales for embracing whole-of-government competition with China. First, China is working to reshape the international order in its favor by eroding

⁵ Wayne M. Morrison, *China's Status as a Nonmarket Economy (NME)*, Washington, D.C.: Congressional Research Service, IFI0385, updated January 10, 2019.

⁶ Tom Miles, "China Pulls WTO Suit over Claim to Be a Market Economy," Reuters, June 17, 2019.

⁷ Linking economic and national security is not a new concept (it appears in previous NSSs), but the linkages are more explicit in the 2017 NSS and the Trump administration invoked national security arguments to its employment of tariffs and other trade policy levers. For comparisons, see Executive Office of the President, *National Security Strategy*, Washington, D.C.: The White House, February 2015, p. iii; and Executive Office of the President, *National Security Strategy*, Washington, D.C.: The White House, May 2010, p. 1. For a 1990s discussion, see C. R. Neu and Charles Wolf Jr., *The Economic Dimensions of National Security*, Santa Monica, Calif.: RAND Corporation, MR-466-OSD, 1994.

⁸ Donald J. Trump, "Remarks by President Trump on the Administration's National Security Strategy," December 18, 2017b.

⁹ Executive Office of the President, 2017c, p. 2; see also Donald J. Trump, "Remarks by President Trump at APEC EO Summit / Da Nang, Vietnam," November 10, 2017a.

¹⁰ Executive Office of the President, 2017c, p. 28.

¹¹ DOD, *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge*, Washington, D.C.: DOD, January 19, 2018, p. 2.

international institutions, coercing neighbors, and leveraging economic pressure to realize political objectives vis-à-vis other countries. Second, China has long seen itself in competition with the United States and has steadily worked to erode U.S. advantages, including using influence operations to target U.S. citizens and organizations. Third, China takes a whole-of-nation approach to competition with the United States, including large-scale technology theft and state support that both coerces and undercuts U.S. businesses. Fourth, China fails to abide by international commitments, including its WTO obligations. Fifth, Chinese laws, regulations, and practices erode the privacy of Americans' personal information. Sixth, Chinese Communist Party leaders have directed large-scale human rights abuses in Xinjiang; curtailed Hong Kong political, economic, and other freedoms; and increased multifaceted pressure on Taiwan.¹² DOD, U.S. Department of State, and White House reports covering U.S. policy toward China have raised these concerns.¹³

In 2020 the coronavirus disease 2019 (COVID-19) pandemic further reinforced the Trump administration's view of China as a problematic global player. Senior U.S. officials criticized Chinese leaders' efforts to cover up the outbreak and accused China of hoarding personal protective equipment, leading to global shortages, and shipping excess equipment to other countries for diplomatic gains. Then-Secretary of State Michael R. Pompeo, for example, repeatedly blamed China for exploiting the international community's preoccupation with the pandemic to engage in provocative behavior against Hong Kong, against Taiwan, or in the South China Sea.¹⁴

These views of China are certainly not universal, and others either add more context or disagree. One in-depth study of China's grand strategy found that China's main aims throughout its modern history were not to reshape the international order but to restore and maintain the nation's territorial integrity and keep any other power from dominating the Asia-Pacific region. More recently, it has aimed at so-called national rejuvenation in the form of a wealthy, strong, civilized, and harmonious nation. Furthermore, China's leaders believe that the United States is the disruptive partner in that it intends to cause the overthrow of rule by the Chinese Communist Party.¹⁵ These goals do not necessarily contradict U.S. views, but they certainly emphasize different goals.

Others go further and disagree with the U.S. assessment. There appears to be agreement that China's negative behavior has contributed to the deterioration of relations. Despite that, one China expert has noted that the idea that China wants to "build a revisionist, Sino-centric world order fundamentally incompatible

¹² These speeches and statements include Michael R. Pence, "Remarks by Vice President Pence on the Administration's Policy Toward China," October 4, 2018; Michael R. Pompeo, "The China Challenge," speech at the Hudson Institute's Herman Kahn Award Gala, New York, October 30, 2019; Matt Pottinger, "Remarks by Deputy National Security Advisor Matt Pottinger to the Miller Center at the University of Virginia," May 4, 2020; Robert O'Brien, "The Chinese Communist Party's Ideology and Global Ambitions: Remarks Delivered by National Security Advisor Robert C. O'Brien on June 24, 2020, in Phoenix, Arizona," USC US-China Institute, June 24, 2020; Christopher Wray, "The Threat Posed by the Chinese Government and the Chinese Communist Party to the Economic and National Security of the United States," speech to the Hudson Institute video event "China's Attempt to Influence U.S. Institutions," July 7, 2020; William P. Barr, "Attorney General William P. Barr Delivers Remarks on China Policy at the Gerald R. Ford Presidential Museum," July 16, 2020; and Michael R. Pompeo, "Communist China and the Free World's Future," speech delivered at the Richard Nixon Presidential Library and Museum, Yorba Linda, Calif., July 23, 2020c.

¹³ DOD, *Indo-Pacific Strategy Report*, Washington, D.C.: DOD, June 1, 2019, pp. 7–10, 31, 43; U.S. Department of State, *A Free and Open Indo-Pacific: Advancing a Shared Vision*, Washington, D.C.: U.S. Department of State, November 4, 2019, pp. 5–6, 8–13, 21–23; The White House, *United States Strategic Approach to the People's Republic of China*, Washington, D.C.: The White House, May 20, 2020a, pp. 1–7.

¹⁴ David Brunnstrom and Humeyra Pamuk, "Pompeo Renews Criticism of China over Virus but Welcomes Supplies," Reuters, April 22, 2020.

¹⁵ Andrew Scobell, Edmund J. Burke, Cortez A. Cooper III, Sale Lilly, Chad J. R. Ohlandt, Eric Warner, and J. D. Williams, *China's Grand Strategy: Trends, Trajectories, and Long-Term Competition*, Santa Monica, Calif.: RAND Corporation, RR-2798-A, 2020, pp. 11, 18, 8.

with the U.S.-led international system” is a “distorted viewpoint” that could lead to U.S. actions that will undermine what has largely been a constructive, if challenging, relationship.¹⁶ Furthermore, China has contributed dramatically to global economic growth, benefits from and supports such international institutions as the WTO, and will necessarily need to play a role in solving global problems, even with recognition of such actions as its severe internal repression, its technology theft, and its frequent attempts to economically coerce other countries.

U.S. Policy to Counter PRC Economic “Aggression”

Although the Trump administration did not have one main publicly available document that comprehensively laid out its economic strategy with regard to China, three public documents (the 2017 NSS, a 2018 White House report on Chinese technology transfer, and a 2020 White House report to Congress) outlined the administration’s approach on countering what it identified as PRC economic aggression. The 2017 NSS described Chinese “economic aggression” as problematic PRC behaviors, including “dumping, discriminatory non-tariff barriers, forced technology transfers, non-economic capacity, industrial subsidies, and other support from governments and state-owned enterprises.”¹⁷ A 2018 report by the White House Office of Trade and Manufacturing Policy further specified six types of Chinese activities intended to

1. **protect China’s home market from imports and competition**, including tariff and nontariff barriers and regulatory issues
2. **expand China’s share of global markets** via state support of Chinese firms to help them gain market share both in the Chinese domestic market and globally
3. **secure and control core natural resources globally** through nontransparent or financially unsustainable lending (lending that might not be justified on strict business principles) and other practices
4. **dominate traditional manufacturing industries** such as shipbuilding, automobile production, appliance manufacturing, and computer hardware manufacturing
5. **acquire key technologies and IP from other countries**, including the United States
6. **capture emerging high-technology industries that will drive future growth**, including advancements in the defense industry.¹⁸

A May 2020 White House report to Congress defined the Trump administration’s five specific economic approaches to China. First, the United States would enforce the so-called Phase One trade deal, signed in

¹⁶ Michael D. Swaine, *A Relationship Under Extreme Duress: U.S.-China Relations at a Crossroads*, Atlanta: Carter Center, January 16, 2019.

¹⁷ Executive Office of the President, 2017c, p. 19. “Non-economic capacity” refers to production capacity that might not have business or economic justification; U.S. Senate Committee on Finance, *Hearing Before the Committee on Finance, United States Senate, One Hundred Fifteenth Congress, First Session on the Nomination of Robert E. Lighthizer, to Be United States Trade Representative, with the Rank of Ambassador Extraordinary and Plenipotentiary, Executive Office of the President*, Senate Hearing 115-164, March 14, 2017, Washington, D.C.: U.S. Government Printing Office, 2018.

¹⁸ The Office of Trade and Manufacturing Policy’s report focused on the fifth and sixth approaches laid out in this list; White House Office of Trade and Manufacturing Policy, *How China’s Economic Aggression Threatens the Technologies and Intellectual Property of the United States and the World*, Washington, D.C.: White House Office of Trade and Manufacturing Policy, June 2018, pp. 1–2. See also The White House, 2020a, pp. 1–7. A related infographic developed by the Office of Trade and Manufacturing Policy listed more than 50 assessed “acts, policies, and practices” that China employs in support of these six objectives. See Peter Navarro, “White House National Trade Council Director Peter Navarro on Chinese Economic Aggression,” speech at the Hudson Institute, Washington, D.C., June 28, 2018.

January 2020, including increasing U.S. exports to China. Second, the United States would levy tariffs until both sides reach a Phase Two deal that addresses PRC technology transfer and IP theft. Third, the administration would seek to reduce the effects of Chinese subsidies and overcapacity by protecting strategic U.S. industries, including the manufacture of steel and aluminum; filing WTO cases against China; and harnessing existing antidumping and countervailing duties laws. Fourth, it would undertake domestically focused actions such as tax reform, deregulation, and promoting innovation in such sectors as fifth-generation (5G) telecommunications technology. Finally, the United States would work with allies and partners to adopt similar standards and policies. The report also mentioned the need to protect the American consumer from counterfeit and substandard products made in China and noted the administration's focus on partnering with Congress, the private sector, academia, and other actors to better compete with China.¹⁹

In addition to these approaches, and accelerated by the COVID-19 pandemic, senior Trump administration officials in 2020 raised the option of reshoring U.S. businesses and pursuing further economic decoupling between the United States and China. Some argued for the need to do so because U.S. firms are not allowed to “participate and compete on a fair basis” in China's economy.²⁰ Others, such as Ellen Lord, then–undersecretary of defense for acquisition and sustainment, said that amid the COVID-19 pandemic the DOD would like to “reshore as much as possible” after realizing its supply chain vulnerabilities, particularly for the supply of microelectronics and rare earth minerals.²¹

Nested under the Trump administration's broader economic approach to China were specific goals for different sectors. Priorities for three key sectors are worth highlighting for this report:

- **Manufacturing:** Trump administration priorities were embedded within the administration's broader strategy of “rejuvenating” the U.S. economy via job creation, advancing “free, fair, and reciprocal” trade relationships, and improving supply chain resiliency and expanding the defense industrial base.²² China-specific priorities included addressing the U.S.-China trade imbalance by expanding market opportunities for U.S. goods, countering Chinese dumping and other nontariff barriers, leveraging international institutions such as the WTO to enforce commitments that Beijing has previously agreed to, and lessening the impact of Chinese industrial subsidies on the U.S. economy.
- **Technology:** The Trump administration focused on preserving U.S. “technological advantage” and protecting the U.S. economy “from competitors who unfairly acquire our intellectual property.” NSS focus areas included supporting U.S. leadership in emerging technologies and strengthening the National Security Innovation Base. China-related policy efforts include reducing technology transfer to China, restricting Chinese investment in U.S. firms working on sensitive or leading technologies, curtailing U.S. university and other research partnerships with the Chinese military or affiliated institutions, and protecting both commercial and public digital infrastructure from cyberexploitation.²³

¹⁹ The White House, 2020a, pp. 2–3, 11, 12–13.

²⁰ David Lawder, “Trump Threat to ‘Decouple’ U.S. and China Hits Trade, Investment Reality,” Reuters, June 23, 2020; “Mnuchin Says U.S.-China Decoupling Will Occur if Firms Cannot Compete Fairly,” Reuters, June 23, 2020; “Trump Raises Idea of Decoupling U.S. Economy from China,” Reuters, September 7, 2020.

²¹ Justin Doubleday, “Pentagon Acquisition Chief Calls to ‘Re-Shore as Much as Possible’ in Wake of COVID Supply Chain Challenges,” *Inside Defense*, July 8, 2020.

²² Executive Office of the President, 2017c, pp. 18–29.

²³ Executive Office of the President, 2017c, pp. 17–22.

- **Finance:** U.S. policy priorities for this sector centered on increasing market access.²⁴ China has a largely closed financial system that allows Beijing to manage its exchange rate and have monetary independence, both of which are important for its development strategy.²⁵ The Trump administration sought to reduce barriers to entry for U.S. firms into Chinese financial markets, including easing capital controls and restrictions on foreign investment in Chinese companies. The administration also sought to improve the transparency of Chinese firms listed on U.S. stock exchanges.²⁶

Major Lines of Efforts to Counter PRC Economic Behavior

Following investigations into specific cases in 2017, in early 2018 the administration began a series of trade actions, including raising tariffs on washing machines and solar panels and “considering recommendations on import restrictions for steel and aluminum, plus other trade sanctions against China over alleged intellectual property theft.”²⁷ The DOC, in its so-called Section 232 reports, blamed China for global overcapacity of both steel and aluminum, finding that “the quantities and circumstances of steel and aluminum imports ‘threaten to impair the national security,’ as defined by Section 232.”²⁸ Beijing itself launched a probe into imports of sorghum from the United States.²⁹ In March 2018 the Trump administration announced a 10 percent tariff on aluminum and a 25 percent tariff on steel products from China and other countries, “based on ‘national security’ justifications under Section 232 of the Trade Act of 1962.” China countered by increasing tariffs on \$3 billion in U.S. goods from 15 to 25 percent, and both countries additionally filed complaints against each other with the WTO.³⁰ Additional Section 232 investigations continued through 2020.

In August 2017 President Trump issued a memorandum stating that “China has implemented laws, policies, and practices and has taken actions related to intellectual property, innovation, and technology that may encourage or require the transfer of American technology and intellectual property to enterprises in China or that may otherwise negatively affect American economic interests.”³¹ The USTR was to determine, under Section 301 of the Trade Act of 1974, “whether to investigate any of China’s laws, policies, practices, or actions that may be unreasonable or discriminatory and that may be harming American intellectual property rights,

²⁴ Executive Office of the President, 2017c, p. 4.

²⁵ China has been reluctant to open its financial markets due to concerns about volatile capital inflows or outflows, which would make its macroeconomic management much more difficult.

²⁶ U.S. Department of the Treasury, “President’s Working Group on Financial Markets Releases Report and Recommendations on Protecting Investors from Significant Risks from Chinese Companies,” press release, Washington, D.C., August 6, 2020b.

²⁷ Kristin Huang, “Update: China, US ‘to Resume Comprehensive Economic Dialogue’ amid Trade War Fears,” *South China Morning Post*, February 9, 2018. For a timeline of trade war actions, see Chad P. Bown and Melina Kolb, “Trump’s Trade War Timeline: An Up-to-Date Guide,” Peterson Institute for International Economics, September 28, 2020.

²⁸ DOC, “Secretary Ross Releases Steel and Aluminum 232 Reports in Coordination with White House,” press release, Washington, D.C., February 16, 2018. Section 232 refers to Section 232 of the Trade Expansion Act of 1962, which allows for investigations to determine the effect of imports on national security; see U.S. Bureau of Industry and Security (BIS), Office of Technology Evaluation, *Section 232 Investigations Program Guide: The Effect of Imports on National Security*, Washington, D.C.: U.S. Department of Commerce, June 2007).

²⁹ Huang, 2018.

³⁰ Congressional Research Service, *U.S.-China Relations*, Washington, D.C.: Congressional Research Service, R45898, August 29, 2019, p. 21.

³¹ Executive Office of the President, “Addressing China’s Laws, Policies, Practices, and Actions Related to Intellectual Property, Innovation, and Technology,” memorandum of August 14, 2017, *Federal Register*, Vol. 82, No. 158, August 17, 2017b.

innovation, or technology development.”³² The Office of the USTR conducted an investigation and released its findings in the Section 301 report in March 2018. The review focused on four areas: China’s technology transfer regime, discriminatory licensing practices, state support for strategic acquisition of U.S. assets, and “cyber-enabled theft of U.S. IP and trade secrets.”³³ Following the issuance of the report, the administration announced tariffs of 25 percent on \$250 billion of Chinese products in three tranches, while China retaliated by raising tariffs on \$110 billion worth of U.S. goods.³⁴

The tariffs initiated a round of over a dozen negotiations in 2018 and 2019, both to negotiate removing the initial series of tariffs and to forestall additional tariffs.³⁵ Following a presidential-level meeting in Argentina in December 2018, the United States agreed to not raise tariffs on \$200 billion worth of Chinese goods from 10 to 25 percent. This was in exchange for China’s agreement to increase purchases of U.S. agricultural, energy, industrial, and other products, with China’s agricultural purchases to ramp up immediately.³⁶

In December 2019, the USTR announced that both countries had reached an agreement on a “Phase One” trade deal that “requires structural reforms and other changes to China’s economic and trade regime in the areas of intellectual property, technology transfer, agriculture, financial services, and currency and foreign exchange.”³⁷ Following the December announcement, the United States halted additional tariffs that were to go into effect in December. The United States lowered a 15 percent tariff on \$120 billion worth of Chinese goods to 7.5 percent, but kept a 25 percent tariff on \$250 billion worth of imports.³⁸ Although U.S. departments and agencies noted progress on implementation of the Phase One deal, it was also clear that some provisions would be unlikely to be met in 2020. During the first nine months of 2020, for example, Chinese imports of U.S. goods were less than one-third the level needed to reach the quantity agreed to in the deal by the end of 2020.³⁹ Of note, in September 2020 the WTO found that U.S. tariffs on \$200 billion worth of Chinese imports violated WTO rules.⁴⁰

Table 3.1 summarizes the three main lines of effort observed in U.S. government actions to counter China’s assessed problematic economic behavior from 2017 through the fall of 2020, with select examples provide in parentheses.

U.S. actions in the economic domain have been accompanied by broader U.S. efforts to improve general economic competitiveness and compete with China in noneconomic domains. Table 3.2 summarizes these from 2017 through the fall of 2020, with a focus on actions that affect the U.S. business community.

³² Executive Office of the President, 2017.

³³ Office of the United States Trade Representative, *Findings of the Investigation into China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 301 of the Trade Act of 1974*, Washington, D.C.: Executive Office of the President, March 22, 2018, pp. 1–2.

³⁴ Congressional Research Service, 2019, p. 19.

³⁵ Congressional Research Service, 2019, pp. 19–21.

³⁶ The White House, “Statement from the Press Secretary Regarding the President’s Working Dinner with China,” press release, Washington, D.C., December 1, 2020b.

³⁷ Office of the USTR, “United States and China Reach Phase One Trade Agreement,” press release, Washington, D.C., December 13, 2020. USTR, 2020.

³⁸ USTR, 2020.

³⁹ Chad P. Bown, “US-China Phase One Tracker: China’s Purchases of US Goods (as of August 2020),” Peterson Institute for International Economics, September 25, 2020.

⁴⁰ Tim Fernholz, “China Is Winning the Trade War,” *Quartz*, September 15, 2020.

TABLE 3.1

U.S. Government Efforts to Counter China's Problematic Economic Behavior, 2017–2020

Lines of Effort	Primary Mechanisms and Tools (Examples in Parentheses)
Counter Chinese products sold at below-market prices (“dumping”)	• Direct departments and agencies to investigate dumping (hydrofluorocarbons,^a wood products,^b structural steel^c) • Harness existing legislation such as investigations under Section 232 of the 1962 Trade Expansion Act to determine effect of imports on national security (cranes,^d vanadium^e) • Enact new legislation (fiscal year 2020 National Defense Authorization Act ban on federal funds to purchase Chinese rail cars)^f • Levy tariffs (washing machines and solar panels; steel and aluminum)^g • Add Chinese firms to DOC Entity List^h
Enforce U.S. trade laws, lessen bilateral trade deficit, increase access to PRC market	• Hold high-level bilateral dialogue and gain Chinese commitments (2017 Comprehensive Economic Dialogue)ⁱ • Direct departments and agencies to investigate significant deficits^j • Harness existing legislation (annual assessment on countries’ compliance with their WTO obligations)^k • Continue to designate China as a nonmarket economy^l • Levy tariffs (trade war—new tariffs or raise previous tariffs)^m • Designate (and then undesignate) China as a currency manipulatorⁿ • Enact rule to treat a foreign country’s currency undervaluation as a subsidy for purposes of U.S. countervailing duty proceedings^o • Reach agreements to increase U.S. exports to China (beef, liquefied natural gas^p) and ability to invest in Chinese financial sector (such as ability of credit rating agencies to operate in China^q) • Advocate to enforce U.S. audits of Chinese firms listed on U.S. stock exchanges and raise listing standards (could result in delisting noncompliant firms)^r • Warn investors, including universities, of risks of investing in U.S.-listed Chinese firms that are noncompliant^s • Halt fund shift that would have included Chinese firms in federal Thrift Savings Plan^t
Strengthen export controls and limit forced/illicit technology transfer	• Direct agencies to investigate, counter tech transfer, theft, or espionage; indict firms and individuals, whether based in China or the United States (Department of Justice China Initiative)^u • Harness existing legislation (investigations under Section 301 of the Trade Act of 1974 to determine if trade barriers exist due to unfair IP, tech transfer, and innovation practices)^v • Enact new legislation to restrict problematic investments, and exports (Foreign Investment Risk Review Modernization Act of 2018 [FIRRMA], Export Control Reform Act of 2018)^w • Restrict PRC students’ and researchers’ entry into the United States if they have history of supporting China’s military-civil fusion efforts;^x limit or cancel visas for researchers with ties to the PLA and Chinese graduate students studying in some high-tech fields^y • Add Chinese firms to DOC Entity List for tech transfer concerns (Huawei^z), support to the PLA • Increase restrictions on Chinese firms via Export Administration Regulations (EAR) and Foreign-Produced Direct Product Rule (Huawei)^{aa} • Restrict specific exports to China (e.g., restrict artificial intelligence [AI] software designed to analyze satellite images)^{bb} • Block government subsidies to U.S. companies retaining equipment in their networks (Huawei / ZTE Corporation);^{cc} remove equipment from defense firms’ supply chains • Work with allies and partners to restrict Chinese access to or participation in key technology/infrastructure development (5G)^{dd} • Publicize information on PLA-linked Chinese companies^{ee}

Table 3.1—Continued

NOTES: Listed mechanisms and tools are as of September 15, 2020. The table does not include actions taken as part of broader competition that are outside direct economic competition, such as Xinjiang-related sanctions and visa restrictions placed on Chinese reporters.

^a DOC, “U.S. Department of Commerce Announces Affirmative Preliminary Circumvention Ruling on Exports of Hydrofluorocarbon Blends from China,” press release, Washington, D.C., January 23, 2020a.

^b DOC, “U.S. Department of Commerce Initiates Antidumping Duty (AD) and Countervailing Duty (CVD) Investigations of Imports of Wood Mouldings and Millwork Products from Brazil and China,” press release, Washington, D.C., January 29, 2020c.

^c DOC, “Commerce Finds Dumping of Imports of Fabricated Structural Steel from Canada, China, and Mexico, and Countervailable Subsidization of Imports of Fabricated Structural Steel from China and Mexico,” press release, Washington, D.C., January 24, 2020b.

^d DOC, “U.S. Department of Commerce to Initiate Section 232 Investigation into Mobile Crane Imports,” press release, Washington, D.C., May 6, 2020d.

^e DOC, “U.S. Secretary of Commerce Wilbur Ross Initiates Section 232 Investigation into Imports of Vanadium,” press release, Washington, D.C., June 2, 2020f.

^f Public Law 116-92, National Defense Authorization Act for Fiscal Year 2020, Section 7613, Limitation on Certain Rolling Stock Procurements: Cybersecurity Certifications for Rail, Rolling Stock and Operations, December 20, 2019.

^g Bown and Kolb, 2020.

^h See, for example, David Shepardson and Josh Horwitz, “U.S. Expands Blacklist to Include China’s Top AI Startups Ahead of Trade Talks,” Reuters, October 7, 2019.

ⁱ U.S. Department of the Treasury, “U.S.-China Comprehensive Economic Dialogue,” webpage, last updated June 26, 2017.

^j Executive Office of the President, Omnibus Report on Significant Trade Deficits, Executive Order 13786 of March 31, 2017, *Federal Register*, Vol. 82, No. 64, April 5, 2017a.

^k USTR, *2017 Report to Congress on China’s WTO Compliance*, Washington, D.C.: Executive Office of the President, January 2018a.

^l Morrison, 2019.

^m Bown and Kolb, 2020.

ⁿ U.S. Department of the Treasury, “Treasury Designates China as a Currency Manipulator,” press release, Washington, D.C., August 5, 2019; Andrea Shalal and Alexandra Alper, “U.S. Treasury Drops China Currency Manipulator Label Ahead of Trade Deal Signing,” Reuters, January 13, 2020.

^o U.S. International Trade Administration, “Modification of Regulations Regarding Benefit and Specificity in Countervailing Duty Proceedings,” *Federal Register*, February 4, 2020a; Brian Picone, “U.S. Department of Commerce Publishes Final Rule on Treatment of Alleged ‘Currency Undervaluation’ in Countervailing Duty Proceedings,” White & Case, February 7, 2020.

^p The White House, 2020a.

^q Aries Poon, “Fitch Becomes 2nd Wholly Owned Foreign Credit Rating Agency in China,” S&P Global, May 15, 2020.

^r Humeyra Pamuk and Alexandra Alper, “Exclusive: Trump Administration to Soon End Audit Deal Underpinning Chinese Listings in U.S.—Official,” Reuters, July 13, 2020.

^s Pamuk and Alper, 2020.

^t Ana Swanson, “Federal Retirement Fund Halts Planned China Investment Under Pressure,” *New York Times*, May 13, 2020a.

^u Center for Strategic and International Studies, “China Initiative Conference,” webpage, undated.

^v Bown and Kolb, 2020.

^w Noah Barkin, “Export Controls and the U.S.-China Tech War: Policy Challenges for Europe,” *Merics China Monitor*, March 18, 2020.

^x KPMG, “United States—New Proclamation Limiting Entry of Certain Chinese Students, Researchers,” June 1, 2020.

^y Edward Wong and Julian E. Barnes, “U.S. to Expel Chinese Graduate Students with Ties to China’s Military Schools,” *New York Times*, May 28, 2020.

^z Bown and Kolb, 2020.

^{aa} DOC, “Commerce Addresses Huawei’s Efforts to Undermine Entity List, Restricts Products Designed and Produced with U.S. Technologies,” press release, Washington, D.C., May 15, 2020e.

^{bb} Richard Burke et al., “Bureau of Industry and Security Issues First ‘Emerging Technology’ Control on Artificial Intelligence-Based Geospatial Imagery Software,” JD Supra, February 10, 2020.

^{cc} David Shepardson, “U.S. Agency Votes 5–0 to Bar China’s Huawei, ZTE from Government Subsidy Program,” Reuters, November 22, 2019.

^{dd} The White House, 2020a, pp. 12–13; Barkin, 2020.

^{ee} DOD, “DOD Releases List of Additional Companies, in Accordance with Section 1237 of FY99 NDAA,” press release, Washington, D.C., August 28, 2020.

TABLE 3.2

U.S. Government Efforts to Broadly Compete with China, 2017–2020

Lines of Effort	Primary Mechanisms and Tools (Examples in Parentheses)
Strengthen U.S. economic competitiveness in general and vis-à-vis China	• Reshore production back to the United States or shift supply chains away from China^a • Lower corporate tax rate to bring business back to the United States (2017 Tax Cut and Jobs Act)^b • Deregulate or reform regulations (2019 Executive Order on American AI Initiative,^c 2020 Guiding Principles for AI regulation,^d 2019 Executive Order on Biotechnology,^e the Federal Communications Commission's 5G FAST Plan^f) • Increase federal subsidies and spending (prioritizing science, technology, engineering, and mathematics spending at \$200 million/year and encouraging matching from companies in 2017)^g • Increase DOD-led innovation spending (Defense Innovation Unit;^h Air Force Pitch Day, inaugurated in 2019;ⁱ establish in 2018 and increase funding for the Joint Artificial Intelligence Center (JAIC);^j launch the Defense Advanced Research Projects Agency's AI Next initiative in 2018^k) • Issue new government strategies (2018 Strategy for Advanced Manufacturing)^l • Hold corporate road shows promoting U.S. businesses abroad (2018 U.S. Indo-Pacific Business Forum)^m • Reauthorize U.S. Export-Import Bank in 2019 for seven yearsⁿ • Restrict H1-B visas for PRC citizens and other foreign nationals^o
Compete with China politically and militarily	• Assign officials to the United Nations to counter Chinese malign influence^p • Align U.S. policy stance in support of 2016 intergovernmental Permanent Court of Arbitration ruling on South China Sea^q • Issue business advisories (Xinjiang)^r • Expand DOC Entity List to target PRC companies involved in human rights abuses^s • Sanction PRC individuals, organizations, and firms involved in Hong Kong autonomy erosion, South China Sea militarization, Iran's nuclear weapons program, and Xinjiang^t • Restrict PRC diplomat travel, hosted events within United States without prior approval^u • Restrict or cancel visas for PRC government-linked individuals (officials, scholars, and reporters^v) or firms reportedly engaged in human rights abuses (Huawei^w) • Counter China's Belt and Road Initiative (BRI): – Pass Better Utilization of Investments Leading to Development Act (2018) to create the International Development Finance Corporation (DFC) and double previous investment cap to \$60 billion^x – Establish Australia–Japan–United States trilateral partnership for infrastructure investment in the Indo-Pacific^y • Create “Clean Network” initiative to protect U.S. and foreign digital networks and data^z • Ban or consider banning social media apps that share user data with Chinese authorities (TikTok, WeChat)^{aa}

NOTES: Listed actions are as of September 15, 2020. The table does not include actions directly related to COVID-19.

^a Patrick Van den Bossche, Brooks Levering, Yuri Castano, and Brandon Blaesser, *Trade War Spurs Shape Reversal in 2019 Reshoring Index, Foreshadowing COVID-19 Test of Supply Chain Resilience*, Chicago: Kearney, undated b.

^b Public Law 115-97, An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018, December 22, 2017.

^c Executive Office of the President, Maintaining American Leadership in Artificial Intelligence, Executive Order 13859 of February 11, 2019, *Federal Register*, Vol. 84, No. 31, February 14, 2019.

^d Russell Vought, “Guidance for Regulation of Artificial Intelligence Applications,” draft memorandum for heads of executive departments and agencies, Washington, D.C.: Executive Office of the President, January 7, 2020.

^e Executive Office of the President, Modernizing the Regulatory Framework for Agricultural Biotechnology Products, Executive Order 13874 of June 11, 2019, *Federal Register*, Vol. 84, No. 115, July 14, 2019.

^f Federal Communications Commission, “The FCC’s 5G FAST Plan,” September 28, 2018.

^g Valerie Strauss, “Suddenly, Trump Wants to Spend Millions of Dollars on STEM in Public Schools,” *Washington Post*, September 25, 2017.

^h Defense Innovation Unit, “Accelerating Commercial Technology for National Security,” homepage, last updated July 19, 2021.

Table 3.2—Continued

ⁱ AFWERX SBIR/STTR, “Air Force Pitch Day,” webpage, undated.

^j Joint Artificial Intelligence Center, “About the JAIC: The JAIC Story,” webpage, 2019.

^k Defense Advanced Research Projects Agency, “AI Next,” webpage, undated.

^l National Science and Technology Council, Committee on Technology, Subcommittee on Advanced Manufacturing, *Strategy for American Leadership in Advanced Manufacturing*, Washington, D.C.: Executive Office of the President, October 2018.

^m U.S. Chamber of Commerce, “Indo-Pacific Business Forum,” webpage, July 30, 2018.

ⁿ Export-Import Bank of the United States, “President Donald J. Trump Signs Historic Seven-Year Long-Term Reauthorization of EXIM,” press release, Washington, D.C., December 20, 2019.

^o Executive Office of the President, Proclamation Suspending Entry of Aliens Who Present a Risk to the U.S. Labor Market Following the Coronavirus Outbreak, June 22, 2020a.

^p “U.S. Tasks Official to Counter China’s ‘Malign Influence’ at U.N.,” Reuters, January 23, 2020.

^q Michael R. Pompeo, “U.S. Position on Maritime Claims in the South China Sea,” press statement, July 13, 2020a.

^r U.S. Department of State, U.S. Department of the Treasury, DOC, and U.S. Department of Homeland Security, *Xinjiang Supply Chain Business Advisory*, July 1, 2020.

^s DOC, “Commerce Department Adds Five Chinese Entities to the Entity List for Participating in China’s Campaign of Forced Labor Against Muslims in Xinjiang,” press release, Washington, D.C., June 24, 2021.

^t See, for example, U.S. Department of the Treasury, “Treasury Sanctions Chinese Entity and Officials Pursuant to Global Magnitsky Human Rights Executive Order,” press release, Washington, D.C., July 31, 2020a.

^u Michael R. Pompeo, “Secretary Michael R. Pompeo at a Press Availability,” September 2, 2020d.

^v Jane Perlez, “F.B.I. Bars Some China Scholars from Visiting U.S. over Spying Fears,” *New York Times*, April 14, 2019; Ted Hesson, “U.S. Tightens Visa Rules for Chinese Journalists amid Coronavirus Tensions,” Reuters, May 8, 2020.

^w Michael R. Pompeo, “U.S. Imposes Visa Restrictions on Certain Employees of Chinese Technology Companies That Abuse Human Rights,” press statement, U.S. Department of State, July 15, 2020b.

^x Public Law 115-254, Division F—BUILD Act of 2018, FAA Reauthorization Act of 2018, October 5, 2018.

^y U.S. International Development Finance Corporation, “US–Japan–Australia Announce Trilateral Partnership for Indo-Pacific Infrastructure Investment,” press release, Washington, D.C., July 30, 2018.

^z U.S. Department of State, “The Clean Network,” webpage, undated.

^{aa} Executive Office of the President, Executive Order on Addressing the Threat Posed by TikTok, August 6, 2020b; Executive Office of the President, Executive Order on Addressing the Threat Posed by WeChat, August 6, 2020c.

PRC Government Responses to the U.S. Approach to Competition

In addition to reviewing the Trump administration’s measures against China, it is important to also briefly examine Chinese reactions and measures China took against the United States economically. China responded to U.S. economic actions through a combination of carrots and sticks. Table 3.3 summarizes the PRC “sticks” (direct and indirect retaliation in response to U.S. actions) along with targeted “carrots” to incentivize the Trump administration, specific U.S. sectors, and individual firms to pursue greater cooperation with China (or Chinese firms) and reduce U.S. penalties or other negative actions against the Chinese government, entities, or individuals. Many of these measures, such as tariffs on U.S. goods, affected U.S. companies directly.

Summary

The Trump administration’s and the U.S. government’s response to problematic PRC economic practices involved numerous lines of effort. These included new laws, more aggressive use of existing laws, and actions that in some ways broke precedent in dealing with trade disagreements, particularly the 25 percent tariffs in response to the Section 301 investigation. China retaliated with its own measures, some reciprocal but others through use of authorities, powers, and methods available to it as part of its government-involved economic system, such as subsidies. While these actions were put in place by governments, the entities truly affected were the millions of businesses that trade and invest globally. In the next five chapters we turn to how businesses and their employees viewed and reacted to these policy changes.

TABLE 3.3
PRC Responses to U.S. Economic Efforts Targeting China, 2017–2020

PRC Approaches	Mechanisms and Tools (Examples in Parentheses)
Direct retaliation in response to U.S. measures	• Increase tariffs on U.S. goods^a • Decrease purchase of select U.S. goods^b • Limit use of U.S. technology by PRC government (Hewlett-Packard [HP], Dell, Microsoft)^c • Increase pressure on individual U.S. businesspeople (harassment)^d • Issue “unreliability entity list” for foreign firms^e • Strengthen export control rules (AI-related technology)^f • Establish state-backed fund for specific technology investment (semiconductors)^g
Indirect retaliation in response to U.S. measures	• Leverage U.S. laws, regulations, and policies to delay or reverse U.S. government actions (Huawei / ZTE Corporation on equipment bans)^h • Promulgate and accelerate rollout of laws, regulations, and processes to strengthen state access to and control over Chinese-owned and China-based entities, individuals, and data (2017 Cybersecurity Law)ⁱ • Increase PRC state subsidies to domestic firms^j • Increase inspections/scrutiny of U.S. firms operating in China^k • Delay issuing licenses or increase regulatory requirements^l • Obfuscate but continue programs to recruit U.S. talent (Thousand Talents)^m • Continue PRC-directed commercial espionage and theftⁿ
Targeted carrots to induce cooperation from U.S. entities	• Selectively increase domestic market access to foreign firms through new laws, approvals, and licenses (PRC financial sector)^o • Attract foreign capital to PRC initiatives (BRI, Hong Kong Wealth Management Connect initiative)^p • Provide benefits (protection against competition, reduced administrative red tape) to select U.S. firms to advance PRC interests^q • Relax immigration rules to attract and retain foreign talent^r

NOTES: Listed actions are as of September 15, 2020. Focuses on actions in the economic realm.

^a Bown and Kolb, 2020.

^b Yuan Yang, Archie Zhang, and Emiko Terazono, “China Tells Companies to Stop Buying US Agricultural Goods,” *Financial Times*, August 5, 2019.

^c Arjun Kharpal, “China Reportedly Orders State Offices to Remove Foreign Tech Which Could Hit US Firms like Microsoft,” CNBC, December 9, 2019.

^d Paul Mozur, Alexandra Stevenson, and Edward Wong, “Koch Executive’s Harassment in China Adds to Fears Among Visitors,” *New York Times*, July 11, 2019.

^e Bonnie S. Glaser and Kelly Flaherty, “US-China Relations in Free Fall,” *Comparative Connections*, Vol. 22, No. 2, September 2020; Zen Soo, “China Announces Regulations for ‘Unreliable Entity’ List,” AP, September 19, 2020.

^f Glaser and Flaherty, 2020.

^g “China to Fund \$29 Billion Towards Its Chip Ambitions,” Bloomberg, October 28, 2019.

^h Sijia Jiang and Jan Wolfe, “Huawei Fights Back Against U.S. Blackout with Texas Lawsuit,” Reuters, March 6, 2019.

ⁱ Lauren Maranto, “Who Benefits from China’s Cybersecurity Laws?” Center for Strategic and International Studies, June 25, 2020.

^j Tom Hancock and Yizhen Jia, “China Paid Record \$22bn in Corporate Subsidies in 2018,” *Financial Times*, May 27, 2019.

^k Lou Longo, “U.S. Companies in China Face Greater Scrutiny as Relations Erode,” *Industry Week*, August 26, 2020.

^l “China Puts Off Licenses for US Companies amid Tariff Battle,” Voice of America, September 11, 2018.

^m Office of the Secretary of Defense, *Military and Security Developments Involving the People’s Republic of China 2020: Annual Report to Congress*, Washington, D.C.: DOD, September 1, 2020.

ⁿ Office of the Secretary of Defense, 2020.

^o Office of the Secretary of Defense, 2020.

^p Daniel Kliman, “China’s Power Play: The Role of Congress in Addressing the Belt and Road,” Center for a New American Security testimony before the U.S. Senate Finance Committee, Subcommittee on International Trade, Customs, and Global Competitiveness, June 12, 2019, p. 5; Weizhen Tan, “As China Tightens Its Grip on Hong Kong, It’s Also Paving the Way for Money to Flow into the City,” CNBC, July 6, 2020.

^q Frank Tang, “Beijing Cuts Red Tape for Foreign Firms as It Vies for Investors,” *South China Morning Post*, September 27, 2017.

^r Zhuang Pinghui, “China Relaxes Immigration Rules to Attract and Retain More Highly Skilled Overseas Talents,” *South China Morning Post*, July 17, 2019.

Individual-Level Analysis: Survey of U.S. Public Views of China

One way to assess how U.S. business sectors view competition with China is by aggregating the views of individuals working in those sectors. Individuals are the leaders and employees of U.S. businesses. Individuals may support or oppose U.S. government policies based on how policies affect their companies, which in turn could improve or diminish their salaries and employment prospects. It is also possible for people to possess or develop varied views of China (or Chinese people) based on whether their jobs bring them into close contact with China (or Chinese people). This chapter analyzes four questions that we submitted to a nationally representative U.S. survey to understand how American individuals view China and how they view three potential U.S. economic policy measures against China.

Method

We utilized the RAND American Life Panel (ALP), “a nationally representative, probability-based panel of respondents aged 18 and older who are regularly interviewed over the Internet for research purposes” to survey the U.S. public.¹ We used four questions to understand whether respondents view China as a threat or opportunity and assess their support for three measures the United States (or U.S. public) could adopt to engage in (or support) taking a tougher stance against China. The four survey questions are as follows:

Question 1. Do you see China as a security or economic threat to or opportunity for the United States?

Question 2. Should the U.S. government stop U.S. companies from providing services or goods to Chinese actors that undermine U.S. interests or values even if it weakens the U.S. economy? (Example: The U.S. government should stop U.S. companies from selling to Chinese companies that provide technology to censor the Chinese internet.)

Question 3. Foreign workers and students are important contributors to U.S. innovation, but a small portion may illegally take innovation back to their home country, and others may return to their home country with new skills and compete against the United States. Should the United States limit Chinese workers and students even if it weakens the U.S. economy because of less innovation?

Question 4. The U.S. government has said that Huawei, a Chinese telephone company, could be collecting user information and intelligence on behalf of the Chinese military. Huawei has disputed such allegations, and many countries use Huawei phones. Are you willing to buy a phone produced by a Chinese technology company with potential links to the Chinese military?

¹ For more information on the ALP, see RAND Corporation, “RAND American Life Panel,” webpage, undated. The questions were included in an ALP omnibus survey. The final compilation of questions, including these specific study questions, were submitted to RAND’s Human Subjects Protection Committee (HSPC) and approved under the master ALP HSPC protocol as appropriate for fielding. The master protocol includes an approved annual consent protocol and data safeguarding procedures.

In addition to the four questions we submitted, the survey asked respondents for basic demographic variables such as race, education, gender, age, marital status, and income.

The survey took place between March 3, 2020, and April 24, 2020; notably, this was at an important stage in the COVID-19 pandemic. On March 13, 2020, President Trump declared COVID-19 to be a national emergency.² Then, on March 19, California became the first state to issue a stay-at-home order, followed by 43 states and the District of Columbia through April 7.³ The majority of responses were recorded within the first few days of the survey taking place, before the national emergency was declared and the stay-at-home orders were issued. RAND sent 3,403 invitations to potential participants. We received 2,488 completed responses, for a response rate of 73.1 percent.

To assess how individuals within different business sectors view China and potential U.S. measures against China, we created an industry variable based on reported occupation to capture those working in the manufacturing, technology, and financial sectors. We used the existing 22 occupation categories in the survey and allocated each occupation to a sector in line with the sector definitions in Chapter Two. Table A.1 in Appendix A displays how we grouped different ALP occupation categories into our three sectors. This allocation is not wholly satisfactory, as many occupations could be carried on in any of the industries. Accordingly, this may introduce error into our analysis, as the relationship between specific occupations and specific industries is not one-to-one. However, we provide the results for two reasons: first, this report is aimed at understanding sectoral views and effects, and so we believe it is worth attempting to use the individual-level analysis for this purpose; and second, the weakness of the results provides support for using the other methods that appear in subsequent chapters.

To isolate the impact of industry on individual views, we included the available demographic factors as control variables. We also created a variable to account for political affiliation based on the individual's voter intent in the 2020 election. Table A.2 in Appendix A provides the summary statistics of all the demographic variables we included in our analysis.

In the following sections we provide baseline statistics about the respondents who answered each question. We then use statistical analysis (logistic regression) to estimate the determinants of participant views on China and participant support for U.S. measures against China, displaying results based on population weights.⁴ Tables A.3 and A.4 in Appendix A provide full results.

Findings

We explore the findings of the survey first by respondents' views on China and then by their views on three different potential U.S. economic actions.

