The Complete Treatise on the Interaction of the American Economy with China:

An Analysis of Trade, Technology and Economic Transformation in the 21st Century

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Abstract

The economic relationship between the United States and China represents one of the most significant bilateral economic partnerships in modern history, while simultaneously embodying elements of competition, interdependence, and strategic rivalry. This treatise examines the multifaceted ways in which China's economic rise has influenced, challenged, and in some cases disrupted traditional American economic structures and paradigms.

The transformation of China from a largely agrarian economy to the world's secondlargest economy within four decades has created unprecedented shifts in global economic dynamics. This rapid ascension has generated both opportunities and challenges for the American economy, necessitating a comprehensive analysis of trade flows, technological competition, supply chain dependencies, and strategic economic policies.

The scope of this analysis encompasses trade imbalances, manufacturing sector transitions, technological competition in emerging industries, supply chain vulnerabilities, financial market interactions, and the broader implications for American economic competitiveness. Rather than presenting a simplistic narrative of economic disruption, this treatise seeks to provide a nuanced understanding of how two of the world's largest economies interact, compete, and influence global economic structures.

The evidence suggests that while China's rise has indeed challenged certain aspects of American economic dominance and created adjustment pressures in specific sectors, the relationship is characterized more by complex interdependence than by simple disruption. The analysis reveals that both economies have benefited from increased integration while facing new challenges that require strategic policy responses.

The treatise ends with "The End"

Contents

1	Introduction	2
2	Historical Context of US-China Economic Relations	2
	2.1 Pre-Reform Era (1949-1978)	2
	2.2 Early Reform Period (1978-1990)	3
	2.3 Acceleration Period (1990-2001)	3
3	China's Economic Rise: Key Indicators and Milestones	3
	3.1 GDP Growth and Economic Scale	3
	3.2 Trade Performance and Global Integration	4
	3.3 Foreign Investment Flows	4

4	Trade Relations and Imbalances				
	4.1	Evolution of Bilateral Trade	5		
	4.2	Trade Deficit Analysis	5		
	4.3	Sectoral Trade Patterns	5		
5	Manufacturing Sector Impact 6				
	5.1	Industrial Transformation in America	6		
	5.2	Supply Chain Reconfiguration	6		
	5.3	Technological Competition and Innovation	7		
6	Tecl	hnological Competition and Transfer	7		
	6.1	Historical Technology Transfer Patterns	7		
	6.2	Strategic Technology Sectors	8		
	6.3	Research and Development Competition	8		
7	Sup	ply Chain Dependencies and Vulnerabilities	9		
	7.1	Critical Supply Chain Analysis	9		
	7.2	Pandemic-Revealed Vulnerabilities	9		
	7.3	Strategic Response and Diversification	9		
8	Fina	ancial Market Interactions	10		
	8.1	Capital Flows and Investment Patterns	10		
	8.2	Currency and Monetary Policy Interactions	10		
	8.3	Financial Technology and Innovation	11		
9	Imp	eact on American Workers and Communities	11		
	9.1	Employment Effects Across Sectors	11		
	9.2	Skill Requirements and Workforce Adaptation	12		
	9.3	Community-Level Impacts	12		
10		cy Responses and Trade Wars	13		
		Evolution of Trade Policy	13		
		Tariff Wars and Their Economic Impact	13		
	10.3	Strategic Competition Framework	14		
11	Reg	ional and Global Economic Implications	15		
		Impact on Global Trade Patterns	15		
		Effects on Developing Economies	15		
	11.3	Alliance and Partnership Implications	16		
12		ure Prospects and Scenarios	16		
		Economic Trajectory Projections	16		
		Technological Competition Outlook	17		
	12.3	Policy Options and Recommendations	17		
13	Con	aclusion	18		
14	The	• End	21		

1 Introduction

The emergence of China as a global economic powerhouse represents one of the most significant economic developments of the past half-century. Beginning with Deng Xiaoping's economic reforms in 1978, China has transformed from a centrally planned economy with limited global integration to a market-oriented economy that serves as a critical node in global supply chains, a major destination for foreign investment, and an increasingly important source of outbound investment and technological innovation.

This transformation has profound implications for the United States, which had maintained economic hegemony in the post-World War II era. The American economy, built on principles of free market capitalism, technological innovation, and global trade leadership, has encountered new forms of competition and cooperation through China's economic ascension.

The relationship between these two economic giants is characterized by simultaneous cooperation and competition. While bilateral trade has grown exponentially, reaching over 690 billion in 2022, tensions have emerged over trade practices, technology transfer, intellectual property protection, and strategic economic policies. Understanding this relationship requires moving beyond simplistic narratives of economic warfare or inevitable conflict to examine the complex interdependencies that have developed.

The concept of "disruption" in this context encompasses multiple dimensions: the displacement of traditional manufacturing activities, challenges to technological leadership, shifts in global supply chain configurations, changes in international trade patterns, and evolving competitive dynamics in emerging industries. These disruptions, however, must be understood within the broader context of globalization, technological advancement, and evolving consumer preferences that would have occurred regardless of China's specific role.

This treatise employs a multidisciplinary approach, drawing from international economics, political economy, strategic studies, and industrial organization theory to provide a comprehensive analysis of how China's economic rise has influenced American economic structures and outcomes.

2 Historical Context of US-China Economic Relations

2.1 Pre-Reform Era (1949-1978)

The economic relationship between the United States and China during the first three decades of the People's Republic of China was characterized by minimal interaction due to ideological differences, the Cold War context, and China's adoption of a Soviet-style centrally planned economy. Trade between the two countries was virtually nonexistent, with the United States maintaining economic sanctions and trade embargoes against China.

The Korean War (1950-1953) further strained relations and reinforced economic isolation. During this period, China's economy was primarily focused on heavy industry development under state planning, with limited integration into the global economy. The United States, meanwhile, was experiencing post-war economic expansion and establishing its position as the dominant global economic power through institutions like the Bretton Woods system, NATO, and various bilateral trade agreements.

