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# From Cold War Sanctions to Weaponized Interdependence

## An Annotated Bibliography on Competition and Control over Emerging Technologies

CSET Data Brief


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## Table of Contents

## Introduction

CSET is providing this annotated bibliography as a resource for researchers interested in studying the history and future of international competition and control over emerging technologies. We hope that this review will prove useful for scholars interested in the history of Cold War economic and technological policies, technological competitiveness, economic statecraft, and the escalating technological rivalry between Beijing and Washington. It covers decades of scholarship on technology and strategic economic competition, drawing from a wide variety of sources, from journal articles to declassified CIA documents, and a range of perspectives, from academics to policymakers.

The bibliography includes five main sections. Each section features an introduction synthesizing its contents and then lists and briefly summarizes individual sources in chronological order. First is a section surveying the hefty theoretical literature on economic interdependence, conflict, and economic statecraft, including perennial debates over the "commercial peace" theory and the efficacy of sanctions. The next two sections review strategic economic competition, export controls, and technology transfer policies during the Cold War and the post-Cold War era. The fourth section concentrates on U.S. fears of domestic economic decline and technological dependence on Japan in the 1980s and early 1990s. The final section focuses on scholarly discussions of China's rise, U.S. export controls and technology transfer policies toward Beijing, and a potential U.S.-China decoupling.

## Observations and Key Takeaways

This review suggests several important lessons for scholars and policymakers grappling with the thorny challenges of strategic economic and technological competition.

First, economics and technology are crucial components of national security and key factors influencing geopolitical outcomes. A strong economy can achieve technological breakthroughs that, in turn, help fuel economic growth and development. States can exploit economic and technological power to wield international power and influence, including by drawing upon their technological capabilities to develop cutting-edge weapon systems that enhance national military might. In the Cold War, the economic and technological advantages enjoyed by the United States and its allies forced the Soviet Union to play catch-up and helped NATO offset Soviet military advantages. The transatlantic alliance, along with Japan, established the Coordinating Committee for Multilateral Export Controls (COCOM) early in the Cold War to harmonize technology transfer policy against Communist states. In the 1980s and early 1990s, Japan's impressive economic growth and technological development led many U.S. observers to fear that Tokyo would convert its burgeoning commercial strength into hard power and match or overtake the United States. Yet in the current U.S. confrontation with China, Washington and Beijing are far more evenly matched, presenting an even greater challenge.

Second, the literature also demonstrates the value and limitations of export controls and technology transfer regulations. Export controls may lead to security gains at the cost of economic and diplomatic losses. For instance, restricting exports of Technology X may deny its military benefits to Country Y; however, the manufacturers of Technology X could suffer lost revenue and reduced competitiveness, and foreign allies may chafe if the regulations impact their own industries. ITAR regulations on the U.S. space industry are an important example of the many unintended consequences of export controls, especially their potentially adverse long-term economic and strategic consequences. There are no hard-and-fast rules governing these

calculations, and officials must carefully evaluate trade-offs before implementing wide-ranging technology transfer policies.

Third, many experts agree that when enacting technology controls, policymakers should prioritize multilateralism and coordination with allies over unilateral and abrupt moves that alienate foreign partners. Not only do unilateral export controls run the risk of diplomatic damage, but they are less effective than multilateral efforts. Robust diplomatic, intelligence, and law enforcement cooperation is key to shoring up multilateral technology control regimes. Otherwise, adversaries can capitalize upon allied disunity to obtain protected technologies. The determining factor is the availability of the technology in question, since unilateral export controls are futile if a given technology is easily obtainable through other partner states.

Fourth, export controls are a delaying measure, not a permanent solution for the problem of technology transfer to adversaries. The technological laggard is on the offensive, maintaining the initiative and enjoying plentiful means of acquisition—including cyberespionage, front companies, and insider agents. At the same time, the technological leader is playing defense, forced to continually protect intellectual property, human capital, physical goods, and digital networks. Indeed, even without the benefits of industrial cyberespionage, the Soviet Union still used its intelligence agencies and other state organs to great effect in its decades-long campaigns to acquire advanced foreign technology. Try as they might, it is impossible for states to permanently safeguard technologies against well-resourced and aggressive state acquisition efforts.