² Donald J. Trump, Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak, Proclamation 9994 of March 13, 2020, *Federal Register*, Vol. 85, No. 53, March 18, 2020.

³ Time and Date, "First Day of Stay at Home Order in the United States," webpage, undated.

⁴ For our analysis, we used population weights and adjusted for sampling error in each ALP survey response question to allow for valid inferences about whether the results were representative of the broader population at large. Table A.2 in Appendix A provides the weighted and unweighted summary statistics for the sample. We generated the weighted mean via "raking," by which we match weighted marginal totals with the corresponding total in the population. In our case, this was performed using the Current Population Survey as a benchmark. In general, the unweighted sample tended to be older and more female than the population; the weights adjust for these differences. In the following sections, unless otherwise specified, we display only the weighted results, although we do not find that the weights make a significant difference in our results. For our weighting method, see Craig A. Bond and Howard J. Shatz, *U.S. Consumer Preferences for Telephone and Internet Services*, Santa Monica, Calif.: RAND Corporation, RR-1382-FCC, 2016, p. 8.

Views of China as Threat or Opportunity (Question 1)

A plurality of individuals (41 percent of respondents) viewed China as a security threat and also an economic opportunity (option f) out of a total of seven different ways to view China (see Table 4.1). Aggregating the responses for options a, b, and f, we find that the majority of surveyed U.S. respondents (75 percent) viewed China as, at least, a security threat. However, support for an overall hawkish line toward China was tempered by the fact that 49 percent of all respondents viewed China as an economic opportunity (aggregating responses to options d and f), compared with the 36 percent that viewed it as an economic threat to the United States (aggregating responses to options b and c). All of these responses are statistically significant, meaning they are not the outcome of chance and they represent the views of the broader population. This suggests that U.S. policymakers should be aware that a large portion of the U.S. population still wants to work with China economically despite viewing China as a security threat.

TABLE 4.1
Responses to Views of China as Threat or Opportunity (Question 1)

Response (China is a . . .)	Weighted Proportion (%)
(a) A security threat	4.75*** (1.15)
(b) A security and economic threat	29.45*** (1.52)
(c) An economic threat	6.73*** (0.77)
(d) An economic opportunity	7.84*** (1.14)
(e) Not a threat or opportunity	10.07*** (1.02)
(f) A security threat and an economic opportunity	41.01*** (1.76)
Unknown	0.16** (0.07)

SOURCE: Authors' calculations from RAND Corporation, undated.

NOTES: Number of observations is 2,488. Standard error is in parentheses. Proportions may not sum to one because of rounding. * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

To understand what drives these results, we aggregated the survey responses into three different views of China and analyzed them in relation to our industry variable and demographic variables. The aggregated views of China, or outcome variables, are as follows:

1. security threat = 1 if China is a security threat (i.e., options a, b, and f) and 0 otherwise
2. economic threat = 1 if China is an economic threat (i.e., options b and c) and 0 otherwise
3. economic opportunity = 1 if China is an economic opportunity (i.e., options d and f) and 0 otherwise

We find that these views are likely associated with a combination of demographic variables (Table A.3 in Appendix A provides the full results). We highlight here some of the strongest and most statistically significant associations—that is, those at least statistically significant at the 5 percent level, unless otherwise stated; significant at the 5 percent level means that there is only a 5 percent or lower chance that they do *not* accurately represent the views of the U.S. population:

- Older respondents are more likely to support strategic competition with China, as one year of age increases the perception of China as a security and economic threat by 0.44 percent and 0.33 percent per year, respectively, all else equal. Age also decreases viewing China as an economic opportunity by 0.2 percent per year of age, all else equal.
- Those with no high school education are more likely to view China as a security threat. This same group, however, views China as less of an economic threat and more of an economic opportunity. Beyond this group, there was no clear association between education level and views of China as economic threat, although respondents with bachelor's degrees view China more as an economic opportunity.
- Women are more likely to view China as less of a security threat and less of an economic threat.
- Respondents in the Middle Atlantic, East North Central, and West North Central regions are least likely to view China as a security threat.⁵ Living in these regions drops viewing China as a security threat by roughly 20 percent compared with the population as a whole. The Pacific region is similar, but lesser in magnitude, with a 13 percent decrease in view of China as a security threat.⁶
- Republicans are likely to view China as a security threat (increase by 9 percent) and economic threat (increase by 19 percent). Viewing China as an economic opportunity also drops by 13.6 percent for Republicans.
- Finally, the results showed two interesting findings that are not statistically significant at the 5 percent level, but statistically significant at the 10 percent level: participants who self-identify as Asian or Pacific Islander are less likely (by 15.7 percent) to view China as a security threat, and participants born outside the United States are less likely (by 8.5 percent) to view China as a security threat.

We do not find any statistically significant relationship between industry and any of the three potential views of China. This suggests that there are not strong uniform views about China within each of the three U.S. business sectors.

We next analyze how respondents view three different U.S. economic policy options or actions through their answers to the remaining survey questions.

Support for Limiting U.S. Goods and Services to Problematic PRC Actors (Question 2)

Nearly 60 percent of respondents said they would support U.S. companies not selling goods and services to Chinese actors that undermine U.S. interests or values (see Table 4.2). This result is statistically significant.

These results are likely associated with age (support for limiting services and goods increases by 0.2 percent per year of age), and gender (support for limiting goods and services drops by 16 percent if the respondent is female).

We again do not find, using this method, any statistically significant relationship between industry and willingness to limit goods and services to PRC actors. Table A.4 in Appendix A provides the full results.

⁵ These regions are based on U.S. Census data divisions. The Middle Atlantic comprises New Jersey, New York, and Pennsylvania; the East North Central region comprises Indiana, Illinois, Michigan, Ohio, and Wisconsin; and the West North Central region comprises Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

⁶ The Pacific region comprises Alaska, California, Hawaii, Oregon, and Washington.

TABLE 4.2
Responses to Whether to Limit Goods and Services to PRC Actors
(Question 2)

Response (I support limiting U.S. goods and services to problematic PRC actors)	Weighted Proportion (%)
(a) Yes	59.74*** (1.72)
(b) No	39.62*** (1.72)
Unknown	0.64*** (0.24)

SOURCE: Author's calculations from RAND Corporation, undated.

NOTES: Number of observations is 2,488. Standard error is in parentheses. Proportions may not sum to one because of rounding. * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

Support for Limiting Chinese Nationals Studying or Working in the United States (Question 3)

In contrast to the support for limiting goods and services, a majority of respondents (64 percent) do not support limiting Chinese nationals from studying or working in the United States (see Table 4.3).

As with other questions, the respondents' backgrounds are linked to their answer to this question (see Table A.4 in Appendix A for full results):

- Those living in urban areas may be more wary of competition from Chinese students or workers and are more inclined (by 6 percent) to support such limits.
- More educated workers—those holding a bachelor's degree or an advanced degree—are less likely to support limits on Chinese students by about 8 percent. However, those with no high school education are 17.4 percent more likely to support this option.
- Those who are not White / Caucasian, Black / African American, or Asian or Pacific Islander are also more likely to support such limits.
- Republicans are more willing to support limits; an affiliation with the Republican Party increases support for this policy by 31 percent.

TABLE 4.3
Responses to Whether to Limit PRC Nationals Studying or Working
in the United States (Question 3)

Response (I support limiting PRC nationals studying or working in the United States)	Weighted Proportion (%)
(a) Yes	35.14*** (1.73)
(b) No	64.24*** (1.74)
Unknown	0.62** (0.28)

SOURCE: Author's calculations from RAND Corporation, undated.

NOTES: Number of observations is 2,488. Standard error is in parentheses. Proportions may not sum to one because of rounding. * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

For this question, we do find some variation by industry. Those working in the financial sector were 7.4 percent less likely to support limiting PRC nationals, although this result is only statistically significant at the 10 percent level. This suggests that the finance industry may have a less negative (or more positive) view of Chinese nationals than do other industries. One explanation may be that the financial sector may depend more on, employ more, or interact more with Chinese nationals.

Willingness to Buy a Mobile Phone from a PRC Company with Potential Military Links (Question 4)

Possibly reflecting a combination of privacy and security concerns, 83 percent of respondents did not want to purchase a Chinese mobile phone given knowledge that the Chinese military could use the phone to collect user information and intelligence (Table 4.4).

TABLE 4.4
Responses to Buying a PRC Phone from a Chinese Company with Military Links (Question 4)

Response (I would buy Chinese technology from PRC company with military links)	Weighted Proportion (%)
(a) Yes	17.05*** (1.57)
(b) No	82.55*** (1.58)
Unknown	0.41* (0.22)

SOURCE: Author's calculations from RAND Corporation, undated.

NOTES: Number of observations is 2,488. Standard error is in parentheses. Proportions may not sum to one because of rounding. * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

Although the vast majority of respondents would not buy a Chinese phone, we do see two factors associated with willingness to buy one (see Table A.4 in Appendix A): age (inclination to buy a Chinese phone decreases by 0.4 percent per year of age) and residing in the West North Central region (those in this region are 18 percent less likely to buy the phone).⁷

We do not find any statistically significant relationship between employment industry and willingness to buy a Chinese mobile phone.

Summary

The U.S. public generally views China as a military or security threat, although this is tempered by a plurality of respondents who view China as providing economic opportunity. Our survey results for the three economic actions or options that the United States or U.S. public could take suggest further nuance about the U.S. public's views of China economically. On one hand, the U.S. public is generally supportive of restricting U.S. corporate products or services to China and boycotting problematic PRC products, suggesting a willingness to curb potential economic gains from China to protect U.S. interests and values. At the same time, there is much less support for limiting Chinese workers and students in the United States.

⁷ The West North Central region comprises Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

In terms of potential drivers of respondents' views or positions, we find that older people and Republicans tend to support taking a more competitive approach toward China and are more wary of China and Chinese products. Other demographic variables, such as higher education, gender (female), and whether respondents are born abroad, have varying degrees of moderating impact to discourage participants from supporting tougher economic actions against China or boycotting PRC products.

Among industries, we find limited evidence to suggest that those in the financial sector were less likely to support limits on PRC nationals studying or working in the United States. We did not find any other statistically significant results based on industry. It is also possible that our results are due to the limitations of our methodology for identifying participants by industry.⁸

⁸ As discussed in the main text, the ALP survey employment category is coarse and does not ask for industry, but rather asks for occupation function. It is possible, for example, that both technology workers and financial workers fall under the category of "management occupations," which we designated as part of only the financial industry.

Firm- and Sector-Level Analysis: Survey of Corporate Earnings Calls

U.S. policies that affect economic relations with China present a challenge to companies that buy Chinese products, sell to Chinese businesses and people, or invest in China. Leaders of these companies must assess the effects of these policies and inform company ownership of these effects and how the company might adjust. One way to capture these business leader views is through public statements that are, by regulation, intended to not be misleading—specifically, presentations in corporate earnings calls to company owners and business analysts. Accordingly, we conducted large-scale textual analysis of quarterly corporate earnings call transcripts from U.S. companies to analyze how different firms view China or its China-related operations. Most U.S. listed firms hold regular earnings conference calls with their shareholders (owners), analysts, and other interested parties during which management provides views on the firm’s past and future performance and responds to question from call participants. Earnings call transcripts provide a valuable resource to track changes in corporate perspectives over time.

Method

We analyzed quarterly earnings calls from two pools of companies. We first examined earnings calls from the 283 S&P 500 firms within our three sectors.¹ We were able to obtain earnings calls for the majority (252 out of 283) of these firms, including for 128 manufacturing firms, 70 technology firms, and 54 financial firms. Appendix B lists the S&P companies we found earnings calls for, along with our categorization of these firms.

We then supplemented and conducted an additional, separate analysis of firms in the Russell 2000 Index. While the S&P 500 contains the largest companies, the Russell 2000 contains much smaller companies. We first identified 350 firms with the lowest market capitalization to analyze: 150 manufacturing firms, 100 technology firms, and 100 finance firms. However, we were able to find publicly available earnings calls only for small portion of these firms and had difficulty finding earnings calls particularly for the finance firms. As a result, we expanded our search for the earnings calls of the next 200 smallest finance firms. Across the total of 550 firms we searched for from the Russell 2000, we were able to obtain earnings calls for 193 firms (78 manufacturing firms, 63 technology firms, and 52 financial firms). Appendix C lists the Russell 2000 companies along with our categorization of these firms.

To track changes over time, we analyzed all quarterly earnings calls starting from Q1 2017 to Q2 2020. We used FD (Fair Disclosure) Wire, accessed via Nexis Uni, to retrieve earnings call transcripts using queries generated from the firm names on our list. Not all firms had earnings calls available for all 14 quarters

¹ Based on our definition of the sectors, the full set of relevant S&P 500 firms includes 134 manufacturing firms, 83 technology firms, and 66 financial firms.

we covered.² Nevertheless, the LexisNexis search results did produce enough data for the purpose of our analysis.

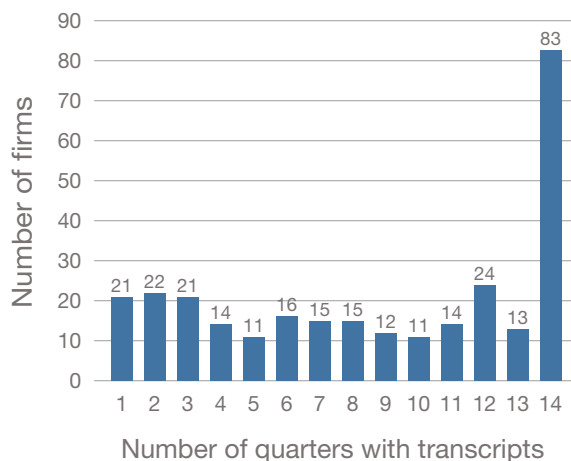
On the S&P side, we were able to match at least one transcript from LexisNexis for 252 firms, and 83 firms had results for all 14 quarters. Of the Russell 2000 firms we searched for, we were only able to match 193 to results from LexisNexis. This is not surprising given the smaller size of these companies, and many (41 companies) only had one quarter of data available. Figure 5.1 shows the distribution of quarterly calls retrieved by firm for the S&P 500 sample, and Figure 5.2 shows the same for the Russell 2000 sample.

Once the text from each earnings call was retrieved, we filtered for sentences in the transcripts that used keywords corresponding to the following terms: *China*, *geopolitical*, *tariff*, and *trade war*.³ As depicted in Tables 5.1 and 5.2, only a portion of the earnings calls (and a subset of the companies within all data) mentioned these keywords; out of 2,208,971 total sentences in the S&P sample there were 26,276 (1.2 percent) that matched our search criteria, and out of the 1,306,655 in the Russell 2000 sample there were 7,079 (0.5 percent).

Given the amount of information available for S&P 500 firms, we divide and present analysis for S&P 500 firms by sector and subsector. In contrast, because there are many fewer Russell 2000 firms that have publicly available earnings calls and mention China in these calls, we divide Russell 2000 firms only by sector.

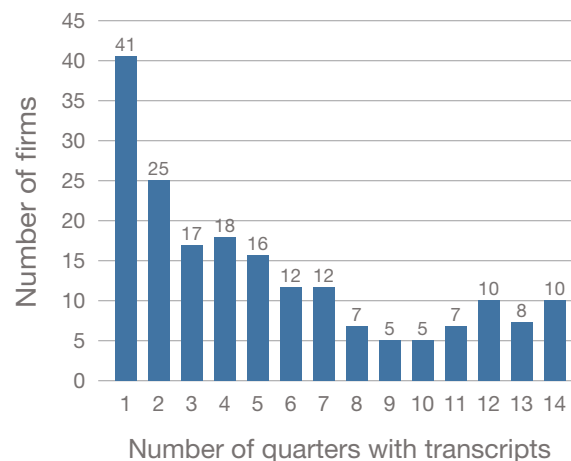
Using FinBERT, a pretrained natural language-processing model, to conduct sentiment analysis of financial texts, we then coded each sentence for whether the sentence conveyed a more positive, neutral, or negative sentiment.⁴ FinBERT was chosen based on its relatively high performance for related tasks and low bar-

FIGURE 5.1
Distribution of Quarterly Transcripts by Firm for S&P 500



SOURCE: LexisNexis's Fair Disclosure Wire.

FIGURE 5.2
Distribution of Quarterly Transcripts by Firm for Russell 2000



SOURCE: LexisNexis's Fair Disclosure Wire.

² In some cases, the gaps were introduced by subtle variations in firm name that precluded a match on LexisNexis, and we did several passes to correct the most obvious mismatches.

³ We discarded search results for another topic, *Phase One*, as it did not produce results related to our topic of study. The search terms we used were *China* (*Beijing, China, Chinese, Shanghai*); *geopolitical* (*geopolitical, geo-political, geopolitics*); *tariff* (*tariff, tariffs*); and *trade war* (*trade tension, trade war*).

⁴ See Dogu Araci, Theofilos Papapanagiotou, and Paul v.d. B., "FinBERT: Financial Sentiment Analysis with BERT," GitHub, undated; and Dogu Tan Araci, *FinBERT: Financial Sentiment Analysis with Pre-Trained Language Models*, thesis, University of Amsterdam, June 25, 2019.

TABLE 5.1
S&P 500 Earnings Call Sentences, by Tag

Sector/Subsector	<i>China</i>	<i>Tariff</i>	<i>Geopolitical</i>	<i>Trade War</i>	Total Sentences
Manufacturing	11,915	3,478	248	169	15,452
Consumer discretionary	2,765	1,296	48	26	3,999
Consumer staples	2,307	214	60	10	2,556
Industrials	3,975	1,745	112	65	5,772
Materials	2,868	223	28	68	3,125
Technology	4,277	633	153	141	5,025
Hardware	3,500	584	113	122	4,159
Software	777	49	40	19	866
Financials	723	107	150	72	1,015
Asset management and banks	165	26	70	39	283
Diversified finance	381	9	52	18	451
Insurance	151	35	17	3	201
Regional banks	26	37	11	12	80
Total	16,915	4,218	551	382	21,492

SOURCE: Authors' analysis of earnings calls from LexisNexis's Fair Disclosure Wire.

TABLE 5.2
Russell 2000 Earnings Call Sentences, by Tag

Sector	<i>China</i>	<i>Tariff</i>	<i>Geopolitical</i>	<i>Trade War</i>	Total Sentences
Manufacturing	2,553	1,113	47	117	3,566
Technology	2,015	355	35	67	2,324
Financials	139	73	21	54	261
Total	4,707	1,541	103	238	6,151

SOURCE: Authors' analysis of earnings calls from LexisNexis's Fair Disclosure Wire.

riers to use.⁵ The combination of context provided by a search term hit in a sentence, and the sentiment score of that sentence is an indicator, albeit imperfect, for whether firms feel relatively optimistic or pessimistic about the search term topic (e.g., their business prospects, including operations, sales, or investments related to China). A more positive sentiment score in a sentence with the term *China* in it suggests that a firm is relatively optimistic about its transactions or opportunities related to China, whereas a more negative sentiment reflects concern or pessimism with regard to the company's China-related operations.

Table 5.3 shows example sentences from our four subtopics that are representative of positive and negative scores. Sentiment scores have an upper bound of 1 (very positive) and a lower bound of -1 (very negative). A sentiment score of 0 indicates a relatively neutral view.

⁵ Kostadin Mishev, Ana Gjorgjeviki, Irena Vodenska, Lubomir T. Chitkushev, and Dimitar Trajanov, "Evaluation of Sentiment Analysis in Finance: From Lexicons to Transformers," *IEEE Access*, Vol. 8, July 29, 2020.

TABLE 5.3
Sample Sentiment Analysis Codings for Earnings Call Sentences

Topic	Sentiment	Score	Example Sentence
China	Positive	0.94	During the December quarter, we gained market share in refrigerator applications and won new customers in the Chinese home appliance market.
	Negative	-0.93	We continue to face softness in certain end markets, namely China, automotive and electronics, which impacted overall growth.
Trade war	Positive	0.92	Regardless how this trade war plays out, I am confident that the strength of our brand portfolio, our margin-enhancing growth prospects and internal manufacturing capabilities will allow us to deliver increased profitability over the long term.
	Negative	-0.96	We continue to see uneven demand due in part to ongoing trade tensions, which impact market stability and customer confidence.
Tariff	Positive	0.94	We continue to believe that our business in China will improve in the coming year, and we have not seen any negative impact as a result of the imposed tariffs.
	Negative	-0.95	If I fast-forward a little into 2019, we think tariffs will be having a negative impact on our total sourcing costs.
Geopolitical	Positive	0.94	We had another strong quarter of performance across the business, demonstrating our ability to execute despite the ongoing uncertainty in both the macro and geopolitical environments.
	Negative	-0.96	Despite strong market performance year-to-date, average market levels are still lower than they are a year ago and investor optimism remains fragile as geopolitical risk and global growth concerns persist.

To estimate overall sentiment within each subsector or sector per quarter, we first averaged the sentence sentiment scores associated with each individual company to arrive at one sentiment value per company per quarter. We then averaged the sentiments across firms within the subsector or sector.⁶ Tables 5.4 and 5.5 depict the count, median, and standard deviation of average sentiment scores per firm per quarter. The *count* is the total number of firm-quarter observations, with each firm-quarter observation constituting the average sentiment associated with that firm in that quarter. The *average* is the average of all firm-quarter average sentiment scores, and the *standard deviation* is the standard deviation of all firm-quarter average sentiment scores. While the mean values are all positive (with the exception of a small set of regional banks), the standard deviations provide an indication of how the fluctuations veer into more negative territory. These standard deviations do not show a strong trend over the three-and-a-half-year period, either consistently narrowing or widening, although S&P manufacturing and three of its subsectors (excluding consumer staples) exhibit a modest trend. Average standard deviations for S&P manufacturing and three of its subsectors narrow through late 2018 and early 2019, and then rise through the Q2 2020, with quarterly volatility. Subsequent analysis in the findings section examines the average sentiment scores by quarter to reveal trends over time. Appendix D provides details on the number of sentences and firms per quarter included in the earnings call analysis (see Tables D.1–D.2). It also provides graphs of the time trend of standard deviations (see Figures D.1–D.4).

⁶ Making each firm equal in the aggregation was done to guard against the possibility that our results would be skewed in case one or a few firms in a subsector or sector include significant discussion on China-related issues in their earnings calls. The flip side is that a single reference from one firm is given the same weight as lengthy discussion from another.

TABLE 5.4

S&P 500 Earnings Call Average Sentiment per Firm per Quarter

Sector/Subsector	Count	Mean	Standard Deviation
Manufacturing	1,310	0.251	0.331
Consumer discretionary	311	0.245	0.302
Consumer staples	256	0.368	0.338
Industrials	456	0.265	0.325
Materials	287	0.130	0.323
Technology	572	0.211	0.341
Hardware	394	0.167	0.327
Software	178	0.309	0.350
Financials	280	0.184	0.428
Asset management and banks	94	0.132	0.380
Diversified finance	78	0.231	0.433
Insurance	68	0.256	0.471
Regional banks	40	0.092	0.431

NOTE: **Count** is the total number of firm-quarter observations over the entire 14-quarter period; **Mean** is the overall average of the average firm sentiment for each quarter for all firms; **Standard Deviation** is the overall standard deviation of the average firm sentiment for each quarter for all firms.

TABLE 5.5

Russell 2000 Earnings Call Average Sentiment per Firm per Quarter

Sector	Count	Mean	Standard Deviation
Manufacturing	560	0.145	0.403
Technology	344	0.186	0.389
Financials	138	0.041	0.551

NOTE: **Count** is the total number of firm-quarter observations over the entire 14-quarter period; **Mean** is the overall average of the average firm sentiment for each quarter for all firms; **Standard Deviation** is the overall standard deviation of the average firm sentiment for each quarter for all firms.

Relying on FinBERT’s natural language-processing model to conduct sentiment analysis has the benefit of lower human error in coding, but the automated system could create errors as well. Three types of errors present themselves. First, the sentiment could be incorrectly coded: a negative sentiment could be coded as positive and vice versa. Second, a sentiment could be off-topic despite the keyword; as a hypothetical example, a statement such as “My birthday cake was delicious and served on fine china” could be rated as a positive sentiment related to China. Third, the strength of the sentiment could be incorrectly rated.

We had two researchers independently check the ratings for the first two errors because whether the coding was right or wrong would be more obvious for these two errors, whereas more judgment would be needed—and larger differences of opinion could emerge—regarding the third error. Each researcher checked 10 percent of the S&P 500 sample and 10 percent of the Russell 2000 sample, with the sentences to be checked randomly drawn. In addition, the sentences checked were not the same random sample for each researcher.

The first researcher found that for both the S&P 500 and the Russell 2000 samples, more than 90 percent of the sentences in the random sample were correctly coded. The second researcher found more ambiguous

results. Sentences that were clearly positive or negative tended to have the correct numerical rating (more than 80 percent for each sample), but sentences with more neutral sentiments had more errors. If these errors are randomly distributed, our analysis should not be affected; however, if they occur systematically in one direction or the other, then our analysis could be in error. Full results of the validation exercise and a more detailed discussion appear in Appendix E.

Findings

The following sections first analyze the earnings call results for S&P 500 firms and then compare them with findings from Russell 2000 firms. Although large standard deviations make it difficult to assess results with confidence, the data suggest that manufacturing and technology firms were more concerned with (had decreasing sentiment toward) China-related operations from 2018 to late 2019. Although sentiment turned more positive for these two sectors in early 2020, the average sentiment scores did not return to early 2017 levels. In contrast, S&P 500 financial firms saw a dip in sentiment in Q1 2018 (compared with late 2017) and a subsequent increase in sentiment from 2018 to Q2 2020.⁷ Financial firms had a more positive sentiment score in Q2 2020 than Q1 2017. This suggests that financial firms could have viewed the actions taking by the Trump administration—or actions taken by China in response—as providing them with slightly more opportunities or benefits overall compared with costs. In contrast, manufacturing and technology firms may not have benefited as much and may have faced more difficulties and costs. We do not find any significant difference between how large (S&P 500) and small (Russell 2000) firms viewed China-related activities.

S&P 500 Earnings Calls

Average sentiment associated with China remained positive for all three sectors from January 2017 to June 2020. For the manufacturing and technology sectors, there is a general dip in sentiment from early 2017 until mid- to late 2019, with some upward movements afterward and particularly in early 2020 (see Figure 5.3). Even so, the data suggest growing concern, anxiety, or uncertainty with respect to China-exposed business operations and activities from late 2017 onward. Throughout this analysis, we focus on the sentiment point estimates. We note, however, that the large standard deviations in average sentiment of earnings calls make it difficult to assess these results—or the differences by sector—with confidence.

Finance is the only sector in which S&P 500 firms felt more positive toward China by late 2019 / early 2020 compared with early 2017. Even for financials, however, S&P 500 firms were less positive with respect to their China-related operations in late 2019 / early 2020 than during the Q4 2017. Much of the optimism and positive sentiment scores in Q4 2017 were driven by the increased access and new business opportunities in China.⁸

As the United States embraced economic measures targeting China from early 2018 onward, such as the Section 301 tariffs, there were increasing numbers of S&P earnings calls referencing China (see Figure 5.4). Specifically, the number of China-related sentences in quarterly earnings calls by sector divided by total number of firms in the sector increased.⁹ Across all three sectors, there was an almost doubling of earnings

⁷ As the section “Russell 2000 Earnings Calls” will discuss, we were not able to collect sufficient data from Russell 2000 financial firms to have much confidence in the quarterly average sentiment scores or associated trend line.

⁸ For example, BlackRock’s Q4 2017 earnings call note that the company had obtained its private fund management registration in China. Similarly, Chubb Limited’s Q4 transcript noted a new strategic cooperation agreement with PICC Property and Casualty Company of China.

⁹ We divide the number of sentences by the total number of firms per sector because each sector did not have the same number of firms.

FIGURE 5.3
Average China-Related Sentiment by S&P 500 Sector, 2017–2020

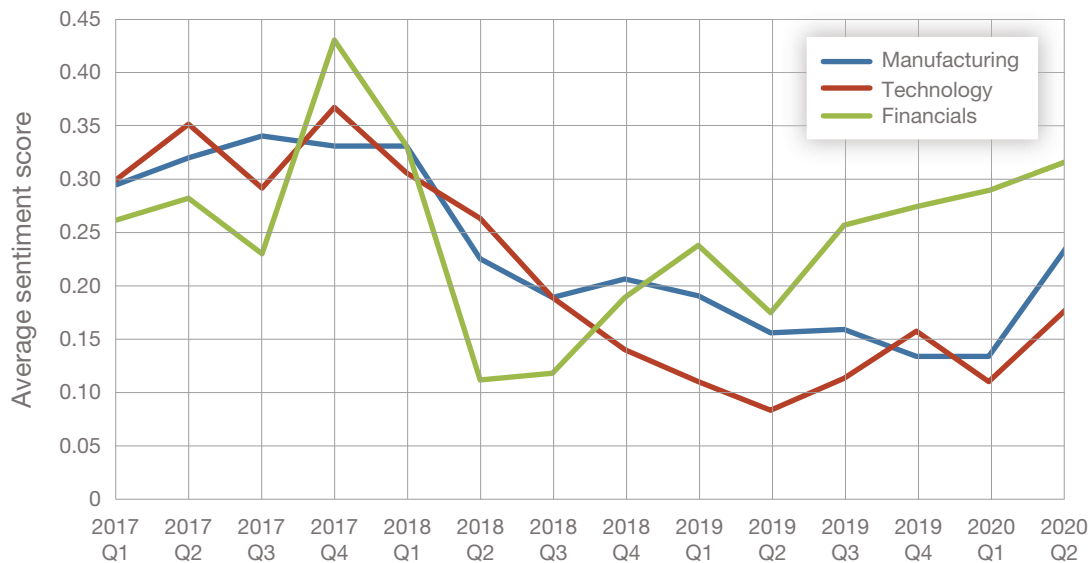
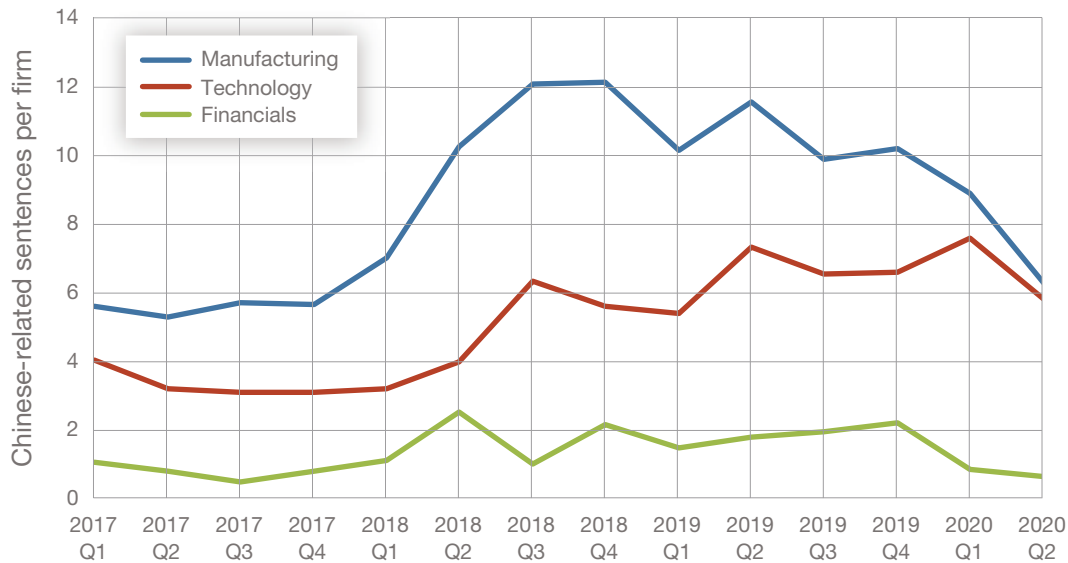


FIGURE 5.4
China-Related Sentences per Firm by S&P 500 Sector, 2017–2020

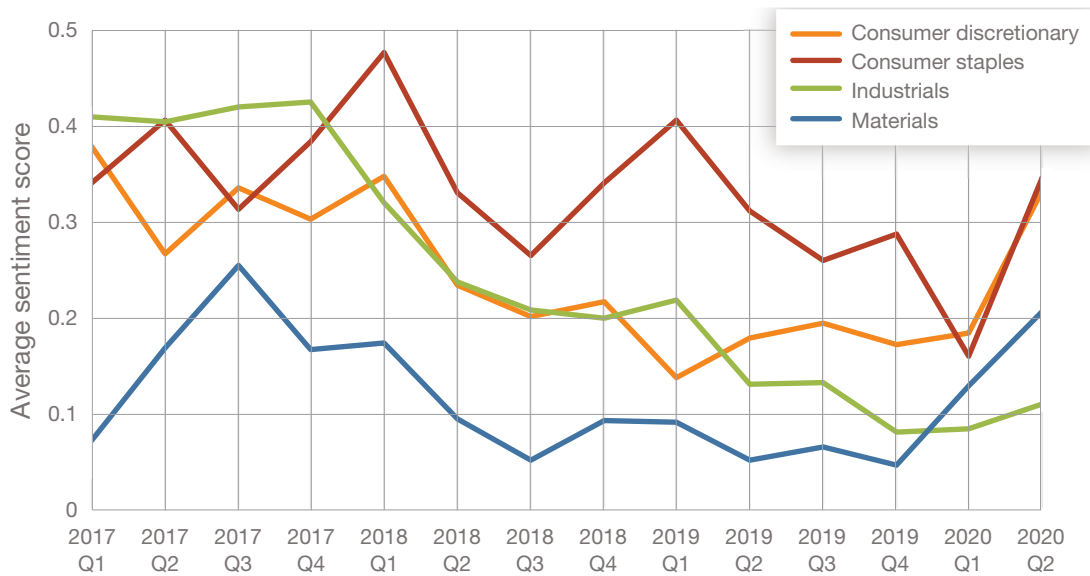


calls that reference China between early 2017 and Q2 or Q3 of 2018. The manufacturing sector referenced China-related operations or activities the most.

Manufacturing Sector

Across the manufacturing subsectors, sentiment toward China declined the most in industrials firms, or manufacturers and distributors involved in aerospace and defense, electric equipment, machinery, tools, building, and construction (see Figure 5.5). All the other subsectors also saw a decrease in sentiment from early 2017 to late 2019, with some rebounding in early 2020. Industrials and consumer discretionary firms

FIGURE 5.5
Average China-Related Sentiment by S&P 500 Manufacturing Subsector, 2017–2020



mentioned China the most, suggesting that these two subsectors were most concerned with China-related developments (see Figure D.5). These two subsectors also saw a significant increase in mentions of China between Q1 2018 and Q2 2020.

Technology Sector

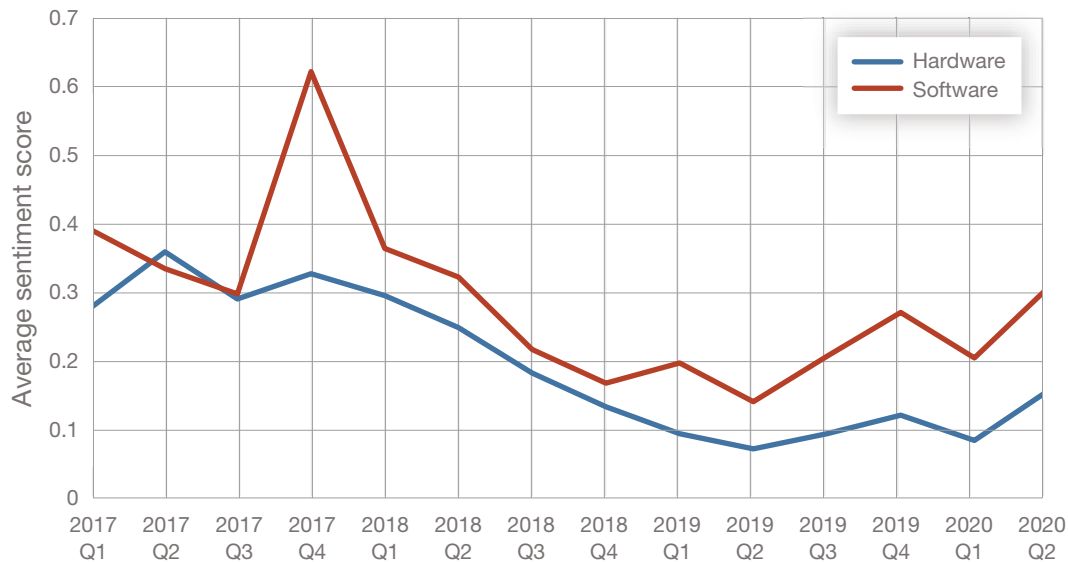
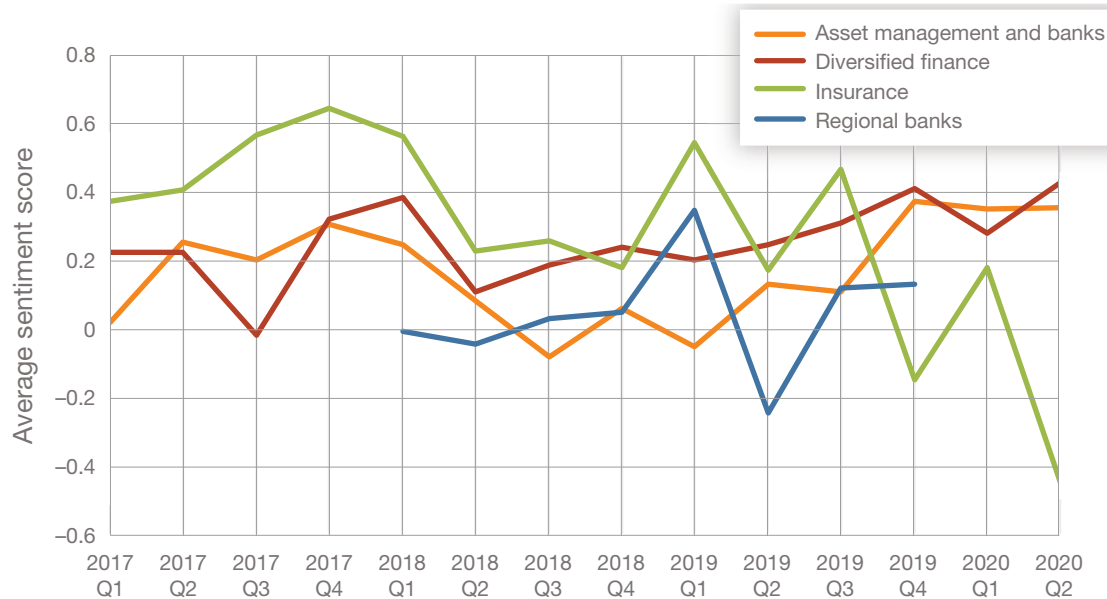
Among the two subsectors of the technology sector, there appeared to be a similar general downward trend of sentiment from 2017 to late 2019. Software companies, in particular, saw a larger drop in sentiment regarding China-related business operations and activities from 2017 after a significant positive spike in sentiment in Q4 2017 (see Figure 5.6). This spike was chiefly a result of two things: earnings calls that referred to China’s online pay market, including the success and record number of sales from Alibaba’s Single’s Day on November 11, 2017, and the potential of the Chinese market;¹⁰ and earnings calls that reported new opportunities or Chinese use of U.S. software.¹¹ Hardware companies mentioned China-related operations and activities more than software companies, and there was a significant increase in mentions of China in Q3 2018 and beyond (see Figure D.6).

Financial Sector

Finance is the only sector in which earnings calls from all subsectors displayed at least one quarter where the average sentiment toward China-related business operations or activities was negative (see Figure 5.7).

¹⁰ This was seen, for example, in Facebook’s and PayPal’s Q4 earnings calls. For Alibaba’s Single’s Day, see Jon Russell, “Alibaba Smashes Its Single’s Day Record Once Again as Sales Cross \$25 Billion,” *Tech Crunch*, November 11, 2017. We note that in this analysis, Mastercard, PayPal, and Visa are categorized as software and technology companies rather than financial companies.

¹¹ For example, IBM’s Q4 earnings call shared that the Beijing Institute of Technology selected the IBM LinuxONE platform for its blockchain solution. Similarly, Microsoft noted that the Bank of China adopted Windows 10 in Q3 2017. Mastercard stated that it signed new deals with the Agricultural Bank of China, the China Industrial Bank, and the Industrial and Commercial Bank of China. PayPal highlighted the progress it had made with UnionPay, and Visa stated that it executed a deal with the Industrial and Commercial Bank of China.

FIGURE 5.6**Average China-Related Sentiment by S&P 500 Technology Subsector, 2017–2020****FIGURE 5.7****Average China-Related Sentiment by S&P 500 Financial Subsector, 2017–2020**

While insurance companies generally saw a decline in China-related sentiment from 2017 onward, diversified finance companies saw a slight growth in sentiment toward China in early 2020 compared with early 2017. There was a bit more volatility in the average sentiment from asset management and regional banks, with sentiment in asset management firms dipping in late 2018 / early 2019, and into negative territory, before rebounding to positive territory. Of the four subsectors, diversified finance mentioned China-related operations or activities the most (see Figure D.7 in Appendix D). For diversified finance, the earnings calls show a general increase in China-related sentences between Q3 2018 and Q1 2020, with two spikes, in Q4 2018 and Q3 2019.

Russell 2000 Earnings Calls

Analysis of earnings calls from Russell 2000 companies shows that smaller companies in the manufacturing and technology sectors generally shared the concerns of larger S&P 500 companies with regard to China-related business operations and activities. Similar to larger firms, sentiment toward China dropped for smaller manufacturing and technology firms from early 2017 until late 2019 before rebounding to some extent in early 2020. Smaller technology firms appeared to have a slightly more positive sentiment on China than larger technology firms. For these two Russell 2000 sectors, the average sentiment scores were based on at least 100 sentences per quarter. Similar to the S&P 500 data, large standard deviations in average sentiment scores make it difficult to assess results with confidence.

Earnings call data, however, suggest a slightly different picture for how smaller (Russell 2000) financial firms viewed China compared with larger (S&P 500) firms. Earnings calls from S&P 500 firms displayed a large spike in sentiment in Q4 2017, followed by a dip and then a generally positive upward trend from Q2 2018 onward. There was more volatility in how smaller financial firms viewed China-related activities: the average sentiment score for Russell 2000 financial firms oscillated between positive and negative from Q1 2017 to Q2 2018 (see Figure 5.8). Smaller financial firms had mainly positive average sentiment scores from Q3 2018 onward. Although this could suggest that smaller financial firms had a more pessimistic outlook on China prior to mid-2018, the Russell 2000 average sentiment scores were based on a very small sample of financial firms and China-related sentences (fewer than ten firms, and fewer than 20 sentences, from Q1 2017 to Q1 2018) and we caution against giving too much weight to findings from only a handful of firms.¹² We also find that the average sentiment score of Russell 2000 financial firms is influenced by non-China-related sentences that used the term *geopolitical*.¹³ The low score in Q1 2017, for example, is partially explained by concern over North Korea–related geopolitical tensions.¹⁴

Finally, similar to those of the S&P 500, smaller manufacturing and technology firms included more China-related sentences in their earnings calls than did finance companies. For Q1 2017 and Q4 2019 to Q2 2020, the Russell 2000 data show that smaller technology companies had more China-related sentences in their earnings calls than did manufacturing firms (see Figure 5.9).

Summary

The trade war and other U.S. policies that confronted China definitely caught the attention of the business community, with words related to those policies appearing more frequently in earnings calls throughout the period. For most sectors that we are analyzing, sentiment became less positive, but rarely negative. This suggests that businesses were waiting to see how policies evolved and that they still viewed China as a legitimate and positive business partner, albeit one that might merit caution. Larger firms (those in the S&P 500) tended to have more positive sentiments toward the end of the period—particularly consumer staples manufacturers, consumer discretionary manufacturers, asset managers and banks, and diversified finance companies.

¹² As discussed earlier, we searched for earnings calls for 300 Russell 2000 financial firms. Despite casting a wide net, we found earnings calls for only 52 financial firms, and many firms did not have earnings calls every quarter.

¹³ If we focus only on sentences that included the term *China*, the trend line for Russell 2000 financial firms looked quite different and more positive in 2017. We do not see a significant change in trend lines for any other sector in the S&P 500 or Russell 2000 if we only look at sentences that include *China* or if we look at *China* and the other sentence tags (*geopolitical*, *tariff*, and *trade war*).