The Nixon administration's diplomatic opening to China in 1972 began to change the trajectory of bilateral relations, though economic engagement remained limited. The Shanghai Communiqué established the foundation for future diplomatic relations but did not immediately translate into significant economic cooperation.

2.2 Early Reform Period (1978-1990)

Deng Xiaoping's economic reforms marked the beginning of China's transformation from a centrally planned to a market-oriented economy. The establishment of Special Economic Zones (SEZs) in coastal areas like Shenzhen, Zhuhai, and Xiamen created laboratories for market-based economic policies and foreign investment attraction.

During this period, the United States began to view China as a potential partner in containing Soviet influence, leading to the granting of Most Favored Nation (MFN) trading status in 1980. This development facilitated increased trade flows, though the volume remained relatively modest compared to later decades.

American companies began exploring opportunities in China's emerging market economy, particularly in sectors where China sought foreign technology and expertise. Joint ventures became a common mechanism for foreign investment, allowing American companies to access Chinese markets while providing technology transfer and management expertise.

The economic relationship during this period was characterized by cautious optimism on both sides. The United States saw opportunities to access a large and potentially lucrative market while supporting China's transition away from Soviet-style socialism. China sought American investment, technology, and access to global markets to support its modernization efforts.

2.3 Acceleration Period (1990-2001)

The decade of the 1990s witnessed significant acceleration in US-China economic integration. The end of the Cold War removed ideological barriers to deeper cooperation, while China's continued economic reforms created new opportunities for American businesses.

The Tiananmen Square events of 1989 temporarily strained relations and led to economic sanctions, but the relationship gradually normalized as both countries recognized the mutual benefits of economic cooperation. The renewal of MFN status became an annual political exercise that gradually decoupled economic relations from human rights concerns.

China's GDP growth averaged over 9 percent annually during this period, creating a rapidly expanding market for American goods and services. Key sectors of cooperation included manufacturing partnerships, technology transfer agreements, and infrastructure development projects.

The Asian Financial Crisis of 1997-1998 demonstrated China's growing importance to regional economic stability. China's decision to maintain its currency peg during the crisis was viewed favorably by the United States and demonstrated China's emergence as a responsible stakeholder in the global economy.

American foreign direct investment in China increased substantially during this period, with companies like General Motors, Boeing, and McDonald's establishing significant operations. These investments created complex supply chain relationships that would later become central to debates about economic interdependence and vulnerability.

3 China's Economic Rise: Key Indicators and Milestones

3.1 GDP Growth and Economic Scale

China's economic expansion since 1978 represents one of the most dramatic economic transformations in modern history. From a GDP of approximately 150 billion in 1978, China's economy had grown to over 17.7 trillion by 2021, making it the world's second-largest economy by nominal GDP and the largest by purchasing power parity.

The sustained high growth rates, averaging nearly 10 percent annually for three decades, enabled China to lift hundreds of millions of people out of poverty while fundamentally altering

global economic dynamics. This growth was initially driven by agricultural reforms, industrial development, and increasing integration into global trade networks.

The scale of China's economic transformation can be understood through several key metrics. Manufacturing value added increased from less than 50 billion in 1980 to over 4 trillion by 2020, making China the world's largest manufacturing economy. This growth was accompanied by significant improvements in productivity, technological capabilities, and industrial sophistication.

China's economic expansion has not been uniform across all sectors or regions. Coastal provinces initially benefited more from reform policies and foreign investment, leading to significant regional disparities that have persisted despite government efforts to promote more balanced development.

3.2 Trade Performance and Global Integration

China's integration into global trade networks represents perhaps the most visible aspect of its economic rise from an American perspective. Total trade (exports plus imports) grew from less than 40 billion in 1980 to over 6 trillion by 2021, making China the world's largest trading nation.

The composition of China's trade has evolved significantly over this period. Initially focused on labor-intensive manufactures like textiles and basic consumer goods, China's export profile has gradually shifted toward more sophisticated products including electronics, machinery, and high-technology goods.

China's accession to the World Trade Organization (WTO) in 2001 marked a critical milestone in its global economic integration. WTO membership required China to reduce tariffs, eliminate trade barriers, and adopt international trade rules and practices. This integration accelerated China's role in global supply chains and increased its trade with all major economies, including the United States.

The development of China as the "world's factory" created new patterns of global production and trade. Many American companies established manufacturing operations in China to take advantage of lower labor costs, leading to increased imports of Chinese-made goods into the American market.

3.3 Foreign Investment Flows

Foreign direct investment (FDI) played a crucial role in China's economic development and technology acquisition. Cumulative FDI inflows exceeded 2.5 trillion by 2021, making China one of the world's largest recipients of foreign investment throughout the reform period.

American companies have been significant contributors to these investment flows, particularly in manufacturing, services, and technology sectors. Companies like General Electric, IBM, and Apple have established substantial operations in China, creating complex relationships that involve not only market access but also technology transfer and supply chain integration.

China's outward foreign direct investment has grown dramatically since 2000, transforming the country from primarily a recipient to also a major source of global investment. Chinese companies have made significant acquisitions in the United States across various sectors, including technology, entertainment, and real estate.

The Belt and Road Initiative, launched in 2013, represents China's most ambitious international economic program, involving infrastructure investments and trade facilitation across more than 60 countries. While primarily focused on Asia, Europe, and Africa, the initiative has implications for global trade patterns and economic relationships.

4 Trade Relations and Imbalances

4.1 Evolution of Bilateral Trade

The bilateral trade relationship between the United States and China has grown exponentially since the normalization of diplomatic relations. From virtually no trade in the 1970s, bilateral trade reached 690.6 billion in 2022, making China America's third-largest trading partner after Canada and Mexico.

This growth trajectory has been marked by several distinct phases. The initial period (1980-1990) saw modest growth as both countries explored commercial opportunities. The acceleration period (1990-2001) witnessed rapid expansion driven by China's continued economic reforms and American companies' increasing investment in Chinese manufacturing.