Finally, when formulating export controls and technology transfer policies, officials must be prepared to swiftly update them as the technology evolves. As new technologies emerge and diffuse, and as standards adapt, export control policies must change accordingly. Maintaining obsolete restrictions on the books is ineffective and counterproductive. In some cases, if a given technology becomes sufficiently widespread, export controls will serve as little more than a bureaucratic hindrance for companies. Thus, policymakers should develop efficient mechanisms for

modernizing regulations as the state of the field changes, lest export controls and technology transfer rules be rendered obsolete.

## Theory of Strategic Economic Competition and Statecraft

The literature on economics, interdependence, and conflict is truly vast and spans centuries. This section covers a number of prominent topics in the domain, including the relationship between interdependence and conflict, the concept of "economic security," and the disputed efficacy of economic sanctions. This section also covers the theory and practice of embargoes and economic warfare. A perennial academic debate is whether interdependence fosters peace (the "commercial peace" theory) or creates incentives for war. Experts have also considered whether the globalization of production, international financial flows, and an information-based global economy have helped to promote peace. Just as scholars have historically shown how trade can enable a dominant power to cultivate political influence in a less powerful state, more recent work has explored "weaponized interdependence"—the leveraging of economic ties to shape and influence adversary behavior—in international economics and technology. This section also includes a number of case studies exploring economic coercion, from the United States and Hawaii to India and Nepal.

Table 1: Selected Publications on Theory of Strategic Economic Competition and Statecraft

| Publication | Summary |
|---|---|
| Knorr 1975 | In the wake of the OPEC oil crisis, Knorr disagrees with the notion "that economic power is becoming increasingly important in shaping international relations, or . . . a substitute for military power." He notes that military, public opinion, diplomatic, and trade factors influence the outcome of attempted economic coercion. |
| Navari 1989 | Navari examines the writings of Norman Angell, an early international relations theorist who argued prior to World |

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| | War I that international economic interdependence would check state incentives for war. Navari outlines Angell's theory of modernity and interdependence, critiquing its "excessive generality" and insufficient attention to state power and nationalism. However, she highlights Angell's recognition of how growing interdependence would affect international politics. |
| Førland 1991 | Førland emphasizes that the Coordinating Committee for Multilateral Export Controls cannot be seen in terms of economic sanctions, but rather as a tool of economic warfare. Sanctions are a coercive tool, while COCOM aimed to impede Soviet military capabilities. He offers a theoretical discussion on the definition of economic warfare and sides with President Dwight D. Eisenhower in rejecting the notion of inherent "strategic goods." |
| Førland 1993 | Provides a pessimistic perspective on economic warfare, finding it "impotent when waged against a confident and ruthless power elite with a firm grip on the army." Førland contends that "The top strategic item is . . . the one that is relatively most expensive for the importing country to produce domestically and therefore gives the largest gains from trade." |
| Cable 1995 | Cable describes the emerging fusion of economic and security issues amidst globalization and international interdependence. He objects to the concepts of economic security and geo-economics, calling the former too broad and the latter too narrowly focused on unilateral action over multilateralism. |
| Barbieri 1996 | Contrary to conventional wisdom, Barbieri finds that "[E]xtensive economic interdependence increases the likelihood that dyads engage in militarized dispute" but does not significantly affect "the incidence of war." |