¹⁴ For example, Orchid Island Capital's 2017 Q1 earnings call mentions the geopolitical risk associated with North Korea.

FIGURE 5.8
Average China-Related Sentiment by Russell 2000 Sector, 2017–2020

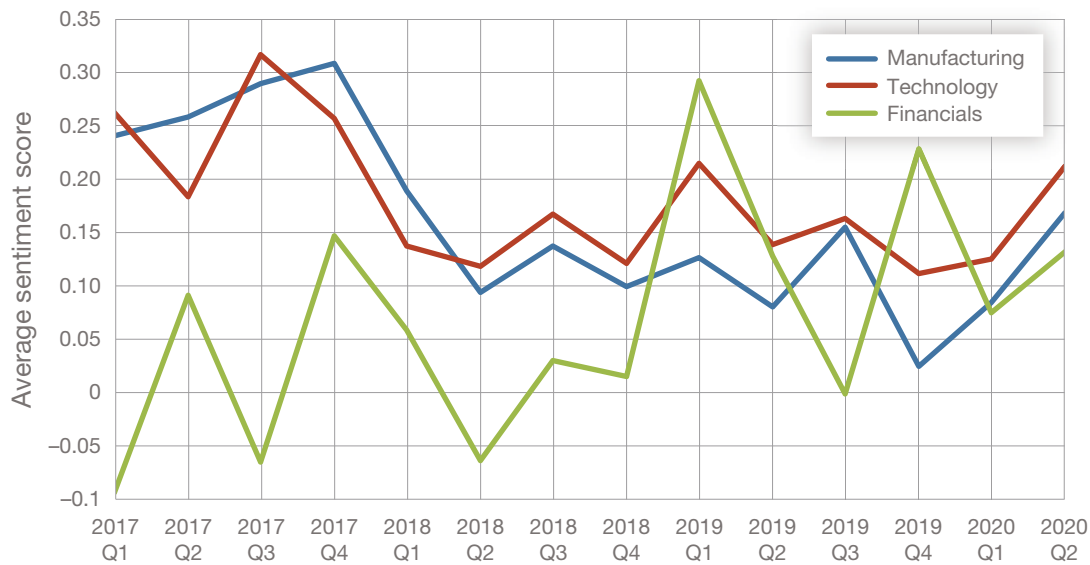
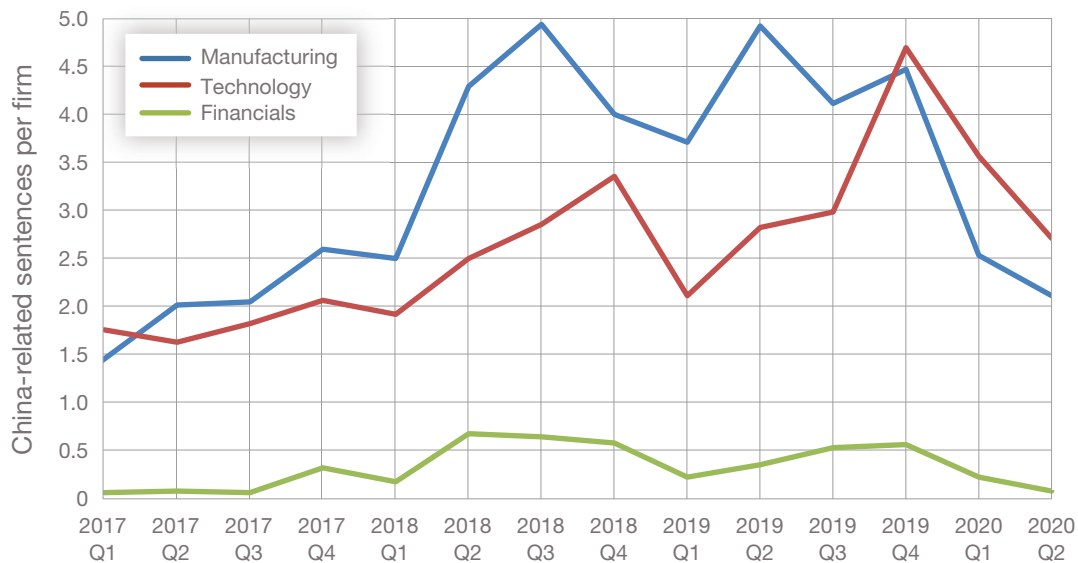


FIGURE 5.9
China-Related Sentences per Firm by Russell 2000 Sector, 2020



There is a chance that these results do not represent actual trends because of the large standard errors in the analysis. However, if they do represent actual trends, they might reflect positive longer-term views of the Chinese market on the part of manufacturers, the fact that China has set as a policy the gradual opening of its financial markets, and the signing of the Phase One trade deal in December 2019.

Views from the Manufacturing Sector

Until it was surpassed by China in 2010, the United States had the world's largest manufacturing sector as measured by output.¹ The U.S. manufacturing sector contributed to 9.5 percent of U.S. real GDP in 2019 and 8 percent of total nonfarm U.S. employment as of December 2019.² It is large and diverse, with nearly 250,000 firms, yet only 1.5 percent of the firms have more than 500 employees.³ Companies in the sector include consumer discretionary manufacturers (e.g., General Motors, Nike), consumer staples (e.g., General Mills, Procter & Gamble), industrials (e.g., General Electric, Lockheed Martin), and materials (e.g., Dow, Nucorp). As noted above, we do not include firms that produce computer and electronic products in our definition of the manufacturing sector but instead consider them separately in the technology sector. The following sections analyze the U.S. manufacturing sector's views of U.S.-China competition.

Background: Operations and Involvement in China

U.S. manufacturing companies have been active in China for decades since China's opening up in 1978. Based on the 131 manufacturing firms in the S&P 500, the majority of the largest U.S. manufacturing companies rely on China for 5 percent or less of their global sales (see Figure 6.1). Only 15 firms rely on China for more than 10 percent of their global sales. In addition to sales in China, approximately one-fourth of U.S. firms have production facilities in China.⁴ Eighty-one percent depend to some extent on China for manufactured parts and components, and 78 percent rely on China for materials. In contrast, only 30 percent of firms rely on China for research and design.⁵

The U.S. manufacturing sector leads U.S. FDI in China and is a top destination for PRC FDI in the United States. In 2019, U.S. manufacturers had \$43.8 billion invested in China (38 percent of total U.S. FDI in China). Manufacturers of transportation equipment invested the most in China (\$12.8 billion), followed by companies producing chemicals (\$11.7 billion). Similarly, China had \$5.6 billion invested in the U.S. manufacturing sector by 2019 (15 percent of all Chinese FDI in the United States). China invested the most

¹ Darrel M. West and Christian Lansang, *Global Manufacturing Scorecard: How the U.S. Compares to 18 Other Nations*, Washington, D.C.: Brookings Institution, July 10, 2018.

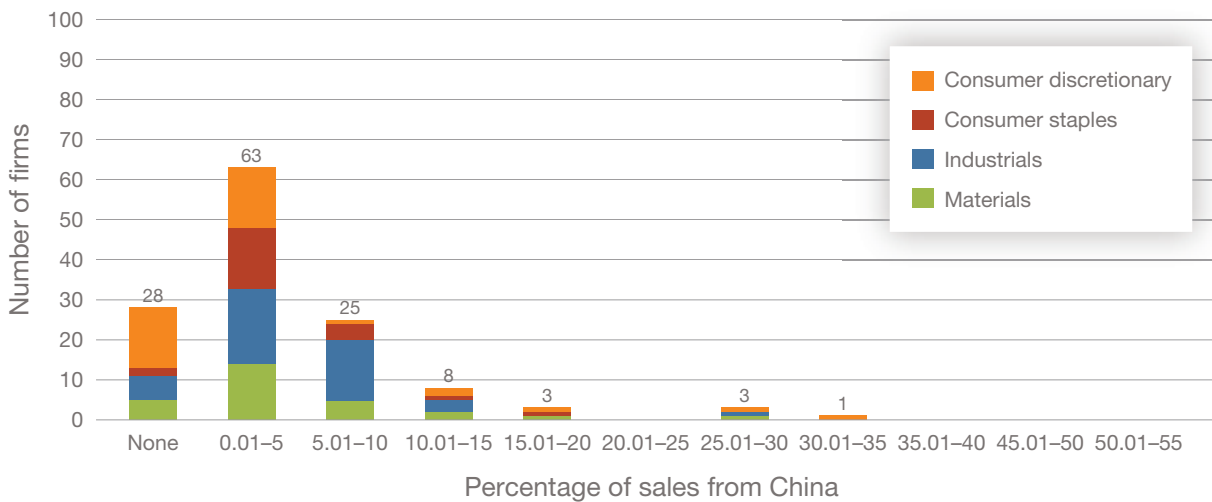
² For GDP share, see BEA, *Gross Domestic Product by Industry: Fourth Quarter and Year 2019*, Washington, D.C.: DOC, April 6, 2020a. For employment share, see BLS, 2018.

³ Three-fourths of manufacturing firms employ fewer than 20 employees. National Association of Manufacturers, "Facts About Manufacturing," webpage, undated.

⁴ This figure is based on survey results of North American manufacturing companies. See Thomas Publishing Company, *Thomas Industrial Survey: Coronavirus Impacts on North American Manufacturing*, New York: Thomas Publishing Company, February 2020.

⁵ Thomas, "New Survey: Coronavirus Impacts on North American Manufacturing, March 2020," press release, New York, March 19, 2020.

FIGURE 6.1
Percentage of Sales to China for S&P 500 Manufacturing Firms, December 2019



SOURCE: Data on each company's Q4 2019 revenue from China, from FactSet GeoRev, December 2019.

in other manufacturing (\$2.5 billion), followed by transportation equipment (\$1.6 billion) and machinery (\$591 million).⁶

Views of Competition from China and China-Related Operations

The growth of China's economy and U.S.-China trade has significantly affected the sector. One study, for example, found that increased U.S. imports from China explain 16 percent of the decline of U.S. manufacturing employment from 1990 through 2000, 26 percent of the decline from 2000 through 2007, and 21 percent over the entire period.⁷ Another study found that although U.S. imports from China from 1995 to 2011 led to a loss of 2.0 million U.S. jobs (with 1.4 million in the manufacturing sector), the overall increase in U.S. exports to the world during this same period generated a gain of 3.7 million jobs (with 1.9 million in manufacturing) for the United States. In other words, despite imports from China, there was a net gain of 0.5 million jobs in the U.S. manufacturing sector during this period.⁸ Similarly, other studies show that U.S. exports to China create American jobs. One report found that in 2015, U.S. exports to China directly supported 1.5 million jobs and indirectly supported another 0.3 million jobs.⁹ However, as the U.S. manufacturing goods trade deficit with China grew from \$75 billion in 2002 to \$233 billion in 2017, there is growing concern that there will be more job losses in the manufacturing sector due to import competition from China.¹⁰

⁶ BEA, "Balance of Payments and Direct Investment Position Data," webpage, undated b.

⁷ Autor, Dorn, and Hanson, 2013.

⁸ Robert C. Feenstra and Akira Sasahara, "The 'China Shock,' Exports and U.S. Employment: A Global Input-Output Analysis," Cambridge, Mass.: National Bureau of Economic Research, NBER Working Paper 24022, November 2017.

⁹ Oxford Economics, *Understanding the U.S.-China Trade Relationship*, Washington, D.C.: U.S.-China Business Council, January 2017. Because a good portion of U.S. exports to China include agricultural commodities, not all of these employment gains are in the manufacturing sector.

¹⁰ These figures are calculated from U.S. Census Bureau, "USA Trade® Online," online database, undated; data downloaded July 20, 2020. Robert E. Scott, *The China Toll Deepens: Growth in the Bilateral Trade Deficit Between 2001 and 2017 Cost 3.4*

Manufacturing companies view China as engaging in unfair, distortionary, and protectionist policies to facilitate market gains globally and in the United States. U.S. steel producers, for example, have criticized China for a range of measures: dumping steel below production cost; IP theft, including alleged hacking into U.S. Steel; massive PRC government subsidies of its steel industry, including state ownership of majority shares in firms and shielding them from competing with private enterprises; manipulating its currency (weakening its value) to subsidize PRC exports;¹¹ and exploiting loopholes to export more steel, including not reporting steel exports in a timely manner to international organizations, transshipment of steel, and changing the labels of PRC steel products to read “Made in Vietnam.”¹²

As a diverse sector, manufacturing shares many of the concerns identified by the U.S. business community with respect to operating in China. According to the U.S. Chamber of Commerce’s 2017 survey, the top ten challenges were (1) competition with Chinese companies in China; (2) difficulties obtaining licenses and approvals; (3) barriers to investing in China; (4) uneven enforcement of PRC regulations and laws or uncertain PRC policy climate; (5) lack of IP rights enforcement or protection; (6) cybersecurity and technology security, including the effects of China’s cyberregulation and data regulation on business operations; (7) cost increases in China; (8) the effects of U.S.-China relations on business; (9) data flow barriers; and (10) restrictive PRC capital controls.¹³

As U.S.-China trade tensions grew from 2017 onward, U.S. companies suffered from higher tariffs levied by both countries and faced a more uncertain business environment in China. Chinese suppliers and customers were wary of doing business with U.S. companies. There was increased PRC scrutiny on U.S. firms and evidence that Chinese regulators excluded American companies from bids or tenders or delayed U.S. requests for approval of licenses or products.¹⁴

While all these policies caused challenges for U.S. manufacturing firms, their effects may have varied based on the extent to which the firm’s products require more R&D. A 2020 survey suggested that R&D-intensive industries—which included aerospace companies—were most concerned with “uncertainties in the U.S.-China economic relationship and bilateral tariffs” than any other issue. These same companies also had more concerns about “uncertain Chinese policy environment” and “market access barriers or government policies that disadvantage foreign companies” (two factors that were their second and third concerns) than did resources and industrial firms, which viewed these two issues as the least concerning out of a range of eight issues. Instead, resources and industrial firms, which included auto companies and companies engaged in machinery equipment, and chemicals, were most concerned about slower growth in China than any other issue.¹⁵

Million U.S. Jobs, with Losses in Every State and Congressional District, Washington, D.C.: Economic Policy Institute, October 23, 2018.

¹¹ Despite criticism from the U.S. manufacturing sector, the United States only officially designated China a currency manipulator from 1992 to 1994 and again from 2019 to 2020.

¹² Kevin M. Dempsey, “Re: Request for Public Comments Concerning Proposed Modification of Action Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation,” correspondence from American Iron and Steel Institute to Joseph Barloon, June 17, 2019a; American Iron and Steel Institute, “Steelbriefs Profile—Senator Amy Klobuchar,” undated.

¹³ U.S.-China Business Council, *2017 Member Survey*, Washington, D.C.: U.S.-China Business Council, 2017.

¹⁴ U.S.-China Business Council, *2019 Member Survey*, Washington, D.C.: U.S.-China Business Council, 2019.

¹⁵ American Chamber of Commerce in China, *2020 China Business Climate Survey Report*, Beijing: American Chamber of Commerce in China, March 2020, p. 35.

These differences are likely caused by Beijing's desire to acquire advanced U.S. technology to build its own industry or shield its leading firms from U.S. competition. As Ace Hardware, a company that sells home improvement components, explains,

The Chinese government has never restricted Ace in its business dealings in China and has not employed any tactics, such as opaque and discretionary administrative approval processes, joint venture requirements, foreign equity limitations, procurements or other mechanisms to regulate or intervene in our operations in China. . . . Simply put, the Chinese government is not interested in our technology.¹⁶

Major U.S. Policy Actions or PRC Responses That Affected the Sector

Since 2017, almost all of the major U.S. economic actions against China and corresponding PRC responses have targeted the manufacturing sector. Table 6.1 displays the three major tariff actions that the United States took and PRC retaliation. Tariffs levied under Section 201 of the 1974 Trade Act (on solar cells and residential washers) and Section 232 of the 1962 Trade Expansion Act (on steel and aluminum imports) were global tariffs that also applied to China. In contrast, Section 301 tariffs were initiated in response to China's unfair acts, policies, and practices related to technology transfer, IP, and innovation.¹⁷ All three tariff actions covered manufacturing inputs or goods, with the Section 232 tariffs on imported aluminum and steel shielding U.S. producers from competition but also raising prices for or constraining supply to a wide range of U.S. industries dependent on aluminum and steel inputs. China responded by imposing several rounds of tariff increases on the United States in 2018 and 2019, raising these import taxes on a combined total of approximately \$185 billion worth of U.S. manufactured and other goods across two years.

In addition to imposing tariffs on PRC products, increased U.S. scrutiny on foreign (PRC) investment in the United States has also introduced more friction on completing international investment in the manufacturing sector. In 2018 the United States enacted FIRRMA, which expanded the power of the Committee on Foreign Investment in the United States (CFIUS) to review foreign transactions or investments for national security purposes.¹⁸ Under FIRRMA, and in 2018 via a pilot program, CFIUS requirements initially expanded mandatory filing requirements to cover transactions involving controlling investments by foreign persons in U.S. businesses. The new requirements targeted any transactions to produce, design, test, manufacture, fabricate, or develop critical technologies in one or more of 27 key industries. Twenty-three out of 27 industries in the pilot program have NAICS codes that correspond to the manufacturing sector as defined

¹⁶ Brian Wiborg, "Re: Ace Hardware Corporation: Comments in Opposition to Inclusion of Home Improvement Articles in USTR Section 301 Annex Docket No. USTR-2019-0004," correspondence from Ace Hardware Corporation to Robert Lighthizer, June 17, 2019.

¹⁷ China is not among the top ten countries from which the United States imports steel directly. In terms of quantity, China accounted for approximately 2 percent of U.S. steel imports in 2017; in terms of dollar value, it made up 3 percent of steel imports in 2017. China also does not export aluminum in commodity form to the United States but ships semifinished aluminum products. China, however, is a major producer of both steel and aluminum: it is the world's largest steel producer, and it accounted for more than half of the world's primary aluminum production in 2019. Its massive production of both materials affects international capacity and prices. See Rachel F. Fefer, Keigh E. Hammond, Vivian C. Jones, Brandon J. Murrill, Michaela D. Platzer, and Brock R. Williams, *Section 232 Investigations: Overview and Issues for Congress*, Washington, D.C.: Congressional Research Service, R45249, August 24, 2020; U.S. International Trade Administration, "Steel Imports Report: United States," *Global Steel Monitor*, May 2020b; and John Kruzel, "How Much Steel Does the U.S. Import from China?" *Politifact*, March 8, 2019.

¹⁸ U.S. Department of the Treasury, *Summary of the Foreign Investment Risk Review Modernization Act of 2018*, Washington, D.C.: U.S. Department of the Treasury, undated a.

TABLE 6.1

Major U.S. Tariff Actions Applicable to China Since 2017, and PRC Retaliation

Tariff	Description of U.S. Action	PRC Retaliation
Section 201 (February 7, 2018)	\$7 billion tariff-rate quota on solar cells, solar modules, large residential washers, and large residential washer parts; \$1.9 billion of tariffs on washers and \$5.2 billion on solar products	Imposed preliminary tariffs on U.S. sorghum in April 2018, then ended them in May; filed WTO dispute case regarding solar panels in August 2018
Section 232 (March 23, 2018)	\$40 billion tariffs on aluminum imports (10% tariffs, \$16.6 billion) and selected steel imports (25% tariffs, \$23.4 billion)	Imposed \$3 billion tariffs (10–25%) on offal, steel, nuts, pork, stone fruits (cherries, peaches)
Section 301 (July 6, 2018)	Approximately \$550 billion total <i>Stage 1 (\$34 billion):</i> 25% import tariff on 818 products, including machinery, manufacturing inputs, elevators, and aircraft parts, effective July 6, 2018 <i>Stage 2 (\$16 billion):</i> 25% import tariff on 279 products, including soybeans, automobiles, and chemicals, effective August 23, 2018 <i>Stage 3 (\$200 billion):</i> 25% import tariff on 5,745 products, including food, beverage, chemicals, wood, and fabrics; 10% tariff effective September 24, 2018; 25% tariff effective May 10, 2019 <i>Stage 4:</i> two parts covering electronics, sports equipment, clothes, wooden hangers, food, beverages, chemicals, glasses, and blinds <i>Stage 4A (\$126 billion):</i> 15% import tariff on 3,299 product lines, effective September 1, 2019; tariffs reduced to 7.5%, effective February 14, 2020 <i>Stage 4B (\$156 billion):</i> proposed 15% import tariff on 542 products, canceled December 13, 2019	Approximately \$185 billion total <i>Round 1 (\$34 billion):</i> 25% retaliatory tariffs on 545 products, including soybeans, automobiles, and various chemicals, effective July 6, 2018 <i>Round 2 (\$16 billion):</i> 25% retaliatory tariffs on 333 products, including coal, fuel, buses, and medical equipment, effective August 23, 2018 <i>Round 3 (\$60 billion):</i> 5–10% retaliatory tariffs on 5,000+ products, including agricultural equipment, machinery, and textiles, effective September 28, 2018 <i>Round 4 (\$75 billion):</i> 5–10% retaliatory tariffs on 5,000+ products, including automotive goods, agricultural products, chemicals, crude oil, whiskey, and seafood (some involved increasing tariffs on products covered in the first three rounds); tariffs imposed in two stages, on September 1, 2019, and December 15, 2019; rates reduced on February 14, 2020

SOURCES: R. Williams, Christopher A. Casey, Cathleen D. Cimino-Isaacs, Rachel F. Fefer, Keigh E. Hammond, Vivian C. Jones, Andres B. Schwarzenberg, and Karen M. Sutter, *Trump Administration Tariff Actions: Frequently Asked Questions*, Washington, D.C.: Congressional Research Service, R45529, February 22, 2019; Anite Regmi, *China's Retaliatory Tariffs on U.S. Agriculture: In Brief*, Washington, D.C.: Congressional Research Service, R45929, September 24, 2019; Jenny Hopkinson, *Profiles and Effects of Retaliatory Tariffs on U.S. Agricultural Exports*, Washington, D.C.: Congressional Research Service, R45448, December 31, 2018; Jon Cowley, Ivy Pan, Jenny Tan, and Di Wu, *China Retaliatory Tariff Updates in Response to the Phase One Deal*, Beijing: Baker McKenzie, March 2020; Aaron Flaaen and Justin Pierce, *Disentangling the Effects of the 2018–2019 Tariffs on a Globally Connected U.S. Manufacturing Sector*, Washington, D.C.: Federal Reserve Board, Divisions of Research & Statistics and Monetary Affairs, Finance and Economics Discussion Series 2019-086, 2019; Shapiro, “Tariff News,” webpage, undated; Bown and Kolb, 2020.

NOTES: Under a tariff-rate quota, the quantity of a specific good under the quota level is charged one tariff amount, while any quantities of that good above the quota level are charged a higher amount; see U.S. Customs and Border Protection, “Quota Administration,” webpage, last modified December 20, 2017.

for this study.¹⁹ In 2020 the requirements were further revised to end the use of NAICS codes to determine critical technology; U.S. business would instead have to file for a CFIUS review if a “U.S. regulatory authorization” would be required for the company to export, reexport, or transfer the company’s goods or technologies to foreign investors or foreign persons involved in the transaction. “U.S. regulatory authorization”

¹⁹ In 2020, the Department of the Treasury embraced new CFIUS regulations that absorbed the pilot program. The Treasury plans to replace declarations based on the NAICS codes to one based on U.S. export licensing requirements. See David Levin, Sherry Liu, and Raymond Paretzky, “New CFIUS Rules May Impact All Foreign Investment in the United States,” JD Supra, October 16, 2018; and Robert Larussa and John M. Beahn, “Client Alert: CFIUS Proposes Changes to Mandatory Filing Requirements,” JD Supra, May 26, 2020.

refers to regulatory licenses or authorizations set by the four main U.S. export control regimes.²⁰ This change means that manufacturing companies with Chinese investors would more likely have to file CFIUS reviews given the stricter U.S. export requirements to China (versus manufacturing companies with investors from allied countries).

Similarly, U.S. efforts to tighten exports of U.S. products have affected the manufacturing and technology sectors. Since the passing of the Export Control Reform Act of 2018, the DOC has been developing export controls on 14 emerging technologies, many of which fall under the manufacturing sector.²¹ In January 2020, for example, the BIS rolled out rules to limit exports of geospatial software.²² This was followed by inclusion of 24 precursor chemicals and other items to the controlled list in June 2020 and six other categories of controlled items in October 2020.²³ In August 2020 the BIS sought public commentary on how “to identify and describe foundational technologies” to control and noted that foundational technologies include “not only ‘technologies’ but also ‘commodities’ and ‘software.’”²⁴ These new rules, along with other BIS additions of Chinese companies, individuals, and organizations to the DOC Entity List, as well as expansion of restrictions on exports for military end uses or to military users (with corresponding removal of license exception of exports to China for civilian end uses), impose additional requirements and limits on what U.S. manufacturers can export to China.²⁵

Responses to Increased U.S.-China Competition

This section explores how the U.S. manufacturing sector is responding to the aforementioned U.S. and PRC economic actions. This involves considering at least four ways tariffs could change industry employment, wages, sales, and other characteristics: (1) tariffs protect some U.S. manufacturers from import competition, (2) tariffs increase the cost of imported PRC intermediate inputs and hurt some manufacturers producing for export and the U.S. domestic market, (3) PRC retaliatory actions disadvantage U.S. firms exporting to China, and (4) tariffs create uncertainty that could discourage significant investment or other operations. We combine these considerations with the additional consequence of limiting PRC investment in the manufacturing sector and export restrictions on U.S. (higher-value) manufacture sales to China.

²⁰ These include “(a) A license or other approval issued by the Department of State under the ITAR [International Traffic in Arms Regulations]; (b) A license from the DOC under the EAR; (c) A specific or general authorization from the Department of Energy under the regulations governing assistance to foreign atomic energy activities at 10 CFR part 810 other than the general authorization described in 10 CFR 810.6(a); or (d) A specific license from the Nuclear Regulatory Commission under the regulations governing the export or import of nuclear equipment and material at 10 CFR part 110.” U.S. Department of the Treasury, Office of Investment Security, “Provisions Pertaining to Certain Investments in the United States by Foreign Persons,” *Federal Register*, Vol. 85, No. 179, September 15, 2020b.

²¹ The 14 technologies are AI and machine learning technology; quantum information and sensing technology; additive manufacturing (3D printing); advanced computing technology; position, navigation, and timing technology; data analytics technology; brain-computer interfaces; advanced materials; biotechnology; microprocessor technology; logistics technology; robotics; advanced surveillance technologies; and hypersonics. Barkin, 2020.

²² Burke et al., 2020.

²³ BIS, “Implementation of the February 2020 Australia Group Intersessional Decisions: Addition of Certain Rigid-Walled, Single-Use Cultivation Chambers and Precursor Chemicals to the Commerce Control List,” *Federal Register*, Vol. 85, No. 117, June 17, 2020a; BIS, “Implementation of Certain New Controls on Emerging Technologies Agreed at Wassenaar Arrangement 2019 Plenary,” *Federal Register*, Vol. 85, No. 193, October 5, 2020c.

²⁴ BIS, “Identification and Review of Controls of Certain Foundational Technologies,” *Federal Register*, Vol. 85, No. 167, August 27, 2020b.

²⁵ Judith Lee, Chris Timura, R. L. Pratt, Samantha Sewall, Laura Cole, and Josh Suo Zhang, *U.S. Moves to Tighten Export Controls on China and Other Jurisdictions with Policies of Civil-Military Fusion*, New York: Gibson Dunn, May 4, 2020.

Major Adjustments or Changes in Business Activities

Here we look at changes in U.S. manufacturing activities across five main business functions: operations, sales and marketing, finance, R&D, and employment and human resources, as well as changes since the onset of COVID-19.

Operations

U.S. imports of manufactured goods from China declined from \$540 billion in 2018 to \$452 billion in 2019, and U.S. goods exports to China—and globally—declined.²⁶ It is difficult to assess how many of those declines were attributable directly to trade actions. However, the decrease in imports from China was accompanied by an increase in imports (\$31 billion) from Asian low-cost countries other than China and increase in imports (\$13 billion) from Mexico.²⁷ These statistics suggest that while U.S. policies may have reduced imports from China, it is not clear that U.S. manufacturing sector performance improved, particularly as regard its exports.

U.S. manufacturing firms operating in China are considering a range of responses to the tariffs and increasing U.S.-China trade tensions, including moving manufacturing and supply chains out of both China and the United States. According to the American Chamber of Commerce's survey of China members in 2019, 6 percent of technology and other R&D-intensive industries are considering relocating some or all of manufacturing out of China. Similarly, 7 percent of these firms are considering relocating some or all manufacturing out of the United States. Eighteen percent of firms intend to adjust their supply chains by sourcing components and assembly outside China, and 20 percent seek to source components and assembly outside the United States. For resources and industrial firms, 15 percent of firms seek to relocate some or all manufacturing out of China, and 5 percent seek to relocate some or all manufacturing out of the United States.²⁸ Thirty-two percent of these firms are adjusting supply chains to countries other than China, and the same percentage of firms are also adjusting their supply chains to countries other than the United States.²⁹ These figures, backed by examples provided by manufacturing groups, suggest that U.S. policies and PRC retaliation have complicated and increased the costs of operations for U.S. firms with activities in China and the United States.³⁰

Compared to U.S. firms in other sectors, U.S. manufacturing firms are most concerned with relocating manufacturing and adjusting supply chains. This does not mean, however, that U.S. manufacturers are keen on exiting China. Survey results show the opposite: U.S. manufacturing firms are the least likely to exit China (only 1 percent to 2 percent have considered exiting China) compared with other types of U.S. firms (2 percent to 5 percent).³¹

²⁶ U.S. goods imports from China had increased between 2017 and 2018 before dropping in 2019. U.S. goods exports to China declined from \$132 billion in 2017 to \$108 billion in 2019. Global U.S. goods exports increased from 2017 (\$1,557 billion), but decreased from \$1,666 billion in 2018 to \$1,643 billion in 2019. The U.S. manufactured goods trade deficit with China also declined. See BLS, "U.S. International Trade in Goods and Services, June 2020," webpage, August 5, 2020b.

²⁷ Vietnam accounted for 46 percent of the increase in U.S. imports from other Asian countries. Some of this increase is likely caused by PRC transshipment to Vietnam to dodge U.S. tariffs. See Van den Bossche, Levering, et al., undated b.

²⁸ Resources and industrial firms include those engaged in agribusiness; automotive and transportation vehicle manufacturing; machinery, equipment, systems, and controls manufacturing; oil, gas, and energy; and other industrial endeavors, such as chemical manufacturing, mining, paper production, and packaging. American Chamber of Commerce in China, 2020, p. 16.

²⁹ American Chamber of Commerce in China, 2020, p. 79.

³⁰ Linda Dempsey, "Re: USTR-2019-0004; Request for Comments Concerning Proposed Modification of Action Pursuant to Section 301: China's Actions, Policies, and Practices Related to Technology Transfer, Intellectual Property and Innovation," correspondence from National Association of Manufacturers to Robert Lighthizer, June 12, 2019, p. 6; American Chemistry Council, "Firsthand Accounts of the Impact of China Section 301 Tariffs on U.S. Chemical Manufacturers," webpage, September 25, 2018.

³¹ American Chamber of Commerce in China, 2020, p. 79.

This reluctance to exit China is likely driven by a number of factors. First, China has a positive manufacturing environment with low cost; skilled labor; and relatively lax labor, health and safety, and environmental regulations. As one business executive noted, many manufacturing production processes have a layer of activities in China to take advantage of these conditions, and this is particularly the case for operations that are capital-intensive or less environmentally friendly (e.g., lithium-ion battery production).³²

Second, China is a large market with growth opportunities and a number of U.S. companies are located in China to serve Chinese customers. The working population in China is larger than that of Europe and the United States combined, and as incomes in China rise, the Chinese consumer market is one in which U.S. companies will want to have a stake.³³ The size of the Chinese market has caused some to believe that China could be a “self-sustaining growth story” and that companies could survive by selling only to the Chinese market.³⁴

Third, U.S. companies face difficulty (in both time and cost) finding new suppliers from other countries. According to the Association of Home Appliance Manufacturers, for example, manufacturers may require up to three years to qualify new suppliers from other countries due to the need to consider a range of factors including “tooling, sourcing of raw materials, testing, capacity, quality, regulatory compliance, social compliance, safety approvals, engineering time and investment, existing inventory at the current supplier, and lead time.” Shifting sourcing countries for widely used home appliance parts primarily only produced in China—such as toasters, coffeemakers, and teamakers—“would take over five years resulting in product shortages and/or noticeable price increases.”³⁵

Sales and Marketing

Across the sector, there are reports that U.S. and PRC actions have caused firms to increase the price of their products, which has resulted in lost sales and market shares. Many manufacturers report that tariffs levied on imported products are from wholly owned U.S. operations, in which there is no Chinese partner or unfair PRC practice involved that would result in technology transfer, increasing the costs to U.S. firms.³⁶ Many companies have had no choice but to pass the costs on to customers. Section 201 tariffs on solar cells and residential washers, for example, caused manufacturers to increase the cost of U.S. washing machines by 12 percent after the tariff was implemented.³⁷

The roller-coaster U.S. steel producers experienced demonstrates an interesting case of multiple U.S. and PRC actions contributing to a short-term boost (an increase in sales and profits) complicated by longer-term declines in prices and production. In the immediate months after the passing of Section 232 tariffs, U.S. steel producers increased steel prices over 20 percent, generating significant criticism from and costs for downstream U.S. manufacturing companies.³⁸ Protectionism and increased profits encouraged U.S. steel producers to boost domestic capacity, including restarting furnaces. These activities occurred as the global economy cooled (due to a range of factors), the United States imposed Section 301 tariffs and China retaliated, and

³² Telephone interview with financial sector executive, November 5, 2020 (name withheld on request).

³³ Goldman Sachs, “The Rise of China’s New Consumer Class,” webpage, undated b.

³⁴ Telephone interview with financial sector executive, November 5, 2020 (name withheld on request).

³⁵ Jennifer Cleary, “Re: AHAM Comments on Docket No. USTR-2019-004, United States Trade Representative Request for Comments Concerning Proposed Modification of Action Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation,” correspondence from Association of Home Appliance Manufacturers to Robert Lighthizer, June 17, 2019.

³⁶ L. Dempsey, 2019, p. 3.

³⁷ Williams et al., 2019, p. 24.

³⁸ Mark J. Perry, “Backfire Economics: Double-Digit Increases in U.S. Steel Prices to the Highest in the World Are Crippling Manufacturers,” American Enterprise Institute, October 24, 2018.

demand for steel products fell. By mid- to late 2019, U.S. steel prices fell, and some leading U.S. steel companies began losing significant market value and had to idle production capacity.³⁹

In contrast to steel producers, the U.S. automotive industry likely suffered the most harm from U.S. and PRC actions. Auto producers faced higher input costs for steel, U.S. tariffs on \$20 billion worth of auto parts imported from China annually, and retaliatory PRC tariffs on \$13 billion worth of assembled motor vehicle exports to China annually.⁴⁰ The auto industry was also threatened with the potential that the United States could impose additional Section 232 tariffs on automobiles and auto parts (which appears to have been shelved by the Trump administration). Modeling various potential future scenarios, the Center for Automotive Research found sizable declines in annual auto sales, price increases, decreases in total car dealership revenue, and declines in total U.S. employment.⁴¹

With respect to operations in China in 2018, a sizable portion of U.S. firms had to increase the sale price of their products (30 percent) and experienced a decrease in demand for products (29 percent), increased costs of manufactured products (33 percent), loss of business to competitors (21 percent), and reduced profits (39 percent) and revenues (26 percent). Surveys suggest that more U.S. firms experienced these negative business effects in 2018 than in 2019.⁴²

This does not mean, however, that all U.S. manufacturing firms suffered sales and market losses during this period. Some firms did not experience as great a degree of negative business consequences because the goods they produce or the immediate products required for production of their goods were not targeted by the tariffs that the United States or China imposed on each other. Some of these firms saw increases in sales and market shares as they took advantage of the growing Chinese consumer market. Athletic goods manufacturer Nike, for example, was largely unaffected by U.S.-China trade tensions and saw large sales gains in China in 2018 and 2019.⁴³

Finance

Compared to a high in 2016, overall Chinese investment in the U.S. manufacturing sector was lower annually from 2017 to 2019. Figure 6.2 shows PRC investment in five different subsectors. Across all subsectors, PRC investment dipped in 2017 before increasing in 2018 and 2019, with growth concentrated in two subsectors: consumer products and services and machinery.

A number of factors explain the fluctuation and relatively lower PRC investment in recent years.⁴⁴ Among these, it is possible that heightened U.S. security concerns, increased U.S. scrutiny under CFIUS, and bilateral

³⁹ Matthew Townsend and Joe Deaux, “The Trump Tariff Twist That Has Cost U.S. Steel \$5.6 Billion,” Bloomberg, July 7, 2019.

⁴⁰ Williams et al., 2019, p. 24.

⁴¹ The study examined the combined effects of Section 301 tariffs, Section 232 steel and aluminum tariffs, an implemented United States–Mexico–Canada Agreement (USMCA), and different potential Section 232 tariffs on autos and auto parts. Across the ten different scenarios, the Center for Automotive Research estimated that the U.S. auto industry could have lost 183,000 to 1.3 million sales of automobiles per year, and each vehicle sold in the United States could have cost between \$350 and \$2,750 more depending on how the auto tariff was implemented. U.S. car dealerships were likely to experience a decline in revenue totaling between \$6.1 billion and \$43.6 billion and total economy-wide employment losses of between 71,200 and 366,900 employees. For each scenario, the study detailed how each different, individual U.S. policy contributed to the estimated changes. See Michael Schultz, Kristin Diczek, Yen Chen, and Bernard Swiecki, *U.S. Consumer & Economic Impacts of U.S. Automotive Trade Policies*, Ann Arbor, Mich.: Center for Automotive Research, February 2019.

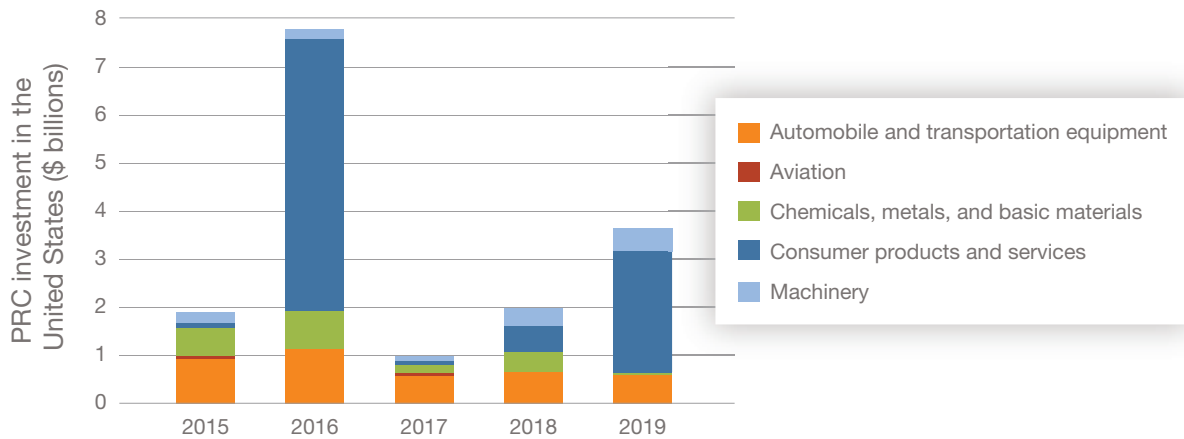
⁴² The survey is of all U.S. firms, not just manufacturing firms. See American Chamber of Commerce in China, 2020, p. 77.

⁴³ John Butters, “Are S&P Companies Citing a Negative Impact from China on Q4 Earnings Calls?” FactSet, January 14, 2019; Kimberly Chin and Khadeeja Safdar, “Strong Sales in China Lift Nike Results,” *Wall Street Journal*, September 24, 2019.

⁴⁴ Some of this decline in PRC investment in recent years is due to factors not related to U.S.-China trade or bilateral economic tensions. China began tightening regulations on outbound direct investments in 2017, limiting the ability of PRC firms to invest abroad. This was primarily driven by internal PRC concerns to reduce leverage in its financial markets and was not a

FIGURE 6.2

PRC Investment in the U.S. Manufacturing Sector, 2015–2019



SOURCE: Rhodium Group and National Committee on U.S.-China Relations, “The U.S.-China Investment Hub,” webpage, undated.

NOTE: Figures are current-year dollar amounts.

tensions may have discouraged or limited some PRC investments in the sector due to concerns about uncertainty associated with return on investment or increased costs of investment activity. In 2019, for example, China’s sovereign wealth fund announced that it would have to be more cautious in making further investments in the U.S. manufacturing sector due to the trade war.⁴⁵ The same year, Wanhua Chemicals halted a \$1.25 billion plant project in Louisiana that could have employed 1,800 people reportedly due to increased construction costs from the desire to use imported PRC materials subject to tariffs.⁴⁶ PRC firms may have also been discouraged (or limited) from investing in specific sectors such as aviation and machinery where U.S. technology or products could have military application.⁴⁷

U.S. company filings to CFIUS with respect to PRC mergers, acquisitions, or takeovers since 2017 experienced approximately a 50 percent fall within the manufacturing and technology sectors, followed by the financial sector, with a fall of approximately 35 percent.⁴⁸ Figure 6.3 depicts the total number of notices that U.S. companies filed that involved transactions with Chinese investors, as well as the proportion of PRC transactions out of the total number of notices filed to CFIUS (from all foreign investors) that calendar year. In 2016, for example, CFIUS received 54 notices from U.S. companies of PRC transactions, accounting for a

retaliatory move. PRC investment in the United States is dominated by large mergers and acquisitions that contribute to more volatility across years; the large volume of PRC investment in consumer products in 2016, for example, was largely driven by Chinese firm Haier’s acquisition of GE Appliances for \$5.6 billion. See “China Codifies Crackdown on ‘Irrational’ Outbound Investment,” Bloomberg, August 18, 2017; Rhodium Group and National Committee on U.S.-China Relations, undated; Thilo Hanemann, Daniel H. Rosen, Cassie Gao, and Adam Lysenko, *Two-Way Street: 2019 Update; U.S.-China Investment Trends*, New York: Rhodium Group and National Committee on U.S.-China Relations, May 2019; and Thilo Hanemann, Daniel H. Rosen, Cassie Gao, and Adam Lysenko, *Two-Way Street: 2020 Update; U.S.-China Investment Trends*, New York: Rhodium Group and National Committee on U.S.-China Relations, May 2020.

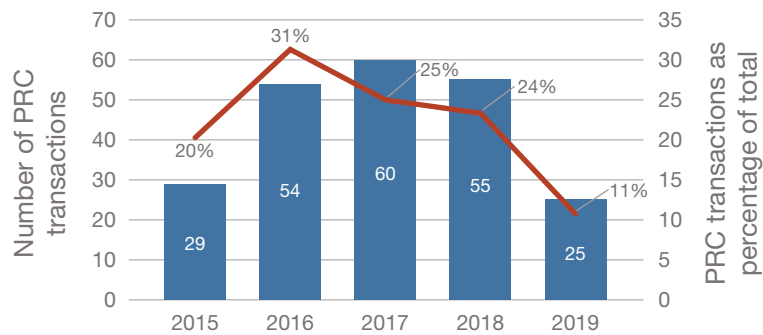
⁴⁵ China Investment Corporation had formed a joint venture (JV) with Goldman Sachs and raised \$3 billion of an intended \$5 billion to invest in U.S. manufacturing and infrastructure projects. See Lingling Wei, “Goldman, China’s Sovereign-Wealth Fund Begin Investing in U.S. Manufacturing,” *Wall Street Journal*, September 20, 2019.

⁴⁶ Billy Huang, “Chinese Investment Is Saving American Factories and Manufacturing Despite the Trade War, Even Though Trump Won’t Admit It,” *South China Morning Post*, January 23, 2020.

⁴⁷ Rhodium Group and National Committee on U.S.-China Relations, undated.

⁴⁸ CFIUS, 2019; CFIUS, 2020.