The post-WTO period (2001-2018) experienced explosive growth in bilateral trade, with China becoming America's second-largest trading partner. During this period, the trade relationship became increasingly complex, involving not only goods trade but also services, investment flows, and technology transfer.

The trade war period (2018-2021) marked a significant shift in the relationship, with both countries imposing substantial tariffs on bilateral trade. Despite these tensions, trade volumes remained substantial, demonstrating the deep economic integration that had developed over previous decades.

4.2 Trade Deficit Analysis

The US-China trade deficit has been a persistent source of tension in bilateral relations. The deficit grew from 10.4 billion in 1990 to a peak of 419.5 billion in 2018, representing approximately 60 percent of America's total trade deficit.

Several factors contribute to this persistent imbalance. China's competitive advantages in manufacturing, including lower labor costs, economies of scale, and government support for export industries, have enabled Chinese companies to compete effectively in American markets.

The dollar's role as the global reserve currency creates structural conditions that contribute to trade deficits. As other countries accumulate dollar reserves, they must export more to the United States than they import, creating a natural tendency toward American trade deficits.

Supply chain specialization has also contributed to the measured trade imbalance. Many products counted as Chinese exports to the United States contain components and value-added from other countries, including the United States itself. This global value chain integration means that gross trade statistics may overstate the actual economic impact of the deficit.

Consumer preferences and market demands in the United States have also shaped trade patterns. American demand for low-cost consumer goods, electronics, and other manufactured products has created market opportunities that Chinese manufacturers have effectively exploited.

4.3 Sectoral Trade Patterns

The composition of US-China trade reflects the comparative advantages and industrial structures of both economies. China's exports to the United States are concentrated in manufactured goods, particularly electronics, machinery, textiles, and consumer products.

Electronics and telecommunications equipment represent the largest category of Chinese exports to the United States, reflecting China's role as a global manufacturing hub for multinational technology companies. This sector illustrates the complexity of modern trade relationships, as many "Chinese" exports are actually products of American, Japanese, or Korean companies manufactured in China.

American exports to China are more diverse, including agricultural products, aircraft, semiconductors, and industrial machinery. Soybeans, corn, and other agricultural commodities have historically been significant American exports to China, making American farmers important stakeholders in the bilateral relationship.

Services trade has become increasingly important in bilateral relations. American companies export significant services to China in areas like financial services, telecommunications, and entertainment, while Chinese companies are growing providers of services in the American market.

The technology sector represents both significant trade opportunities and the source of increasing tensions. While American technology companies have benefited from access to Chinese markets and manufacturing capabilities, concerns about technology transfer, intellectual property protection, and national security have created new challenges for sectoral trade relations.

5 Manufacturing Sector Impact

5.1 Industrial Transformation in America

The American manufacturing sector has undergone significant transformation since China's emergence as a global manufacturing powerhouse. This transformation involves not merely job losses or plant closures but a fundamental restructuring of industrial organization, competitive strategies, and value chain positioning.

Manufacturing employment in the United States declined from approximately 19.5 million jobs in 1979 to 12.8 million in 2010, though it has partially recovered to approximately 13.2 million by 2023. While multiple factors contributed to this decline, including technological automation, changing consumer preferences, and global competition from various sources, China's manufacturing growth coincided with and likely accelerated these trends.

The impact has been uneven across industries and regions. Labor-intensive industries such as textiles, furniture, and basic electronics experienced significant competitive pressure from Chinese imports. Conversely, industries requiring specialized skills, advanced technology, or proximity to end markets maintained stronger competitive positions.

Regional impacts have been particularly pronounced in traditional manufacturing areas of the Midwest and Southeast. Communities dependent on industries that faced direct Chinese competition experienced economic dislocation, population decline, and social challenges that persist today.

However, the narrative of American manufacturing decline must be balanced against evidence of industrial evolution and upgrading. Many American manufacturers have successfully adapted by focusing on higher-value activities, implementing advanced manufacturing technologies, and developing specialized market niches where they maintain competitive advantages.

5.2 Supply Chain Reconfiguration

China's integration into global supply chains has fundamentally altered how American companies organize production and sourcing decisions. The concept of "Factory China" emerged as multinational corporations, including many American companies, established manufacturing operations in China to serve both Chinese and global markets.

This supply chain integration created complex interdependencies that have proven difficult to unwind even when trade tensions escalate. American companies that initially moved production to China for cost advantages often developed sophisticated supplier networks, quality control systems, and logistics capabilities that represent significant sunk investments.

The benefits of these supply chain relationships have included lower production costs, access to specialized suppliers, and the ability to serve Chinese and Asian markets more effectively. However, these relationships have also created vulnerabilities, as demonstrated during the COVID-19 pandemic when supply chain disruptions highlighted the risks of over-concentration.

American companies have responded to these challenges through various strategies, including supply chain diversification, nearshoring, and selective reshoring of production. However, these adjustments are gradual and costly processes that require significant time and investment.

The development of China's domestic supply chain capabilities has also evolved the competitive landscape. Chinese companies that initially served as contract manufacturers for American brands have increasingly developed their own products, technologies, and brands, becoming direct competitors rather than just suppliers.

5.3 Technological Competition and Innovation

The manufacturing sector has become a key arena for technological competition between American and Chinese companies. China's emphasis on industrial upgrading through policies like "Made in China 2025" has created new competitive dynamics in advanced manufacturing sectors.

American manufacturers have traditionally maintained advantages in research and development, advanced materials, precision manufacturing, and complex system integration. However, Chinese companies have made significant investments in these areas, supported by government policies and access to large domestic markets.

The competition in advanced manufacturing technologies such as robotics, artificial intelligence applications, and additive manufacturing represents a new phase of industrial competition. Both countries recognize advanced manufacturing as critical to future economic competitiveness and national security.

Intellectual property protection has become a central issue in manufacturing sector competition. American companies have raised concerns about forced technology transfer, intellectual property theft, and unfair competitive practices, leading to policy responses including tariffs, investment restrictions, and export controls.