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| Morgan and Schwebach 1997 | Using a spatial model, the authors present a pessimistic view of sanctions, writing that "In most cases, a state imposing sanctions . . . can expect an outcome that is just about the same as would be obtained without sanctions." |
| McMillan 1997 | McMillan conducts a literature review, concluding that studies generally affirm the pacifying effect of interdependence. She suggests potential avenues for further scholarly work, including the question of how to quantify interdependence. |
| Pape 1997 | Pape insists that economic sanctions are ineffective due to nationalism, state countermeasures, and elites redistributing the economic burden onto other groups. However, sanctions may work better in marginal disputes and on dependent or economically unequal states. |
| Mastanduno 1998 | Mastanduno suggests that international multipolarity and unipolarity spur the alignment of economic and security issues, while bipolarity discourages it. Two other factors influencing alignment are the severity of threats and state competitiveness. |
| Barbieri and Levy 1999 | Barbieri and Levy write that both liberal and realist theories expect trade between two countries to be sharply curtailed or blocked entirely during conflict. However, the authors find otherwise and urge a reconsideration of the dominant theories. |
| Liberman 1999/2000 | Examining Japanese and German expansion, Liberman finds that "Expecting protracted attrition warfare with severed trade links gives trade-dependent states powerful security incentives to seize resource-rich territory. . . . [I]nterdependence . . . heightens incentives to shore up economic vulnerabilities through expansion." |

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| | The combination of "defense dominance and economic interdependence" can thus incentivize conquest. |
| Abdelal and Kirshner 1999/2000 | Citing Albert Hirschman, an early scholar of asymmetric trade, this study shows how economic dependence can create domestic constituencies with vested interests that benefit the dominant power. Abdelal and Kirshner use case studies of the United States and Hawaii, Austria and Czechoslovakia, and Ukraine and Russia to illustrate the theory in practice. |
| Blanchard and Ripsman 1999/2000 | Blanchard and Ripsman conduct three case studies: 1933 British sanctions on the Soviet Union, 1979 Arab League sanctions on Canada, and 1989–1990 Indian sanctions on Nepal. They conclude that "[E]conomic coercion worked primarily because domestic and international political conditions existed that magnified the political costs of noncompliance for the target state." They stress the importance of political costs, not economic costs, but note that policymakers can mitigate political costs "resulting from economic distress." |
| Mastanduno 1999/2000 | Mastanduno reviews scholarly discussions on the effects and effectiveness of economic sanctions, policy integration, methodological issues in research, questions of interdependence and war, and similar topics. |
| Brooks 1999 | Brooks asserts that increased economic globalization has reduced the incentives for conquest among highly developed countries. He cites several factors driving this trend, including "the increased geographic dispersion of production," "the greatly enhanced significance of interfirm alliances," and "the general shift toward 'knowledge-based' economies in the most advanced countries." His article also includes an in-depth literature review on economics and conquest. |

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| Bolks and Al-Sowayel 2000 | Bolks and Al-Sowayel determine that the target state's "political structure and regime stability" influence the duration of sanctions, also finding that sanctions involve high costs and lengthy timespans. |
| Brooks 2002 | Using the case studies of South Africa, Iraq, Haiti, and Yugoslavia, Brooks concludes that sanctions that impact ordinary citizens or certain constituencies are "effective against democratic states." Meanwhile, targeted sanctions against regime insiders are more effective when confronting authoritarian states. |
| McGillivray and Stam 2004 | The authors find that "[L]eadership change strongly affects the duration of sanctions only in the case of nondemocratic systems." |
| Allen 2005 | Allen examines the domestic factors behind economic sanction outcomes, such as domestic politics and regime type. For instance, she concludes that "The presence of a democratic target shortens the duration of sanctions." |
| Hufbauer, Schott, Elliott, and Oegg 2007 | This major study of sanctions relies on 174 sanctions cases ranging from World War I to the year 2000. The authors note the symbolic role of sanctions, the significance of domestic politics, the reasons why sanctions fail, and more. They state that sanctions were "at least partially successful in 34 percent of the cases," but sanctions conducted with narrower aims were more successful than those implemented for regime change or military purposes. |
| Hegre, Oneal, and Russett 2010 | This is another contribution in the extensive academic literature on whether economic interdependence through trade leads to peace. Hegre, Oneal, and Russett use a gravity model of trade to answer this question in the affirmative. They also write that by around 2004–2005, |