FIGURE 6.3
CFIUS-Covered Transactions Involving Chinese Investors, 2015–2019



SOURCES: CFIUS, *Annual Report to Congress, CY 2016 and CY 2017*, Washington, D.C.: U.S. Department of the Treasury, November 2019; CFIUS, *Annual Report to Congress, CY 2019*, Washington, D.C.: U.S. Department of the Treasury, July 2020b.

total of 31 percent of all CFIUS notices. Chinese investors accounted for the most notices filed with CFIUS from 2015 to 2018. In 2019, however, Japanese investors surpassed China in filing the most CFIUS notices (a total of 46), and Chinese investors accounted for only 11 percent of all notices.

Aside from China investing in the U.S. manufacturing sector, survey results in 2020 show that a quarter or more of U.S. manufacturing firms with operations in China have delayed or canceled investment decisions: 32 percent of technology and R&D intensive firms and 24 percent of resources and industrial firms. This is more than the portion of firms in the consumer or service sectors (22–25 percent) that have delayed or canceled select investments. At the same time, a small number (8 percent) of U.S. manufacturing firms are continuing to increase investments. This number is again higher than the proportion of firms from other sectors (3–6 percent) increasing investments.⁴⁹

Research and Development

U.S. companies continue to conduct the majority of their R&D within the United States (domestic R&D totaled \$323 billion in 2018, or 85 percent of global U.S. multinational enterprise R&D expenditure), and manufacturing companies make up a significant portion (44 percent) of total U.S. R&D expenditure.⁵⁰ China was the sixth largest foreign destination for U.S. multinational enterprise R&D expenditure (\$3.8 billion in 2018), falling behind India and Canada.⁵¹ The manufacturing sector accounted for \$1.4 billion worth of U.S. R&D expenditure in China in 2018 (36 percent of total U.S. R&D expenditure in China), with the most expenditure on chemicals and transportation equipment.⁵²

While R&D spending by the U.S. manufacturing sector generally increased from 2010 to 2018, there was a clear drop in spending in 2019 compared with 2018 across the sector as a whole and in each of the four sub-

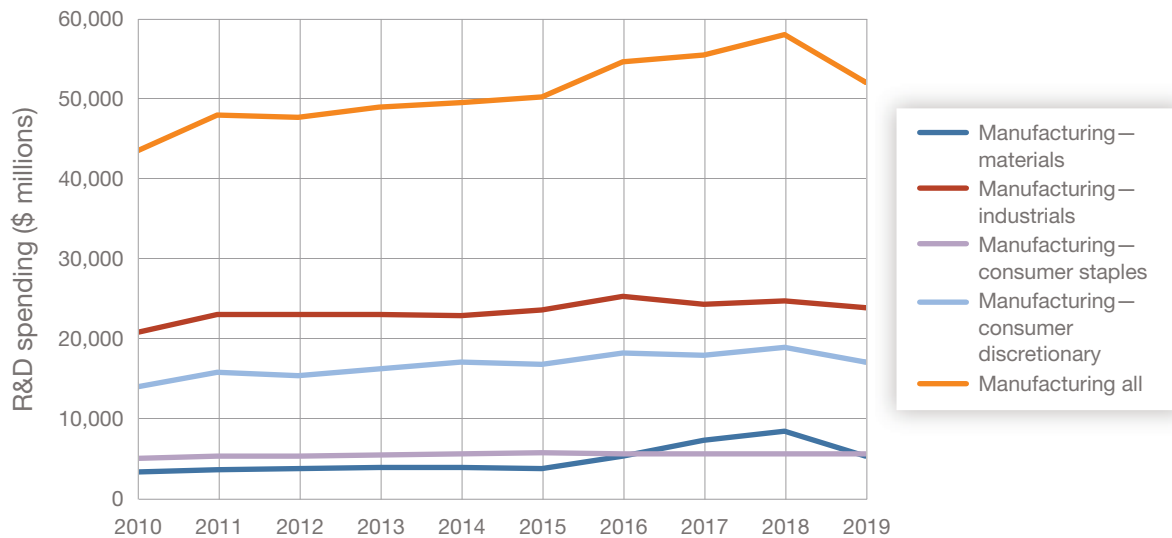
⁴⁹ American Chamber of Commerce in China, 2020, p. 79.

⁵⁰ These figures exclude computer and electronic products, and are calculated as R&D performed by manufacturing sector U.S. parent plus R&D performed by manufacturing sector majority-owned foreign affiliates divided by R&D performed by all U.S. parents plus R&D performed by all majority-owned foreign affiliates. See BEA, “Activities of U.S. Multinational Enterprises, 2018,” webpage, August 2020d.

⁵¹ Kaj Malden and Ann Listerud, *Trends in U.S. Multinational Enterprise Activity in China, 2000–2017*, Washington, D.C.: U.S.-China Economic and Security Review Commission, July 1, 2020.

⁵² BEA, “Worldwide Activities of U.S. Multinational Enterprises: Preliminary 2018 Statistics,” webpage, last modified August 20, 2020e.

FIGURE 6.4
Research and Development Expense for Manufacturing Sector, 2010–2019



SOURCE: Compustat Database.

NOTE: Figures are current-year dollar amounts.

sectors (see Figure 6.4). These overall statistics correspond with anecdotal evidence that a number of companies may have delayed or limited R&D expenditures as their sales decreased or operational costs increased due to more expensive or difficult to obtain materials or parts.⁵³

Employment and Human Resources

Employment grew significantly from January 2017 to February 2019, when the sector began to see some months with job losses and other months with job increases before a drop in employment from February 2020 onward due to COVID-19.⁵⁴ It is likely that the growth in manufacturing employment from 2017 to early 2019 was due to the positive effects of U.S. corporate tax cuts, as well as regulatory reform,⁵⁵ and since the Section 301 tariffs were not implemented until mid-2018, it may have taken months for U.S. and PRC trade actions to have an effect on employment.⁵⁶

There is abundant anecdotal evidence across the sector that suggests that the tariffs—particularly the more extensive Section 301 tariffs—have caused firms to delay or reduce hiring in the United States (particularly for those firms shifting production out of the country) and scale back on wage increases or other benefits for U.S. employees. Economists estimate that, looking at the sector as a whole, the small positive effect on U.S. employment from tariff import protection on U.S. producers is more than offset by the larger negative

⁵³ We examined 2018 and 2019 company annual reports, including 10K Securities and Exchange Commission (SEC) filings, from 12 U.S. companies representing different segments of the manufacturing sector: 3M, A. O. Smith, Avery and Dennison, Boeing, Caterpillar, Dow, Dupont de Nemours, Ford, General Electric, General Motors, Johnson & Johnson, and United Technologies / Raytheon. A number of annual reports that mention decrease in R&D also mention lower sales in China, decreases in revenue from China operations, and increased costs of raw materials and parts.

⁵⁴ BLS, 2021c.

⁵⁵ Thomas Franck, “Job Gains for the Manufacturing Industry in the Last 12 Months Are the Most Since 1995,” CNBC, August 3, 2018.

⁵⁶ Thomas Franck, “It’s Official. Manufacturing Is Getting Crushed,” CNBC, October 4, 2019.

effects of rising input costs and retaliatory tariffs.⁵⁷ According to the National Association of Manufacturers, “for many companies, these types of cost-cutting efforts negate other benefits they may have expected from administration-led policy changes such as domestic tax reform.”⁵⁸

There is some evidence that these trade policies may also have negatively affected U.S. manufacturing firms’ operations in China; a small proportion of U.S. firms (all types, not just manufacturing-specific firms) in China have reported reductions in staff in 2018 and 2019 as a result of the bilateral tariffs.⁵⁹ U.S. multinational manufacturing enterprises employed approximately 527,100 employees in China in 2018, lower than the 562,700 employees employed in China in 2017.⁶⁰

Changes Since the Onset of COVID-19

For U.S. manufacturers, COVID-19 has exacerbated many of the costs discussed above, and it is likely that the pandemic swamped any effects of China-specific trade and investment policies. By April 2020, surveys of North American manufacturing firms showed that 41 percent of firms experienced a decrease in demand for their products; industries experienced at least a 38 percent drop in international demand for products or services; over half of all firms experienced shutdown of essential business, affecting more than 70 percent of firms in the transportation, chemical, engineering, automotive, and construction sectors; and 28 percent of firms had layoffs as a result of COVID-19, with another 16 percent expecting to lay off workers. More North American companies (64 percent of all manufacturers) were willing to move production back home in April 2020 than in February or March 2020.⁶¹ The pandemic also may have added incentives for some firms to shift some production out of China to build greater resilience in their supply chains, establishing a greater number of sources for inputs so as to decrease reliance on any one source—especially China.⁶²

Responses to Shape U.S. Policies or PRC Responses

While there has been relatively less public opposition to Section 201 tariffs, U.S. manufacturing companies and representatives have taken clear public positions for or against Section 232 and Section 301 tariffs. Not surprisingly, steel and aluminum producers have strongly supported and defended the need for Section 232 steel and aluminum tariffs. Downstream manufacturing companies, including users of steel and aluminum products, have pointed out that the tariffs benefit a small number of producers at the cost of a larger number of manufacturing companies. Ford Motor Company executives, for example, criticized the U.S. government for its steel tariffs, arguing that the tariffs have made steel more expensive in the United States than in any other market.⁶³

In contrast, there has been very little support for Section 301 tariffs. Most companies agreed with the Trump administration’s desire to combat unfair Chinese trade practices but did not believe that tariffs were the best or main way to do so. The National Association of Manufacturers, for example, urged the U.S. gov-

⁵⁷ Flaaen and Pierce, 2019, p. 20.

⁵⁸ L. Dempsey, 2019, p. 6.

⁵⁹ American Chamber of Commerce in China, 2020, p. 77.

⁶⁰ BEA, *Activities of U.S. Multinational Enterprises, 2017*, Washington, D.C.: U.S. Department of Commerce, August 2019; BEA, 2020.

⁶¹ Thomas Publishing Company, 2020.

⁶² Patrick Van den Bossche, Brandon Blaesser, Yuri Castano, and Kelsey Serraneau, *Global Pandemic Roils 2020 Reshoring Index, Shifting Focus from Reshoring to Right-Shoring*, Chicago: Kearney, undated a.

⁶³ Keith Naughton and Joe Deaux, “Ford Ratchets Up Rebuke of Trump Tariffs as Steel Costs Rise,” Bloomberg, October 22, 2018.

ernment to utilize an approach toward China that incorporates “both carrots and sticks, leverage and direct negotiation, existing trade enforcement tools and new ones crafted to China’s market-distorting behaviors.”⁶⁴ The Motor & Equipment Manufacturers Association recommended that the United States combine more targeted PRC policies with “sustained bilateral negotiations with China that pocket progress as it occurs, as well as multilateral negotiations and pressure in concert with the USMCA, EU, Japan, and other allies.”⁶⁵ The companies that supported Section 301 were those that had products that were excluded from the tariffs. Table 6.2 shows a cross-section of public comments submitted by different manufacturing groups on proposed Section 301 tariffs.

There is less clarity on where the U.S. manufacturing sector as a whole stands with respect to the new CFIUS requirements, as well as increased U.S. export restrictions. Some business groups have argued for clearer and narrower definitions of terms used in proposed regulations to restrict PRC investment,⁶⁶ while others have urged U.S. officials to incorporate exceptions and exemptions in order to promote national secu-

TABLE 6.2
Select Views on Section 301 Tariffs from Manufacturing Sector Groups

Group	Views
National Association of Manufacturers	Opposes: causes direct harm and significant uncertainty for manufacturers; damages trade, investment, jobs, and domestic output; increases customer prices; leads to cost cutting that hampers prospects for future growth; leads to adjusting or relocating U.S. operations; reverses benefits of tax reform, challenges U.S. technology leadership
Motor & Equipment Manufacturers Association	Opposes: imposes significant harm on small- and medium-size businesses; disrupts manufacturing operations; diverts USTR resources from passing and implementing the USMCA and negotiating trade agreements with the EU and Japan; forced domestic production undermines U.S. global competitiveness
Association of Home Appliance Manufacturers	Opposes: disrupts Americans’ daily home lives; increases costs for consumers; diverts resources from R&D; raises costs for home appliance manufacturers; leads to losses in American jobs; products not part of PRC Made in China 2025 industrial initiative; no evidence that tariffs will change PRC acts, policies, and practices related to technology transfer, IP, and/or innovation
Sports and Fitness Industry Association	Opposes: harms U.S. manufacturers (especially small businesses) depending on PRC raw materials; lack of U.S. production capacity; products not available elsewhere; increases cost to customers; causes U.S. job loss; will not stop unreasonable and discriminatory PRC actions
Society of Chemical Manufacturers & Affiliates	Opposes: specialty chemical manufacturers are highly dependent on unique components, and changing would be costly; many chemical inputs not available outside China; tariffs on PRC raw materials and intermediates will make U.S. chemical manufacturing costly, and as a result, help China achieve Made in China 2025 goals
Association for Accessible Medicines	Supports: supports continued exclusion of finished generic pharmaceuticals and active pharmaceutical ingredients from tariffs
Precious Metals Association of North America	Opposes: depends on PRC raw materials that allow U.S. firms to make affordable jewelry; adds additional frictions to operations; risks PRC retaliation; causes U.S. job loss, decreases wages, and revenue

SOURCE: Public Comments Concerning Proposed Modification of Action Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, USTR-2019-0004.

⁶⁴ L. Dempsey 2019, p. 2.

⁶⁵ Ann Wilson, “Re: Request for Public Comment Concerning Proposed Modification Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation [Docket No. USTR-2019-0004],” correspondence from Motor & Equipment Manufacturers Association to Robert Lighthizer, June 17, 2019.

⁶⁶ Kevin M. Dempsey, “Re: Comments on the Proposed Rule Implementing the Foreign Investment Risk Review Modernization Act of 2018,” correspondence from American Iron and Steel Institute to Thomas Feddo, October 17, 2019b.

ity while not burdening or limiting friendly foreign investors.⁶⁷ Experts have pointed out that the new U.S. regulations and export restrictions introduce more compliance burdens on U.S. companies continuing to do business with China, and firms will need to allocate additional labor to ensure compliance and handle the necessary paperwork. It is also very likely that new requirements, including the need for U.S. government approval for licenses or reviews, could delay planned transactions by months, potentially scuttling proposed business deals.⁶⁸ It is possible that some businesses are adopting a wait-and-see mode to determine their appropriate course of action after the U.S. government have finalized the rules.

Overall Effect of Increased U.S.-China Competition on the Sector

While the U.S. manufacturing sector supported the Trump administration’s goal of countering unfair PRC economic practices, it has been generally wary of the specific approach and tools the administration embraced to do so. Most U.S. manufacturing companies with operations in China wanted to continue to manufacture products there or sell to the Chinese market. There was widespread concern within the sector that Section 301 tariffs against China were doing more harm than good.

In general, available evidence suggests that the measures that the Trump administration embraced to compete with China have had an overall negative effect—imposing more costs than benefits—on the U.S. manufacturing sector across the five main business functions: operations, sales and marketing, finance, R&D, and employment and human resources (see Table 6.3).

This does not mean, however, that the U.S. manufacturing sector will not support increased U.S.-China economic competition. The sector is likely to support more tailored, specific policies targeting problematic PRC practices instead of broader-brush actions such as tariffs imposed on a wide range of PRC products. It is likely to support the use of more economic “sticks” against China if such measures are balanced by offering China incentives, or “carrots,” and if such actions are part of coordinated multilateral efforts (in concert with key U.S. allies and partners) to level the playing field against China. The unknown factor in such a policy direction is how well these policies will work overall and in comparison with current policy directions.

TABLE 6.3
Effect of the Trump Administration’s China Policies on the Manufacturing Sector

Business Functions	Effect on Sector
Operations	Negative
Sales and marketing	Negative
Finance	Negative
R&D	Negative
Employment and human resources	Negative
Overall	Negative

⁶⁷ Paul D. Ryan, “Re: Comments on Provisions Pertaining to Certain Investments in the United States by Foreign Persons, 84 Fed. Reg. 50,174, September 14, 2019 (TREAS-DO-2019-0008),” correspondence from the Association of Global Automakers to Thomas Feddo, October 17, 2019.

⁶⁸ Lee et al., 2020.

Views from the Technology Sector

America's IT and communications technology production sector is often considered the most advanced in the world. This sector contributed to 4.9 percent of U.S. real GDP in 2019 and 1.8 percent of total farm U.S. employment.¹ Like the manufacturing sector, it is large and diverse, with only 25.8 percent of firms having more than 500 employees in 2017.²

Technology encompasses a wide variety of phenomena, from genomics to materials. For technology, we focus on two types of groups. The first group comprises software companies that provide internet services, software, and IT services. These companies may operate online databases or interactive services (e.g., search engines and social networking), provide technical assistance (e.g., data analytics and numeric processing), or otherwise design software for personal or business use. These companies tend not to require fixed presences in operating countries or manufacturing hubs. Examples of these companies include Facebook, Google, and Microsoft. The second group comprises hardware companies that manufacture or operate tangible equipment such as telecommunications devices (e.g., routers, phones), semiconductors, and other physical components (e.g., computers, peripherals, and memory storage). Examples of such companies include Apple, Intel, Nvidia, and Qualcomm. Of the 83 technology companies within the S&P 500, we classify 40 of them as software firms and 43 as hardware firms.

The following sections look at how the technology sector views U.S.-China competition.

Background: Operations and Involvement in China

The technology sector is involved in China through two primary means: (1) manufacturing their products and (2) selling their products, which need not be manufactured in China, to Chinese customers.³ In the case of the former, U.S. companies have substantial involvement in producing their products in China. This can be measured using import activity. According to one analysis, the U.S. imports 93 percent of laptops, 73 percent of mobile phones, 52 percent of projectors, 88 percent of video game consoles, 58 percent of microphones, and 51 percent of lithium-ion batteries from China.⁴ The Apple case is particularly well known.

¹ BEA, "GDP by Industry," webpage, last modified January 5, 2022; the tech sector's contribution to GDP was calculated by adding lines 19, 52, and 53; BLS, "Current Employment Statistics—CES (National)," Table 7, "Most Recent Industry-Specific Employment Peak and Trough, and Changes from Peak and Trough to Current Employment, Seasonally Adjusted (in Thousands)," May 21, 2020a; the tech sector's contribution was calculated by summing computer and electronic products; telecommunications; data processing, hosting and related services; and other information services.

² Statista, "Breakdown of Information Technology (IT) Employment Figures in the United States in 2017, by Company Size," webpage, January 2017.

³ It is worth noting that American companies do perform R&D in China. However, as described in later sections, these offices are of minimal importance.

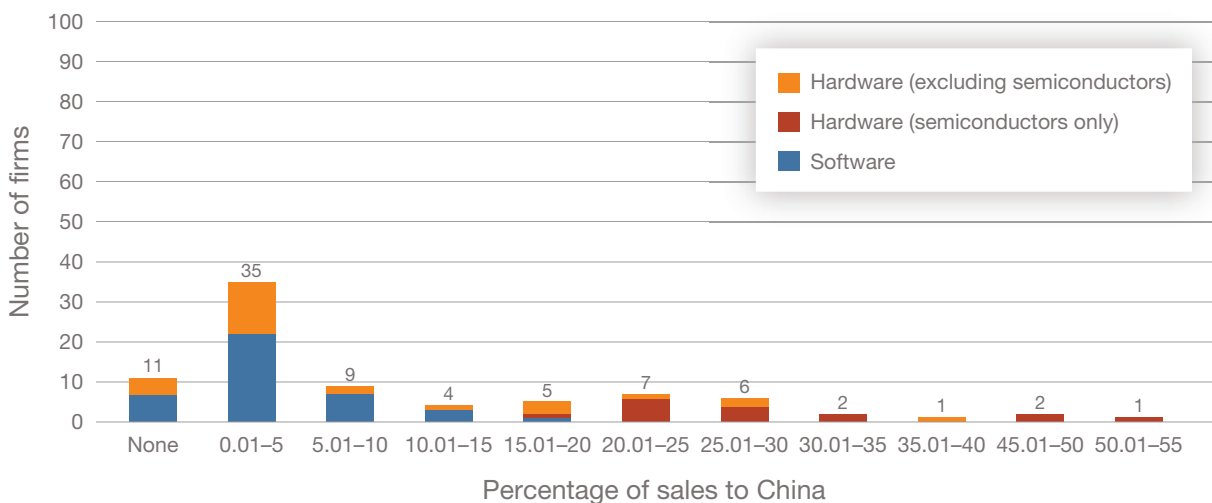
⁴ James Rogers, Andrew Foxall, Matthew Henderson, and Sam Armstrong, *Breaking the China Supply Chain: How the "Five Eyes" Can Decouple from Strategic Dependency*, London: Henry Jackson Society, May 2020, p. 26.

Aside from the hundreds of thousands of contractors that Apple indirectly hires (via Foxconn) to assemble iPhones,⁵ most of Apple's immediate suppliers have manufacturing operations in China.⁶ Many of these suppliers have their own Tier 2 suppliers for their products. Although the suppliers of these Tier 2 companies are difficult to measure, it likely only entangles Apple further into China. This supply chain is fragile. When Chinese factories shuttered to contain the COVID-19 outbreak, Apple ran into supply issues, running low on replacement parts for iPhones.⁷ This situation is likely to complicate any firm's exit from China, for firms cannot readily replace the availability of midlevel-skilled Chinese employees, seasonal workers, and infrastructure that has been built up over decades.

The second primary means of involvement in China is selling to Chinese firms. Across the S&P 500 technology sector, median sales were \$9.9 billion in 2019, of which 4.45 percent was to Chinese clients.⁸ Some firms, however, rely on Chinese sales much more than their other technology counterparts. For the most part, software companies do not substantially rely on Chinese sales, while hardware companies are more dependent on them. For software firms in 2019, the median firm had \$10.2 billion in sales, with 3.3 percent to China. The median hardware firm had \$9.7 billion in sales in 2019, with 15.7 percent to China. The high exposure of the hardware industry to China is driven in large part by the semiconductor industry. The median semiconductor firm had \$6.7 billion in sales in 2019, with 27 percent of those sales being made to China. Of the top 20 technology firms with exposure to China, 15 operate in the semiconductor industry (see Figure 7.1).

Furthermore, as shown in Figure 7.1, engagement with China is skewed, as are overall sales. For example, among all technology firms, even though median sales were \$9.9 billion, the average was \$26.8 billion, with the maximum being \$280.5 billion. And while the median of sales to China was 4.45 percent, the average was 10.7 percent, with the maximum being 55.0 percent. Figures are similarly skewed for total sales in both

FIGURE 7.1
Percentage of Sales to China for S&P 500 Technology Firms, December 2019



SOURCE: Data on each company's Q4 2019 revenue from China from FactSet GeoRev, December 2019.

⁵ Tripp Mickle and Yoko Kubota, "Tim Cook and Apple Bet Everything on China. Then Coronavirus Hit," *Wall Street Journal*, March 3, 2020.

⁶ Apple Inc., *Supplier List*, Cupertino, Calif.: Apple Inc., 2020.

⁷ Mark Gurman, "Apple Warns Stores About a Shortage of Replacement iPhones," *Bloomberg*, March 4, 2020.

⁸ The revenue figures are from Compustat. Figures for percentage of sales exposure to China are from FactSet, 2019.

the software and hardware sectors, although the percentage of sales to China for each is not. For the software sector, while the median percentage of sales to China was 3.3 percent, the mean was 4.2 percent; for the hardware sector, those figures were 15.7 percent and 16.5 percent, respectively.

In general, the U.S. technology sector (including other non-S&P 500 companies) has made substantial investments in China. According to the BEA, in 2019, technology firms invested a total of \$12.6 billion in China: firms specializing in “computer and electronic products” and “information” had \$10.4 billion and \$2.2 billion invested, respectively. In 2019, Chinese investment in the United States in “computer and electronic products” amounted to \$572 million, and investment in “information” totaled \$2.3 billion.⁹

It is worth noting that looking at current sales only measures the present situation and omits any plans that firms may have to expand operations. Some companies, such as PayPal and Visa, have taken such actions as acquiring a local license to operate and acquiring local companies to expand operations in China. To the extent that companies may have substantial plans to expand operations, U.S.-China competition may create tensions between the U.S. government and companies.

Views of Competition with China and China-Related Operations

The technology sector has operated in China for decades. Hardware companies have sought to use the country as a low-cost manufacturing base. These ties have continued with China producing much of the United States’ imported electronics. Furthermore, as China has grown economically, U.S. companies—both hardware and software—also have increasingly tried to access the domestic Chinese market for its large potential. The 83 S&P 500 companies that we classified as being in the technology sector collectively brought in \$18.1 billion in revenue from China in 2019. The sector seeks to use China as a manufacturing hub while being able to sell its products to local consumers.

U.S. firms face a number of obstacles in their China-related operations. Some of these involve difficulties associated with operating in a foreign environment; for example, Amazon was unable to gain a foothold in the Chinese market, attributable to “cutthroat local competitors” and inability to “adapt well to the unique Chinese market.”¹⁰ Other hurdles that U.S. companies mention include cyberespionage against U.S. firms, forced IP transfers, and protectionist policies that prevent U.S. firms from fully competing and favor domestic Chinese companies.¹¹ There is also some concern that U.S. policymakers may impose actions to limit the ability of U.S. firms to sell or work with Chinese firms (e.g., export controls), especially if such action is uncoordinated with allied countries and results in the displacement of U.S. firms by firms in U.S.-allied countries in the Chinese market.¹²

U.S. companies also have concerns about how Chinese firms operate and compete in the Chinese market or abroad. These concerns stem from an unlevel playing field caused by the protection and support the Chinese government provides Chinese firms (e.g., government subsidies). Beijing, for example, provided substantial money to fund Huawei’s R&D.¹³ U.S. companies are also wary of the willingness of some Chinese

⁹ BEA, undated b. The BEA category “information” includes more subcategories than are included in our definition of the technology sector. Unfortunately, more granular figures were not available from the BEA.

¹⁰ Karen Weise, “Amazon Gives Up on Chinese Domestic Shopping Business,” *New York Times*, April 18, 2019.

¹¹ Wayne M. Morrison, *China-U.S. Trade Issues, July 12, 2006–July 30, 2018*, Washington, D.C.: Congressional Research Service, Report RL33536, July 30, 2018.

¹² Telephone interview with industry group representative, July 7, 2020 (name withheld on request).

¹³ At one point, Huawei was widely dismissed as a credible competitor, but over the years it has made aggressive pushes in the 5G space. According to *Tech Crunch* editor-at-large Mike Butcher, Huawei’s R&D is financed in large part by China, allowing

firms to use problematic means (e.g., IP theft) to edge out competition. The U.S. Department of Justice, for example, indicted a state-owned Chinese company for IP theft from Micron Technologies, its competitor.¹⁴ According to an executive at a business group, these tactics, in combination with larger PRC geopolitical efforts such as the BRI, could further disadvantage U.S. companies as they move into China or third countries (including those in Europe), potentially costing revenue streams or threatening business solvency.¹⁵

Major U.S. Policy Actions or PRC Responses That Affected the Sector

All the major U.S. policy actions and PRC responses that affected the manufacturing sector (discussed in Chapter Six) also affected the technology sector. These include the reciprocal tariff actions that culminated in the Phase One deal in January 2020 that required China to bolster IP measures, implement a plan to deal with counterfeit goods, improve the protection of trade secrets, and increase penalties for infringements.¹⁶ The Phase One deal, however, left broader issues unresolved, including reciprocal market access, subsidies for Chinese firms, and cross-border data flows.¹⁷

Along with expanded export restrictions on goods produced with sensitive U.S. technologies and other materials with dual civil-military applications,¹⁸ the DOC proposed a rule that would empower it to regulate certain transactions between firms in the United States and “foreign adversaries” in the name of securing the information and communications technology and services (ICTS) supply chain.¹⁹ These actions have, for example, restricted the ability of Huawei to purchase semiconductors produced using U.S. technology and has tightened exports to China’s largest chipmaker, Semiconductor Manufacturing International Corporation.²⁰

The United States has also taken policy actions to counter what then–Federal Bureau of Investigation director Christopher Wray called a “comprehensive threat to America’s innovation [and] to our economic security.”²¹ Under its China Initiative, launched in 2018, the Department of Justice’s focus ranged from “the investigation and prosecution of trade secret theft and economic espionage, to better countering threats

it to spend nearly \$12 billion on 5G R&D, which is three times that of its competitor Ericsson. Because no Western company has the same level of state backing, this has produced a situation in which few Western companies (and no U.S. companies) make critical 5G products. This Chinese support for Huawei, as Butcher summarizes, is aimed “to destroy competitors like Ericsson, Nokia and Samsung.” See “How China’s Huawei Took the Lead over U.S. Companies in 5G Technology,” *Washington Post*, April 10, 2019; and Mike Butcher [@mikebutcher], “I’m Pretty Sick of the Poor Quality Debate About Whether to Involve Huawei in the Roll-Out of 5G in the UK and Elsewhere. The Simple Fact Is That It Is NOT the Only Provider of 5G Networks—But It Is the Largest and (Surprise!) the CHEAPEST,” Twitter thread, January 27, 2020.

¹⁴ Paul Wiseman and Michael Liedtke, “Here Are 5 Cases Where the U.S. Says Chinese Companies and Workers Stole American Trade Secrets,” *Chicago Tribune*, February 21, 2019.

¹⁵ Telephone interview with industry group representative, July 7, 2020 (name withheld on request).

¹⁶ Economic and Trade Agreement Between the Government of the United States of America and the Government of the People’s Republic of China, January 15, 2020.

¹⁷ David J. Lynch, “Initial U.S.-China Has Major Hole: Beijing’s Massive Business Subsidies,” *Washington Post*, December 31, 2019.

¹⁸ Lee et al., 2020.

¹⁹ DOC, “Securing the Information and Communications Technology and Services Supply Chain,” proposed rule, Regulations.gov, December 23, 2019.

²⁰ DOC, 2020e; “U.S. Tightens Exports to China’s Chipmaker SMIC, Citing Risk of Military Use,” Reuters, September 26, 2020.

²¹ Wray, 2020.

posed by Chinese foreign investment and supply chain vulnerabilities.”²² The department opened more than 2,000 counterintelligence investigations against China as of mid-2020 and criminally prosecuted individuals, whether Chinese nationals or otherwise, for some relation to Chinese programs that engage in alleged IP theft or espionage.²³ These activities against problematic Chinese agents were further augmented by visa restrictions on Chinese citizens, canceling the visas of Chinese graduate students and researchers with ties to the PLA.²⁴ The Trump administration also temporarily suspended all H-1B visa issuance during 2020, an action that affected Chinese nationals and other foreigners.²⁵

Specific to the technology sector, U.S. officials debated increasing scrutiny of or removing Chinese-listed technology firms such as Alibaba from U.S. stock exchanges (and did require the stock exchanges to delist some Chinese state-owned enterprises, or SOEs).²⁶ Trump administration officials also considered proposals to fund a Western competitor to large Chinese technology corporations in critical areas such as 5G.²⁷ These represent a more aggressive position against Chinese actions than had occurred before 2017.

On the Chinese side, Beijing considered retaliatory measures to U.S. actions, including tariffs on technology sector imports from the United States,²⁸ although some of these were rolled back by the Phase One deal and afterward.²⁹ China also considered export restrictions on critical materials (e.g., rare earth minerals that are used in tech products such as phones and semiconductors).³⁰

China took steps to try to decrease technological reliance on the United States or U.S. products. For example, Beijing increased investment and support for its key technologies, including providing \$2.2 billion to the Semiconductor Manufacturing International Corporation.³¹ In the aftermath of the DOC’s ICTS rule, Beijing ordered Chinese telecoms to remove Oracle products from their networks.³² China sought to increase recruitment of technical specialists, such as Chinese nationals who have studied in the United States, by offering tax subsidies, research grants, wage supplements, and office and laboratory space. China also

²² U.S. Department of Justice, Office of Public Affairs, “The China Initiative: Year-in-Review (2019–20),” press release, Washington, D.C., November 16, 2020b.

²³ Wray, 2020; Ellen Barry and Gina Kolata, “China’s Lavish Funds Lured U.S. Scientists. What Did It Get in Return?” *New York Times*, February 6, 2020; U.S. Department of Justice, “Chinese Telecommunications Device Manufacturer and Its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice,” press release, Washington, D.C., January 28, 2020a; Catherine Mataic, “U.S. Attorney Warns of Upcoming ‘Spike’ in Prosecutions Related to China Ties,” *Science*, February 7, 2020.

²⁴ See, e.g., Wong and Barnes, 2020; and AFP, “China Rips into Trump Order Revoking Visas of 1,000 Chinese students,” *The Guardian*, September 10, 2020.

²⁵ Michael D. Shear and Miriam Jordan, “Trump Suspends Visas Allowing Hundreds of Thousands of Foreigners to Work in the U.S.,” *New York Times*, June 22, 2020.

²⁶ Pamuk and Alper, 2020; Tanner Brown, “Congress Could Kick China Listings off U.S. Stock Exchanges, but It Won’t Happen Overnight,” *Market Watch*, May 23, 2020; Chong Koh Ping, “Looming Delisting Jolts Chinese Telecom Stocks,” *Wall Street Journal*, January 4, 2021.

²⁷ “Really? Is the White House Proposing to Buy Ericsson or Nokia?” *New York Times*, February 7, 2020; “Senate Leaders Announce Bipartisan 5G Leadership Act,” Tom Cotton, Senator for Arkansas, press release, Washington, D.C., May 23, 2019.

²⁸ Maggie Fitzgerald, “Here’s a List of American Products Targeted by China’s New Tariffs,” CNBC, August 23, 2019.

²⁹ Finbarr Bermingham and Frank Tang, “China Announces New Raft of US Imports Eligible for Trade War Tariff Waivers amid Rising Superpower Tensions,” *South China Morning Post*, May 12, 2020.

³⁰ “Factbox: How China Tariffs on U.S. Commodities, Energy Stand After Phase 1 Trade Deal,” Reuters, January 15, 2020.

³¹ “China Semiconductor Fab SMIC Gets \$2.2 Bln Investment from Gov’t Funds amid Global Chip Spat,” Reuters, May 18, 2020.

³² Ana Swanson and David McCabe, “Trump Effort to Keep U.S. Tech out of China Alarms American Firms,” *New York Times*, February 16, 2020.

shifted investment in technology firms from those in the United States to those in other advanced, non-U.S. countries.³³

The actions taken by both China and the United States pointed in the direction of technological “decoupling,” under which supply chains and technological R&D would occur independently in each country. Possible implications include products developed in one country being excluded for sale in the other, a divergence in technology standards, and a loss of China-based revenue for U.S. firms based in China. Decoupling is likely to be enormously expensive for both countries, and to date, both sides have been cautious of fully embracing the possibility.

Responses to Increased U.S.-China Competition

This section explores how the U.S. technology sector responded to U.S. and PRC economic actions. We analyze the consequences of U.S. and Chinese policy actions across the hardware and software subsectors separately, as the reactions may vary between them.

Major Adjustments or Changes in Business Activities

We look at changes in U.S. technology sector activities across five main business functions: operations, sales and marketing, finance, R&D, and employment and human resources, as well as changes since the onset of COVID-19.

Operations

The hardware portion of the technology sector showed little inclination to support overall U.S. policy actions toward China during the Trump administration. While the subsector may be broadly sympathetic to the larger goal of fair trade practices and IP rights, it was similar to the manufacturing sector in that there were large concerns about how increased U.S.-China competition would threaten supply chains, increase costs, and reduce market access to the large Chinese domestic market.³⁴

Reluctance to support U.S. policy has manifested from those concerns. For example, when the Trump administration proposed placing tariffs on electronic goods, hardware firms such as Apple and HP replied that such tariffs would harm their business by making their products less affordable for American consumers. Although the tariffs incentivized supply chain relocation, they noted that this could not be easily achieved in the short term. Supply chain relocation would decrease their revenue by making their products more expensive for consumers, largely benefiting non-U.S. competitors, which do not tend to have large U.S. market share and consequently would not see their costs increase because of the tariffs. If firms had to pay for supply chain relocation, this would reduce the funding available to maintain R&D and America’s lead in innovation.³⁵

But even if the supply chain were to be reconfigured, technology firms may not be able to completely remove Chinese production. In exchange for market access in China, which firms highly desire, the Chinese

³³ Yuan Yang, “U.S. Tech Backlash Forces China to Be More Self-Sufficient,” *Financial Times*, January 15, 2020.

³⁴ Devi Keller (on behalf of SIA), comment to proposed rule (USTR-2019-0004-1743), June 16, 2019, p. 1; Mike Russo (on behalf of SEMI), comment to proposed rule (USTR-2019-0004-0124), May 29, 2019, p. 1.

³⁵ Regulations.gov, “Comment from Anonymous, Apple Inc.,” comment ID USTR-2019-0004-2547, initially posted on June 20, 2019b; Regulations.gov, “Comment from Jon Dickinson, HP Inc.,” comment ID USTR-2019-0004-2520, initially posted on June 19, 2019e.

authorities often require at least some domestic production.³⁶ In addition, as one executive with experience in venture capital pointed out, “low labor costs in China are no longer an attraction. What they offer is scale leverage [that] is very hard to replicate elsewhere. [China] became much better at producing higher-end stuff.” As HP pointed out, companies often single-source or mostly source from China:

Currently, China is the single source for HP laptop production; any changes in sourcing aimed to mitigate tariff impacts would be costly.

China has the most mature ecosystem for laptop manufacturing in the world. This ecosystem has evolved over decades through the steady investment of U.S., Japanese, and Taiwanese companies across the supply chain. China is currently the source of over 90% of laptop and tablet units imported to [sic] the U.S. China’s volume of supply is 42 times greater than the next largest supplier—Taiwan.

Therefore, shifting that large a volume of supply to other countries would be difficult and take time. [] In order for HP to mitigate tariffs on laptops, we would have to invest [] to build new facilities and supply chain lines. []. Finally, even with adjustments to our supply chain, not all tariff impacts could be mitigated, as certain critical components can be made only in China, such as [].³⁷

On the software side, the production of software does not generally require Chinese involvement. Software companies, however, may have R&D facilities on the mainland, but in our interviews, many executives reported that these facilities tended to not be of principal importance and may work on matters such as adapting existing products for the Chinese market.³⁸ Consequently, the concerns about supply chains do not apply here and the operations of software companies were less affected.

Sales and Marketing

Hardware firms were wary of tensions that would suppress profits that could be used to fund research and maintain or bolster the competitiveness of their products (or be paid out to owners). In the case of the tariffs on Chinese imports, the semiconductor industry expressed concerns about increased costs, due in large part to the structure of the semiconductor supply chain. According to the Semiconductor Industry Association (SIA), a typical semiconductor is constructed in seven stages.³⁹ Most of the manufacturing is done in Japan, Malaysia, Singapore, or the United States, with final assembly of the chip done in China. Although SIA asserts that the final assembly in China is a cost-effective step, it is relatively low in value added.

Consequently, the hardware industry feared that any increased China-U.S. competition may threaten this final assembly, raising prices while not necessary protecting their IP. This is evident in their public comments in the USTR’s proposal to raise tariffs on semiconductor products. The industry noted that as a result of the tariffs, vendors would have to raise prices, reducing demand for products and cutting profit margins; this would result in a smaller American IT market by \$70 billion over 2019–2020 and “costs to the U.S. economy and IT sector in the form of cutbacks in IT spending, job losses and weaker wage growth as companies face slowing profitability and revenue.” It feared that this would be followed by knock-on effects such as reduced

³⁶ This may violate WTO rules. See U.S. International Trade Administration, “Trade Guide: WTO Agreement on Trade-Related Investment Measures,” webpage, undated b.

³⁷ Regulations.gov, 2019e, p. 4; the square brackets represent business-confidential information that was redacted from the public USTR filings.

³⁸ Telephone interview with industry group representative, July 7, 2020 (name withheld on request).

³⁹ Nathan Associates, *Beyond Borders: The Global Semiconductor Value Chain*, Washington, D.C.: Semiconductor Industry Association, May 2016, p. 10.

investment in new technologies and that increased prices would reduce their competitive ability relative to Chinese firms.⁴⁰

For software firms, the response to increased U.S.-China competition has been relatively muted because this subsector differs from the hardware subsector. Most of this subsector is not as exposed to China economically. According to FactSet, of the top 23 firms with the highest percentage of revenue in China, only one is a software company and it is a financial technology (fintech) company: Mastercard. The prospects for many software firms are not particularly good; in fact, many have tried and failed to enter the Chinese market. Companies such as Amazon, Facebook, and Google have tried to operate in the Chinese market but left, finding the operational burdens (such as those related to censorship) too large or finding themselves unable to make significant headway into the economy.⁴¹ Others, such as Microsoft, have refused to offer services such as email to Chinese customers on human rights principles.⁴² Meanwhile, China has promoted its own national champions in the form of Alibaba, Baidu, and Renren, raising the barrier to entry for any would-be U.S. firms. Consequently, most of these firms have little revenue at stake in China.

It is important to point out that U.S. fintech companies have a more optimistic view of prospects in China compared with more traditional software firms. Similar to financial firms that view the China market as a potential growth opportunity (for more detailed discussion, see Chapter Eight), fintech firms benefited from more access in China during the Trump administration. For example, in September 2019 PayPal became the first foreign payment platform licensed for services in China, ending a monopoly by the state-owned Union-Pay.⁴³ Similarly, as of mid-2020, Mastercard and Visa, the world's largest payment companies, were closer to getting approvals to operate in mainland China.⁴⁴

U.S. fintech companies, however, obtained market access after Chinese companies were well-established, inviting questions as to how much they can benefit from such increased access. For example, while market barriers initially prevented U.S. e-commerce companies from competing in this emerging sector in 2013, by the time they were lowered in 2015, "major Chinese e-commerce companies [e.g., state-owned UnionPay] had established highly integrated platforms and payment systems linked to local social media giants and gained the loyalty of the Chinese customer base, making it nearly impossible for foreign companies to get a share of the market."⁴⁵ In the case of traditional payment processing credit card companies like Mastercard and Visa, the Chinese government allowed them to operate in China only after domestic mobile payment companies had occupied the lion's share of the payments market and had nothing to fear from foreign competitors.⁴⁶ Since 2013, PRC e-commerce companies such as Ant Financial, Alibaba, and Tencent have

⁴⁰ Regulations.gov, "Comment from Devi Keller, Semiconductor Industry Association," comment ID USTR-2019-0004-17430, initially posted on June 17, 2019d.

⁴¹ Shannon Liao, "Amazon Admits Defeat Against Chinese E-Commerce Rivals like Alibaba and JD.com," *The Verge*, April 18, 2019; Paige Leskin, "Here Are All the Major U.S. Tech Companies Blocked Behind China's 'Great Firewall,'" *Business Insider*, October 10, 2019.

⁴² Gregory Scruggs, "Microsoft President Talks 'Tech Cold War' with China, Which Accounts for 2% of the Company's Revenue," *Geek Wire*, January 15, 2020.

⁴³ Evelyn Cheng, "Amid Trade War, China Moves to Remove Limits on Foreign Ownership in the Financial Industry," *CNBC*, October 14, 2019.

⁴⁴ Nicholas R. Lardy and Tianlei Huang, "Despite the Rhetoric, US-China Financial Decoupling Is Not Happening," *Peterson Institute for International Economics*, July 2, 2020. See also "Visa, Mastercard, AmEx Win Easier Access to China Market," *Bloomberg*, January 15, 2020.

⁴⁵ U.S.-China Economic and Security Review Commission, *2019 Report to Congress of the U.S.-China Economic and Security Review Commission*, Washington, D.C.: U.S.-China Economic and Security Review Commission, November 2019, p. 189.

⁴⁶ Martin Chorzempa, "Did the US-China Phase One Deal Deliver a Win for US Financial Services?" *Peterson Institute for International Economics*, January 27, 2020; Cheng, 2019.