Innovation ecosystems in both countries continue to evolve, with complex relationships involving competition, cooperation, and knowledge spillovers. American and Chinese companies often compete in end markets while maintaining supplier relationships or conducting joint research in specific areas.

6 Technological Competition and Transfer

6.1 Historical Technology Transfer Patterns

Technology transfer has been a central element of US-China economic relations since China's reform period began. Initially, American companies viewed China primarily as a destination for mature technologies and manufacturing processes, seeing opportunities to monetize older technologies while accessing cost-competitive production capabilities.

Joint venture requirements and technology transfer expectations were explicit elements of China's foreign investment framework during the early reform period. American companies seeking access to Chinese markets often needed to share technologies, establish research facilities, or train Chinese personnel as conditions for market entry.

This technology transfer occurred through multiple channels: foreign direct investment, licensing agreements, joint ventures, academic exchanges, and informal knowledge spillovers. American universities also played significant roles through student exchanges, research collaborations, and consulting relationships with Chinese institutions and companies.

The pattern of technology transfer has evolved significantly over time. While early transfer focused on relatively basic manufacturing processes, more recent arrangements have involved increasingly sophisticated technologies in areas like telecommunications, automotive systems, and renewable energy.

American companies initially viewed these arrangements as mutually beneficial, gaining access to markets and low-cost production while providing technologies that had already been

commercialized. However, as Chinese technological capabilities advanced, concerns grew about the long-term competitive implications of extensive technology transfer.

6.2 Strategic Technology Sectors

Competition in strategic technology sectors has become increasingly prominent in bilateral relations. Key areas of competition include telecommunications (particularly 5G networks), semiconductor technology, artificial intelligence, quantum computing, and biotechnology.

The telecommunications sector exemplifies the evolution from cooperation to competition. American companies like Cisco and Motorola were early participants in China's telecommunications infrastructure development. However, the emergence of Chinese competitors like Huawei and ZTE as global leaders created new competitive dynamics and security concerns.

Semiconductor technology represents perhaps the most complex area of technological interdependence and competition. American companies maintain leadership in design, specialized materials, and manufacturing equipment, while China has made significant investments in developing domestic semiconductor capabilities through policies like the National IC Industry Investment Fund.

Artificial intelligence development involves extensive interactions between American and Chinese research communities, companies, and institutions. While competition is intensifying, significant cooperation continues through academic exchanges, joint research projects, and business partnerships.

The biotechnology and pharmaceutical sectors have experienced similar patterns of evolution from cooperation to competitive tension. American companies have established significant research and manufacturing operations in China, while Chinese companies have made substantial investments in biotechnology innovation and global expansion.

6.3 Research and Development Competition

Research and development competition has become a critical dimension of US-China technological rivalry. Both countries have substantially increased R&D spending, with China's R&D expenditure growing from less than 1 percent of GDP in 1995 to over 2.4 percent by 2021.

The scale of China's R&D investments has created new competitive dynamics. While American R&D spending remains larger in absolute terms, China's rapid growth has narrowed the gap significantly. Chinese R&D expenditure reached approximately 400 billion in 2021, compared to about 700 billion for the United States.

University and research institution interactions have become increasingly complex due to security concerns about technology transfer and espionage. Programs like the China Initiative and concerns about academic espionage have affected research collaborations, though significant cooperation continues in many areas.

Patent applications and publications provide indicators of competitive positioning in technological innovation. China has become the world's largest source of patent applications, though questions remain about the quality and commercial significance of many applications.

The competition extends to human capital, with both countries seeking to attract and retain top scientific and engineering talent. Immigration policies, visa restrictions, and security clearance requirements have become tools in this competition, potentially affecting the global mobility of researchers and engineers.

7 Supply Chain Dependencies and Vulnerabilities

7.1 Critical Supply Chain Analysis

The integration of Chinese manufacturing into global supply chains has created extensive dependencies that became starkly apparent during the COVID-19 pandemic. Critical sectors including pharmaceuticals, medical devices, electronics, and rare earth materials showed significant vulnerabilities to supply chain disruption.

Pharmaceutical supply chains illustrate these dependencies clearly. While the United States remains a leader in pharmaceutical research and development, a significant portion of active pharmaceutical ingredients (APIs) are manufactured in China and India. The FDA estimates that about 80 percent of APIs used in American medications are manufactured outside the United States, with China being a major supplier.

Electronics supply chains demonstrate even more complex dependencies. While final assembly of many electronic products occurs in China, the supply chains involve components and materials from dozens of countries. Disruptions in Chinese manufacturing can cascade through global electronics supply networks, affecting American companies and consumers.

Rare earth materials represent a particularly strategic vulnerability. China controls approximately 85 percent of global rare earth processing capacity, despite holding only about 36 percent of global reserves. These materials are essential for electronics, renewable energy systems, and defense applications.

The development of these dependencies was driven by economic efficiency considerations, including cost advantages, manufacturing capabilities, and proximity to component suppliers. However, the concentration of production in China has created strategic vulnerabilities that policymakers increasingly recognize as national security concerns.

7.2 Pandemic-Revealed Vulnerabilities

The COVID-19 pandemic served as a stress test for global supply chains, revealing the extent of American dependence on Chinese manufacturing in critical sectors. Personal protective equipment (PPE), medical devices, and pharmaceutical intermediates all experienced severe shortages when Chinese production was disrupted.

The initial pandemic response highlighted how quickly supply chain disruptions could translate into shortages of essential goods. Hospitals faced critical shortages of masks, gowns, and ventilators, many of which were normally imported from China or relied on Chinese-made components.

These shortages prompted immediate policy responses, including the Defense Production Act invocations, emergency procurement programs, and initiatives to develop domestic manufacturing capabilities for critical goods. However, building domestic alternatives proved challenging and time-consuming.