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| | even skeptics of the commercial peace argument acknowledged that there was a rough consensus favoring the hypothesis. |
| Ronis 2011 | This edited volume contains chapters on energy security, education, and innovation as part of national security. |
| Gartzke and Lupu 2012 | Gartzke and Lupu defend the commercial peace theory, which many critics attempt to invalidate by citing the case of World War I. The authors show that the war started among less interdependent states closely allied with more interdependent great powers. They find that, in fact, "[E]conomic linkages served an important role in averting escalation to warfare in the series of crises that led up to the Great War." |
| Whang and Kim 2015 | The authors analyze sanctions from a signaling perspective, showing that sanctions do not impose sufficient costs on the imposing state to demonstrate its seriousness and determination to the target state. |
| Snyder 2015/2016 | Snyder reviews a book by scholar Dale C. Copeland, who contends that "[I]nterdependence promotes peace when states expect mutually beneficial trade to continue, but . . . creates incentives for war when at least one of the states expects that trade trends will leave it dangerously vulnerable." |
| Blackwill and Harris 2016 | Blackwill and Harris provide a brief history of U.S. geo-economic policies. They argue that starting in the Nixon administration, "[G]eoeconomics began to fall off the radar." Neoclassical economics became increasingly detached from statecraft, with harmful results for U.S. foreign policy. The authors call for reintegrating geo-economics back into the foreign policy agenda. |

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| Gowa and Hicks 2017 | The authors analyze data on trade during World War I, determining that "Rather than resulting in a wholesale breakdown of trade, the war rerouted it along the fault lines it created." These changes were facilitated by the substitutability of goods. |
| McCormack and Pascoe 2017 | McCormack and Pascoe theorize that sanctions function as buffers against war "by destroying targeted states' military power . . . [and] prevent[ing] adverse shifts in the distribution of power that could otherwise lead to armed conflict." Their examples include U.S. sanctions on Iran since 1979 and Japan before World War II. They suggest that "Scholars and policy makers should ask . . . what target state behavior would have looked like had sanctions not been imposed." |
| Roberts, Choer Moraes, and Ferguson 2018 | The authors suggest that "the old International Economic World Order" featured greater distinctions between economics and security, while under the "emerging Geoeconomic World Order," the two are more closely aligned. The transition point between the two was around 2017–2018. They describe "economic convergence that has changed the geopolitical balance of power" and the shifting focus from absolute to relative gains. |
| Drezner, Farrell, and Newman 2021 | An edited volume of essays building upon Henry Farrell and Abraham L. Newman's concept of "weaponized interdependence." The contributions cover topics ranging from international finance and technological interdependence to Russia's Gazprom and China's Belt and Road Initiative. |

## Export Controls and Technology Transfer during the Cold War

Amidst the high drama of the Cold War, a battle raged over the Soviet Union's attempts to gain access to U.S. high technology—which, Washington feared, could negate NATO's qualitative military edge over Warsaw Pact forces. Working through COCOM, the United States and its allies attempted to harmonize their export restrictions and deny their adversaries access to sensitive technologies as Moscow and its allies mounted a sustained espionage offensive. Over the decades, significant controversies periodically erupted within and between governments over export control breaches and U.S. efforts to block the transfer of certain technologies to the Soviet Union. From the Kama River truck plant to Siberian pipeline sanctions and the Toshiba-Kongsberg case, these polemics spilled over into congressional debate, media coverage, and academic attention. A key theme in this section—which scholars and policymakers alike debated—is the fundamental question of which items should be protected and how best the government should do so. Another recurring strand is the need for multilateral cooperation, including through COCOM, in order to effectively control technology transfer. This section also includes sources on Soviet military-industrial espionage, including intelligence documents, academic studies, and major works based on primary materials.