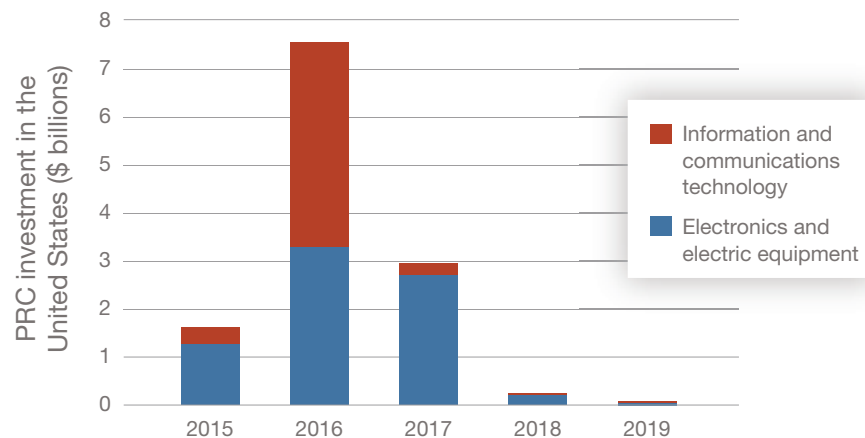
engaged in direct competition with fintech startups in the technology sector by offering new investment and borrowing opportunities for consumers, including payment platforms, peer-to-peer lending platforms, and money market funds.⁴⁷

Finance

PRC investment in the U.S. hardware and software subsectors declined during the Trump administration. Figure 7.2 shows PRC investment in electronics and electric equipment (hardware) and information and communications technology (software, with some hardware).⁴⁸ This was driven in large part by more aggressive moves on the part of U.S. policymakers under an empowered CFIUS regime. Well-known Chinese transactions that were blocked or halted include Kunlun Tech’s \$245 million acquisition of dating app Grindr and Broadcom’s \$117 billion deal for Qualcomm.⁴⁹

Instead of investing in the United States, Chinese investors increased their deal volume in Europe. Chinese investors, however, were described as being interested in U.S. firms but wary of attracting the scrutiny of the U.S. government. As Li Juzhen, an investment manager at Beijing-based GSR United Capital put it, “The preference for European tech firms and decline in [Chinese tech investments in] the US does not mean Chinese investors are losing interest in the US market. It is more because of the uncertainty considering current US-China relations, but it could be temporary.”⁵⁰

FIGURE 7.2
PRC Investment in the U.S. Technology Sector, 2015–2019



SOURCE: Rhodium Group and National Committee on U.S.-China Relations, undated.

NOTE: Figures are current-year dollar amounts.

⁴⁷ Virgilio Bisio, *China’s Banking Sector Risks and Implications for the United States*, Washington, D.C.: U.S.-China Economic and Security Review Commission, May 27, 2020, p. 17; Owen Walker, “BlackRock Co-Founder Warns on Complacency over Chinese Tech,” *Financial Times*, April 15, 2018.

⁴⁸ Along with the data in Figure 7.3, other sources similarly show a decline in PRC investment in the U.S. technology sector. One report, for example, tracked the decline in number and value of PRC investments in U.S. technology firms from 32 deals (worth \$2.2 billion) in Q1 2018 to 21 deals (worth \$0.4 billion) in Q3 of 2019. See GP Bullhound, “Quarterly Insights into Asian Tech Investments,” November 4, 2019.

⁴⁹ Mira R. Ricardel, “These New Rules Might End Tech’s Reliance on Chinese Investors,” *Fortune*, January 20, 2020.

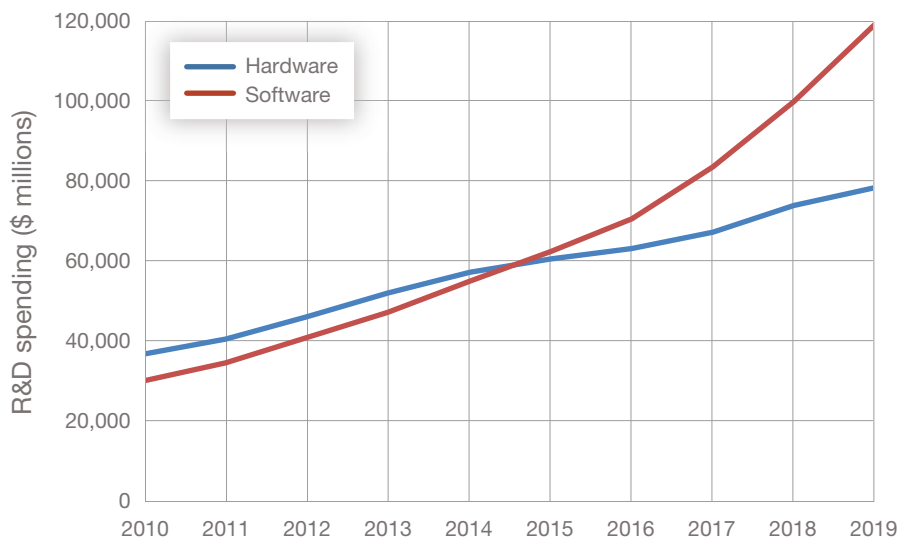
⁵⁰ Li Juzhen, quoted in Yujie Xue, “Chinese Investment in US Tech Companies Hits New Low as Bilateral Relations Remain Tense, Report Says,” *South China Morning Post*, May 22, 2020.

Research and Development

In contrast to its decline in the manufacturing sector, R&D spending continued to increase for the technology sector from 2010 to 2019 (see Figure 7.3). It is not clear if U.S.-China tensions contributed to this trend.

But evidence might suggest that tensions may have had little effect because R&D was already decoupled. Very few U.S. companies, whether software or hardware, have important R&D offices in China. Due to IP concerns, limited market access, and the unlevel playing field, an American Chamber of Commerce survey reported that fewer than 4 percent of American companies deem their China offices their most important R&D hubs. The majority believed their Chinese R&D operations were of “minimal importance” or just one of several innovation hubs.⁵¹

FIGURE 7.3
Research and Development Expense for the U.S. Technology Sector, 2010–2019



SOURCE: Compustat Database.

NOTE: Figures are current-year dollar amounts.

Employment and Human Resources

For the most part, employment in the technology sector has been stable since 2017. Hardware companies increased employment from 1.04 million jobs in December 2016 to 1.10 million in December 2019, while software companies increased employment from 1.38 million to 1.40 million jobs over the same time.⁵² Because employment is affected by various factors, including those not related to U.S.-China competition, it is not readily apparent if U.S.-China tensions had a significant effect on overall technology sector employment levels.

A new development that may have affected corporate activities was the difficulty of obtaining U.S. visas. For example, the suspension of H-1B visa issue between June and the end of 2020 likely deterred hiring skilled foreign workers that could contribute to the U.S. technology sector’s innovative capability. This fol-

⁵¹ Daniel Ren, “Why American Companies Refuse to Make China Their Main Innovation Hub,” *South China Morning Post*, April 19, 2018.

⁵² BLS, 2018.

lowed the Trump administration's decision to cut visas for individuals with ties to the PLA. These moves may pose barriers for U.S. innovation. Because U.S. companies do little of their R&D in China, they usually sponsor talented Chinese engineers with H-1B visas. Chinese nationals, however, only account for 10 percent of H-1B visa holders as of 2017.⁵³ It is possible that restricting visas may further reduce the number of skilled Chinese nationals working in the U.S. technology sector, given the trend of more scientists of Chinese origin returning to China.⁵⁴

Changes Since the Onset of COVID-19

Since 2017, U.S. businesses have thought about localizing production near consumption. Functionally, that means that production may move out of China, but not necessarily home to the United States; exports to Asian countries may be made in China, while exports destined for the United States would be made in North America. Companies such as Apple and HP have weighed whether to shift as much as 30 percent of their China-based production to such places as India, the Philippines, Taiwan, and Vietnam.⁵⁵ More generally, across the technology sector as a whole, the *Washington Post* reported that a July 2019 survey from QIMA “showed that demand for China-based [quality control] inspections from U.S. companies had fallen 13 percent in the first half of 2019. In the same window, overall demand for inspections in South Asia jumped 34 percent.”⁵⁶ According to a report from Kearney, for U.S. manufacturing and technology sectors (as defined by this report), the shift out of China represents about \$90 billion in imported goods.⁵⁷

The emergence of the COVID-19 pandemic is likely to accelerate much of these trends and, in particular, supply chain relocation. The pandemic has brought up much talk of “supply chain resilience” and the dangers of overly relying on a single country for production. As a result, supply chains are likely to shift to reduce reliance, but the extent to which this phenomenon will occur is unknown. While building a resilient supply chain will increase security of supply, it will also incur costs such as excess inventory and capital expenditure to build factories that tie up shareholder capital without necessarily generating immediate value.

Responses to Shape U.S. Policies or PRC Responses

Although the hardware industry was sympathetic to broader concerns in the U.S.-China relationship (e.g., IP theft), it took clear public positions against the administration's actions. It appears that these concerns were driven in large part by economic considerations. An executive at a venture capital fund pointed out that profits were a principal concern and that “[m]any [firms] are saying that will continue working with China and [will find ways to] circumvent U.S. restrictions. Companies have always done this . . . as was the case with selling telecom equipment in Brazil. People are incentivized to figure out workarounds.”⁵⁸ In response to some export controls, an executive at a U.S. company worried that “[s]ecuring new clients in China, or even

⁵³ Jacob Funk Kirkegaard, “The U.S. H-1B Visa: A Boon for High-Skilled Immigrants from India,” Peterson Institute for International Economics, November 19, 2019.

⁵⁴ Cong Cao, Jeroen Baas, Caroline S. Wagner, and Koen Jonkers, “Returning Scientists and the Emergence of China's Science System,” *Science and Public Policy*, Vol. 47, No. 2, April 2020.

⁵⁵ Lauly Li and Cheng Ting-Fang, “Apple Weighs 15%–30% Capacity Shift out of China amid Trade War,” *Nikkei Asia*, June 19, 2019; Masamichi Hoshi, Rei Nakafuji, and Yusho Cho, “China Scrambles to Stem Manufacturing Exodus as 50 Companies Leave,” *Nikkei Asia*, July 18, 2019.

⁵⁶ Taylor Telford, “More than 50 Major Companies, from Google to Nintendo, Pull Production from China Because of the Trade War,” *Washington Post*, July 19, 2019.

⁵⁷ This figure groups the manufacturing and technology sectors. See Van den Bossche, Levering, et al., undated b.

⁵⁸ Telephone interview with industry expert, May 7, 2020 (name withheld on request).

in Asia, could be more challenging from now on as prospective clients would think twice before they buy American equipment or technologies like ours.”⁵⁹

As in the manufacturing sector, we identified very little support for Section 301 tariffs (see Table 7.1). Companies may sympathize with broader concerns that U.S. policymakers are trying to address, but rarely did companies think tariffs were the best means of achieving such an objective. The concerns generally relate to increased prices for consumers, decreasing the amount of profit and investment capacity.

The lack of support for Trump administration measures against China extended to other forms of policy actions. Some of the resistance was relatively benign. For example, the Business Roundtable opposed the ICTS rule, deeming it “unworkable for U.S. businesses” and writing that it would create “uncertainty and confusion that could undermine both U.S. competitiveness and national security objectives” because “[f]oreign partners will do less business with U.S. companies.”⁶⁰ Other responses to U.S. policies were more aggressive, as in the case with Huawei. Although U.S. companies were banned from exporting U.S. technology to Huawei as early as May 2019, some U.S. companies shifted tactics by making products outside the United States (products produced overseas are not always considered made in America) and then selling the products to Huawei.⁶¹ In May 2020 this resulted in a new rule to address this loophole.⁶²

Perhaps to the dismay of U.S. policymakers, hardware companies, already with substantial interests in China, may now actually prefer to not have policy support from the U.S. government, or to be able to select what type of policy support to use. HP noted that it already “implemented practices that are more effective

TABLE 7.1
Select Views on Section 301 Tariffs from Technology Sector Groups

Group	Views
SIA	Opposes: increases prices; decreases economic activity of the IT market; decreases investment in U.S. products
Entertainment Software Association ^a	Opposes: increases prices for consumers; decreases investment in gaming; decreases job availability
Computer and Communications Industry Association	Opposes: decreases innovation; increases prices for consumers; “Chinese retaliation is compounding the negative impact to American consumers, illustrating how China is lowering barriers to the market for other countries and diverting trade away from the U.S. market”
A joint statement by laptop manufacturers (i.e., Dell, HP, Microsoft, Intel)	Opposes: decreases innovation; increases prices for consumers
Information Technology Industry Council	Opposes: harm to U.S. consumers; costs U.S. jobs; undermines U.S. technology companies in the intense competition for global leadership

SOURCE: Public Comments Concerning Proposed Modification of Action Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, USTR-2019-0004.

^a Although the name of this association contains “Software,” the concerns it relays pertain only to hardware, such as gaming consoles or controllers; in this sense, it is acting on behalf of hardware manufacturers.

⁵⁹ Yifan Yu, “US Tech Industry Fears New Huawei Ban Will Scare Off Customers,” *Nikkei Asia*, June 12, 2020.

⁶⁰ “Business Roundtable Comments to the Proposed Rule on Securing the Information and Communications Technology and Services Supply Chain,” Business Roundtable, January 10, 2020.

⁶¹ Jeanne Whalen, Greg Bensinger, Ellen Nakashima, and Hamza Shaban, “Huawei Supply Ban Roils Stocks as U.S. Companies Begin to Cut off China Tech Giant,” *Washington Post*, May 20, 2019; Paul Mozur and Cecilia Kang, “U.S. Tech Companies Sidestep a Trump Ban, to Keep Selling to Huawei,” *New York Times*, June 29, 2019.

⁶² Jeanne Whalen, “U.S. Tries to Narrow Loophole That Allowed China’s Huawei to Skirt Export Ban,” *Washington Post*, May 15, 2020.

at remedying the problematic Chinese IP practice.” In lieu of the aforementioned tariffs, it preferred Section 337 actions, in which HP would bring IP-related disputes to the International Trade Commission, seeking enforcement actions such as keeping out infringing imported goods:

Section 337 actions enjoy high success rates and are effective because they completely exclude infringing products from the U.S. market. A broad-based tariff, by contrast, is a less effective tool since it would still allow infringing products into the U.S. market, would not distinguish between legitimate and illegitimate goods and would indiscriminately raise prices for all customers. A number of printer technology companies, including HP, Canon, and Epson, have used Section 337 actions successfully in recent years.⁶³

In the case of the software industry, which has a relative lack of economic interests in China, companies have tried to maintain neutrality in the U.S.-China competition; Microsoft even declared itself a “neutral digital Switzerland.” Several reasons potentially motivate this desire to maintain neutral. First, as a former policy adviser at Google pointed out, the companies continue to hold out hope that they can operate in China to maximize profits.⁶⁴ Second, there exist some cultural and human resource concerns. As an executive with strong connections to Silicon Valley pointed out, “The industry has a strong ‘Silicon Valley bias’—people don’t care about the government and are focused on their own business. There is an arrogant view that D.C. is focused on solving ‘yesterday’s problems.’”⁶⁵ Additionally, Microsoft president Brad Smith noted that “[there has been an] explosion of innovation in China” and that what “we at Microsoft have long appreciated is the enormous ingenuity of the engineering population of China.” In fact, Smith argued that basic research on topics like machine learning and quantum computing must be published for the sake of scientific advancement.⁶⁶ Microsoft founder Bill Gates further deplored the “paranoid” view inherent in the technology tensions between China and the United States, saying that trying to stop Beijing from developing innovative technologies is “beyond realistic.”⁶⁷

Compared to the hardware sector, it is possible that the software sector could benefit to some degree from increased U.S.-China competition for several reasons. First, competition could create growth potential for some software companies. U.S. software companies could benefit from limits on the use and sales of PRC software products in the United States. U.S.-China tensions could also create demand for specific America-made technology services (particularly for security or military use) and increase U.S. federal contracts. In fact, such contracts have been growing at a rapid pace. The Pentagon’s spending on “Command, Control, Communications, Computers, and Intelligence” systems, which include IT spending, has grown 60 percent since 2016, from \$7.4 billion to \$11.9 billion.⁶⁸ This has resulted in notable contracts. Recently, the Pentagon offered Microsoft a \$10 billion Joint Enterprise Defense Infrastructure contract to build a cloud computing service.⁶⁹ This represents a substantial increase from the \$259 million in federal contracts that Microsoft

⁶³ Regulations.gov, “Comment from Andy Binder, HP Inc.,” comment ID USTR-2019-0004-1701, initially posted on June 17, 2019c.

⁶⁴ Jacob Helberg, “Silicon Valley Can’t Be Neutral in the U.S.-China Cold War,” *Foreign Policy*, June 22, 2020.

⁶⁵ Telephone interview with industry expert, May 7, 2020 (name withheld on request).

⁶⁶ Brad Smith, quoted in Scruggs, 2020.

⁶⁷ Marrian Zhou, “Bill Gates: Paranoia on China Is a ‘Crazy Approach’ to Innovation,” *Nikkei Asia*, November 8, 2019.

⁶⁸ Office of the Under Secretary of Defense, *Program Acquisition Cost by Weapon System: United States Department of Defense Fiscal Year 2021 Budget Request*, Washington, D.C.: DOD, 2020.

⁶⁹ John D. McKinnon and Aaron Tilley, “Pentagon Picks Microsoft for JEDI Cloud-Computing Contract over Amazon,” *Wall Street Journal*, October 25, 2019.

received in 2016 and the \$459 million offered in 2019.⁷⁰ Additionally, exclusion of Chinese companies operating in the United States may produce an opportunity for domestic companies to expand further.

Second, technology companies could use competition with China to obtain more U.S. government or public support. For example, Facebook is the subject of an antitrust investigation.⁷¹ Since it is currently blocked in China and is unlikely to see any significant near-term business opportunity there (which requires setting up a local subsidiary subject to censorship, a violation of Facebook's stated norms), the company's chief executive officer, Mark Zuckerberg, appealed to U.S. patriotism to defend the company, suggesting that if Facebook's development is hindered, then it will be unable to push the forefront of key national priorities such as AI, perhaps surrendering this field to China.⁷² The wielding of U.S.-China tensions by technology giants could grow in appeal in response to antitrust concerns, especially as other technology companies (e.g., Amazon, Google) face similar situations.⁷³

Although federal contracts and barriers to entry to the U.S. market may benefit some U.S. technology firms, technology executives are broadly worried about "techno-nationalism"—which, as one executive defined it, was a process through which each country would erect its own barriers to support its own domestic technology firms and harm the prospects of American technology firms seeking to provide to a global market. For example, the executive pointed out that forcing TikTok to localize its American data in the United States may give a convenient excuse for other countries to force technology firms operating in their territories to localize their data and incentivize the development of competitors in areas where none exist (e.g., data localization in Europe may help the GAIA-X project, which seeks to foster "digital sovereignty" for Europe).⁷⁴ In our discussions, the fear of "techno-nationalism" was palpable, sufficient to offset any gains made possible by U.S.-China tensions to select U.S. technology firms. For this reason, any policy that could generate techno-nationalism is unlikely to be broadly supported by U.S. technology firms.

Overall Effect of Increased U.S.-China Competition on the Sector

Overall, evidence suggests that there was limited support, if not opposition, in the technology sector for Trump administration measures to confront China economically and technologically. In the hardware space, companies are too entangled in terms of production and a desire to sell in the Chinese market to want any friction that threatens those interests. U.S. policy actions negatively affected their business model; export controls and tariffs increased the cost of business and decreased their profit margins. The upside for U.S. policymakers is that if decoupling occurs, U.S. firms' economic interest in China will likely decrease, lowering the incentive to go against U.S. government policy. The extent to which the interest will decrease and whether that will be enough to bolster support for U.S. government initiatives, however, is unknown.

Likewise, support in the software sector is likely to be weak, but for different reasons. Unlike the hardware sector, the software sector is less exposed to China in terms of sales and supply chain considerations. Even if they seek to expand their operations abroad, it is unclear whether such endeavors will necessarily be fruitful.

⁷⁰ Washington Technology, "2016 Top 100," webpage, undated a; Washington Technology, "2019 Top 100," webpage, undated b.

⁷¹ Rishi Iyengar, "The Antitrust Case Against Facebook: Here's What You Need to Know," CNN, December 11, 2020.

⁷² Kara Swisher, "Zuckerberg: The Recode Interview," Recode, October 8, 2018.

⁷³ See, e.g., Lauren Feiner, "Bezos Will 'Break Up His Own Company' Before Regulators Do, Atlantic Writer Who Profiled the CEO Predicts," CNBC, October 15, 2019; Tim Higgins, "Elon Musk Calls for Amazon Breakup in Latest Spat with Jeff Bezos," *Wall Street Journal*, June 4, 2020; Gilad Edelman, "Google's Antitrust Cases: A Guide for the Perplexed," *Wired*, December 18, 2020.

⁷⁴ Telephone interview with industry executive, August 3, 2020 (name withheld on request).

U.S.-China tensions could open pockets of additional market opportunities—for example, additional federal contracts and filling the void left by PRC companies banned from operations in the United States. This, however, is unlikely to be enough of an incentive for companies to support greater confrontation with China. For one, federal contracts are unlikely to rival the global market in size. More saliently, companies are worried about the rise of techno-nationalism that would depress their prospects abroad. Additionally, support is still constrained by cultural factors such as workers refusing to help government agencies; for example, Microsoft workers protested a data analysis contract with U.S. Immigration and Customs Enforcement,⁷⁵ and Google employees protested helping the Pentagon improve drone strikes.⁷⁶

Table 7.2 shows that, in general, increased U.S.-China competition has had an overall negative effect on the business of the technology sector—imposing more costs than conferring benefits across the five main business functions: operations, sales and marketing, finance, R&D, and employment and human resources.

Absent any changes to economic incentives, support for U.S. policies against China might increase if more targeted policies (instead of broader actions such as across-the-board tariffs) were implemented. Additionally, the business community strongly encourages working with key U.S. allies and partners on any measures; an executive at a large business organization pointed out that if export controls were unilateral, China might still be able to buy the end product, with the only result being that American companies would be displaced from making sales.⁷⁷

TABLE 7.2
Effect of the Trump Administration’s China Policies on the Technology Sector

Business Functions	Impact on Hardware Subsector	Impact on Software Subsector
Operations	Negative	Neutral
Sales and marketing	Negative	Negative
Finance	Negative	Negative
R&D	Neutral	Neutral
Employment and human resources	Negative	Negative
Overall	Negative	Negative

⁷⁵ Jamie Condliffe, “Amazon Is Latest Tech Giant to Face Staff Backlash over Government Work,” *New York Times*, June 22, 2018.

⁷⁶ Scott Shane and Daisuke Wakabayashi, “‘The Business of War’: Google Employees Protest Work for the Pentagon,” *New York Times*, April 4, 2018.

⁷⁷ Telephone interview with industry group representative, July 7, 2020 (name withheld on request).

Views from the Financial Sector

The United States is home to the largest, most liquid, and most sophisticated financial markets in the world.¹ In 2019 the U.S. financial and insurance sector represented 7.6 percent of real GDP and accounted for about 4.3 percent of total nonfarm U.S. employment.² Like the manufacturing and technology sectors, the U.S. financial sector is diverse. For simplicity, our analysis will group these types of firms indexed on the S&P 500 into four subsectors: asset managers and global banks, regional banks, insurance firms, and diversified finance.

The first category includes large asset managers like BlackRock, Fidelity, and Invesco, and diversified banks and investment banks like Citigroup, Goldman Sachs, JPMorgan Chase, and Morgan Stanley. Examples of the 11 regional banks in the S&P 500 include the Citizens Financial Group, Fifth Third Bancorp, PNC Financial Services, and SVB Financial Group. The nearly two dozen insurance firms indexed in the S&P 500 include industry giants like Aflac, Allstate, MetLife, Progressive, and State Farm. The last category, diversified finance, consists of a broad range of financial services corporations like American Express, Capital One Financial, and Discover, as well as financial exchanges like CME Financial Services and credit rating agencies and financial data providers like Moody's and S&P Global. The following sections examine the U.S. financial sector's views of U.S.-China competition.

Background: Operations and Involvement in China

The Chinese financial system has experienced a historic period of opening to foreign firms and capital, particularly since 2018. However, despite significant progress made toward market liberalization and the coupling of the U.S. and Chinese financial systems, the PRC still maintains one of the most restrictive foreign investment environments in the world for the U.S. banking and financial sector.

The slow process of U.S.-China financial integration dates back to 1973, enabled by President Richard Nixon's Cold War foreign policy reorientation toward rapprochement with China, when Chase Manhattan Bank became the first U.S. correspondent to the state-owned People's Bank of China since the Communist

¹ For example, as of 2018 the U.S. banking system had \$17.9 trillion in assets; U.S. asset managers held nearly \$51 trillion in mutual funds, retirement assets, and insurance assets; U.S. insurers' net premiums written totaled \$1.1 trillion; U.S. private equity firms had over \$500 billion invested domestically; and U.S. venture capitalists had some \$84 billion invested globally (2017). SelectUSA, "Financial Services Spotlight: The Financial Services Industry in the United States," website, undated.

² The financial and insurance sectors contributed \$1.63 trillion to total real GDP in 2019 (\$21.4 trillion); BEA, 2020b. In 2019 the financial and insurance sectors averaged 6.4 million jobs monthly, compared with the total nonfarm monthly average of 150.9 million jobs; BLS, 2018.

Party's revolutionary victory in 1949.³ Yet, until just a few decades ago, the PRC had virtually no private financial sector to speak of, as nearly all banking operations were conducted by enterprises of the state.⁴

U.S. financial companies began to slowly penetrate Chinese financial markets in the 1990s.⁵ The first business ventures were primarily limited to cooperation with the Chinese government, SOEs, and state-owned banks, the primary capital holders in the early years of market-oriented reforms. Since then, capital controls and barriers to foreign investment in domestic financial companies have remained the defining factors limiting the growth of U.S. participation in China's massive financial markets despite long-standing PRC pledges to remove barriers to entry and level the competitive field for foreign firms.⁶

China's financial industry is composed of a diverse range of institutions—fintech companies, brokerages, trust companies, and financial leasing companies—but it remains overwhelmingly dominated by commercial banks. Commercial banks provide nearly 70 percent of all credit to the economy and account for more than 80 percent of total assets held by domestic financial institutions. In the decade following the 2008–2009 global financial crisis, assets in China's banking sector quadrupled from \$10.2 trillion to \$41.6 trillion as its commercial banks expanded their balance sheets and extended massive numbers of loans to companies and local governments.⁷ The value of China's financial markets has grown to the equivalent of roughly *half of global GDP*.⁸

Mainland China's financial industry remains, however, relatively underdeveloped and the banking system has recently come under significant pressure to clean up its balance sheets and dispose of nonperforming loans generated during the last decade of rapid expansion.⁹ The economic fallout of the COVID-19 pandemic exacerbated these concerns “about a buildup of hidden risks on lenders’ balance sheets” as Chinese banks have reportedly taken “extraordinary [new] measures to avoid recognizing bad loans”—in a reversal of recent progress made to improve transparency and strengthen regulation in the rapidly-expanded financial industry.¹⁰ Furthermore, during this historic decade of credit and debt growth, a “vast amount of investment” was

³ JPMorgan Chase & Co., *The History of JPMorgan Chase & Co.: 200 Years of Leadership in Banking*, New York: JPMorgan Chase & Co., 2008, p. 13. See also “Chase Agrees to Be Agent for Bank of China in U.S.,” *New York Times*, July 5, 1973; William Burr, “‘Casting a Shadow’ over Trade: The Problem of Private Claims and Blocked Assets in U.S.-China Relations, 1972–1975,” *Diplomatic History*, Vol. 33, No. 2, April 2009, p. 325.

⁴ Douglas J. Elliott and Kai Yan, “The Chinese Financial System: An Introduction and Overview,” Brookings Institution, July 2013, p. 3.

⁵ For example, in 1993, Goldman Sachs served as the lead manager of the “first ever public bond offering by a Chinese issuer in the United States,” and the following year, Goldman opened its first office in China. Similarly, in 1994, J.P. Morgan opened its first representative offices in Beijing and Shanghai. Goldman Sachs, “Expanding Its Commitment to China, Goldman Sachs Opens Offices in Beijing and Shanghai,” webpage, undated a; J.P. Morgan, “J.P. Morgan in China,” webpage, undated.

⁶ U.S.-China Economic and Security Review Commission, 2019, p. 63.

⁷ Bisio, 2020, pp. 4, 9. What began as a government stimulus policy to keep unemployment low and growth high persisted in practice even after the two-year program ended, with unabated expansion in credit supply, particularly to SOEs, outlasting the recession for years. As a result, China's massive economic growth in the decade after 2009 depended largely on the proliferation of state-led investment and credit—including riskier lending to subpar or less productive SOEs, private firms, and households—rather than private sector-led and consumption-driven growth. See Logan Wright and Daniel Rosen, “Chinese Credit Stimulus: Yesterday's Solution, Not Today's,” Rhodium Group, March 24, 2020; and Lin William Cong, Haoyu Gao, Jacopo Ponticelli, and Xiaoguang Yang, “China Weathered the Global Recession with an Aggressive Stimulus Package. But Did It Prop Up the Wrong Firms?” KelloggInsight, August 1, 2019.

⁸ Wright and Rosen, 2020.

⁹ Evelyn Cheng, “New U.S. Sanctions Add Uncertainty for Global Banks Looking to Tap China Market,” CNBC, August 11, 2020a; Evelyn Cheng, “Beijing Pushes Ahead with Opening Up Its Financing Sector Despite Trade Tensions,” CNBC, September 25, 2020c.

¹⁰ “China Makes Bad Loans Disappear as Virus Pummels Banks,” Bloomberg, February 27, 2020.

directed toward the real estate market rather than more diversified financial products, leading to persistent speculation and fears of a looming correction in China's property bubble.¹¹ These trends have all contributed to the recent acceleration of China's opening to foreign capital.¹²

To these ends, in April 2018, Chinese Communist Party general secretary and PRC president Xi Jinping and People's Bank of China governor Yi Gang announced that the PRC would accelerate its financial opening with historic policy actions designed to "(1) increase market access in the banking, securities, and insurance industries; (2) grant foreign institutions equal treatment in credit and payment sectors; and (3) open up the domestic bond market to foreign investors."¹³ Beginning in 2018 as the U.S.-China trade war accelerated, Beijing introduced a set of 11 new rules to remove the shareholding limits for foreigners in PRC securities firms, mutual fund firms, and futures companies—eventually giving foreign companies a path to obtain full ownership.¹⁴ In June 2018, Chinese regulators further agreed to raise "foreign equity caps on banking, securities, and insurance joint ventures to 51 percent"—and to eventually remove them entirely by 2020.¹⁵ In 2018–2019, the PRC also continued to pursue the opening of its stock and bond markets to attract new foreign capital by launching the long-awaited Shanghai-London Stock Connect and by removing limits on foreign holdings in Chinese banks. (Prior to these reforms, individual and group foreign institutions were limited to 20 percent and 25 percent holding stakes in Chinese banks, respectively.)¹⁶

Despite such progress in opening to foreign competition, U.S. financial firms listed in the S&P 500 Index have not been significantly dependent on revenues from China (see Figure 8.1). Based on our analysis of 66 financial firms in the S&P 500 and financial data provided by FactSet, the average firm exposure to the Chinese market was only about 1.2 percent of global revenue, with no firms relying on China for more than 10 percent of their global revenue. Only six firms (four insurers and two asset managers) received more than 5 percent of their total revenue from China, while China accounted for between 0 and 5 percent of global revenue for about one-third of U.S. financial firms in the S&P 500.¹⁷ Significantly, nearly six in ten U.S. financial firms listed in the S&P 500 had no reported revenues in the PRC in 2019. This includes 100 percent of regional banks, 58 percent of asset managers and global banks, 52 percent of insurance companies, and 38 percent of diversified finance firms.

¹¹ Telephone interview with industry group representative, September 23, 2020 (name withheld on request). See also Wright and Rosen, 2020.

¹² As the U.S.-China Economic and Security Review Commission recently explained,

The challenges facing China's banking system may also present some opportunities for U.S. financial companies. Despite its unprecedented expansion after the 2008–2009 global financial crisis, China's financial system remains underdeveloped and lacks robust mechanisms for pricing risk. Chinese policymakers know this and would like to harness foreign expertise to professionalize the financial sector and find innovative solutions to current problems. Although the moderate expansion of market access to China's financial markets over the last two years stems in part from a need for capital, stresses in the banking sector do underpin legitimate demand for the services of foreign ratings agencies, insurers, fund managers, and distressed asset managers. (See U.S.-China Economic and Security Review Commission, 2019, pp. 63–66)

¹³ Bisio, 2020, pp. 18–19.

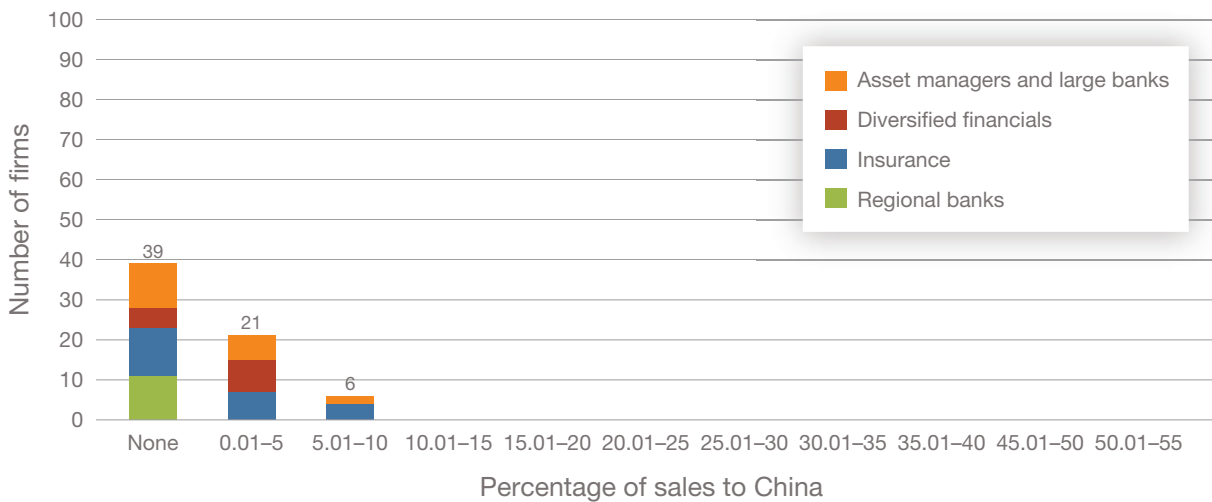
¹⁴ Cheng, 2019.

¹⁵ The full ownership restrictions were set to be removed from futures companies on January 1, 2020; mutual fund management companies on April 1, 2020; and securities companies on December 1, 2020. U.S.-China Economic and Security Review Commission, 2019, p. 65.

¹⁶ Cheng, 2020c.

¹⁷ These four insurance firms include MetLife (9.2 percent), AIG (5.7 percent), Assurant (5.6 percent), and Principal Financial Group (5.4 percent). The two asset managers include State Street Corporation (9.1 percent) and Northern Trust (6.7 percent). See Appendix A for a complete list of these 66 financial sector firms.

FIGURE 8.1
Percentage of Sales to China for S&P 500 Financial Firms, December 2019



SOURCE: Data on each company's Q4 2019 revenue from China from FactSet GeoRev, December 2019.

As of 2020, most of the largest U.S. financial firms in the class of asset managers, diversified banks, and investment banks had set up offices in China and were offering China-related products to their clients. In this financial firm category, at least 12 companies out of 19 in our S&P 500 Index sample had offices in mainland China. The picture is similar for diversified financial firms (at least eight out of 13 had operations in China) and insurance companies (at least 11 out of 22). U.S. regional banks, in general, did not have significant operations in China and did not compete with Chinese banks for shares of the commercial banking market. Instead their presence was often limited to small offices that typically did not offer any core products or services and appeared to have mainly a consulting role.¹⁸

China is also a modest destination for FDI for the U.S. financial sector. In 2019 the U.S. financial and insurance industry (excepting depository institutions) held \$9.6 billion in FDI in China.¹⁹ Depository institutions accounted for an additional \$4.95 billion of U.S. FDI in China in 2019.²⁰ Taken together as an economic sector, U.S. financial, insurance, and depository institutions thus accounted for \$14.6 billion (12.6 percent) of America's total FDI position in China at the start of 2020 (\$116.2 billion).²¹ On the other side of the FDI ledger,

¹⁸ For example, PNC Financial Services maintains a Shanghai Representative Office to "help U.S. companies navigate the day-to-day challenges of doing business in China," but it does not have regular commercial banking branch / ATM locations in the country. Likewise, Silicon Valley Bank, another U.S. regional bank in the S&P 500, maintains offices in Beijing, Hong Kong, and Shanghai, but these locations do not appear to offer regular commercial banking services to the general public. PNC Financial Services, "How PNC Can Help You Succeed in China," webpage, undated; Silicon Valley Bank, "International SVB Locations," webpage, undated.

¹⁹ This figure compares with \$122.2 billion of total FDI from the nondepository financial and insurance subsector in the Asia-Pacific region (7.9 percent) and \$847.1 billion in all countries worldwide (1.1 percent). BEA, undated b.

²⁰ This figure compares with \$40.9 billion in FDI from depository institutions in the Asia-Pacific region (12.1 percent) and \$135.4 billion globally (3.6 percent). BEA, "Foreign Direct Investment Position in the United States on a Historical-Cost Basis, 2019," webpage, undated a.

²¹ To put these figures in additional context, in 2019 China ranked as the fifth largest global FDI destination for U.S. depository institutions and the fifteenth top destination for other U.S. finance and insurance companies. BEA, "U.S. Direct Investment Position Abroad on a Historical-Cost-Basis, 2019," DOC.

the foreign investment position of the Chinese financial sector in the United States is significantly smaller.²² In 2019, Chinese financial, insurance, and depository institutions together accounted for just \$3.1 billion, or 8 percent of total PRC investment in the United States. This \$3.1 billion from China made up only 0.4 percent of total FDI stock (from all countries) in these sectors in the United States (\$763.3 billion).²³

Beyond bilateral FDI, U.S. policy toward the PRC could also affect U.S. financial exchanges, which list Chinese companies. Notably, between September 2019 and October 2020, the number of Chinese companies listed and raising capital on the U.S. financial market's three biggest exchanges—Nasdaq, the New York Stock Exchange (NYSE), and the NYSE American—increased from 172 to 217, including 13 national-level Chinese SOEs. At the same time, these firms' total market capitalization more than doubled, from about \$1 trillion to over \$2.2 trillion.²⁴

Views of Competition from China and China-Related Operations

U.S. financial firms remain largely excluded from the Chinese domestic market due to a variety of regulatory restrictions, such as negative investment lists and ownership caps, and a host of other distortionary and protectionist laws and practices designed to advantage state-owned and private domestic firms over foreign competition.²⁵ For decades, the U.S. financial sector has actively lobbied and negotiated for policy changes in three areas: (1) full ownership and operating control of their operations in China, (2) greater market access, and (3) general relief on various regulatory issues.²⁶ To these ends, actions taken by Beijing since 2018 (described in the section “Background: Operations and Involvement in China” in this chapter) have generally been viewed by the U.S. financial industry as a step in the right direction toward liberalization—albeit as a still plodding progress. The PRC's policy changes have opened new business opportunities and enabled many major American players to take control of existing JVs—even if business leaders remain skeptical about their implementation in practice and wary of remaining formal and informal competitive disadvantages and barriers to doing business in China.²⁷ For example, in a recent survey by the American Chamber of Commerce in China, 74 percent of respondents said that the environment is improving in the financial services sector (e.g., banking, insurance), while 100 percent said it was improving in investing (e.g., private equity and venture capital).²⁸

Notably, the U.S. and Chinese financial industries' drift toward deeper integration is generally viewed as mutually beneficial to both national interests and as generally unmarred by the direct national security implications implicit in the trade wars and IP espionage battles dominating U.S.-China competition in the

²² U.S.-China Economic and Security Review Commission, 2019, p. 182.

²³ BEA, undated a.

²⁴ U.S.-China Economic and Security Review Commission, 2019, pp. 176–178; U.S.-China Economic and Security Review Commission, “Chinese Companies Listed on Major U.S. Stock Exchanges,” press release, Washington, D.C., October 5, 2020.

²⁵ For example, in a September 2019 survey of 333 American companies conducted by Pricewaterhouse Coopers and the American Chamber of Commerce in Shanghai, 81 percent of member respondents in the U.S. banking, finance, and insurance sector indicated that local market access remained one of the key barriers to growth in China—the highest share of all industries, including manufacturing and technology. Evelyn Cheng, “U.S. Companies Are Canceling Investment into China at a Faster Clip, Survey Shows,” CNBC, September 11, 2020b.

²⁶ Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

²⁷ Telephone interviews with industry group representatives, September 22, 2020; September 23, 2020; and October 9, 2020 (names withheld on request).

²⁸ American Chamber of Commerce in China, 2020, p. 32.

tech and manufacturing sectors.²⁹ In fact, some U.S. financial leaders argue that the trade war and rising bilateral tensions have possibly helped press China to accelerate the timeline of its long-term financial liberalization plans.³⁰ For example, after Washington announced in July 2020 that it would revoke Hong Kong's special trading status—a move that was itself a policy response to Beijing's imposition of the controversial Hong Kong National Security Law the week before—China's central bank launched the Wealth Management Connect initiative to bring more financial inflows into Hong Kong and made significant efforts to further shore up and liberalize its financial sector.³¹ Furthermore, as one interviewee noted, the expertise of U.S. financial service firms is sometimes of great political value for the communist party government because they can be leveraged as a “politically less dangerous” option for reforming and restructuring struggling and bloated SOEs.³²

In short, given China's professed commitment to opening up and its desire to attract foreign capital—as well as broader macroeconomic fundamentals such as continued Chinese economic growth; an expanding middle class; increasing demand for equity and debt products, insurance, credit ratings and risk pricing, and other asset management and financial services—industry representatives interviewed generally concurred that U.S. firms view the scale of China's underdeveloped financial markets as an unprecedented business opportunity.³³ Morgan Stanley and Oliver Wyman publicly estimate, for example, that China is the third largest asset market in the world, with \$5.3 trillion of assets under management that are expected to grow to \$9 trillion by 2023, “providing western fund managers with their single biggest growth opportunity globally over the next decade.”³⁴ Similarly, Goldman Sachs's copresident of Asia-Pacific operations outside Japan recently explained that the firm's expansion in China “will be driven by ‘explosive’ growth in asset management. . . . Chinese households are sitting on about 90 trillion yuan (\$13 trillion) in investible assets. Clients increasingly want to diversify away from cash and real estate, as China is phasing out guaranteed wealth management products that have dominated its investment scene.”³⁵ Likewise, at the start of 2020, the market capitalization of the Shanghai and Shenzhen stock exchanges totaled \$8.5 trillion, “making China the second-largest equities market in the world after the United States.”³⁶ China's insurance market has also become the second largest in the world, surpassed only by that of the United States.³⁷ And China's rapidly growing e-commerce market for peer-to-peer payments and lending is the largest in the world, comprising over 4,000 platforms with total loans valued at some \$20 billion annually.³⁸

²⁹ Telephone interviews with industry group representatives, September 22, 2020; and October 9, 2020 (names withheld on request).

³⁰ Telephone interview with industry group representative, September 22, 2020 (name withheld on request).

³¹ We note that although these measures were touted as a part of the trade deal, many were actually announced in the previous years and were motivated by various considerations ranging from the desire to win over an important economic constituency in the United States to the realization that allowing more foreign competition in the domestic financial market was ultimately in China's own interest. Tan, 2020.

³² Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

³³ Telephone interviews with industry group representatives, September 22, 2020; September 23, 2020; October 9, 2020; October 14, 2020; October 22, 2020; and November 5, 2020 (names withheld on request).

³⁴ Peter Smith, “JPMorgan Pays \$1bn to Take Full Control of China Fund Venture,” *Financial Times*, April 3, 2020.

³⁵ Cathy Chan, “Goldman Plans to Double China Headcount to 600 in Five Years,” Bloomberg News, January 12, 2020.

³⁶ Bisio, 2020, p. 4.

³⁷ Deloitte, *China Market Opportunities for Foreign Insurance Companies Under the New Opening-Up Policies*, New York: Deloitte, June 2020, p. 5.

³⁸ Anjan V. Thakor, “Fintech and Banking: What Do We Know?” *Journal of Financial Intermediation*, Vol. 41, 2020, p. 4.