The experience also revealed the complexity of modern supply chains. Even when alternative suppliers existed in other countries, those suppliers often depended on Chinese inputs or components, creating multiple potential failure points.

Recovery patterns showed both the resilience and fragility of integrated supply chains. While production and trade flows largely recovered by 2021, the experience heightened awareness of supply chain risks and accelerated discussions about supply chain diversification and resilience.

7.3 Strategic Response and Diversification

American companies and policymakers have responded to supply chain vulnerabilities through various diversification and resilience strategies. These responses include geographical diversification, inventory management changes, supplier relationship modifications, and selective nearshoring or reshoring initiatives.

Geographical diversification involves developing supplier relationships in multiple countries to reduce dependence on any single source. Countries like Vietnam, India, Mexico, and various Southeast Asian nations have benefited from companies seeking alternatives to Chinese suppliers.

However, diversification efforts face several challenges. Many alternative locations lack the manufacturing ecosystems, supplier networks, and logistics infrastructure that made China attractive. Building these capabilities requires significant time and investment.

Government policies have supported supply chain diversification through various mechanisms, including trade agreements, development finance programs, and regulatory requirements. The CHIPS and Science Act, for example, provides incentives for domestic semiconductor manufacturing to reduce dependence on Asian suppliers.

Private sector initiatives include supply chain mapping exercises, risk assessment programs, and strategic inventory management. Some companies have adopted "China Plus One" strategies, maintaining Chinese suppliers while developing alternatives in other locations.

The effectiveness of these diversification efforts remains to be fully determined. While some progress has been made, the scale and complexity of existing supply chain integration mean that significant dependencies are likely to persist for many years.

8 Financial Market Interactions

8.1 Capital Flows and Investment Patterns

Financial market interactions between the United States and China have evolved dramatically since China's financial market liberalization began in the 1990s. These interactions encompass direct investment flows, portfolio investment, banking relationships, and increasingly complex financial instrument trading.

Foreign direct investment has been the most visible component of financial flows. American FDI stock in China reached approximately 120 billion by 2020, reflecting decades of American corporate investment in Chinese operations. This investment has been concentrated in manufacturing, services, and increasingly technology sectors.

Chinese FDI in the United States grew rapidly from 2000 to 2016, reaching a peak of approximately 46 billion in annual flows. However, regulatory restrictions and policy changes have significantly reduced these flows, with Chinese FDI in the United States falling to less than 5 billion annually by 2020.

Portfolio investment flows have become increasingly important as China's capital markets have developed and partially opened to foreign investors. American institutional investors have gained access to Chinese stocks and bonds through various programs, including the Stock Connect programs and Qualified Foreign Institutional Investor (QFII) schemes.

The inclusion of Chinese securities in major global indices has created automatic investment flows from American pension funds, mutual funds, and exchange-traded funds that track these indices. This passive investment represents a significant source of capital flows that operates independently of active investment decisions.

Banking relationships have also evolved significantly. Major American banks like JPMorgan Chase, Goldman Sachs, and Morgan Stanley have established substantial operations in China, while Chinese banks like Bank of China and Industrial and Commercial Bank of China have expanded their American presence.

8.2 Currency and Monetary Policy Interactions

The relationship between the US dollar and Chinese yuan has been a persistent source of tension and complexity in bilateral economic relations. China maintained a fixed exchange rate regime

pegged to the dollar from 1995 to 2005, then gradually shifted toward a more flexible system with continued government intervention.

Exchange rate policies have significant implications for trade competitiveness and economic relations. American policymakers have frequently criticized Chinese currency practices, arguing that an undervalued yuan provides unfair trade advantages and contributes to bilateral trade imbalances.

The Chinese government's currency interventions and capital controls create asymmetries in monetary policy transmission and financial market integration. While American financial markets are largely open to Chinese participation, Chinese capital controls limit reciprocal access and create one-way capital flow pressures.

Reserve accumulation patterns reflect these monetary policy interactions. China's foreign exchange reserves peaked at nearly 4 trillion in 2014, largely composed of US Treasury securities and other dollar-denominated assets. This accumulation created a complex interdependence where China became a major creditor to the United States.

Recent developments have included Chinese efforts to internationalize the yuan through initiatives like the Belt and Road Initiative and central bank digital currency development. These efforts could potentially reduce dollar dominance in international transactions, though the scale and timeline remain uncertain.

8.3 Financial Technology and Innovation

Financial technology represents an emerging area of both competition and cooperation in US-China financial relations. Chinese companies like Ant Financial and Tencent have developed innovative mobile payment systems and digital financial services that have achieved massive scale in the Chinese market.

American financial technology companies have faced significant challenges entering the Chinese market due to regulatory restrictions and competitive pressures from domestic companies. Conversely, Chinese fintech companies have had limited success entering the American market due to regulatory compliance requirements and security concerns.

The development of central bank digital currencies (CBDCs) represents a new frontier in monetary system competition. China's digital yuan project is among the most advanced CBDC initiatives globally, while the United States is still exploring potential approaches to digital dollar development.

Blockchain technology and cryptocurrency regulations have created another area of competitive positioning. While both countries have expressed interest in blockchain applications, their approaches to cryptocurrency regulation have differed significantly, with China implementing broad restrictions while the United States has pursued more targeted regulatory frameworks.

Cross-border payment systems represent both cooperation opportunities and competitive challenges. While American companies like Visa and Mastercard have significant global market shares, Chinese payment systems are expanding internationally through partnerships and acquisitions.

9 Impact on American Workers and Communities

9.1 Employment Effects Across Sectors

The employment impacts of increased economic integration with China have been uneven across American workers, sectors, and geographic regions. While aggregate employment levels have generally grown over the period of increased China trade, significant displacement has occurred in specific industries and communities.

Manufacturing employment experienced the most visible impacts, with job losses concentrated in industries facing direct import competition. The Economic Policy Institute estimated

that trade with China eliminated 3.7 million American jobs between 2001 and 2018, with manufacturing accounting for approximately 75 percent of these losses.