Table 2: Selected Publications on Export Controls and Technology Transfer during the Cold War

| Publication | Summary |
|---|---|
| CIA Directorate of Intelligence 1970 | This intelligence document discusses COCOM technology exports to the Soviet bloc and resulting intra-alliance disagreements. It includes statistics on "exceptions requests" and their projected economic value, as well as the overall volume of trade. |

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| Defense Science Board Task Force on Export of U.S. Technology 1976 | Produced by a Pentagon panel headed by J. Fred Bucy, this major study of export controls and technology transfer emphasized controlling revolutionary technologies, not products, and reducing COCOM lists. It declared that "[C]ontrol of design and manufacturing know-how is absolutely vital to the maintenance of U.S. technological superiority," a finding that has significantly influenced the export control literature. |
| Office of Technology Assessment 1979 | This government report analyzes patterns of East-West trade and technology transfer, concluding that the scale of the trade is relatively small, that export controls do not significantly hamper Communist states, and that U.S. and European technological products are a small but disproportionately valuable part of Communist imports. It includes chapters assessing economic, foreign policy, and military implications, as well as discussions of COCOM, the Soviet Union, and China. |
| Yergin 1980 | This monograph reviews technology transfer regulations in West Germany, the United Kingdom, and France. It presents a positive assessment of COCOM but urges policymakers to streamline and rationalize the organization's processes. |
| Bucy 1980/1981 | Bucy, the head of an influential Pentagon panel on export controls, reiterates his report's main points. He insists that the United States must have a coherent technology transfer strategy focused on revolutionary technologies with military implications. Bucy observes that "The argument that the Soviets will eventually acquire any item or technology they want badly enough does not relieve the West of the obligation to impede that effort and to make Soviet acquisition of technology as costly for them as possible." |

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| Bricker 1981 | Bricker, a colonel in the U.S. Air Force Reserve, presents a very critical assessment of the Soviet technology transfer problem and provides a list of controversial export control cases, including the Dresser drill bits case. He is especially scathing on the U.S. Department of Commerce's role. |
| Gustafson 1981 | Gustafson assesses the Soviet institutions devoted to technology policy. He is pessimistic about the feasibility and prospects of expanded export controls, but he also concludes that due to its political and economic dysfunctions, the Soviet Union does a poor job of effectively absorbing and capitalizing upon foreign technology. Gustafson notes that "[I]n the end the transfer of technology depends less on the fact that knowledge and skills have been divulged than on the fact that the receiver knew how to make creative use of them." |
| Director of Central Intelligence 1981 | This Special National Intelligence Estimate assesses Soviet military use of foreign technologies and the potential effects of U.S. technology transfer regulations. Its conclusions are somewhat pessimistic, emphasizing the limitations of sanctions and unilateral actions. |
| Central Intelligence Agency 1982 | This declassified document from the CIA attributes the loss of U.S. technology with military applications to open source acquisitions, trade transfer, and Soviet intelligence. It assesses that up to 75 percent of "militarily significant Western technology being acquired by the Soviet Bloc" is obtained through intelligence means. The memo concludes with policy recommendations, urging a strategic and whole-of-government approach. |
| Director of Central | This Special National Intelligence Estimate surveys some of the divides between the United States and its COCOM |