At the same time, U.S. financial institutions seeking to operate in China also “know better by now than to assume that the economy’s scale will directly translate into business for them,”³⁹ and past efforts “to encourage China to adopt market-oriented reforms have had little success.”⁴⁰ U.S. financial firms understand that a range of factors could continue to disadvantage their ability to compete. As one interviewee noted, it is very “institution-specific” as to which chief executive officers are “very long China,” and which are less so.⁴¹ On the regulatory front, significant challenges remain despite the momentum in financial integration that was achieved through 2020.⁴² Beyond regulatory challenges, structural legacies will prohibit market penetration for decades or longer regardless of market liberalization. Chinese banks account for over three-fourths of all assets in China’s financial system, and the government maintains a controlling stake in China’s largest five banks and significant stakes in countless second-tier commercial banks.⁴³ U.S. financial firms understand that they will not likely be able to “compete for deposits against the likes of Industrial and Commercial Bank of China, which boasts some 15,700 branches”—but they may be able to compete for significantly larger market shares in asset management and investment banking, where success is “more related to experience than sheer heft.”⁴⁴

According to an analysis by Deloitte in the insurance subsector, some 50 foreign firms have entered the market since the 1990s, but as of the end of 2018, the largest Sino-foreign JVs accounted for just 1.3 percent and 0.5 percent of the life insurance and non-life-insurance market shares, respectively, while the top 15 firms in each market segment remained dominated by Chinese-owned enterprises.⁴⁵

Finally, U.S. financial institutions generally do not view Chinese banks and financial companies as major competitors *outside* China. Instead, leaders in the U.S. financial industry expressed the outlook that their know-how, deep capital bases, expertise, and global reach place them in a position that is unlikely to be challenged by Chinese financial institutions in the foreseeable future.⁴⁶ If anything, the dominant

³⁹ “Is Wall Street Winning in China?” *The Economist*, September 22, 2020.

⁴⁰ Bisio, 2020, pp. 18–19.

⁴¹ Telephone interview with industry group representative, October 9, 2020 (name withheld on request).

⁴² Telephone interviews with industry group representatives, September 22, 2020; September 23, 2020; and October 9, 2020 (names withheld on request). The issues include (1) lengthy approval and licensing processes, sometimes extending multiple years and the bureaucratic opaqueness as well as risk of anti-American discriminatory practices; (2) rule discrepancies between foreign and Chinese firms that disadvantage foreign firms (e.g., limited to pursuing a single license or regulatory approval at a time); (3) Chinese political influence and party market interference that favor PRC firms and could limit the ability of U.S. or foreign firms to make decisions based on profit calculations (instead of political considerations); and (4) lack of legal transparency and jurisprudence uncertainty in China. See Yue Yue, Wu Yujian, and Thomas Zhang, “In Depth: Despite Financial Opening-Up, Foreign Firms Still Face Challenges in China,” *Caixin Global*, August 13, 2019; U.S. Department of State, “2019 Investment Climate Statements: China,” Washington, D.C., 2019; Swanson, 2020a; Ana Swanson, “White House Warns Against Chinese Investment, Citing Risk of Further Sanctions,” *New York Times*, July 7, 2020b; Transparency International, “Corruption Perceptions Index,” 2019; and World Bank, “Ease of Doing Business Rankings,” 2019.

⁴³ J. P. Meltzer and Neena Shenai, “The US-China Economic Relationship: A Comprehensive Approach,” Brookings Institution, February 2019, p. 14; Elliott and Yan, 2013, p. 3.

⁴⁴ “Is Wall Street Winning in China?” 2020.

⁴⁵ Deloitte, 2020, p. 2.

⁴⁶ However, some analysts predict that this may change in the longer term as a result of China’s BRI. As Roy Kamphausen, the commissioner of the U.S.-China Economic and Security Review Commission, recently testified before Congress, “From the available evidence [of China’s BRI strategy], it seems apparent that Beijing is trying to restructure the global governance system by realigning global supply chains, *financial networks*, technical standards, and internet networks and governance to conform to China’s preference.” As one dynamic of this strategy, U.S. firms face an unlevel playing field to finance massive BRI infrastructure projects, except at subcontractor levels. Beijing thus creates leverage over loan recipients across the developing world—many of whom are eventually unable to service BRI-related debt—which it can then use “to pressure participating countries to purchase Chinese-made high-end industrial goods (power generation equipment, telecommunications

positions of the U.S. banks (and U.S. currency) only increased in the years following the 2008–2009 global recession.⁴⁷

Major U.S. Policy Actions or PRC Responses That Affected the Sector

While the most high-profile U.S. economic actions against China (and corresponding PRC responses) since 2017 have been concentrated in the manufacturing and technology sectors, the U.S. federal government has also undertaken a series of direct and indirect measures designed to restrict investments by U.S. financial firms and limit new operations in China.

First, in May 2020 the Trump administration directed the U.S. government’s Thrift Savings Plan, which oversees some \$600 billion in federal retirement dollars, to cancel a plan that would allow investment in Chinese stocks, citing inadequate disclosures and China’s handling of the COVID-19 virus.⁴⁸ Previously, in 2017, the Federal Retirement Thrift Investment Board had decided that the Thrift Savings Plan’s \$40 billion international fund would “begin tracking an index that includes Chinese companies”—an investment shift “hailed by unions” seeking to diversify and boost returns but maligned by China hawks who argue that U.S. federal pension savings should not be invested in dual civil-military Chinese firms, some of which have been sanctioned for human rights abuses.⁴⁹ More broadly, index providers have generally increased the weighting of Chinese stocks in American investment portfolios like 401(k)s and other retirement vehicles, amounting to a major win for the PRC by funneling U.S. capital into the Chinese market and strengthening the renminbi. As one industry analyst recently remarked, “For China, this is the greatest free lunch program for capital they’ve ever known, because they’re able to penetrate the investment portfolios of scores of millions of Americans in one shot.” In the view of some leaders of the U.S. financial industry, such U.S. policy actions “to restrict investment constitute government interference and could destabilize financial markets” as an unintended consequence of market interventions to weaken U.S.-China financial linkages.⁵⁰

Second, as discussed in the preceding chapters, the DOC has also imposed new sanctions regimes against dozens of Chinese private and state-owned firms (as well as some senior Chinese officials) over human rights violations in Xinjiang (in October 2019 and June 2020);⁵¹ the PRC’s actions to undermine the autonomy of and political freedoms in Hong Kong (in July 2020);⁵² the PRC’s militarization of islands in the disputed terri-

equipment) where U.S. companies are currently competitive.” Roy Kamphausen, “Testimony Before the Senate Committee on Finance, Subcommittee on International Trade, Customs, and Global Competitiveness: Hearing on ‘China’s Belt and Road Initiative,’” June 12, 2019, p. 3, emphasis added. See also Carolyn Bartholomew, “Testimony Before the Senate Committee on Finance, Subcommittee on International Trade, Customs, and Global Competitiveness: Hearing on ‘China’s Belt and Road Initiative,’” June 12, 2019, p. 6.

⁴⁷ Telephone interview with industry group representative, May 2020 (name withheld on request).

⁴⁸ Anne Tergesen, “Trump Administration Tells Federal Retirement Plan to Avoid Chinese Stocks,” *Wall Street Journal*, May 12, 2020.

⁴⁹ “After White House Pressure, US Fund Halts China Stock Investments,” Al Jazeera, May 13, 2020.

⁵⁰ Ana Swanson, “Chinese Investment Pits Wall Street Against Washington,” *New York Times*, October 28, 2019.

⁵¹ James Griffiths, “US Blacklists 28 Chinese Organizations and Companies over Xinjian Camps,” CNN, October 8, 2019; David Shepardson and Karen Freifeld, “New U.S. Restrictions on 33 Chinese Firms and Institutions Take Effect June 5,” Reuters, June 3, 2020.

⁵² Francis Yoon and Quentin Webb, “U.S. Sanctions on Hong Kong Security Law Put Banks in a Quandary,” *Wall Street Journal*, July 15, 2020.

torial waters of the South China Sea (in August 2020);⁵³ and national security concerns in advanced computer chips, semiconductors, and other high-tech sectors.⁵⁴ While these sanctions were not primarily directed against financial firms, they nevertheless complicated the compliance efforts of any U.S. financial firms that have had “significant transactions” with these entities in the past, while introducing “uncertainty for international banks that were looking at a historic opening of the Chinese financial market.”⁵⁵

In interviews with RAND researchers, some representatives of the U.S. financial industry expressed particular frustration with the DOC’s interactions with the business community to explain and get feedback on China-related actions since the start of the trade war (2018)—at least relative to the business community’s historical experience interacting with State Department and Treasury officials on similar enforcement issues at the nexus of public- and private-sector interests.⁵⁶ These individuals credited the State Department and Treasury’s longer experience in designing and implementing sanctions regimes compared with the DOC, which historically has had far less institutional practice in sanctions design and enforcement. U.S. financial leaders expressed particular concerns about uncertainty over sanctions enforcement related to individuals and entities vaguely deemed to be “involved in the erosion of certain obligations of China with respect to Hong Kong” under the Hong Kong Autonomy Act of 2020.⁵⁷ For example, could a major U.S. financial firm seeking to, say, expand its controlling share in a JV in Shanghai be penalized if the PRC regulator handling its case ended up on the list of sanctioned individuals? Further, U.S. financial executives indicated that while industry compliance programs are fairly robust at first-level screenings of known, sanctioned individuals and entities, enforcement of bad actors becomes far more difficult at shadowy secondary levels of screening (e.g., shell companies and cryptocurrency financial transactions)—injecting strategic risk to expansion of their business models in Chinese markets due to U.S. policy uncertainty and U.S. sanctions opaqueness.⁵⁸

To better protect the U.S. financial industry and private investors, the U.S. executive branch and Congress have been discussing a variety of other policy measures ranging from strengthening audit and other regulatory scrutiny on Chinese companies selling shares on U.S. stock exchanges and delisting some Chinese firms from U.S. exchanges for a period of three years for disclosure and regulatory compliance failures to a broader campaign designed to persuade public and private investment firms to limit U.S. portfolio flows into China.⁵⁹ Table 8.1 summarizes these major recent policy actions and proposals intended to limit financial interactions with China.

Responses to Increased U.S.-China Competition

This section explores how the U.S. financial sector has responded to the PRC and U.S. economic policy actions. It concludes with reflections on the industry’s response to the COVID-19 pandemic through the lens of U.S.-China competition.

⁵³ Nectar Gan, “U.S. Sanctions 24 Chinese Companies over South China Sea Island Building,” CNN, August 27, 2020.

⁵⁴ Sherisse Pham, “New Sanctions Deal ‘Lethal Blow’ to Huawei: China Decries U.S. Bullying,” CNN, August 18, 2020.

⁵⁵ Cheng, 2020a.

⁵⁶ Telephone interview with industry group representatives, October 9, 2020 (names withheld on request).

⁵⁷ U.S. Senate, Hong Kong Autonomy Act, S.3798, 116th Congress of the United States, 2nd Session, June 25, 2020.

⁵⁸ Telephone interview with industry group representatives, October 9, 2020 (names withheld on request).

⁵⁹ Swanson, 2019; “US Senate Passes Bill That Could Delist Some Chinese Firms,” BBC, May 21, 2020; Swanson, 2020b; Jenny Leonard and Shawn Donnan, “White House Weighs Limits on U.S. Portfolio Flows into China,” Bloomberg, September 27, 2019.

TABLE 8.1

Major U.S. Policy Actions Applicable to Investment in China Since 2018

Date	Policy Action	Description
December 7, 2018	The Public Company Accounting Oversight Board and the SEC issue public statement	Calls attention to information access challenges related to U.S.-listed companies with operations in China
April 21, 2020	The Public Company Accounting Oversight Board and the SEC issue public statement	Calls attention to disclosure, financial reporting, and other risks associated with investment in emerging markets
May 20, 2020	Senate passes S. 945, The Holding Foreign Companies Accountable Act	Imposes consequences on a reporting company—including delisting on U.S. exchanges—if the Public Company Accounting Oversight Board is not allowed to investigate its auditor due to the foreign government's position and requires public companies to disclose whether they are owned or controlled by a foreign government, including members of the Chinese Communist Party
May 29, 2020	Nasdaq proposes amendments to listing rules for "Restrictive Market Companies"	Includes companies that operate in countries that restrict access by U.S. regulators
June 4, 2020	White House issues "Memorandum on Protecting U.S. Investors from Significant Risks from Chinese Companies"	Directs Treasury to convene the President's Working Group on Financial Markets to discuss the risks to investors from China and mandates delivery of report on working group findings within 60 days
August 18, 2020	U.S. State Department sends letter to colleges and universities	Warns the boards of U.S. university endowments that it would be "prudent to divest from Chinese stocks in the likely outcome that enhanced listing standards lead to a wholesale de-listing of PRC firms by the end of next year"

SOURCES: SEC Roundtable: "Emerging Markets, Including China," August 10, 2020; news media reports.

Major Adjustments or Changes in Business Activities

Here we analyze changes in U.S. financial activities across four main business functions: operations, sales and marketing, R&D, and employment and human resources. Unlike the previous chapters, however, we do not assess changes in finance. This is because much of the activities that we would have covered under the financial sector is discussed under the "Operations" section given that this chapter analyzes U.S. financial firms.

Operations

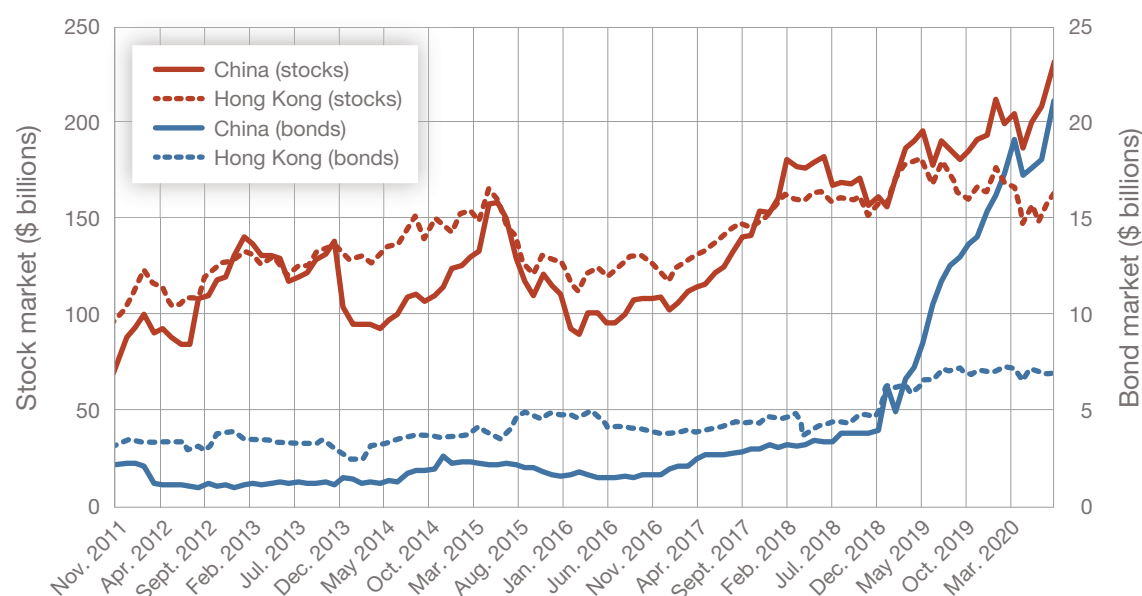
Overall, recent policy developments, particularly since 2018, have had mixed consequences on the operations of American financial firms—although no industry representatives interviewed for this study reported that increased U.S.-China competition under the Trump administration had had a significant, adverse effect on their firms' core operations in China.

Rather, U.S. financial firms have continued to expand their operations in China despite the escalating trade war and other bilateral frictions. As shown in Figure 8.2, U.S. holdings of Chinese stocks and bonds have risen rapidly in recent years, outpacing holdings even in Hong Kong. Increasing exports of financial services to China and portfolio holdings of Chinese assets—together with a flurry of applications for business expansion—suggest that, over the past few years, U.S. financial firms opted for greater participation in the Chinese financial market despite some frustration (and risk) associated with China's alternative accounting practices and challenging developments on the legislative front.⁶⁰ As a July 2020 analysis concludes,

⁶⁰ Frank Tang, "US-China Decoupling Prompts Beijing to Relax Rules for Foreign Investors in Onshore Bond Market," *South China Morning Post*, September 3, 2020.

FIGURE 8.2

Chinese Long-Term Stocks and Bonds Held by U.S. Residents, 2011–2020



SOURCE: U.S. Treasury, "Monthly Holdings of Foreign Long-Term Securities at Current Market Value by U.S. Residents," accessed October 10, 2020.

NOTE: Figures are current-year dollar amounts.

"U.S.-China financial decoupling is not happening"; to the contrary, China's integration into global markets "appears to have accelerated over the past year."⁶¹

On the negative side, China's aforementioned domestic policies on cybersecurity and national security have complicated the operations of all foreign financial firms' JVs operating in China and have added marginal compliance costs due to new data localization and other national security legislation requirements.⁶² In multiple interviews, the 2017 Cybersecurity Law of the People's Republic of China and its numerous clarifications and extensions were cited as a significant challenge for foreign financial companies' technology systems.⁶³ The ambiguous character of some provisions of the law complicates compliance and potentially provides the government with plentiful opportunities for selective enforcement while creating broader data protection concerns.⁶⁴ In the same vein, Beijing's imposition of its wide-ranging Hong Kong National Security Law alarmed many financial firms that were primarily conducting their China-related business there by adding legal uncertainty to their operations.⁶⁵ These costs could be particularly pronounced for hedge funds and traders that engage in short selling and investment activism, since there is a risk that Hong Kong's new

⁶¹ Lardy and Huang, 2020.

⁶² Telephone interview with industry group representative, October 22, 2020 (name withheld on request).

⁶³ Telephone interview with industry group representative, October 9, 2020; and October 22, 2020 (name withheld on request).

⁶⁴ Daniel Rechtschaffen, "Why China's Data Regulations Are a Compliance Nightmare for Companies," *The Diplomat*, June 27, 2019; Maranto, 2020; Laura Noonan, "Morgan Stanley Blocks Remote Network Access for China Interns," *Financial Times*, July 22, 2020.

⁶⁵ Telephone interview with industry group representative, September 22, 2020; and October 9, 2020 (name withheld on request).

security laws could leave them vulnerable for prosecution.⁶⁶ Some business leaders also worried that Beijing could use the new law to force foreign banks to do business with U.S.-sanctioned individuals or firms, thus putting them in legal and political jeopardy.⁶⁷

Other financial firms were concerned that the new law could be used to restrict critical research on publicly traded enterprises with majority state ownership, since certain aspects of their financial performance can be regarded a “state secret.”⁶⁸

On the more positive side, China agreed to increase access for U.S. financial firms as part of the Phase One deal, allowing U.S. companies to expand their operations in China.⁶⁹ That is, despite the Trump administration’s trade wars and increased U.S.-China competition since 2018, industry experts said that most U.S. financial firms with JVs in China plan to increase these operations to 100 percent ownership—even though profit streams from most U.S. financial JVs have historically been relatively immaterial from an overall financial perspective.⁷⁰ As one industry leader noted, the primary motivation for most IP-based firms—including virtually all financial firms—with JVs in China is to maintain market access, not necessarily to compete for large profits from these start-ups’ market shares.⁷¹ In other words, in the view of many U.S. financial firms, Chinese markets are a large source of volume, but not profits; market access is important for their global standing, but not their bottom line. That U.S. financial firms are willing to continue to operate unprofitably is equivalent to an options premium—although many foreign firms have lost money over the years by paying away those premiums.⁷²

At the time of the writing of this report, only a limited number of U.S. financial firms had already received the necessary approvals for full ownership of their JVs in China, while most others were still negotiating with their Chinese partners.⁷³ While a positive trend, the outcome of these ongoing negotiations remained highly uncertain, causing many companies to be concerned that geopolitical tensions could delay the approval of their applications or even halt the liberalization of the Chinese financial sector. That said, no U.S. financial industry representatives interviewed for this study could point to tangible, overt examples of political retaliation or pressure applied to their firms’ operations in China—or to major changes in the constant bargaining between the PRC government and foreign financial firms—as a direct result of the trade war.⁷⁴ While it is difficult to assess the net effect of the U.S.-China competition on the operations of U.S. financial firms, we can still discuss some first- and second-order implications on the industry, subsector by subsector.

First, it appears that the operations of U.S. regional banks were affected the least, since they usually do not operate subsidiaries or JVs in China. That said, growing U.S.-China competition and the imposition of tariffs in the escalating trade war have broadly increased uncertainty in financial markets and caused equity prices to fall, creating second-order effects throughout the entire U.S. financial sector.

⁶⁶ Hudson Lockett and Daniel Shane, “Hong Kong Hedge Funds Explore Exit as National Security Law Looms,” *Financial Times*, June 8, 2020.

⁶⁷ Primrose Riordan and Hudson Lockett, “Businesses in Hong Kong Fear Collateral Damage from Security Law,” *Financial Times*, July 1, 2020.

⁶⁸ Isabel Hilton, “Beijing’s Hong Kong Takeover Is a Masterclass in Creating Fear,” *Financial Times*, July 3, 2020.

⁶⁹ Tang, 2020; telephone interview with industry group representative, November 5, 2020 (name withheld on request).

⁷⁰ Telephone interviews with industry group representatives, October 22, 2020; October 30, 2020; and November 5, 2020 (names withheld on request).

⁷¹ Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

⁷² Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

⁷³ Lardy and Huang, 2020.

⁷⁴ Telephone interviews with industry group representatives, October 9, 2020; October 14, 2020; October 22, 2020; October 30, 2020; and November 5, 2020 (names withheld on request).

Second, the effect of increased U.S.-China competition on asset managers and large diversified banks has been relatively positive. On the one hand, they have been negatively affected by the market-wide macroeffects of the trade war (except in the case of traders who were successful in taking advantage of resulting market volatility). On the other hand, those firms that have operations in (or intend to expand into) China have benefited from increased market access and accelerated approvals by Chinese regulators in the aftermath of the Phase One deal.⁷⁵

Third, the operations of U.S. insurance companies were also set to benefit from increased access to China's domestic market in the aftermath of the Phase One deal. China had promised "to remove business scope limitations, discriminatory regulatory requirements, and overly burdensome licensing and operating requirements," the most extensive such commitment of all financial subsectors.⁷⁶ As one Deloitte study concludes, the operations of U.S. insurers should benefit from three competitive changes in the Chinese market: (1) elimination of requirements mandating that foreign firms must have operated for at least 30 years before accessing China, (2) loosening of ownership caps to permit wholly foreign-owned firms, and (3) removal of rules and regulation on branch establishment by foreign insurers, which do not apply to Chinese firms.⁷⁷ As of mid-2020, however, European and Asian insurance companies were the first foreign beneficiaries to receive approvals to set up wholly owned subsidiaries in China, followed by U.S. companies.⁷⁸

Finally, the operations of other financial institutions grouped into "diversified finance" have also seen significant improvements from China's opening-up policies. In January 2020, for example, American Express became the "first foreign credit card company to launch onshore operations in China." Similarly, in the credit rating services industry, in 2019 S&P Global became the first wholly foreign-owned firm "licensed to conduct

⁷⁵ For example, in September 2020 Citigroup became the first U.S. bank to receive a domestic fund custody license in China, while in early 2020, Goldman Sachs and Morgan Stanley both received approvals to increase their stakes of their JV securities firms in China (as Goldman Sachs Gao Hua Securities Company and Morgan Stanley Huaxin Securities Company) to a 51 percent majority ownership position (from 33 percent and 49 percent, respectively). Meanwhile, in June 2020 JPMorgan received permission to "operate a wholly foreign-owned futures firm" in China. Likewise, in August 2020 asset manager giant Vanguard announced that it would shutter its Hong Kong office and focus its Asian operations on mainland China, with its primary regional office in Shanghai, and BlackRock became the first foreign company to receive approval to set up a wholly owned mutual fund management company in China. In addition, BlackRock and Temasek Holdings received approval to jointly build an asset-management business in China with China Construction Bank, underscoring China's position as one of the priority regions for global asset managers. See Chad Bray, "US Banking Giant Citigroup Granted Custody License in China as Mainland Fund Sector Further Opens Up," *South China Morning Post*, September 2, 2020; Lardy and Huang, 2020; Chad Bray and Enoch Yiu, "Asset Management Giant Vanguard to Close Hong Kong Office, Exit ETF Business as Part of Strategic Reshuffle," *South China Morning Post*, August 26, 2020; "BlackRock Gets Approval to Set Up Mutual Fund Company in China," Bloomberg, August 31, 2020; and Lulu Yilun Chen, "BlackRock, Temasek Set Up China Asset-Management Joint Venture," Bloomberg Quint, August 22, 2020.

⁷⁶ Claire Reade, "Does the Phase One China Deal Measure Up? Depends on How You Measure," Center for Strategic and International Studies, January 22, 2020.

⁷⁷ Deloitte, 2020, p. 3.

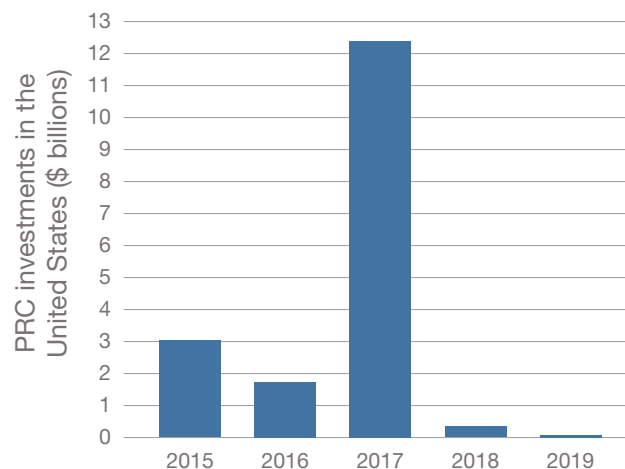
⁷⁸ In March 2019 UK insurance giant Heng An Standard Life was granted approval to form the first foreign-Chinese pension JV in China, while French corporation AXA Tianping became "China's biggest foreign-funded property and casualty (P&C) insurer" when it was allowed to take full ownership of its JV in late 2019. Chubb, a Swiss-incorporated insurance company that is also the largest commercial insurer in the United States, increased its stake in the Huatai JV from 30.9 percent to 46.2 percent in November 2019, while HSBC and Prudential were reportedly considering taking full control of their China ventures as of early 2020. As in other subsectors of the financial industry, the approval process for insurance licensing and business opening remains lengthy despite market reforms and, in 2019, foreign/JV insurers still accounted for only about 7.2 percent of China's massive and growing insurance market. See Dong Jing and Teng Jing Xuan, "Beijing Approves First Chinese-Foreign Pension Insurance Provider," Caixin Global, March 28, 2019. Wany Ying, "AXA to Take Full Ownership of JV in China," *China Daily*, September 3, 2019; Carolyn Cohn and Sinead Cruise, "Exclusive: Prudential Eyes Full Control of China Venture, Considers U.S. Options," Reuters, February 6, 2020; "HSBC Plans to Acquire the Remaining 50% Stake in HSBC Life," *Cailian Press*, May 2020; and Deloitte, 2020, pp. 3–5.

credit rating services in China’s domestic debt market” and in May 2020 Fitch’s established its first wholly foreign-owned subsidiary licensed “to rate China’s onshore issuers, including banks, nonbank financial institutions, and insurers, and their bonds.”⁷⁹

Although China’s financial opening benefited U.S. financial firms by expanding their operations in China, it is not clear that U.S. pressure or the range of actions taken by the Trump administration against China caused China to open up when it did. In late 2016, before the administration was in place, China’s National Development and Reform Commission had already revealed plans “to allow more foreign investment in banking, insurance, securities, and credit-rating firms,” although the extent and timeline for the change were not specified.⁸⁰ It is possible that China could have accelerated its liberalization plans to try to provide a “concession” to the Trump administration. It is also possible that there was no acceleration on Beijing’s part and that China repackaged what it intended to do anyway into the Phase One trade deal, allowing the U.S. side to describe the financial opening as a “win” for the Trump administration. In RAND interviews, U.S. financial sector and industry experts expressed doubt that China would have agreed to open up its financial markets if it was not in China’s interest to do so and that the Trump administration could, at most, take credit for accelerating the pace of liberalization, although even that is up for debate.⁸¹ As one interviewee commented, “Everyone knows what the end game is going to be—the only question is: How many years is it going to take to get it?”⁸²

With respect to Chinese investment in U.S. financial firms, there is some evidence to suggest that general increased U.S.-China tensions and measures the Trump administration took against China may have limited such PRC activities after 2017 (see Figure 8.3). Driven by a one-time jump in 2017, China engaged in levels of investment in the U.S. financial sector (a total of \$17.5 billion) from 2015 onward similar to the levels of investment in the manufacturing (\$16.2 billion) and technology (\$12.5 billion) sectors. But in 2018 and 2019,

FIGURE 8.3
PRC Investment in the U.S. Financial Sector, 2015–2019



SOURCE: Rhodium Group and National Committee on U.S.-China Relations, undated.

NOTE: Data include PRC investment in U.S. financial and business services; figures are current-year dollar amounts.

⁷⁹ Lardy and Huang, 2020. See also “Visa, Mastercard, AmEx Win Easier Access to China Market,” 2020.

⁸⁰ Kevin Yao and Engen Tham, “China to Relax Curbs on Foreign Investment in Financial Sector,” Reuters, December 29, 2016.

⁸¹ Telephone interviews with industry group representatives, September 22, 2020; October 9, 2020; and November 5, 2020 (names withheld on request).

⁸² Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

the level of investment declined dramatically. Furthermore, investment in the financial sector does not represent a significant stake in the U.S. financial industry.

Sales and Marketing

Our analysis did not find strong evidence to suggest that increased U.S.-China competition during the Trump administration adversely affected U.S. financial firms' sales and marketing activities. Aggregate exports of financial services by U.S. firms to China, for example, increased by over 18 percent between 2017 and 2019, from \$4.0 billion to \$4.8 billion.⁸³ Among large diversified banks, most S&P 500 firms in our sample saw an increase in sales to China between 2017 and 2019, with Bank of New York Mellon Corporation, Citigroup, and Morgan Stanley reporting the largest increases over the two-year period.⁸⁴ Most of the growth occurred in financial intermediation services, securities lending and electronic funds transfer, and other financial services (mainly comprised of underwriting and private placement and credit cards and other card-related services). However, as noted earlier, it is important to remember that most U.S. banks have a relatively low baseline exposure to the Chinese market and mostly view China as a source of future sales growth rather than current revenue.⁸⁵

Asset managers also have a low exposure to the Chinese market in terms of global sales but increasingly view Chinese equity and debt as important elements in their global investment portfolios—and thus also an important component of their strategies to market new diversified products to boost sales and profits. This process is accelerating with the inclusion of Chinese bonds and equities into emerging market and global indexes, leading to a shift in strategic allocations toward greater exposure to Chinese assets.⁸⁶ In particular, the returns on Chinese debt instruments are looking more attractive relative to the returns in Europe and the United States, where the yields on government bonds are rather low given the current near-zero-interest-rate environment.⁸⁷ Most hedge funds also continued investing in Chinese assets looking for higher returns and diversification as a result of the accelerated competition between the two countries. Ray Dalio, the head of Bridgewater Associates, described a prevalent view that “China is a competitor of the United States or Chinese businesses are competitors of American businesses or other business around the world, and that therefore you want to be, if you’re diversified, having bets on both horses in the race.”⁸⁸

Perhaps more important, China remains the “largest untapped pool of capital in the world,” with over \$28 trillion in citizens’ bank deposits.⁸⁹ This offers opportunities to foreign asset managers, who can significantly

⁸³ BEA, “Table 2.2: U.S. Trade in Services, by Type of Service and by Country or Affiliation,” webpage, October 10, 2020c.

⁸⁴ According to FactSet estimates, the picture for most other large banks is mixed, since most witnessed an increase in revenue from China in 2018 and a subsequent decrease in 2019 (but with an overall increase over the three-year period). Bank of America appears to be the only large U.S. bank to experience an overall decline in revenue from China between 2017 and 2019. FactSet, 2019.

⁸⁵ In 2019, China represented only about 3.5 percent of total global exports of U.S. financial services, which equaled \$135.7 billion. Shari A. Allen, Alexis N. Grimm, Christopher Paul Steiner, and Rudy Telles Jr., “U.S. International Services: Trade in Services in 2019 and Services Supplied Through Affiliates in 2018,” *Survey of Current Business*, Vol. 100, No. 10, October 2020, Table B, p. 14.

⁸⁶ Kimberley Stafford, Tomoya Masano, Robert Mead, and Stephen Chang, “Investing in China: Evolving Opportunities,” PIMCO, August 27, 2018.

⁸⁷ Ian Hui and Chaoping Zhu, “Enhance Yields with Chinese Bonds in the Zero Interest Rate Era,” J.P. Morgan Asset Management Singapore, June 18, 2020.

⁸⁸ Ray Dalio, quoted in Elliott Smith, “Bridgewater’s Ray Dalio Backs China Despite Trade War Escalation,” CNBC, August 7, 2019.

⁸⁹ World Economic Forum and Oliver Wyman, *China Asset Management at an Inflection Point*, Geneva: World Economic Forum, July 2020.

increase their assets under management by establishing solo ventures or partnerships with local players. For example, Invesco's Great Wall JV in China quadrupled its assets under management to \$31.5 billion in less than a year after entering into a partnership with Ant Financial.⁹⁰ Global banks and asset managers are also exploring new revenue opportunities offered by China's external economic activities—namely, the BRI.⁹¹

Insurance companies also increased their sales in China in 2019 relative to 2017. While data for individual companies show a mixed pattern, the overall premium income from foreign or Sino-foreign JV insurance companies increased by 29.9 percent year on year in 2019, double the growth rate of China's domestic insurers.⁹² As with asset managers and large banks, the main focus of U.S. insurers appears to be on future growth potential of mainland China's underdeveloped insurance market rather than current revenue streams.⁹³ For example, according to a recent analysis by Deloitte, China's per capita insurance rate is only about 0.6 policies per person, compared with about 6.5 and 4.2 in Japan and the United States, respectively, and there have traditionally been far fewer product choices in China's current insurance markets than in more developed ones, creating greater potential for market penetration by U.S. firms in this subsector of the financial industry than in others.⁹⁴ The fact that “sales channels and customer services are not well developed” in the Chinese market often results in “higher insurance coverage than customers' risks may actually need”; new U.S. insurers may thus have competitive advantages in capturing segments of the growing middle class's “demand for better insurance products and services.”⁹⁵

Notably, there was one important source of uncertainty that ran through several financial sector interviews: Industry leaders specifically voiced concerns about their ability to compete in China if future U.S. sanctions regimes were to target WeChat, the monopolistic Chinese-owned messaging and payment application that is insulated by PRC state policy from global competitors like Facebook. At time of this writing, the Trump administration's WeChat ban directly targeted only the app's 19 million domestic users in the United States. But given cases pending in the federal court system, the future legal implications for U.S. financial firms desiring to conduct business in the PRC are much less clear.⁹⁶ Some U.S. financial industry executives we interviewed indicated that virtually all aspects of their local business model and client interface—such as sales, marketing, billing, customer service, and even direct communication with government regulators—are

⁹⁰ Richard Henderson, “Invesco Reaps \$14bn in Funds Through Alibaba Tie-Up,” *Financial Times*, May 21, 2019.

⁹¹ Telephone interview with industry group representative, September 23, 2020 (name withheld on request). For example, the Invesco Belt and Road Debt Fund “invests primarily in debt instruments of emerging countries . . . which . . . could directly or indirectly benefit from the Belt and Road Initiative”; Invesco, “Invesco Belt and Road Debt Fund,” webpage, undated. Other major American and European banks and asset managers have launched similar initiatives. In February 2019, Deutsche Bank launched its BRI hub dedicated to providing “global and local support for BRI-related business”; Deutsche Bank Corporate Bank, *China's Belt and Road Initiative: A Guide to Market Participation*, Frankfurt: Deutsche Bank, November 2019, p. 5. Despite the geopolitical and debt sustainability concerns surrounding the Chinese investment drive, Western banks see the BRI as an opportunity to provide ancillary services, such as foreign exchange, trade finance, interest rate swaps, and cash management to the companies involved in infrastructure projects; Martin Arnold, “Western Banks Race to Win China's Belt and Road Initiative deals,” *Financial Times*, February 26, 2018. At the same time, U.S. financial institutions generally tend to avoid the risk associated with acquiring equity stakes in individual BRI projects. Indeed, some analysis suggests that in order to externalize some of the risk to Chinese financial companies associated with future BRI debt servicing problems, the PRC is in fact now “encouraging U.S. and European investment banks and institutional investors to put capital into Belt and Road projects”; Kliman, 2019, p. 5.

⁹² Estimate by Sina.com, cited in Deloitte, 2020, p. 3.

⁹³ See, for example, Chubb Limited, *Chubb Limited Annual Report 2019*, Zurich: Chubb Limited, February 27, 2020, p. 13.

⁹⁴ Deloitte, 2020, p. 5.

⁹⁵ Deloitte, 2020, p. 6.

⁹⁶ Nicole Hung, “WeChat, Wild Rumors and All, Is Their Lifeline. Washington May End That,” *New York Times*, October 5, 2020.

highly dependent on the WeChat platform and that U.S. government policies designed to mitigate national security risks posed by the app's collection of data on American users could erode their ability to maintain and compete for new market share. Moreover, they questioned whether U.S. firms could be penalized for a financial transaction that originated in mainland China or Hong Kong via WeChat and then migrated into the U.S. financial system. Multiple industry leaders said that this regulatory uncertainty resulting from “ambiguous” and “opaque” U.S. government policy has had a strong, adverse impact on their business strategy making.⁹⁷

Finally, despite the overall bias toward long investment positions and the general dislike of volatility that accompanies trade wars and geopolitical tensions, some financial firms have seen benefits from increasing volatility.⁹⁸ For example, financial exchanges have seen increased trading volumes as market participants tried to hedge their bets during the heights of the trade war.⁹⁹ Some hedge funds and investment funds also benefited from increased volatility and trading products like leveraged and inverse exchange-traded funds, which rise in value when markets go down.¹⁰⁰ Increased geopolitical tensions also expanded the market for certain insurance products, such as trade credit insurance and political risk insurance.

Research and Development

The research that financial companies do is not comparable to the R&D that manufacturing or technology firms engage in, and it is difficult to assess or quantify changes in R&D in the finance industry over time. That said, U.S. financial leaders interviewed generally concurred that the Trump administration's economic policies toward China had no discernible industry-wide effect on investment in R&D activities.¹⁰¹ As one interviewee explained, unlike R&D in industries such as petrochemicals, pharmaceuticals, and defense, most R&D value added in the financial industry lies in software development (i.e., adding layers of logic inside existing platform systems)—which has not been manifestly affected by the U.S. trade war.¹⁰² That is, regardless of White House policies, Chinese rules require U.S. financial firms' systems and software to be hosted in China, making overseas R&D prone to reverse engineering. Another voice from the fintech sector noted, for example, that the U.S. financial industry simply does not do much critical R&D in China due to the underlying IP and legal concerns.¹⁰³ Other interviewees similarly concurred that the issue of moving proprietary client and IP data offshore is generally less of a concern for U.S. financial firms than it is for technology and manufacturing firms.¹⁰⁴

⁹⁷ Telephone interviews with industry group representatives, September 22, 2020; October 9, 2020; and November 5, 2020 (names withheld on request).

⁹⁸ Telephone interview with industry group representatives, October 9, 2020 (names withheld on request).

⁹⁹ Isis Almeida, “World's Biggest Derivatives Exchange Is Getting a Boost from Trade War,” Bloomberg, October 30, 2018.

¹⁰⁰ Samuel Shen and Andrew Galbraith, “Chinese Bears See Trade War Worsening, Flee to Safe Havens, Derivatives,” Reuters, August 8, 2019; Brian J. O'Connor, “Want to Profit from a Trade War? There's an Investment Fund for That,” *New York Times*, July 11, 2019.

¹⁰¹ Telephone interviews with industry group representatives, October 30, 2020; and November 5, 2020 (names withheld on request).

¹⁰² Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

¹⁰³ Telephone interview with industry group representative, October 30, 2020 (name withheld on request).

¹⁰⁴ Telephone interviews with industry group representatives, September 22, 2020; and October 9, 2020 (names withheld on request).

Employment and Human Resources

The Trump administration's policies on China have also not had a major effect on general employment and hiring practices in the financial industry. Overall, between January 2017 and March 2020, total employment in the U.S. financial industry increased every month, from 8.4 million jobs to 8.8 million jobs—until the start of the global COVID-19 pandemic, when 261,000 jobs were lost in April 2020, according to the BLS.¹⁰⁵ Employment has since rebounded month over month.

Like other industries, however, the tightening immigration regime in the United States under the Trump administration arguably made it more difficult for financial companies to hire Chinese nationals domestically—but this problem appears less germane for U.S. firms in finance, than, say, high-tech firms in Silicon Valley.¹⁰⁶ Indeed, in our interviews during the fall of 2020, U.S. financial sector executives did not report any notable disruptions to their ability to hire and maintain talent domestically as a result of tighter immigration restrictions¹⁰⁷—despite the fact that, industry-wide, the rejection rate for high-skilled workers attempting to obtain H-1B visas rose under the Trump administration from 6.1 percent in 2016 to 15.1 percent in 2019.¹⁰⁸

Part of this is because of the way financial companies have adapted already. American financial companies that are expanding their operations in China increasingly rely on local talent, mainly because of China's increasing pool of young, highly skilled professionals who know the domestic market. China's financial opening has likely resulted in further localization of human resources, at least marginally, amid rising geopolitical tensions between the two countries. Discussions with contacts in leading financial institutions suggested that increasing emphasis on local hiring is part of a deep localization strategy that could insulate companies in times of geopolitical tensions.¹⁰⁹ For example, Goldman Sachs's five-year strategic plan included doubling its personnel in China, but finding, competing for, and compensating the right local talent may be challenging.¹¹⁰ As another example, S&P Global has chosen to hire the majority of its employees locally, while bringing in more experienced employees who are native Mandarin speakers from other offices outside China. Likewise, to break into the Chinese life insurance subsector, some major U.S. insurers have adapted their U.S. business models to focus on retail-based sales of life policies with an entirely domestic Chinese agent force and telephone sales team.¹¹¹

Multiple U.S. industry executives interviewed for this study, however, expressed concerns about their ability to retain highly skilled, multilingual young professionals in China. According to them, local talent are at risk of “being poached” by or “jump[ing] ship” for competitive opportunities with domestic and state-owned financial firms.¹¹²

¹⁰⁵ BLS, 2021a.

¹⁰⁶ Michelle Hackman, “Trump Moves to Temporarily Suspend New H-1B, Other Visas amid Covid-19 Pandemic,” *Wall Street Journal*, June 23, 2020.

¹⁰⁷ Telephone interviews with industry group representatives, September 22, 2020; October 22, 2020; October 30, 2020; and November 5, 2020 (names withheld on request).

¹⁰⁸ Michelle Hackman, “New Rules for H-1B Visas: What You Need to Know,” *Wall Street Journal*, October 7, 2020.

¹⁰⁹ Telephone interviews with industry group representatives, September 22, 2020; and September 23, 2020 (names withheld on request). See also Michael Witt, “Prepare for the U.S. and China to Decouple,” *Harvard Business Review*, June 26, 2020.

¹¹⁰ Chan, 2020.

¹¹¹ Telephone interview with industry group representative, September 22, 2020 (name withheld on request).

¹¹² Telephone interview with industry group representative, September 22, 2020; and October 9, 2020 (name withheld on request).