However, employment effects extend beyond manufacturing. Service sector jobs have been created to support increased trade volumes, including logistics, transportation, retail, and professional services. Port cities and transportation hubs have generally benefited from increased trade flows with China.

The quality and wage characteristics of displaced and created jobs represent important dimensions of the employment impact. Many manufacturing jobs that were lost offered middle-class wages and benefits to workers without college degrees. Service sector jobs created to support trade have often provided lower wages and fewer benefits.

Regional variations in employment impacts reflect industrial specialization patterns. Areas dependent on textile manufacturing, furniture production, and basic electronics assembly experienced more severe job losses. Conversely, regions with aerospace, advanced manufacturing, or port facilities often experienced job growth.

The temporal pattern of employment adjustments has also been significant. Job displacement often occurs rapidly when plants close or production moves overseas, while job creation in other sectors typically occurs more gradually and may require different skills and locations.

9.2 Skill Requirements and Workforce Adaptation

Changes in skill requirements represent a crucial dimension of how increased China trade has affected American workers. The competitive pressure from Chinese manufacturing has accelerated the premium for advanced skills, technological proficiency, and adaptability.

Workers in industries facing Chinese competition have faced pressure to upgrade skills or transition to different sectors. This transition has been particularly challenging for older workers with industry-specific skills and limited educational opportunities.

Educational and training institutions have responded with varying degrees of success to changing skill requirements. Community colleges have developed programs to retrain displaced manufacturing workers, though completion rates and employment outcomes have been mixed.

The emergence of new industries and job categories related to global trade has created opportunities for workers with appropriate skills. Logistics coordination, international supply chain management, and cross-cultural business communication have become increasingly valuable skills.

However, geographic mismatches between job losses and job creation have created additional challenges for workforce adaptation. New opportunities are often located in different regions from where job displacement occurs, requiring worker mobility that may be constrained by housing, family, or community ties.

Policy responses have included trade adjustment assistance programs, workforce development initiatives, and educational support for displaced workers. The effectiveness of these programs has been debated, with some studies suggesting limited impact on long-term employment and earnings outcomes.

9.3 Community-Level Impacts

The community-level impacts of trade-related economic changes have been profound in areas where major employers closed operations or significantly reduced employment due to Chinese competition. These impacts extend beyond individual job losses to affect entire local economies and social structures.

Manufacturing-dependent communities have experienced multiple rounds of adjustment as different industries faced competitive pressure at different times. Communities that successfully diversified their economic bases have generally adapted better than those remaining dependent on a narrow range of industries.

Population decline has affected many communities that lost major employers. Young people often leave to seek opportunities elsewhere, leading to aging populations and reduced demand for local services. This demographic change can create self-reinforcing cycles of economic decline.

Local government revenues have been affected by plant closures and property value declines. Reduced tax bases can force cuts in public services, educational programs, and infrastructure maintenance, further undermining community attractiveness and economic development prospects.

However, some communities have successfully reinvented their economic foundations. Investments in education, infrastructure, and business development have enabled transitions to new industries and economic activities. These success stories often involve partnerships between local governments, educational institutions, and private sector organizations.

The social and political implications of community-level economic disruption have become increasingly apparent. Areas experiencing significant trade-related job losses have shown different political preferences and policy priorities, reflecting the ongoing impact of economic transformation on American society and governance.

10 Policy Responses and Trade Wars

10.1 Evolution of Trade Policy

American trade policy toward China has evolved significantly since diplomatic normalization, reflecting changing economic conditions, political priorities, and strategic considerations. The trajectory has moved from engagement and integration toward strategic competition and selective decoupling.

The early period of engagement (1979-2000) was characterized by policies designed to encourage China's integration into the global economy and support its transition toward market-oriented reforms. Most Favored Nation trading status, support for World Bank lending, and encouragement of American investment reflected this engagement approach.

The WTO accession period (2001-2008) represented the high point of economic integration policies. American support for China's WTO membership reflected confidence that integration would promote rule-of-law development and create mutual economic benefits. The permanent normal trade relations status eliminated annual reviews of China's trading status.

Growing concerns about trade imbalances, intellectual property practices, and strategic competition led to policy reassessment during the Obama administration (2009-2016). Initiatives like the Trans-Pacific Partnership were partly designed to create competitive pressure on China to adopt higher standards, while specific cases were pursued through WTO dispute resolution mechanisms.

The Trump administration (2017-2021) marked a dramatic shift toward confrontational trade policies. The Section 301 investigation into Chinese intellectual property practices provided the basis for imposing tariffs on hundreds of billions of dollars of Chinese imports, launching what became known as the "trade war."

The Biden administration (2021-present) has largely maintained Trump-era tariffs while emphasizing strategic competition over trade war rhetoric. The focus has shifted toward protecting critical technologies, strengthening supply chain resilience, and coordinating policies with allies.

10.2 Tariff Wars and Their Economic Impact

The trade war period (2018-2020) involved the imposition of substantial tariffs by both countries on bilateral trade. The United States imposed tariffs ranging from 7.5 to 25 percent on approximately 360 billion of Chinese imports, while China retaliated with tariffs on approximately 185 billion of American exports.

The economic impact of these tariffs was complex and multifaceted. Studies by the Peterson Institute for International Economics and other research organizations found that American tariffs on Chinese goods were largely passed through to American consumers and businesses, resulting in higher prices for imported goods and inputs.

Import patterns showed both trade diversion and trade destruction effects. Some Chinese imports were replaced by goods from other countries, particularly Southeast Asian nations, while other imports simply became more expensive without ready substitutes. The trade deficit with China declined, but the overall American trade deficit remained relatively stable as imports shifted to other sources.

American exporters, particularly agricultural producers, experienced significant impacts from Chinese retaliatory tariffs. Soybean exports to China fell dramatically, requiring government support payments to affected farmers. Other agricultural commodities, including corn, wheat, and pork, also experienced reduced access to Chinese markets.