Changes Since the Onset of COVID-19

In the short term, the most immediate consequence of the COVID-19 pandemic on the financial industry's core business activities in China was a deepening of digital capabilities, including both virtual sales and essential client services, such as document signatures, billing, and claims.¹¹³ Indeed, industry leaders believed that these adaptations in virtual consumer connections will have an enduring effect on the financial services industry's business operations in China. Anecdotally, for example, financial officers cited their expanded reliance on the WeChat platform for both back-of-the house operations and client interface throughout the pandemic.¹¹⁴

One industry representative also reflected that a significant, enduring consequence of the pandemic for financial firms—like those in tech and manufacturing—will be the realization that “resilience is now worth a cost.” Whereas for tech and manufacturing firms, creating resilience might be an exercise in building supply chain redundancies, in the case of financial firms, developments in resilience are more likely to take the form of distributed computer networks.¹¹⁵

For the U.S. financial industry's longer-term interests in China, the most direct effect of the COVID-19 pandemic may be a flood of nonperforming loans for Chinese banks, particularly from corporate borrowers (including SOEs), as the banks continue to “clean up their balance sheets and offload risky assets” that partly fueled the unprecedented banking industry expansion of the last decade discussed previously.¹¹⁶ In the short term, the PRC government put in place loan forbearance programs, as well as new preferential lending programs for firms determined as essential to the pandemic response. But to attract new foreign capital into the banking system over the long run, the Chinese government may eventually need to increase foreign investor confidence in the financial system with a bail out of domestic banks—namely, by directly buying COVID-related nonperforming loans off the balance sheets.¹¹⁷

Less directly, and over longer time horizons, the pandemic's enduring effect on the operations of U.S. financial firms in China will be mainly a function of consequences for GDP growth and a positive interest rate. Both factors played in China's favor in late 2020 given the forecasted pace of economic recovery and the zero-rate policies in Europe and the United States. While there are many reasons to doubt the accuracy of China's official GDP statistics, most forecasts from international institutions and major financial firms predicted a faster economic recovery in China relative to most advanced and developing economies.¹¹⁸ In areas like insurance and personal wealth management, one crosscurrent to macroeconomic slowdown may be a decline in risk tolerance for uncertainty—and an increase in demand for these financial products for those who can afford them.¹¹⁹

¹¹³ Telephone interview with industry group representative, September 22, 2020 (name withheld on request).

¹¹⁴ Telephone interviews with industry group representatives, September 22, 2020; October 9, 2020 (names withheld on request).

¹¹⁵ Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

¹¹⁶ According to survey evidence from early in the pandemic, nearly nine in ten small and medium businesses indicated that they could not survive a prolonged shutdown and that bank loan repayments were among their top burdens. Bisio, 2020, p. 15.

¹¹⁷ Bisio, 2020, p. 15.

¹¹⁸ On China's GDP statistics, see, for example, Wei Chen, Xilu Chen, Chang-Tai Hsieh, and Zheng Song, “A Forensic Examination of China's National Accounts,” Cambridge, Mass.: National Bureau of Economic Research, NBER Working Paper 25754, 2019. On economic projections, see International Monetary Fund, *World Economic Outlook Update June 2020: A Crisis like No Other, an Uncertain Recovery*, Washington, D.C.: International Monetary Fund, June 24, 2020; and Organisation for Economic Co-operation and Development, *OECD Economic Outlook*, Volume 2020, No. 1, Paris: Organisation for Economic Co-operation and Development, June 10, 2020.

¹¹⁹ Telephone interview with industry group representative, September 22, 2020 (name withheld on request).

Responses to Shape U.S. Policies or PRC Responses

Overall, U.S. financial industry leaders interviewed expressed neither approval for nor deep anxieties about the prospect of tougher U.S. economic policies leading to harmful restrictions on operations or transactions with Chinese firms or individuals, at least not in the near- or medium-term future. As one interviewee noted, when most American firms (i.e., in tech and manufacturing) approach the U.S. government to shape policies toward China, they generally are seeking substantive help with enforcement issues or protection from IP violations—but less so financial firms.¹²⁰

In general, leaders of the U.S. financial industry have remained relatively reticent in expressing their criticisms of recent U.S. government policy actions toward the PRC as a result of escalating U.S.-China competition. Indeed, in interviews with the RAND research team, some industry insiders explained that the Trump administration's perceived tendency to "name and shame" U.S. business leaders and firms has deterred more vocal opposition to White House trade policies in public forums.¹²¹

Instead, in RAND interviews, some industry insiders explained that the escalating trade war (and other U.S. policy actions) have driven corporate leaders in the U.S. financial industry to take a more active role in serving in leading advisory boards and business councils as a preferred channel to conduct advocacy activities. One interviewee noted that this practice was viewed as providing shelter from potentially retaliatory Trump administration rhetoric by aggregating private-sector perspectives on a particular issue.¹²²

U.S. financial industry leaders interviewed also acknowledged that direct engagement remained an important way to express policy positions and assert a seat at the table—namely, through the access, influence, and communication channels of high-level individuals and Washington lobbyists.¹²³ However, one business community leader expressed the feeling that many career officials at agencies such as the DOC and the USTR had been pushed out of the policymaking process during the Trump administration, sometimes harming financial giants' ability to influence the White House's U.S.-China economic initiatives through typical input channels with the professional staff of the relevant federal agencies.¹²⁴

Overall Effect of Increased U.S.-China Competition on the Sector

Generally, the U.S. financial sector has been unenthusiastic about most punitive measures resulting from increased U.S.-China competition, such as tariffs, financial sanctions, and restrictions on foreign talent. These reactions stem from a set of structural features of the U.S. financial industry, including its dominant position in the global market, long positions in assets and global diversification, strong belief in capital mobility, and aversion to uncertainty and market volatility.

The dominant position of U.S. financial institutions means that they do not view Chinese firms as serious competitors in the global market. For the most part, U.S. finance majors compete with each other and, increasingly, with other U.S. technology companies. They view China as a market and a business opportunity, not as a competitor. U.S. financial firms are generally further removed from the nexus with national

¹²⁰ Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

¹²¹ Telephone interviews with industry group representatives, September 22, 2020; and October 22, 2020 (names withheld on request). This was similarly echoed "Is Wall Street Winning in China?" 2020.

¹²² Telephone interviews with industry group representatives, September 22, 2020; October 22, 2020; and November 5, 2020 (names withheld on request).

¹²³ Telephone interviews with industry group representatives, October 22, 2020; October 30, 2020; and November 5, 2020 (names withheld on request).

¹²⁴ Telephone interview with industry group representative, November 5, 2020 (name withheld on request).

security than are many tech and manufacturing companies. A long position in assets means that the industry is focused on growth, both in the United States and globally, including in the Chinese market. The global exposure of American finance majors implies that they may suffer from the second-order consequences of the U.S.-China competition, such as the potential deceleration in other emerging economies due to a potential slowdown in the Chinese economic growth due to trade wars, technology restrictions, and fallout from the global pandemic. There are certain exceptions, as some hedge funds may thrive on disruption while trading platforms may see increased volume in times of tensions, but overall the focus remains on the long-term growth of assets and geographic diversification. The latter also implies that China's economic performance will likely lead to increased allocations of U.S. capital to the Chinese equity and bond markets, and, conversely, of Chinese capital to Western markets.

Overall, despite increased policy uncertainty and market volatility induced by the trade war—as well as tightening security legislation in mainland China and in Hong Kong—the Trump administration's policies toward China have had a neutral effect on the U.S. financial sector (see Table 8.2). Although China increased market access for asset managers, banks, insurance firms, and other financial services firms and credit rating agencies, it is debatable whether China did so as a result of pressure from the Trump administration or out of its own interest. Industry insiders believe that the Trump administration *at most* accelerated China's timeline for market reforms. Other actions by the administration did help U.S. companies—for example, in U.S. domestic markets, escalatory policy retaliations have encouraged increased transparency and regulatory oversight of Chinese firms publicly traded on American exchanges.

TABLE 8.2
Effect of the Trump Administration's China Policies on the Financial Sector

Business Functions	Impact on Sector
Operations	Neutral/positive?
Sales and marketing	Neutral/positive?
Finance	(Not applicable)
R&D	Neutral
Employment and human resources	Negative
Overall	Neutral

Conclusions and Implications for the U.S. Government

The U.S. legal and regulatory environment has been an important factor in U.S. business success. Laws enable the enforcement of contracts, the protection of IP, and the raising of capital. Ultimately, the U.S. business community will follow whatever laws and regulations the U.S. government institutes regarding doing business with China, but there are three notable cautions. First, U.S. businesses will certainly try to find legal workarounds, at times staying within the letter of the law rather than the spirit. Second, U.S. laws regarding doing business with China could disadvantage U.S. businesses in relation to foreign competitors, which may not have the same restrictions, with the result that only the U.S. businesses are hurt and policy goals regarding China are not met. Third, as noted in Chapter Eight, there is ambiguity about how the new U.S. measures will be applied, and this could lead to lower levels of business activity out of caution. This ambiguity would compound the ambiguity that China has already created through the way it applies its laws and regulations. Because of these three cautions, there is value to having a stronger understanding of how U.S. businesses have viewed *and adapted to* new U.S. measures regarding China.

Business Community Support for U.S. Policies Toward China

The U.S. business community broadly agreed with the Trump administration's identification of problematic Chinese behavior and practices. These concerns included PRC government support for Chinese companies that gave them an unfair advantage in China and globally; barriers to obtaining licenses and approvals for operations in China; barriers to investing in China; uneven enforcement of PRC regulations and laws or an uncertain PRC policy climate; lack of IP rights enforcement or protection for operations in China; lacking cybersecurity and technology security for operations in China, including negative consequences of China's cyberregulation and data regulation for business operations; and restrictive PRC capital controls. We found this support across all three sectors and across U.S. firms with different market capitalization and different customer bases (whether domestic and international).

It is important to note that despite such concerns over unfair PRC government actions and regarding operations in China, many business leaders we interviewed continued to see the large China market as an opportunity and their companies sought to expand business or operations in China or continue to engage in transactions with Chinese companies. This aligns with our national survey of U.S. individuals from March to April 2020, in which we found 49 percent of all respondents viewed China as an economic opportunity, compared with 36 percent that viewed it as an economic threat and 15 percent that viewed it as neither an economic threat nor opportunity. Our study thus found only limited support from the U.S. business community for a broad decoupling between the U.S. and Chinese economies.

The U.S. business community, however, had concerns with some of the specific approaches and measures the administration embraced to address the situation. In the manufacturing and technology sectors, U.S. corporate leaders felt that unilateral tariffs and restrictions on the types of activities and transactions U.S.

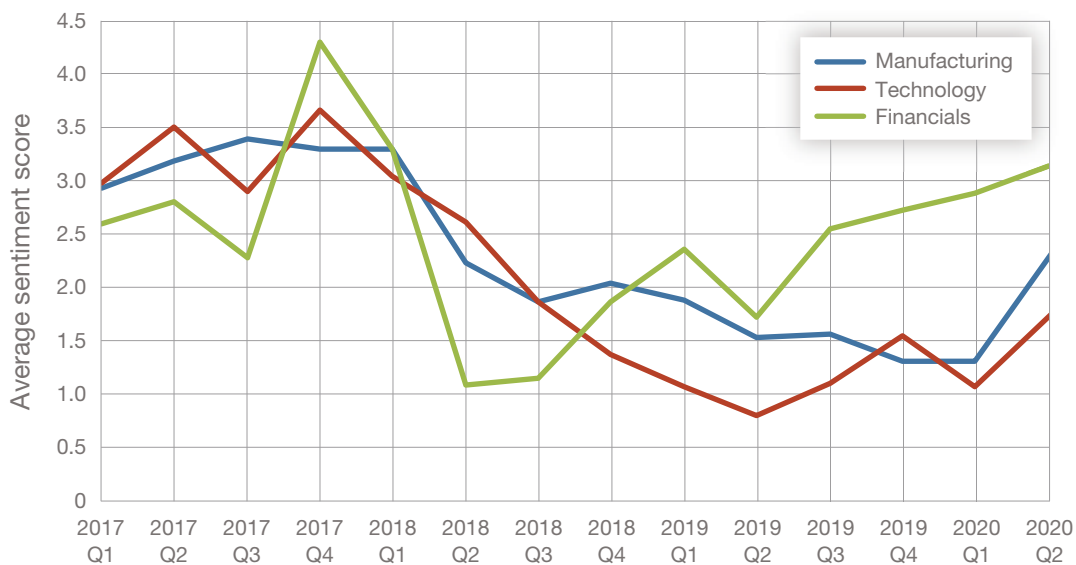
companies could conduct with Chinese actors or in China placed the companies at a disadvantage and did not significantly change or modify PRC behavior. Many corporate leaders voiced concern that the tariffs that the United States levied on Chinese products hurt U.S. businesses more than Chinese ones.

In particular, there was very little support for Section 301 tariffs. Industry groups and specific companies noted the need for the United States to embrace a more balanced approach toward China that incorporates “both carrots and sticks, leverage and direct negotiation, existing trade enforcement tools and new ones crafted to China’s market-distorting behaviors.”¹ The Motor & Equipment Manufacturers Association, for example, has recommended that the United States combine more targeted PRC policies with “sustained bilateral negotiations with China that pocket progress as it occurs, as well as multilateral negotiations and pressure in concert with USMCA, EU, Japan, and other allies.”² A number of corporate leaders we interviewed voiced concern that the tariffs encouraged Chinese companies to switch to working with European or Japanese firms and did not change PRC government support for Chinese companies.

Corporate leaders across all three sectors further expressed frustration at what they perceived to be the inconsistent way in which the Trump administration consulted U.S. businesses for input and information before rolling out major policy changes and reforms. To some, the administration appeared to consult companies and corporate leaders that were more supportive of the president’s overall political platform and agenda. To others, some of the administration’s economic policy and actions toward China were relatively difficult to predict and did not seem to follow known timelines. Coupled with the uncertainty associated with the COVID-19 pandemic, the administration’s actions undermined their firms’ ability to engage in long-term corporate planning. One executive, for example, mentioned that he could only plan for the next three to four months.

Of the three sectors examined in this report, the financial sector had more positive assessment of the Trump administration’s China-related actions than the other sectors. Figure 9.1 shows how S&P 500 compa-

FIGURE 9.1
Average China-Related Sentiment by S&P 500 Sector, 2017–2020



¹ L. Dempsey, 2019, p. 2.

² Wilson, 2019.

nies viewed their China-related operations through coding and averaging what individual companies stated in the transcripts of their quarterly earnings calls. A higher average sentiment score captures greater optimism and positive assessments of the firms' China-related operations or activities. As is shown, the average sentiment score for U.S. manufacturing and technology dropped from 2017 to mid-2020. In contrast, the average sentiment score for U.S. financial companies had a bit more volatility in late 2017 and early 2018 (both spiking and dipping) before rising. Financial companies had a Q2 2020 average sentiment score that was higher than their Q1 2017 score.

The financial sector also benefited the most from the Trump administration's China-related economic policies. As summarized in Table 9.1, the overall effect of the Trump administration's actions toward China was neutral for financials. This contrasts with the overall negative consequences the manufacturing and technology sectors experienced from 2017 to 2020.

Part of why the financial sector fared the best is because the Trump administration did not view deeper U.S. and Chinese financial integration as a major threat to U.S. national security and interests compared with the threat it assessed from China on the manufacturing and technology fronts—whether, for example, in the form of concerns about U.S. manufacturers being able to compete with Chinese companies or PRC theft or acquisition of U.S. IP rights or dual-use technology.

Instead, during the Trump administration, U.S. financial firms obtained more access to the PRC financial market. It is unclear if the administration's policies caused China to accelerate liberalization of its financial markets or if China was already on track to do so due to internal PRC considerations. Chinese policymakers may have sought to open their financial markets to leverage foreign expertise to professionalize the sector and deal with the range of problems the current PRC financial sector faces, including nonperforming loans. Beijing appears to have also timed its financial market liberalization until after key Chinese companies, such as the e-commerce companies like Ant Financial, Alibaba, and Tencent, have established significant market dominance.

The financial sector also had less to lose. Relative to the manufacturing and technology sectors, U.S. financial firms listed in the S&P 500 index are significantly less dependent on revenues from China. Nearly six in ten U.S. financial firms listed in the index had no reported global sales to the PRC in 2019—including 100 percent of regional banks, 58 percent of asset managers and banks, 52 percent of insurance companies, and 38 percent of diversified finance firms. This share is in marked contrast to the manufacturing and technology sectors, where only 21 percent and 13 percent of S&P 500 firms, respectively, reported no global sales to China. China is also currently a modest destination of FDI from the U.S. financial sector (\$14.6 billion)—slightly more so than from the U.S. technology sector (\$12.6 billion), but significantly less so than from the U.S. manufacturing sector (\$43.8 billion).

TABLE 9.1
Effect of the Trump Administration's China Policies on U.S. Business Sectors

Business Functions	Manufacturing	Technology		Finance
		Hardware	Software	
Operations	Negative	Negative	Neutral	Neutral/positive?
Sales and marketing	Negative	Negative	Negative	Neutral/positive?
Finance	Negative	Negative	Negative	(Not applicable)
R&D	Negative	Neutral	Neutral	Neutral
Employment and human resources	Negative	Negative	Negative	Negative
Overall	Negative	Negative	Negative	Neutral

Looking beyond the economic considerations driving the Trump administration's economic measures against China, we found mixed support from the U.S. business community on whether the United States should use economic sanctions to encourage China to change its geopolitical positions or practices. A few U.S. corporate leaders we interviewed expressed strong views that corporations should be willing to support overall U.S. government policy even if it meant that, at least in the short term, U.S. companies may have to suffer economic losses. Others, however, pointed out that using economic sanctions for political purposes risks generating techno-nationalism not only in China but globally. This could have significant negative consequences for larger U.S. firms serving an international market. It is possible that consequences could be mitigated if other major advanced economies joined in the sanctions, but the people we interviewed did not raise this issue, nor did we pursue it in our discussions. Our survey results of U.S. individuals also portray a split view on this topic, with more individuals in favor of supporting U.S. policy at an economic cost: we found that 60 percent of individual respondents were in favor of U.S. companies not selling goods and services to Chinese actors that undermine U.S. interests or values even if it weakens the U.S. economy. Forty percent did not support such limitations.

Our survey results also found that the U.S. government may not always need to take action against problematic PRC products or actors—the U.S. public (and consumers) may avoid buying PRC products if they are informed of the risks. We asked U.S. individuals if they would be willing to buy a Huawei telephone given that the U.S. government has said that Huawei, a Chinese telecommunications company, could be collecting user information and intelligence on behalf of the Chinese military (Huawei has disputed such allegations) and many countries use Huawei phones. We found that 83 percent of respondents were not willing to buy the Chinese phone.

Recommendations for the U.S. Government

In formulating any policy toward China, it is important to recognize that China is intertwined with the U.S. and global economies and that China is a large economy and getting larger. The United States has limited leverage on its own, and any policy is likely to have costs. While the Trump administration's policies can be criticized, coming up with effective alternatives is not a simple task. With that in mind, our research suggests a number of recommendations for how the Biden administration can improve its ability to work with the U.S. business community to advance U.S. economic interests and counter problematic PRC economic behavior:

- **Adopt an economic strategy toward China that balances efforts to counter China with investments in strengthening and sustaining U.S. economic and technological leadership.** The Trump administration's economic approach to compete with China was largely focused on countering China via imposing unilateral tariffs on Chinese trade, preventing Chinese control of sensitive U.S. technology, and limiting transfers of U.S. technology to China. Although the administration did seek to invest domestically to strengthen U.S. technological leadership, it decided to increase investment in select areas (e.g., AI and quantum physics) and not in basic science. There are a large number of measures the Biden administration could embrace to help the United States and U.S. companies compete with China. In general terms, the administration could increase funding for science, technology, engineering, and mathematics education and research or provide tax incentives for companies to invest more in R&D. More specifically, U.S. policy development could be directed toward providing new methods of skill building beyond traditional educational programs; explore programs to improve labor market matching to make better use of human capital; and create programs or facilities, such as shared design or production centers, to accelerate the diffusion of advanced manufacturing techniques.

- **Embrace the full range of trade and economic tools to counter China and expand those tools.** The new administration could also do more to employ a fuller range of tools to counter problematic PRC behavior. For example, the United States can work to restore the dispute resolution system in the WTO and more aggressively pursue cases there. The United States currently seizes counterfeit and pirated goods and has a process to block imports of items with stolen IP; this could be broadened to block any import from a company using stolen IP. Other policies could include measures involving reciprocal treatment for market access and more aggressively limiting Chinese investment or ownership in the United States. Aside from capital returns to recipients of investment, it is not clear that Chinese investment brings the most important benefits of FDI, such as new management methods and markets. In combination, these tools could help U.S. companies compete on a more level playing field and obtain more market access in China without necessarily requiring U.S. companies to incur the costs of tariffs or limits on their activities in China.
- **Work with allies and partners to embrace multilateral measures against problematic PRC activities.** The Biden administration should consult allies and partners prior to embracing major economic actions and, if possible, adopt multilateral instead of unilateral economic actions. Unilateral U.S. political or economic pressure against problematic PRC economic behavior is unlikely to change China's behavior and may hurt U.S. businesses instead of benefiting them. Unilateral restrictions on economic activity with China also risk larger geopolitical ramifications beyond the U.S.-China relationship and could influence other countries to adopt similar protectionist measures to protect their manufacturing or technology sectors. This could challenge existing global economic rules that support an open market and free trade. Although the U.S. economy is larger than the Chinese economy, the U.S. economy combined with the economies of its EU, G7, and other allies is far larger still, and even more important to the Chinese economy; the EU and the United States are the dominant import markets for Chinese businesses, and China relies on those sales for employment and growth.
- **Regularly consult U.S. business leaders in advance of major policy changes.** U.S. business leaders have significant information and experience dealing with the Chinese government and competing against Chinese firms, and they can provide valuable input into potential major economic U.S. policy changes or actions targeting China. According to our interviews, this was one of the biggest gaps in Trump administration policy implementation. Even if U.S. corporate leaders disagree with a proposed policy change, consultations and advance notice will allow them to better plan and adapt business operations accordingly. Furthermore, greater consultation could make them less likely to resist such policies.
- **Avoid U.S. government actions that target the Chinese people.** There is little public support in the United States for limiting PRC nationals from studying or working in the United States. Chinese students and workers also contribute significantly to the U.S. economy and U.S. companies as valuable colleagues and business leaders.
- **Adopt an information strategy to better inform the public about the risks of or problems associated with PRC products.** Our survey results showed that, when informed of the potential risks of a Chinese phone, a majority of the U.S. public declined to purchase the phone. This suggests that the United States could invest in efforts to publicize information regarding the operations and relationships of problematic Chinese companies and allow U.S. customers make informed decisions on what products to purchase. These information activities could be conducted in place of or in conjunction with U.S. government measures to limit the activities of select PRC companies.

RAND American Life Panel China Survey Results

This appendix provides additional information related to the nationally representative survey conducted from the beginning of March 2020 through the end of April 2020, as discussed in Chapter Four. Here we provide information on the mapping of occupations to industries and full statistical results.

Occupations and Industries

This report focuses on how specific industries have responded to U.S. China-related policies. Yet the RAND ALP does not report an industry variable. It does, however, ask for a respondent's occupation, for which the possibilities are listed in the "ALP Occupation" column in Table A.1. To better relate the survey results to our industry analysis, we assigned each ALP occupation into one of four different industries: financials, technology, manufacturing, and other.

The survey data included occupational variables (which we concurred to industries), demographic variables, geographic variables, and political variables. We provide summary statistics in Table A.2.

Tables A.3–A.4 provide full regression results for our analysis of the four survey questions. These tables provide both the coefficients from the regressions as well as the average marginal effects.

TABLE A.1
Mapping American Life Panel Occupations to Industry Variables

ALP Occupation	Assigned Industry
Management occupations	Financials
Business and financial operations occupations	Financials
Computer and mathematical occupations	Technology
Architecture and engineering occupations	Technology
Life, physical, and social science occupations	Technology
Community and social service occupations	Other
Legal occupations	Other
Education, training, and library occupations	Other
Arts, design, entertainment, sports, and media occupations	Other
Health care practitioner and technical occupations	Other
Health care support occupations	Other
Protective service occupations	Other
Food preparation and serving-related occupations	Other
Building and grounds cleaning and maintenance occupations	Other
Personal care and service occupations	Other
Sales and related occupations	Other
Office and administrative support occupations	Other
Farming, fishing, and forestry occupations	Other
Construction and extraction occupations	Manufacturing
Installation, maintenance, and repair occupations	Manufacturing
Production occupations	Manufacturing
Transportation and material moving occupations	Other

TABLE A.2
American Life Panel Survey Summary Statistics, 2020

	Observations	Unweighted Mean	Weighted Mean
Age	2,488	57.958	50.524
Urban (= 1)	2,483	0.783	0.775
Family income			
Less than \$35,000	2,484	0.240	0.265
\$35,000–\$59,999	2,484	0.227	0.208
\$100,000 or more	2,484	0.293	0.287
Education			
No high school	2,488	0.031	0.091
Associate degree	2,488	0.140	0.099
Bachelor's degree	2,488	0.271	0.193
Advanced degree	2,488	0.246	0.165
Female (= 1)	2,488	0.580	0.519
Industry			
Financials	2,387	0.171	0.161
Manufacturing	2,387	0.059	0.077
Technology	2,387	0.083	0.071
Race			
Black/African American	2,488	0.101	0.121
Asian or Pacific Islander	2,488	0.029	0.033
Other	2,488	0.076	0.093
Born outside the U.S. (= 1)	2,488	0.098	0.102
Geographic Region			
Middle Atlantic	2,487	0.133	0.148
East North Central	2,487	0.133	0.131
West North Central	2,487	0.050	0.044
South Atlantic	2,487	0.164	0.157
East South Central	2,487	0.037	0.031
West South Central	2,487	0.146	0.154
Mountain	2,487	0.109	0.102
Pacific	2,487	0.182	0.181
Political Affiliation			
Republican	2,480	0.337	0.334
Other	2,480	0.135	0.177

TABLE A.3
Logistic Regression for Public Views of China (Question 1)

Variables	Security Threat		Economic Threat		Economic Opportunity	
	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Age	0.026*** (0.006)	0.00438*** (0.00105)	0.016*** (0.005)	0.00333*** (0.000974)	-0.009** (0.005)	-0.00218** (0.00110)
Urban (= 1)	-0.078 (0.212)	-0.0129 (0.0346)	0.221 (0.166)	0.0463 (0.0340)	-0.224 (0.172)	-0.0529 (0.0403)
Family income (less than \$35,000)	-0.592** (0.249)	-0.108** (0.0450)	-0.033 (0.209)	-0.00708 (0.0449)	-0.137 (0.210)	-0.0325 (0.0497)
Family income (\$35,000–\$59,999)	-0.015 (0.248)	-0.00252 (0.0402)	0.024 (0.203)	0.00515 (0.0437)	0.069 (0.192)	0.0164 (0.0454)
Family income (\$100,000 or more)	0.198 (0.223)	0.0305 (0.0345)	-0.142 (0.176)	-0.0301 (0.0373)	0.090 (0.174)	0.0213 (0.0411)
Education (no high school)	1.013** (0.462)	0.158*** (0.0579)	-0.687** (0.340)	-0.135** (0.0604)	0.760** (0.335)	0.180** (0.0760)
Education (associate degree)	0.535** (0.222)	0.0922** (0.0369)	-0.095 (0.188)	-0.0205 (0.0402)	0.240 (0.184)	0.0577 (0.0441)
Education (bachelor's degree)	0.691*** (0.218)	0.115*** (0.0352)	-0.002 (0.177)	-0.000510 (0.0384)	0.354** (0.171)	0.0851** (0.0410)
Education (advanced degree)	0.387* (0.225)	0.0686* (0.0391)	0.108 (0.190)	0.0237 (0.0417)	0.219 (0.187)	0.0526 (0.0447)
Female (= 1)	-0.316* (0.175)	-0.0524* (0.0285)	-0.239* (0.140)	-0.0510* (0.0301)	-0.124 (0.142)	-0.0295 (0.0336)
Industry (financials)	0.067 (0.238)	0.0111 (0.0391)	-0.007 (0.189)	-0.00140 (0.0403)	0.155 (0.183)	0.0367 (0.0433)
Industry (manufacturing)	-0.134 (0.386)	-0.0231 (0.0680)	-0.294 (0.294)	-0.0603 (0.0580)	0.319 (0.286)	0.0753 (0.0667)
Industry (technology)	0.298 (0.288)	0.0470 (0.0433)	0.239 (0.258)	0.0523 (0.0572)	-0.169 (0.240)	-0.0398 (0.0563)
Race (Black / African American)	0.243 (0.277)	0.0388 (0.0425)	-0.039 (0.227)	-0.00809 (0.0475)	-0.072 (0.226)	-0.0171 (0.0536)
Race (Asian or Pacific Islander)	-0.817* (0.459)	-0.157 (0.0964)	-0.021 (0.402)	-0.00444 (0.0844)	-0.331 (0.369)	-0.0781 (0.0860)

Table A.3—Continued

Variables	Security Threat		Economic Threat		Economic Opportunity	
	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Race (Other)	0.075 (0.276)	0.0125 (0.0451)	0.421 (0.280)	0.0925 (0.0624)	−0.571** (0.254)	−0.133** (0.0569)
Born outside the U.S. (= 1)	−0.474* (0.264)	−0.0848* (0.0504)	−0.152 (0.231)	−0.0319 (0.0477)	−0.005 (0.227)	−0.00120 (0.0537)
Geographic region (Middle Atlantic)	−1.133*** (0.425)	−0.166*** (0.0550)	−0.696* (0.367)	−0.151* (0.0817)	0.436 (0.371)	0.103 (0.0872)
Geographic region (East North Central)	−1.371*** (0.440)	−0.212*** (0.0608)	−0.403 (0.369)	−0.0902 (0.0833)	0.074 (0.380)	0.0175 (0.0895)
Geographic region (West North Central)	−1.144** (0.488)	−0.168** (0.0709)	−0.009 (0.404)	−0.00195 (0.0927)	0.038 (0.409)	0.00897 (0.0962)
Geographic region (South Atlantic)	−0.739* (0.436)	−0.0972* (0.0532)	−0.213 (0.364)	−0.0483 (0.0831)	0.064 (0.361)	0.0152 (0.0849)
Geographic region (East South Central)	−0.180 (0.574)	−0.0200 (0.0646)	−0.464 (0.444)	−0.103 (0.0984)	0.446 (0.434)	0.106 (0.102)
Geographic region (West South Central)	−0.710* (0.426)	−0.0927* (0.0512)	−0.717* (0.372)	−0.156* (0.0827)	0.235 (0.370)	0.0556 (0.0872)
Geographic region (Mountain)	−0.546 (0.444)	−0.0679 (0.0526)	−0.472 (0.403)	−0.105 (0.0900)	0.288 (0.387)	0.0682 (0.0913)
Geographic region (Pacific)	−0.959** (0.416)	−0.134*** (0.0508)	−0.381 (0.363)	−0.0856 (0.0822)	0.269 (0.360)	0.0636 (0.0846)
Political affiliation (= 1 if Republican)	0.549*** (0.205)	0.0893*** (0.0320)	0.846*** (0.159)	0.191*** (0.0359)	−0.568*** (0.157)	−0.136*** (0.0370)
Political affiliation (= 1 if Other)	0.139 (0.240)	0.0247 (0.0420)	−0.008 (0.217)	−0.00157 (0.0440)	0.087 (0.216)	0.0209 (0.0516)
Constant	0.559 (0.587)		−1.193** (0.520)		0.482 (0.515)	
Observations	2,371	2,371	2,371	2,371	2,371	2,371

SOURCE: Authors' calculations from RAND Corporation, undated. Robust standard errors in parentheses.

NOTES: Robust standard errors in parentheses; results are weighted; results do not include respondents who marked "Don't know or don't remember"; * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

TABLE A.4

Logistic Regression for Public Views of Different U.S. Economic Policy Options (Questions 2–4)

Variables	Question 2: Limit Goods/Services		Question 3: Limit PRC Nationals		Question 4: Buy PRC Phone	
	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Age	0.011** (0.005)	0.00237** (0.00115)	0.004 (0.005)	0.000777 (0.00104)	−0.031*** (0.008)	−0.00419*** (0.00118)
Urban (= 1)	0.057 (0.182)	0.0129 (0.0412)	0.304* (0.183)	0.0596* (0.0349)	0.016 (0.302)	0.00213 (0.0401)
Family income (less than \$35,000)	0.009 (0.210)	0.00210 (0.0480)	0.032 (0.219)	0.00643 (0.0440)	−0.020 (0.324)	−0.00282 (0.0452)
Family income (\$35,000–\$59,999)	0.106 (0.205)	0.0241 (0.0465)	0.123 (0.214)	0.0250 (0.0434)	0.052 (0.295)	0.00737 (0.0421)
Family income (\$100,000 or more)	0.240 (0.194)	0.0538 (0.0435)	−0.015 (0.191)	−0.00307 (0.0381)	−0.328 (0.288)	−0.0419 (0.0367)
Education (no high school)	−0.261 (0.359)	−0.0603 (0.0839)	0.793* (0.414)	0.174* (0.0918)	0.631 (0.469)	0.101 (0.0840)
Education (associate degree)	−0.005 (0.191)	−0.00122 (0.0434)	−0.223 (0.206)	−0.0455 (0.0414)	−0.343 (0.302)	−0.0419 (0.0357)
Education (bachelor's degree)	−0.000 (0.179)	−1.93e-05 (0.0407)	−0.388** (0.176)	−0.0774** (0.0349)	−0.155 (0.258)	−0.0201 (0.0333)
Education (advanced degree)	0.257 (0.203)	0.0567 (0.0446)	−0.402** (0.204)	−0.0798** (0.0399)	−0.086 (0.269)	−0.0114 (0.0354)
Female (= 1)	−0.685*** (0.160)	−0.156*** (0.0351)	−0.217 (0.162)	−0.0437 (0.0327)	−0.111 (0.234)	−0.0148 (0.0316)
Industry (financials)	−0.253 (0.195)	−0.0574 (0.0446)	−0.380* (0.222)	−0.0740* (0.0417)	0.175 (0.284)	0.0235 (0.0393)
Industry (manufacturing)	−0.049 (0.324)	−0.0110 (0.0725)	−0.130 (0.294)	−0.0261 (0.0585)	0.339 (0.405)	0.0478 (0.0613)
Industry (technology)	−0.257 (0.277)	−0.0583 (0.0638)	−0.100 (0.243)	−0.0202 (0.0486)	0.330 (0.381)	0.0463 (0.0572)
Race (Black / African American)	−0.092 (0.251)	−0.0210 (0.0576)	0.368 (0.269)	0.0751 (0.0559)	0.133 (0.349)	0.0178 (0.0480)
Race (Asian or Pacific Islander)	−0.315 (0.412)	−0.0728 (0.0966)	0.036 (0.439)	0.00708 (0.0866)	0.308 (0.499)	0.0433 (0.0756)

Table A.4—Continued

Variables	Question 2: Limit Goods/Services		Question 3: Limit PRC Nationals		Question 4: Buy PRC Phone	
	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Race (Other)	0.335 (0.265)	0.0730 (0.0557)	0.553** (0.268)	0.114** (0.0569)	0.375 (0.348)	0.0538 (0.0536)
Born outside the U.S. (= 1)	0.030 (0.241)	0.00683 (0.0539)	-0.150 (0.276)	-0.0296 (0.0538)	0.010 (0.268)	0.00139 (0.0359)
Geographic region (Middle Atlantic)	0.737* (0.389)	0.167* (0.0888)	-0.539 (0.452)	-0.111 (0.0950)	-0.717 (0.521)	-0.107 (0.0836)
Geographic region (East North Central)	0.376 (0.377)	0.0878 (0.0884)	-0.591 (0.433)	-0.120 (0.0909)	-0.398 (0.562)	-0.0646 (0.0931)
Geographic region (West North Central)	0.276 (0.393)	0.0648 (0.0925)	-0.249 (0.452)	-0.0526 (0.0961)	-1.617*** (0.612)	-0.188** (0.0796)
Geographic region (South Atlantic)	0.440 (0.360)	0.102 (0.0844)	-0.377 (0.419)	-0.0786 (0.0892)	-0.717 (0.492)	-0.107 (0.0805)
Geographic region (East South Central)	0.306 (0.435)	0.0719 (0.102)	-0.112 (0.497)	-0.0239 (0.106)	-0.469 (0.568)	-0.0748 (0.0918)
Geographic region (West South Central)	0.096 (0.369)	0.0226 (0.0873)	-0.317 (0.434)	-0.0666 (0.0923)	-0.574 (0.489)	-0.0892 (0.0815)
Geographic region (Mountain)	0.635* (0.379)	0.145* (0.0876)	0.017 (0.453)	0.00373 (0.0974)	-0.185 (0.510)	-0.0316 (0.0884)
Geographic region (Pacific)	0.399 (0.356)	0.0931 (0.0836)	-0.386 (0.413)	-0.0805 (0.0880)	-0.610 (0.462)	-0.0940 (0.0781)
Political affiliation (= 1 if Republican)	0.218 (0.166)	0.0486 (0.0368)	1.402*** (0.165)	0.306*** (0.0345)	-0.056 (0.250)	-0.00747 (0.0331)
Political affiliation (= 1 if Other)	-0.190 (0.223)	-0.0440 (0.0519)	0.153 (0.247)	0.0281 (0.0462)	-0.018 (0.323)	-0.00248 (0.0434)
Constant	-0.272 (0.535)		-1.056* (0.570)		0.484 (0.817)	
Observations	2,359	2,359	2,361	2,361	2,364	2,364

SOURCE: Authors' calculations from RAND Corporation, undated. Robust standard errors in parentheses.

NOTES: Robust standard errors in parentheses; results are weighted; results do not include respondents who marked "Don't know or don't remember"; * = statistically significant at the 10 percent level ($p < 0.1$); ** = statistically significant at the 5 percent level ($p < 0.05$); *** = statistically significant at the 1 percent level ($p < 0.01$).

Categorization of S&P 500 Companies by Sector

This appendix provides more information on the S&P 500 companies that we included in our analysis of corporate earnings calls, as reported in Chapter Five. We provide the sector distribution of companies in Table B.1, and the specific companies in Table B.2.