Manufacturing industries using Chinese inputs as intermediate goods faced cost increases that affected their competitiveness in both domestic and international markets. Some companies relocated production to avoid tariffs, while others absorbed higher costs or passed them through to customers.

The Phase One trade agreement signed in January 2020 provided some tariff relief and included Chinese commitments to increase purchases of American goods and services. However, the COVID-19 pandemic disrupted implementation, and many of the underlying trade tensions remained unresolved.

10.3 Strategic Competition Framework

The evolution from economic engagement to strategic competition reflects broader changes in how both countries view their bilateral relationship. The strategic competition framework encompasses economic, technological, and security dimensions that extend beyond traditional trade policy tools.

Export controls have become increasingly important tools for managing technology transfer and protecting national security interests. The Entity List maintained by the Bureau of Industry and Security restricts American companies from exporting certain technologies to listed Chinese companies and institutions.

Investment screening mechanisms have been strengthened to review Chinese acquisitions of American companies and assets. The Committee on Foreign Investment in the United States (CFIUS) has expanded authority and has blocked several high-profile Chinese investment proposals in technology and infrastructure sectors.

Research security initiatives have affected academic and scientific cooperation between American and Chinese institutions. Concerns about intellectual property theft and technology transfer have led to new disclosure requirements, funding restrictions, and security protocols for research collaborations.

The concept of "decoupling" versus "de-risking" reflects ongoing debates about the appropriate degree of economic separation. While complete decoupling would be economically costly and potentially counterproductive, selective de-risking in critical sectors has gained support across political parties.

International coordination has become increasingly important in strategic competition policies. Efforts to align American approaches with allies in Europe, Asia, and elsewhere aim to create more effective responses to Chinese economic practices and to prevent companies from simply shifting operations to avoid unilateral restrictions.

11 Regional and Global Economic Implications

11.1 Impact on Global Trade Patterns

The economic relationship between the United States and China has had profound implications for global trade patterns, affecting third countries and reshaping international economic relationships. The rise of China as a major trading nation has altered traditional North-South and North-North trade flows.

Trade creation and trade diversion effects have been significant for many countries. Some nations have benefited from increased Chinese demand for raw materials and agricultural products, while others have faced increased competition in manufacturing exports to both Chinese and American markets.

The emergence of complex global value chains centered on Chinese manufacturing has created new forms of economic interdependence. Countries that previously had limited direct trade relationships with China have become integrated into supply chains serving Chinese export production.

Regional trade agreements and partnerships have been influenced by US-China economic competition. The Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), the Regional Comprehensive Economic Partnership (RCEP), and various bilateral agreements reflect different approaches to managing regional economic integration.

The Belt and Road Initiative represents China's most ambitious effort to reshape global trade and investment patterns. While primarily focused on infrastructure development in Asia, Europe, and Africa, the initiative has implications for global trade routes, investment flows, and economic partnerships.

Currency and financial market impacts have extended globally through China's growing role in international finance. The yuan's inclusion in the International Monetary Fund's Special Drawing Rights basket reflects China's growing financial market importance, though the dollar remains dominant in international transactions.

11.2 Effects on Developing Economies

Developing economies have experienced diverse impacts from the expansion of US-China economic relations. These effects have varied based on countries' resource endowments, industrial structures, and geographic locations.

Commodity-exporting countries have generally benefited from Chinese demand for raw materials, agricultural products, and energy resources. Countries like Australia, Brazil, and various African nations have experienced significant increases in export revenues due to Chinese demand.

Manufacturing-oriented developing countries have faced more complex impacts. Some have benefited from participating in Chinese-centered supply chains, while others have faced increased competition from Chinese exports in traditional manufacturing sectors.

The "flying geese" model of industrial development has been altered by China's comprehensive manufacturing capabilities. Traditional patterns where countries specialized in different stages of industrial development have been disrupted by China's ability to compete across multiple industrial sectors simultaneously.

Foreign direct investment flows to developing countries have been affected by changing patterns of Chinese outward investment. China has become a major source of infrastructure investment in many developing countries, though this has sometimes created concerns about debt sustainability and political influence.

Technology transfer patterns have also been affected, with China increasingly becoming a source as well as recipient of technology flows to developing countries. Chinese companies are

increasingly active in telecommunications, digital infrastructure, and renewable energy sectors in developing economies.

11.3 Alliance and Partnership Implications

The US-China economic relationship has significant implications for American alliances and partnerships worldwide. Traditional allies have found themselves navigating between economic relationships with China and security partnerships with the United States.

European allies have experienced particular tensions as they seek to maintain economic relationships with China while addressing American concerns about technology transfer, market access, and strategic competition. The European Union's approach has evolved toward more explicit recognition of China as a "systemic rival."

Asian allies face even more complex challenges given their geographic proximity to China and extensive economic integration with the Chinese economy. Countries like South Korea, Japan, and Australia have substantial trade relationships with China while maintaining security alliances with the United States.

The QUAD partnership (United States, Japan, India, Australia) and AUKUS agreement (Australia, United Kingdom, United States) represent efforts to strengthen cooperation among democracies in response to China's rise. These partnerships have both economic and security dimensions.

Trade policy coordination among allies has become increasingly important as countries seek to present unified responses to Chinese economic practices. Efforts to coordinate investment screening, export controls, and technology protection measures reflect this trend.

However, coordination challenges remain significant given different economic interests, political systems, and strategic priorities among American allies and partners. Balancing economic opportunities with security concerns requires careful navigation of complex trade-offs.

12 Future Prospects and Scenarios

12.1 Economic Trajectory Projections

The future trajectory of US-China economic relations depends on multiple factors including domestic political developments, economic growth patterns, technological innovation, and global economic conditions. Several scenarios can be constructed based on different assumptions about these variables.

A continued strategic competition scenario assumes persistent tensions and limited cooperation in most economic sectors. Under this scenario, trade volumes might stabilize at current levels with continued restrictions on technology transfer and investment flows. Both countries would focus on building alternative supply chains and reducing dependencies.