TABLE B.1
S&P 500 Companies with Earnings Calls

Category	Number of Firms
Manufacturing Sector	128
Consumer discretionary	33
Consumer staples	24
Industrials	43
Materials	28
Technology Sector	70
Hardware	40
Software	30
Financial Sector	54
Asset management and banks	16
Diversified finance	11
Insurance	17
Regional banks	10
Total of Three Sectors	252

TABLE B.2
Detailed List of S&P 500 Companies with Earnings Calls

Firm	Sector	Subsector
Advance Auto Parts	Manufacturing	Consumer discretionary
Aptiv PLC	Manufacturing	Consumer discretionary
AutoZone Inc.	Manufacturing	Consumer discretionary
BorgWarner	Manufacturing	Consumer discretionary
Carmax Inc.	Manufacturing	Consumer discretionary
D. R. Horton	Manufacturing	Consumer discretionary
Ford Motor Company	Manufacturing	Consumer discretionary
Gap Inc.	Manufacturing	Consumer discretionary
Garmin Ltd.	Manufacturing	Consumer discretionary
General Motors	Manufacturing	Consumer discretionary
Genuine Parts	Manufacturing	Consumer discretionary
Hanesbrands Inc.	Manufacturing	Consumer discretionary
Harley-Davidson	Manufacturing	Consumer discretionary
Home Depot	Manufacturing	Consumer discretionary
L Brands Inc.	Manufacturing	Consumer discretionary
Leggett & Platt	Manufacturing	Consumer discretionary
Lennar Corp.	Manufacturing	Consumer discretionary
Lowe's Cos.	Manufacturing	Consumer discretionary
Mohawk Industries	Manufacturing	Consumer discretionary
Nike	Manufacturing	Consumer discretionary
O'Reilly Automotive	Manufacturing	Consumer discretionary
PulteGroup	Manufacturing	Consumer discretionary
PVH Corp.	Manufacturing	Consumer discretionary
Ralph Lauren Corp.	Manufacturing	Consumer discretionary
Ross Stores	Manufacturing	Consumer discretionary
Tapestry Inc.	Manufacturing	Consumer discretionary
Tiffany & Co.	Manufacturing	Consumer discretionary
TJX Companies Inc.	Manufacturing	Consumer discretionary
Tractor Supply Company	Manufacturing	Consumer discretionary
Ulta Beauty	Manufacturing	Consumer discretionary
Under Armour Class A	Manufacturing	Consumer discretionary
Under Armour Class C	Manufacturing	Consumer discretionary
Whirlpool Corp.	Manufacturing	Consumer discretionary
Altria Group Inc.	Manufacturing	Consumer staples

Table B.2—Continued

Firm	Sector	Subsector
Campbell Soup	Manufacturing	Consumer staples
Church & Dwight	Manufacturing	Consumer staples
Coca-Cola Company	Manufacturing	Consumer staples
Colgate-Palmolive	Manufacturing	Consumer staples
Conagra Brands	Manufacturing	Consumer staples
Coty Inc.	Manufacturing	Consumer staples
Estée Lauder Companies	Manufacturing	Consumer staples
General Mills	Manufacturing	Consumer staples
Hormel Foods Corp.	Manufacturing	Consumer staples
JM Smucker	Manufacturing	Consumer staples
Kellogg Co.	Manufacturing	Consumer staples
Kimberly-Clark	Manufacturing	Consumer staples
Kraft Heinz Co.	Manufacturing	Consumer staples
Lamb Weston Holdings Inc.	Manufacturing	Consumer staples
McCormick & Co.	Manufacturing	Consumer staples
Mondelez International	Manufacturing	Consumer staples
Monster Beverage	Manufacturing	Consumer staples
PepsiCo Inc.	Manufacturing	Consumer staples
Philip Morris International	Manufacturing	Consumer staples
Procter & Gamble	Manufacturing	Consumer staples
The Clorox Company	Manufacturing	Consumer staples
The Hershey Company	Manufacturing	Consumer staples
Tyson Foods	Manufacturing	Consumer staples
3M Company	Manufacturing	Industrials
A.O. Smith Corp.	Manufacturing	Industrials
Allegion	Manufacturing	Industrials
AMETEK Inc.	Manufacturing	Industrials
Arconic Inc.	Manufacturing	Industrials
Boeing Company	Manufacturing	Industrials
Caterpillar Inc.	Manufacturing	Industrials
Cummins Inc.	Manufacturing	Industrials
Deere & Co.	Manufacturing	Industrials
Dover Corp.	Manufacturing	Industrials
Eaton Corp.	Manufacturing	Industrials
Emerson Electric Company	Manufacturing	Industrials

Table B.2—Continued

Firm	Sector	Subsector
Fastenal Co.	Manufacturing	Industrials
Flowserve Corp.	Manufacturing	Industrials
Fortive Corp.	Manufacturing	Industrials
Fortune Brands Home & Security	Manufacturing	Industrials
General Dynamics	Manufacturing	Industrials
General Electric	Manufacturing	Industrials
Honeywell International Inc.	Manufacturing	Industrials
IDEX Corp.	Manufacturing	Industrials
Illinois Tool Works	Manufacturing	Industrials
Ingersoll Rand	Manufacturing	Industrials
Jacobs Engineering Group	Manufacturing	Industrials
Johnson Controls International	Manufacturing	Industrials
L3Harris Technologies	Manufacturing	Industrials
Lockheed Martin Corp.	Manufacturing	Industrials
Masco Corp.	Manufacturing	Industrials
Northrop Grumman	Manufacturing	Industrials
PACCAR Inc.	Manufacturing	Industrials
Parker-Hannifin	Manufacturing	Industrials
Pentair plc	Manufacturing	Industrials
Quanta Services Inc.	Manufacturing	Industrials
Raytheon Co.	Manufacturing	Industrials
Rockwell Automation Inc.	Manufacturing	Industrials
Roper Technologies	Manufacturing	Industrials
Snap-on	Manufacturing	Industrials
Stanley Black & Decker	Manufacturing	Industrials
Textron Inc.	Manufacturing	Industrials
Trane Technologies plc	Manufacturing	Industrials
TransDigm Group	Manufacturing	Industrials
United Technologies	Manufacturing	Industrials
W. W. Grainger Inc.	Manufacturing	Industrials
Xylem Inc.	Manufacturing	Industrials
Air Products & Chemicals Inc.	Manufacturing	Materials
Albemarle Corp.	Manufacturing	Materials
Arcor plc	Manufacturing	Materials
Avery Dennison Corp.	Manufacturing	Materials

Table B.2—Continued

Firm	Sector	Subsector
Ball Corp.	Manufacturing	Materials
Celanese	Manufacturing	Materials
CF Industries Holdings Inc.	Manufacturing	Materials
Corteva	Manufacturing	Materials
Dow Inc.	Manufacturing	Materials
DuPont de Nemours Inc.	Manufacturing	Materials
Eastman Chemical	Manufacturing	Materials
Ecolab Inc.	Manufacturing	Materials
FMC Corp.	Manufacturing	Materials
Freeport-McMoRan Inc.	Manufacturing	Materials
International Flavors & Fragrances	Manufacturing	Materials
International Paper	Manufacturing	Materials
Linde plc	Manufacturing	Materials
LyondellBasell	Manufacturing	Materials
Martin Marietta Materials	Manufacturing	Materials
Newmont Corp.	Manufacturing	Materials
Nucor Corp.	Manufacturing	Materials
Packaging Corporation of America	Manufacturing	Materials
PPG Industries	Manufacturing	Materials
Sealed Air	Manufacturing	Materials
Sherwin-Williams	Manufacturing	Materials
The Mosaic Company	Manufacturing	Materials
Vulcan Materials	Manufacturing	Materials
WestRock	Manufacturing	Materials
Advanced Micro Devices Inc.	Technology	Hardware
Akamai Technologies Inc.	Technology	Hardware
Amphenol Corp.	Technology	Hardware
Analog Devices Inc.	Technology	Hardware
Apple Inc.	Technology	Hardware
Applied Materials Inc.	Technology	Hardware
Arista Networks	Technology	Hardware
AT&T	Technology	Hardware
Broadcom Inc.	Technology	Hardware
CDW	Technology	Hardware
Cisco Systems	Technology	Hardware

Table B.2—Continued

Firm	Sector	Subsector
Corning Inc.	Technology	Hardware
F5 Networks	Technology	Hardware
FLIR Systems	Technology	Hardware
Hewlett Packard Enterprise	Technology	Hardware
HP Inc.	Technology	Hardware
Intel Corp.	Technology	Hardware
IPG Photonics Corp.	Technology	Hardware
Juniper Networks	Technology	Hardware
Keysight Technologies	Technology	Hardware
KLA Corp.	Technology	Hardware
Lam Research	Technology	Hardware
Maxim Integrated Products Inc.	Technology	Hardware
Microchip Technology	Technology	Hardware
Micron Technology	Technology	Hardware
Motorola Solutions Inc.	Technology	Hardware
NetApp	Technology	Hardware
Nvidia Corp.	Technology	Hardware
Qorvo	Technology	Hardware
Qualcomm Inc.	Technology	Hardware
Seagate Technology	Technology	Hardware
Skyworks Solutions	Technology	Hardware
T-Mobile US	Technology	Hardware
TE Connectivity Ltd.	Technology	Hardware
Texas Instruments	Technology	Hardware
Verisign Inc.	Technology	Hardware
Western Digital	Technology	Hardware
Xerox	Technology	Hardware
Xilinx	Technology	Hardware
Zebra Technologies	Technology	Hardware
Accenture plc	Technology	Software
Adobe Inc.	Technology	Software
Alphabet Inc, Class A	Technology	Software
Alphabet Inc, Class C	Technology	Software
Amazon.com Inc.	Technology	Software
ANSYS	Technology	Software

Table B.2—Continued

Firm	Sector	Subsector
Autodesk Inc.	Technology	Software
Booking Holdings Inc.	Technology	Software
Cadence Design Systems	Technology	Software
Cognizant Technology Solutions	Technology	Software
DXC Technology	Technology	Software
eBay Inc.	Technology	Software
Expedia Group	Technology	Software
Facebook Inc.	Technology	Software
Fidelity National Information Services	Technology	Software
Fortinet	Technology	Software
Gartner Inc.	Technology	Software
Global Payments Inc.	Technology	Software
International Business Machines	Technology	Software
Mastercard Inc.	Technology	Software
Microsoft Corp.	Technology	Software
NortonLifeLock	Technology	Software
Oracle Corp.	Technology	Software
Paychex Inc.	Technology	Software
PayPal	Technology	Software
Salesforce.com	Technology	Software
ServiceNow	Technology	Software
Synopsys Inc.	Technology	Software
Twitter Inc.	Technology	Software
Visa Inc.	Technology	Software
Western Union Co	Technology	Software
Ameriprise Financial	Financials	Asset management and banks
Bank of America Corp.	Financials	Asset management and banks
BlackRock	Financials	Asset management and banks
Citigroup Inc.	Financials	Asset management and banks
Comerica Inc.	Financials	Asset management and banks
E*Trade	Financials	Asset management and banks
Franklin Resources	Financials	Asset management and banks
Goldman Sachs Group	Financials	Asset management and banks
Invesco Ltd.	Financials	Asset management and banks
JPMorgan Chase & Co.	Financials	Asset management and banks

Table B.2—Continued

Firm	Sector	Subsector
Morgan Stanley	Financials	Asset management and banks
Northern Trust Corp.	Financials	Asset management and banks
Raymond James Financial Inc.	Financials	Asset management and banks
State Street Corp.	Financials	Asset management and banks
The Bank of New York Mellon Corp.	Financials	Asset management and banks
U.S. Bancorp	Financials	Asset management and banks
American Express Co	Financials	Diversified finance
Capital One Financial	Financials	Diversified finance
Cboe Global Markets	Financials	Diversified finance
CME Group Inc.	Financials	Diversified finance
Discover Financial Services	Financials	Diversified finance
Intercontinental Exchange	Financials	Diversified finance
MarketAxess	Financials	Diversified finance
Moody's Corp.	Financials	Diversified finance
MSCI Inc.	Financials	Diversified finance
Nasdaq Inc.	Financials	Diversified finance
S&P Global Inc.	Financials	Diversified finance
Allstate Corp.	Financials	Insurance
American International Group	Financials	Insurance
Aon plc	Financials	Insurance
Arthur J. Gallagher & Co.	Financials	Insurance
Assurant	Financials	Insurance
Chubb Limited	Financials	Insurance
Everest Re Group Ltd.	Financials	Insurance
Hartford Financial Services Group	Financials	Insurance
Loews Corp.	Financials	Insurance
Marsh & McLennan	Financials	Insurance
MetLife Inc.	Financials	Insurance
Principal Financial Group	Financials	Insurance
Progressive Corp.	Financials	Insurance
Prudential Financial	Financials	Insurance
The Travelers Companies Inc.	Financials	Insurance
W. R. Berkley Corp.	Financials	Insurance
Willis Towers Watson	Financials	Insurance
Citizens Financial Group	Financials	Regional Banks

Table B.2—Continued

Firm	Sector	Subsector
Fifth Third Bancorp	Financials	Regional Banks
Huntington Bancshares	Financials	Regional Banks
KeyCorp	Financials	Regional Banks
M&T Bank Corp.	Financials	Regional Banks
PNC Financial Services	Financials	Regional Banks
Regions Financial Corp.	Financials	Regional Banks
SVB Financial Group	Financials	Regional Banks
Truist Financial	Financials	Regional Banks
Zions Bancorp	Financials	Regional Banks

Categorization of Select Russell 2000 Companies by Sector

This appendix provides more information on the Russell 2000 companies that we included in our analysis of corporate earnings calls, as reported in Chapter Five. We provide the sector distribution of companies in Table C.1 and the specific companies in Table C.2.

TABLE C.1
Russell 2000 Companies with Earnings Calls

Category	Number of Firms
Manufacturing sector	78
Technology sector	63
Financial sector	52
Total of Three Sectors	193

TABLE C.2
Detailed List of Russell 2000 Companies with Earnings Calls

Firm	Sector	Firm	Sector
Agrofresh Solutions Inc.	Manufacturing	Lawson Products Inc.	Manufacturing
Allied Motion Technologies Inc.	Manufacturing	Legacy Housing Corp.	Manufacturing
American Superconductor Corp.	Manufacturing	Lifetime Brands Inc.	Manufacturing
Amyris Inc.	Manufacturing	Lifevantage Corp.	Manufacturing
Astronics Corp.	Manufacturing	Lindblad Expeditions Holdings Inc.	Manufacturing
BG Staffing Inc. ^a	Manufacturing	Liquidity Services Inc.	Manufacturing
Blue Bird Corp.	Manufacturing	LSI Industries Inc.	Manufacturing
Caesarstone Ltd.	Manufacturing	Marine Products Corp.	Manufacturing
Casper Sleep Inc.	Manufacturing	Marrone Bio Innovations Inc.	Manufacturing
Ceco Environmental Corp.	Manufacturing	Mayville Engineering Company Inc.	Manufacturing
Concrete Pumping Holdings Inc.	Manufacturing	Mistras Group Inc.	Manufacturing
Container Store Group Inc.	Manufacturing	Movado Group Inc.	Manufacturing
Costamare Inc.	Manufacturing	Natures Sunshine Products Inc.	Manufacturing
Craft Brew Alliance Inc.	Manufacturing	NewAge Inc.	Manufacturing
Daseke Inc.	Manufacturing	NN Inc.	Manufacturing
Duluth Holdings Inc. Class B	Manufacturing	Northwest Pipe	Manufacturing
DXP Enterprises Inc.	Manufacturing	Olympic Steel Inc.	Manufacturing
Eagle Bulk Shipping Inc.	Manufacturing	Orion Energy Systems Inc.	Manufacturing
Eastern	Manufacturing	Park Ohio Holdings Corp.	Manufacturing
Exone	Manufacturing	Powell Industries Inc.	Manufacturing
Express Inc.	Manufacturing	Ranpak Holdings Corp. Class A	Manufacturing
Franklin Covey	Manufacturing	Rayonier Advanced Materials Inc.	Manufacturing
Funko Inc. Class A	Manufacturing	REV Group Inc.	Manufacturing
Genco Shipping and Trading Ltd.	Manufacturing	Revlon Inc. Class A	Manufacturing
General Finance Corp.	Manufacturing	Rocky Brands Inc.	Manufacturing
GP Strategies Corp.	Manufacturing	Rush Enterprises Inc. Class B	Manufacturing
Graham Corp.	Manufacturing	Ryerson Holding Corp.	Manufacturing
Greenlane Holdings Inc. Class A	Manufacturing	Safe Bulkers Inc.	Manufacturing
Greif Inc. Class B	Manufacturing	Scorpio Bulkers Inc.	Manufacturing
Haynes International Inc	Manufacturing	Suncoke Energy Inc.	Manufacturing
Hertz Global Holdings Inc.	Manufacturing	Systemax Inc.	Manufacturing
Hudson Ltd. Class A	Manufacturing	Tillys Inc. Class A	Manufacturing
Lakeland Industries Inc.	Manufacturing	Timkensteel Corp.	Manufacturing
Landec Corp.	Manufacturing	Titan Machinery Inc.	Manufacturing

Table C.2—Continued

Firm	Sector	Firm	Sector
Transcat Inc.	Manufacturing	Genasys Inc.	Technology
Trecora Resources	Manufacturing	GSI Technology Inc.	Technology
Turtle Beach Corp.	Manufacturing	GTT Communications Inc.	Technology
Ultralife Corp.	Manufacturing	Hackett Group Inc.	Technology
Unifi Inc.	Manufacturing	Hemisphere Media Group Inc. Class A	Technology
Vera Bradley Inc.	Manufacturing	Immersion Corp.	Technology
Veritiv Corp.	Manufacturing	Information Services Group Inc.	Technology
Veru Inc.	Manufacturing	Intelligent Systems Corp.	Technology
Voxx International Corp. Class A	Manufacturing	Intevac Inc.	Technology
Weyco Group Inc.	Manufacturing	Iteris Inc.	Technology
Akoustis Technologies Inc.	Technology	Kimball Electronics Inc.	Technology
Alaska Communications Systems Group	Technology	KVH Industries Inc.	Technology
Alpha And Omega Semiconductor Ltd.	Technology	Livexlive Media Inc.	Technology
Applied Optoelectronics Inc.	Technology	Luna Innovations Inc.	Technology
Asure Software Inc.	Technology	Moneygram International Inc.	Technology
Atomera Inc.	Technology	Napco Security Technologies Inc.	Technology
Avid Technology Inc.	Technology	Neophotonics Corp.	Technology
AXT Inc.	Technology	NVE Corp.	Technology
Bel Fuse Inc. Class B	Technology	Ooma Inc.	Technology
Calamp Corp.	Technology	Orbcomm Inc.	Technology
Cambium Networks Corp.	Technology	Park City Group Inc.	Technology
Casa Systems Inc.	Technology	Pctel Inc.	Technology
ChannelAdvisor Corp.	Technology	PFSweb Inc.	Technology
Clearfield Inc.	Technology	Pixelworks Inc.	Technology
Comscore Inc.	Technology	Quantum Corp.	Technology
Comtech Telecommunications Corp.	Technology	Resonant Inc.	Technology
Cyberoptics Corp.	Technology	Ribbon Communications Inc.	Technology
Daktronics Inc.	Technology	Rimini Street Inc.	Technology
DHI Group Inc.	Technology	Saga Communications Inc. Class A	Technology
Digimarc Corp.	Technology	Servicessource International Inc.	Technology
DSP Group Inc.	Technology	SiTime Corp.	Technology
Eastman Kodak	Technology	Smart Global Holdings Inc.	Technology
Emerald Holding Inc.	Technology	Synchronoss Technologies Inc.	Technology
Eros International Plc Class A	Technology	Telenav Inc.	Technology
Fluent Inc.	Technology	Tribune Publishing	Technology

Table C.2—Continued

Firm	Sector	Firm	Sector
Veritone Inc.	Technology	Heritage Financial Corp.	Financials
Vishay Precision Group Inc.	Technology	Independent Bank Corp.	Financials
Wrap Technologies Inc.	Technology	Ladder Capital Corp. Class A	Financials
Arlington Asset Investment Class A	Financials	Landmark Bancorp Inc.	Financials
Armour Residential Reit Inc.	Financials	Live Oak Bancshares Inc.	Financials
Assetmark Financial Holdings Inc.	Financials	Luther Burbank Corp.	Financials
Bankfinancial Corp.	Financials	Mercantile Bank Corp.	Financials
BGC Partners Inc. Class A	Financials	Midwestone Financial Group Inc.	Financials
Blucora Inc.	Financials	Orchid Island Capital Inc.	Financials
Boston Private Financial Holdings	Financials	Peoples Bancorp Inc.	Financials
Bridge Bancorp Inc.	Financials	Preferred Bank	Financials
Brightsphere Investment Group Inc.	Financials	Pzena Investment Management Inc. CI	Financials
Capstar Financial Holdings Inc.	Financials	RBB Bancorp	Financials
County Bancorp Inc.	Financials	Ready Capital Corp.	Financials
Cowen Inc. Class A	Financials	Sculptor Capital Management Inc. CI	Financials
Curo Group Holdings Corp.	Financials	Silvercrest Asset Management Group	Financials
Donnelley Financial Solutions Inc.	Financials	SmartFinancial Inc.	Financials
Ellington Financial Inc.	Financials	Southern Missouri Bancorp Inc.	Financials
Enova International Inc.	Financials	Sterling Bancorp Inc.	Financials
Equity Bancshares Inc. Class A	Financials	Third Point Reinsurance Ltd.	Financials
Evans Bancorp Inc.	Financials	TPG Real Estate Finance Trust Inc.	Financials
FBL Financial Group Inc. Class A	Financials	Triumph Bancorp Inc.	Financials
First Bancorp	Financials	Univest Financial Corp.	Financials
First Bancorp Inc.	Financials	Veritex Holdings Inc.	Financials
First Foundation Inc.	Financials	Washington Trust Bancorp Inc.	Financials
Flushing Financial Corp.	Financials	Westwood Holdings Group Inc.	Financials
Great Western Bancorp Inc.	Financials	Wisdomtree Investments Inc.	Financials
HCI Group Inc.	Financials		

^a BG Staffing Inc. changed its name to BGSF on February 8, 2021 (BG Staffing Inc., “BG Staffing, Inc. Announces Corporate Name Change to BGSF, Inc. to Reflect Broader Workforce Solutions Strategy,” News Release, January 26, 2021).

Detailed Earnings Calls Results

This appendix provides more information on the analysis of earnings calls, as reported in Chapter Five. Tables D.1 (S&P 500) and D.2 (Russell 2000) provide information on the number of firms and sentences included in the analysis for each quarter. Figures D.1 (S&P 500 manufacturing firms), D.2 (S&P 500 technology firms), D.3 (S&P 500 financial firms), and D.4 (Russell 2000 firms) show the time trend of the standard deviation of the average quarterly sentiment scores. Figures D.5 (S&P 500 manufacturing firms), D.6 (S&P 500 technology firms), and D.7 (S&P 500 financial firms) show the time trend in China-related sentences in earnings calls.

TABLE D.1
Firms and Sentences Included in S&P 500 Earnings Calls Analysis

Sector	2017							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	77	719	79	679	82	733	79	721
Consumer discretionary	15	130	15	139	14	132	14	123
Consumer staples	18	175	17	127	18	153	19	177
Industrials	28	214	30	248	30	261	28	243
Materials	16	200	17	165	20	187	18	178
Technology	36	281	36	225	30	216	38	216
Hardware	22	228	23	157	21	175	25	186
Software	14	53	13	68	9	41	13	30
Financials	18	56	16	42	13	27	13	43
Asset management and banks	4	6	4	6	6	9	4	14
Diversified finance	6	23	6	24	3	10	4	14
Insurance	4	19	6	12	3	7	5	15
Regional banks	4	8			1	1		
Sector	2018							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	92	899	100	1,313	78 99	1,545	103	1,554
Consumer discretionary	20	207	25	316	25	422	27	448
Consumer staples	16	193	21	218	18	166	21	219
Industrials	36	315	34	531	36	721	35	612
Materials	20	184	20	248	20	236	20	275
Technology	30	223	42	280	45	444	45	392
Hardware	20	188	28	224	30	380	34	333
Software	10	35	14	56	15	64	11	59
Financials	22	60	33	136	16	55	27	116
Asset management and banks	8	26	10	45	5	13	9	22
Diversified finance	7	23	7	33	3	23	8	71
Insurance	5	8	9	37	4	11	6	16
Regional banks	2	3	7	21	4	8	4	7

Table D.1—Continued

Sector	2019							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	104	1,295	108	1,479	101	1,266	97	1,306
Consumer discretionary	26	384	31	522	28	397	24	326
Consumer staples	19	148	17	171	20	177	18	232
Industrials	37	491	37	521	32	463	32	467
Materials	22	272	23	265	21	229	23	281
Technology	41	379	47	514	46	458	48	460
Hardware	29	323	34	442	32	386	33	351
Software	12	56	13	72	14	72	15	109
Financials	21	80	21	96	25	106	31	118
Asset management and banks	7	19	8	35	9	28	12	39
Diversified finance	6	36	6	43	7	57	5	46
Insurance	6	20	4	14	4	11	6	20
Regional banks	2	5	3	4	5	10	8	13

Sector	2020			
	Q1		Q2	
	Firms	Sentences	Firms	Sentences
Manufacturing	99	1,139	90	804
Consumer discretionary	27	260	20	193
Consumer staples	16	246	18	154
Industrials	31	396	30	289
Materials	25	237	22	168
Technology	48	529	40	408
Hardware	32	426	31	360
Software	16	103	9	48
Financials	14	45	10	35
Asset management and banks	6	15	2	6
Diversified finance	5	23	5	25
Insurance	3	7	3	4
Regional banks				

TABLE D.2

Firms and Sentences Included in Russell 2000 Earnings Calls Analysis

Sector	2017							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	22	115	25	158	30	161	35	203
Technology	13	112	18	104	16	116	18	131
Financials	4	5	3	6	4	5	6	18
Sector	2019							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	36	196	41	334	47	384	45	311
Technology	21	122	21	158	24	180	30	211
Financials	5	11	16	37	17	35	17	32
Sector	2019							
	Q1		Q2		Q3		Q4	
	Firms	Sentences	Firms	Sentences	Firms	Sentences	Firms	Sentences
Manufacturing	44	289	52	383	51	320	55	348
Technology	22	134	29	178	27	188	41	295
Financials	8	13	13	20	21	29	10	31
Sector	2020							
	Q1		Q2					
	Firms	Sentences	Firms	Sentences				
Manufacturing	41	198	36	166				
Technology	32	224	32	171				
Financials	9	13	5	6				

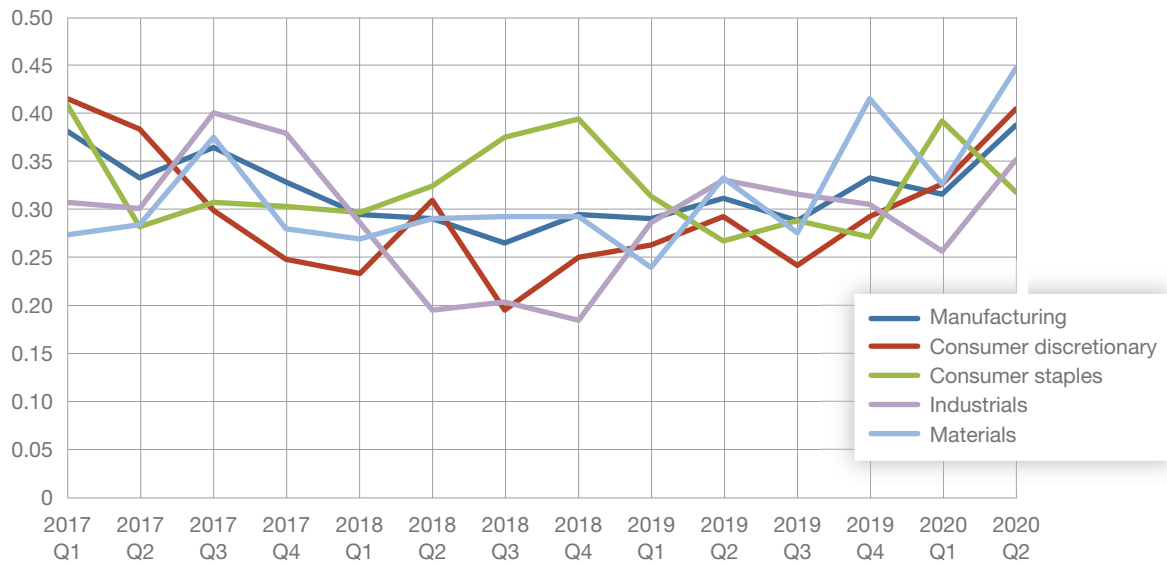
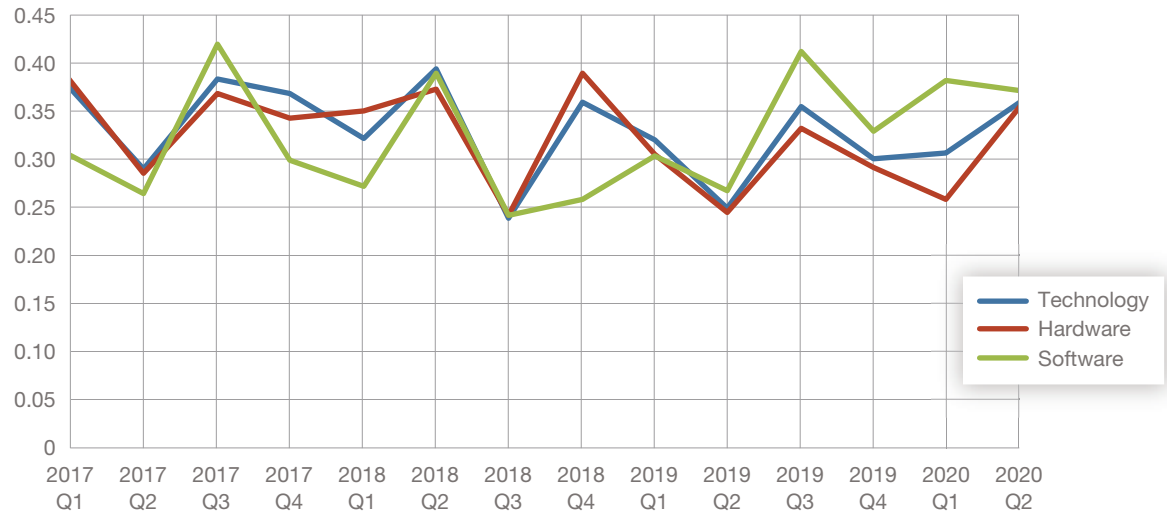
FIGURE D.1**Standard Deviations of Average Quarterly Sentiment of S&P 500 Manufacturing Firms, 2017–2020****FIGURE D.2****Standard Deviations of Average Quarterly Sentiment of S&P 500 Technology Firms, 2017–2020**

FIGURE D.3
Standard Deviations of Average Quarterly Sentiment of S&P 500 Financial Firms, 2017–2020

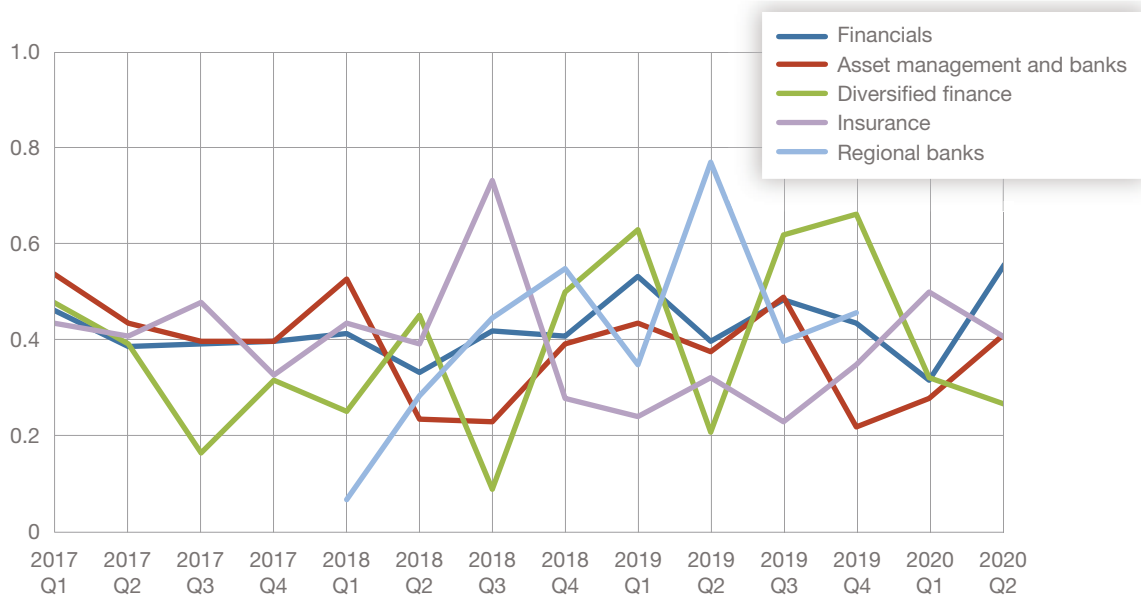


FIGURE D.4
Standard Deviations of Average Quarterly Sentiment of Russell 2000 Firms, 2017–2020

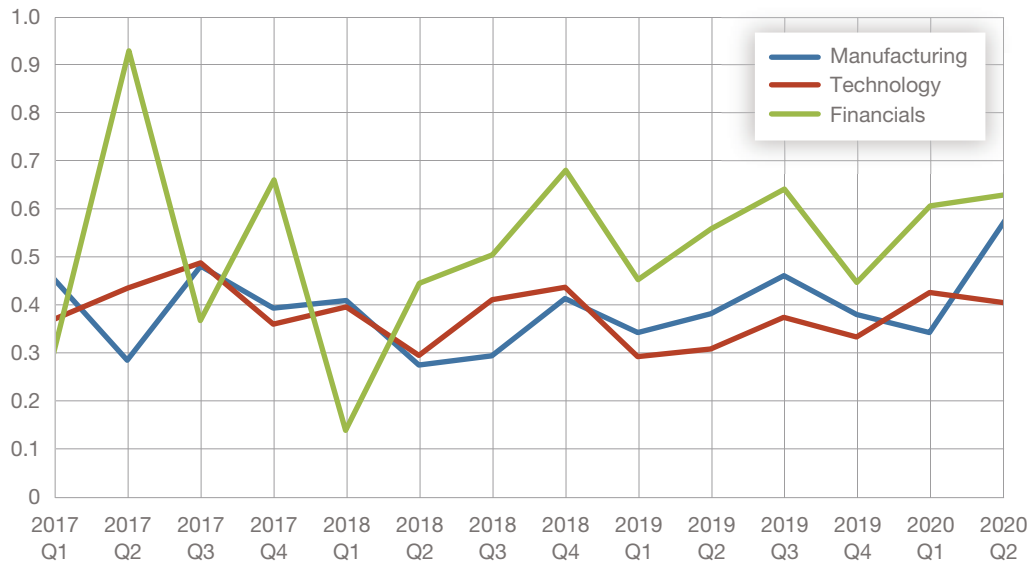


FIGURE D.5

China-Related Sentences per S&P 500 Firm by Manufacturing Subsector, 2017–2020

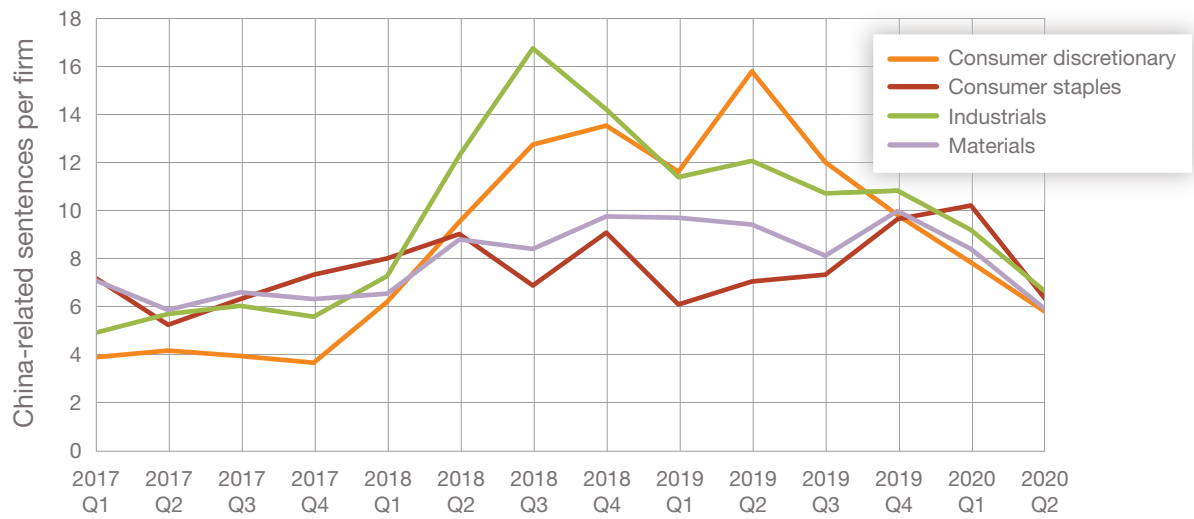


FIGURE D.6

China-Related Sentences per S&P 500 Firm by Technology Subsector, 2017–2020

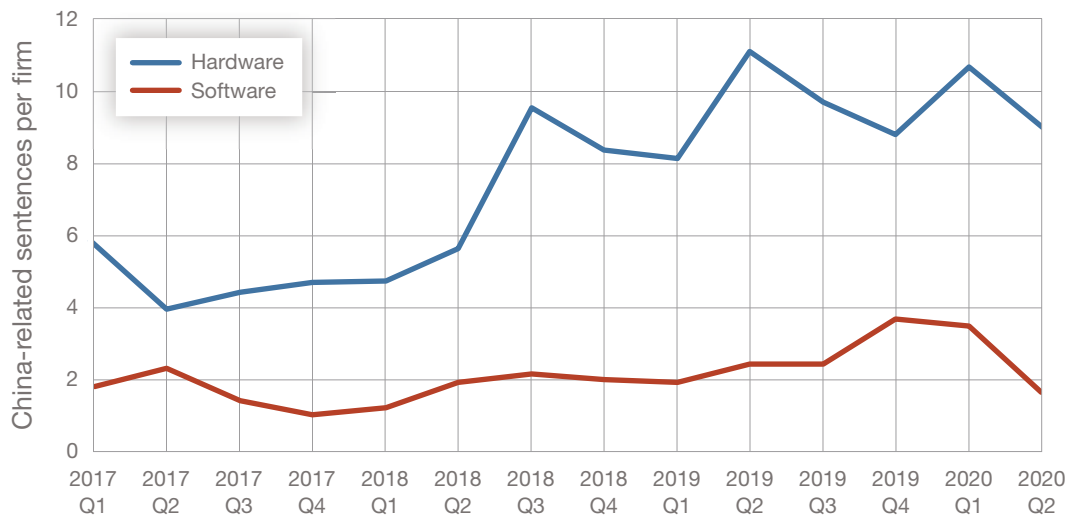
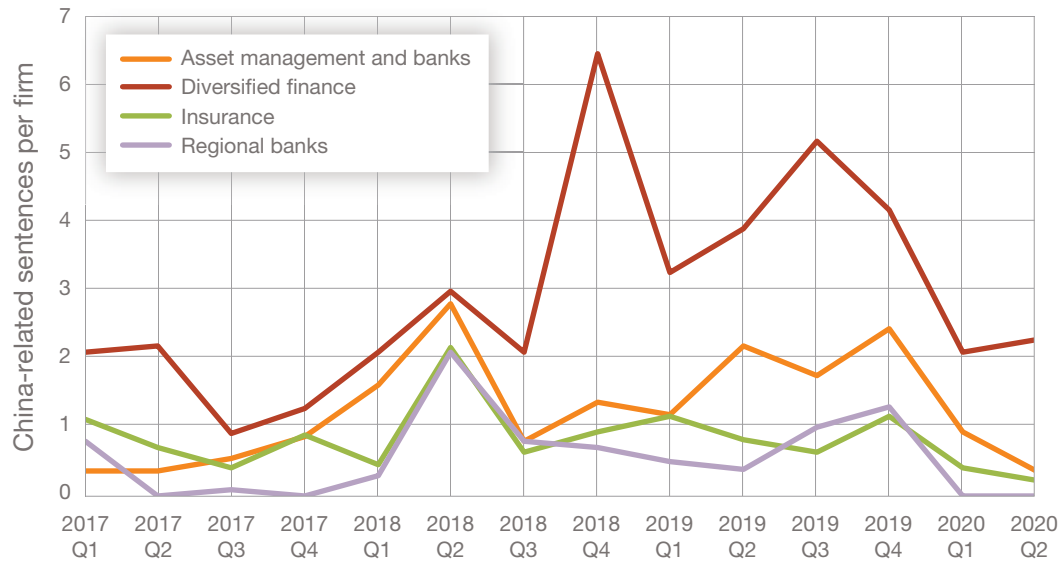


FIGURE D.7

China-Related Sentences per S&P 500 Firm by Finance Subsector, 2017–2020



Validation of Categorization of Earnings Statements

Chapter Five uses FinBERT to code as positive, neutral, or negative 21,492 sentences from S&P 500 earnings calls and 6,151 sentences from Russell 2000 earnings calls. Each of these sentences contained one of the four keywords or variants on which we searched:

- *China*, including *Beijing*, *China*, *Chinese*, and *Shanghai*
- *geopolitical*, including *geopolitical*, *geo-political*, and *geopolitics*
- *tariff*, including *tariff* and *tariffs*
- *trade war*, including *trade tension* and *trade war*.

In addition to the verbal description of positive, neutral, or negative, FinBERT delivered a numerical score from 1.0 to -1.0. We used the numerical score in our analysis (averaging scores per quarter), so the verbal coding is less important. Nonetheless, the verbal coding provides a useful way for us to validate FinBERT's rating.

Relying on FinBERT's natural language-processing model to conduct sentiment analysis has the benefit of lower human error in coding, but the automated system could make errors as well. Three types of errors present themselves.

First, the sentiment could be incorrectly coded: a negative sentiment could be coded as positive, and vice versa. Second, a sentiment could be off-topic despite the keyword. As a hypothetical example, a statement such as "My birthday cake was delicious and served on fine china" could be rated as a positive sentiment related to China. Third, the strength of the sentiment could be incorrectly rated.

We opted to cross-check the ratings for the first two errors because whether the coding was right or wrong would be more obvious for these two errors, whereas more judgment would be needed—and larger differences of opinion could emerge—regarding the third error. To do so, two RAND researchers independently assessed 10 percent of all S&P 500 sentences and 10 percent of all Russell 2000 sentences.

We selected sentences to be checked by using Excel's random number generator. For the S&P 500 sentences, we generated 2,149 random numbers, and for the Russell 2000 sentences, we generated 615 random numbers. Each person who validated the ratings was given a different list of random numbers, so at most we checked 4,298 unique S&P 500 sentences and 1,230 unique Russell 2000 sentences, although it is likely we checked fewer. The main difficulty in reviewing the sentences was that they were presented without context.

Reviewer Results

Reviewer One

Our first reviewer found that of the 2,149 S&P 500 sentences reviewed,

- 112 were ambiguous
- 31 were clearly misclassified
- four were not on topic.

This means that 147 sentences out of 2,149, or 6.8 percent, were incorrectly classified. Of 615 Russell 2000 sentences reviewed,

- 38 were ambiguous
- 14 were clearly misclassified
- five were not on topic.

This means that 57 sentences out of 615, or 9.3 percent, were incorrectly classified.

Reviewer Two

Our second reviewer used a different rating system and reviewed 2,150 S&P 500 sentences and 615 Russell 2000 sentences. We opted to have the raters work independently to see whether the analysis stood up under different methods of evaluation.

Among the 791 *positive* S&P 500 sentences in the sample,

- 692, or 87.5 percent, were coded correctly
- 36, or 4.6 percent, were coded incorrectly
- 50, or 6.3 percent, were ambiguous
- 13, or 1.6 percent, were not on topic.

Among the 310 *negative* S&P 500 sentences in the sample,

- 255, or 82.3 percent, were coded correctly
- 16, or 5.2 percent, were coded incorrectly
- 28, or 9.0 percent, were ambiguous
- 11, or 3.5 percent, were not on topic.

In addition, 1,048 sentences in the sample were coded as neutral. We discuss neutral statements below.

Among the 199 *positive* Russell 2000 sentences in the sample,

- 163, or 81.9 percent, were coded correctly
- 14, or 7.0 percent, were coded incorrectly
- 11, or 5.5 percent, were ambiguous
- 11, or 5.5 percent, were not on topic.

Among the 85 *negative* Russell 2000 sentences in the sample,

- 72, or 84.7 percent, were coded correctly
- seven, or 8.2 percent, were coded incorrectly
- two, or 2.4 percent, were ambiguous
- four, or 4.7 percent, were not on topic.

In addition, 325 sentences in the sample were coded as neutral. We discuss neutral statements below, along with a number of other issues that may suggest weaknesses in our results.

Discussion of Results

Beyond simply assessing the correctness of ratings, there are a number of other factors important to evaluating the machine-generated results.

Neutral Sentences

We did not use the positive, neutral, or negative ratings in our analysis. Rather, we used the numerical score for each sentence, and averaged them to assess the trend. In discussing these trends, we noted when numbers were positive or negative and considered that to be the indicator of sentiment.

However, the sentences designated as neutral by FinBERT could be a problem if they were negative but labeled with a positive number, or positive but labeled with a negative number. In the S&P 500 data set, there were 10,799 sentences labeled as neutral, ranging from 0.49 to -0.45. In the Russell 2000 data set, there were 3,250 such sentences, ranging from 0.49 to -0.43.

We took a more detailed look at neutral statements in the Russell 2000 data set. There are clear examples of statements that lean positive, and have negative numerical ratings, and statements that lean negative, and have positive numerical ratings.

For example, this statement received a score of 0.345 but is clearly on the negative side: *But when you have a 25% tariff, you can't mitigate that completely, you need to pass on price increases.*

While the software performed well at the tails, it is not clear that it performed as well the closer the scores moved toward zero. We cannot assess the effect of this on our analysis. If the errors were not systematic, then they should average out and have little effect on our conclusions. However, if positive sentences were consistently given negative scores or vice versa, our analysis may be in error.

Challenges with Clearly Positive and Negative Sentences

Although sentences rated as positive were generally positive, and those rated as negative were generally negative, there is one caveat. Statements coded as positive do not necessarily mean they were supportive of the trade war policies, although many were. Instead, sentences coded as positive sentiment often involved firms encouraging their investors things were going well *despite* the U.S. policies toward China. This does not cause problems for our analysis because our goal was to assess sentiment toward business with China rather than sentiment toward U.S. policies.

Complexity and Miscoding

Although few sentences with a clear negative or positive sentiments were blatantly miscoded, miscoded sentences tended to be more complex sentences or have more complex relationships between positive and negative words and meanings.

For example, this risk management sentiment was given a numerical score of -0.944, but it could be interpreted as positive: *We saw our risk management metrics in full action in August when markets fell nearly 2% on tariff concerns, and the strategy outperformed its benchmark.*

Likewise, this sentence was coded as positive, and was in fact overall positive, but sentiment toward China is negative: *From a regional perspective, we saw strong growth over market in all major regions of the world despite weakness in Europe and China markets.*

Complex sentences often had several sentiments, and these sometimes resulted in miscoding as well. For example, the following sentence was coded as negative, but the net sentiment is neither clearly positive nor negative, although it could be interpreted as leaning positive: *In the atmosphere of the kind of the macro*

uncertainty driven by trade war rhetoric and so on and so forth and the impacts of the tariffs, I'd say, generally speaking, customers are remaining optimistic although there is, obviously, concern which is dampening enthusiasm for laying down CapEx and taking a long-term view to demand.

And in some cases, technical issues resulted in an incorrect score. For example, the software did not understand that lower freight rates are good. This sentence received -0.932: *As we look at freight rates, clearly, you guys highlighted, obviously, we're heading into the Chinese New Year, rates have come down.*

Challenges with Questions

The earnings call transcripts also contain questions from those attending the meeting. The software rated these as well, although they do not necessarily reflect the sentiment of the company. There is no simple way to exclude them from the analysis.

Abbreviations

5G	fifth generation
AI	artificial intelligence
ALP	American Life Panel
BEA	Bureau of Economic Analysis
BIS	Bureau of Industry and Security
BLS	Bureau of Labor Statistics
BRI	Belt and Road Initiative
CFIUS	Committee on Foreign Investment in the United States
DOC	Department of Commerce
DOD	Department of Defense
EAR	Export Administration Regulations
EU	European Union
FDI	foreign direct investment
Fintech	financial technology
FIRRMA	Foreign Investment Risk Review Modernization Act
GDP	gross domestic product
GICS	Global Industry Classification Standard
HP	Hewlett-Packard
HSPC	Human Subjects Protection Committee
ICTS	information and communications technology and services
IP	intellectual property
IT	information technology
JAIC	Joint Artificial Intelligence Center
JV	joint venture
NAICS	North American Industry Classification System
Nasdaq	National Association of Securities Dealers Automated Quotations
NSS	National Security Strategy
NYSE	New York Stock Exchange
PLA	People's Liberation Army
PRC	People's Republic of China
Q1	first quarter
Q2	second quarter
Q3	third quarter
Q4	fourth quarter
R&D	research and development
S&P	Standard & Poor's
SEC	Securities and Exchange Commission

SIA	Semiconductor Industry Association
SOE	state-owned enterprise
USMCA	United States–Mexico–Canada Agreement
USTR	U.S. Trade Representative
WTO	World Trade Organization

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The administration of President Donald Trump pursued an enhanced—and, in some ways, novel—set of policies designed to confront China over its transgressive and anticompetitive economic behaviors, such as theft of technology and intellectual property and limitations on market access for U.S. businesses. How did the U.S. business community view these policies, and did it broadly support increased U.S. efforts to counter problematic Chinese economic behavior? If not, how could the U.S. government implement policy to better achieve policy goals while also addressing corporate concerns?

In this report, the authors address these questions, which are central to determining whether the U.S. government has crafted an overall economic strategy or approach toward China that is sustainable and feasible. How the business community thinks the United States should deal with China is an overlooked and underappreciated topic, and the United States might find it difficult to compete against China without support from the business community.

The authors assess how the U.S. business community—focusing on the manufacturing, technology, and financial sectors—viewed the Trump administration's China policies through several different lenses: from the perspective of individuals, from the perspective of different firms over time, and from the perspective of specific industry sectors and subsectors. The analysis focuses on Trump administration actions toward China from 2017 through fall 2020.

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