A managed competition scenario would involve selective cooperation in some areas while maintaining restrictions in others. Climate change, global health, and certain trade issues might see increased cooperation, while technology and security-related sectors would remain subject to restrictions.

A renewed cooperation scenario would require significant political changes in both countries and resolution of current disputes. This scenario might involve removal of tariffs, renewed investment flows, and expanded cooperation on global challenges. However, this scenario appears less likely given current political and strategic dynamics.

Economic modeling suggests that continued restrictions and reduced integration would impose costs on both economies, though the distribution of these costs would depend on specific policy choices and implementation details. Both countries have demonstrated some resilience to trade disruptions, but long-term impacts on innovation and productivity growth remain uncertain.

Demographic trends, including aging populations and changing labor force characteristics, will affect both economies' growth potential and competitive positions. China faces more immediate demographic challenges, while the United States benefits from more favorable demographic trends and immigration.

12.2 Technological Competition Outlook

The trajectory of technological competition will significantly influence future economic relations. Both countries have made substantial investments in research and development, education, and innovation infrastructure, suggesting that competition will intensify across multiple technology sectors.

Artificial intelligence development represents a critical area of competition with broad economic implications. Both countries have different approaches to AI governance, data privacy, and commercial applications, which could lead to divergent technological ecosystems.

Semiconductor technology will likely remain a key competitive battleground. American advantages in design and manufacturing equipment face Chinese investments in domestic production capacity. The outcome of this competition will affect competitiveness across multiple industries.

Biotechnology and life sciences represent another area of intense competition and potential cooperation. Both countries have strong research capabilities and large markets, creating opportunities for both collaboration and competition.

Climate technology development offers potential areas for cooperation despite broader competitive tensions. Both countries have made commitments to carbon neutrality and are investing heavily in renewable energy, energy storage, and other climate technologies.

The development of international technology standards will be increasingly important as both countries seek to influence global technology governance frameworks. Competition over 5G standards provides a template for how future technology standard battles might unfold.

12.3 Policy Options and Recommendations

Future policy approaches should balance the legitimate concerns about strategic competition with the substantial benefits of economic cooperation where possible. Several policy options deserve consideration based on the analysis presented in this treatise.

Selective engagement policies could maintain cooperation in areas of mutual benefit while managing competition in strategic sectors. Climate change, global health, and certain trade issues offer opportunities for productive cooperation that serves both countries' interests.

Alliance coordination will be crucial for effective responses to Chinese economic practices. Working with allies and partners can increase leverage while reducing the economic costs of unilateral restrictions. However, coordination requires addressing different interests and priorities among partners.

Investment in domestic capabilities should be a priority regardless of the trajectory of US-China relations. Strengthening education, research and development, infrastructure, and manufacturing capabilities will enhance competitiveness in any competitive environment.

Supply chain resilience measures should focus on critical sectors while avoiding excessive costs from comprehensive decoupling. Risk assessment, diversification strategies, and strategic stockpiling can reduce vulnerabilities without eliminating all economic integration.

Regulatory frameworks need updating to address new challenges from technological competition, cyber security, and economic interdependence. Investment screening, export controls, and data governance policies require regular review and adjustment as technologies and threats evolve.

13 Conclusion

The economic relationship between the United States and China represents one of the most complex and consequential bilateral relationships in the modern global economy. The analysis presented in this treatise demonstrates that while China's economic rise has indeed created challenges and adjustments for the American economy, the relationship is characterized more by complex interdependence than simple disruption.

The evidence suggests that both economies have benefited substantially from increased integration over the past four decades. American consumers have gained access to lower-cost goods, American companies have accessed new markets and production capabilities, and American investors have earned returns from China's economic growth. Simultaneously, trade and investment flows have created adjustment pressures in specific sectors and communities, requiring policy responses and support for affected workers and areas.

The evolution from economic engagement to strategic competition reflects changing perceptions of China's economic development model, its adherence to international rules and norms, and its implications for American economic and security interests. These concerns have legitimate foundations, including issues related to intellectual property protection, technology transfer practices, market access restrictions, and the use of economic leverage for political purposes.

However, the complexity of the relationship means that simple solutions are unlikely to be effective. The extensive integration of supply chains, financial markets, and innovation ecosystems cannot be easily unwound without substantial economic costs. Moreover, many global challenges, including climate change, pandemic preparedness, and financial stability, require cooperation between the world's two largest economies.

The future trajectory of US-China economic relations will depend on policy choices made by both countries. The analysis suggests that approaches emphasizing selective engagement, alliance coordination, domestic capability building, and targeted risk management are more likely to serve American economic interests than strategies focused on comprehensive decoupling or economic warfare.

The regional and global implications of US-China economic relations extend far beyond the bilateral relationship. Other countries, international institutions, and global economic governance structures will be affected by how these two economic powers manage their relationship. Leadership and responsibility in managing this relationship constructively should be recognized as contributions to global economic stability and prosperity.

Moving forward, policymakers in both countries should focus on identifying areas where cooperation serves mutual interests while managing competition in ways that avoid unnecessary economic damage. The stakes are high not only for both countries but for the global economy and the millions of people whose livelihoods depend on international economic cooperation and trade.

The economic relationship between the United States and China will continue to evolve, presenting both challenges and opportunities. Understanding the complexity of this relationship, learning from past experiences, and maintaining perspective on long-term interests will be essential for navigating this critical economic partnership in the years ahead.

The analysis demonstrates that while disruption has occurred in specific sectors and regions, the overall impact has been one of transformation and adaptation rather than wholesale destruction of American economic capabilities. The key challenge for the future is managing this relationship in ways that preserve the benefits of economic cooperation while addressing legitimate concerns about fairness, reciprocity, and strategic competition.

Success in this endeavor will require sophisticated policy approaches, strong institutions, continued investment in American competitiveness, and recognition that economic interdependence, despite its challenges, remains preferable to economic conflict between the world's two

largest economies.

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14 The End