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| Intelligence 1982 | allies over trade with the Soviet bloc; in general, European allies were more supportive of trade. The SNIE also includes details on each country's trade profile with the Soviet bloc. It suggests that strengthening "multilateral and bilateral enforcement of export controls will receive broad support from the COCOM partners." |
| U.S. Congress 1982 | This congressional hearing includes testimony from a variety of speakers, including a Soviet émigré engineer on the limits of the Soviet technology transfer strategy, a convicted conspirator in an Eastern bloc industrial espionage plot, and numerous scientists, policymakers, and intelligence officials. |
| Frost and Stent 1983 | Frost and Stent analyze policy divides and differing views within the transatlantic alliance regarding trade with the Soviet bloc. One problem is that European allies "believe that East-West commercial ties are a normal, desirable aspect of international relations," while the United States is significantly more hawkish on trade. Another problem is unilateral U.S. sanctions, such as those imposed on the Siberian pipeline following the Polish martial law crackdown in 1981. Frost and Stent conclude that "[T]here is no evidence that negative linkage. . . has ever changed Soviet policies on any issues that the Kremlin perceives as vital to Soviet national security. . . [E]conomic sanctions have often proved more costly to the West than to the East." |
| Root 1984 | Root, the former director of the State Department's Office of East-West Trade—who resigned in 1983 "to protest ineffective and counterproductive U.S. methods to achieve stronger controls"—makes the case that effective export controls demand effective multilateral cooperation. He charges that unilateralism is ineffective, counterproductive, and diplomatically costly for the United States. Root advocates a more restrained |

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| | approach to export control regulations than some Reagan administration hardliners. |
| Overly 1985 | Overly provides a historical review of export controls on critical technologies, along with case studies of the 1980–1981 grain embargo and the VAX 11-782 computer. |
| Crawford and Lenway 1985 | The authors examine East-West trade and COCOM, including the Siberian pipeline case, through the prism of "behavioral theories of organization." They write that "[C]oercive means to exact compliance from Europe with a policy of trade restriction . . . will jeopardize long-term cooperation." |
| CIA Directorate of Intelligence 1985 | This CIA report provides details on a Soviet truck plant that benefited from foreign engineering and technological assistance. As the study notes, the Kama River truck plant—some of whose products supplied the Soviet military—"began to be viewed in the West as a prime example of Soviet acquisition of modern Western manufacturing technology." |
| Central Intelligence Agency 1985 | This in-depth report on Soviet military-industrial espionage offers insights into Moscow's technology transfer strategy, with statistics, case studies on acquired technologies, details on involved Soviet institutions and U.S. targets, and more. |
| Yasuhara 1986 | This study of the evolution of U.S. export controls toward China in the early Cold War analyzes the roles of occupied Japan, bureaucratic infighting, and Europe. |
| Blair 1986 | Blair complains that "[O]ften the United States government does not have current information on what is available from foreign competitors and frequently will not |

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| | accept the statements of domestic corporations as to what the foreign competition is providing." This can put U.S. firms at a competitive disadvantage and renders export controls counterproductive. Blair advocates "A self-policing export-control system" using affidavits. |
| Lam 1986 | Lam writes that changes to the Export Administration Act of 1979 and ITAR are positive but do not fully resolve the challenges that universities and academic researchers face from technology transfer regulations. |
| Dobson 1988 | Dobson details President John F. Kennedy's attempts to liberalize U.S. embargo policies, as well as the domestic political constraints that he faced. The article chronicles issues such as pipeline politics and policy reviews. |
| Sawchak 1988 | Sawchak analyzes a complex bureaucratic, legal, and regulatory controversy involving the Pentagon's role in export controls and its competition with the Department of Commerce. He details various legislative proposals aimed at mitigating some of the procedural problems within the export control system. |
| Kelly 1989; Wrubel 1989 | These two articles detail a major technology transfer incident from the Cold War, when the Soviet Union obtained propeller milling and computer equipment from Japanese and Norwegian companies, leading to the development of stealthier nuclear submarines. The so-called Toshiba-Kongsberg case sparked a backlash in the United States and prompted Tokyo and Oslo to revise their export control policies. |
| U.S. Congress 1989 | This congressional hearing includes testimony from officials of the U.S. Departments of Commerce, State, Energy, and Defense, as well as the Defense Advanced Research Projects Agency, and NASA. It focuses on |

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| | "foreign access to federally funded research and development activities." |
| Goodman, Blumenthal, and Geipel 1989/1990 | The authors warn that rapid information technology innovation, globalized production, and bureaucratic inefficiencies are challenging export controls and harming competitiveness. They urge "A more selective policy . . . [to] allow Western countries to capitalize economically on recent changes while continuing to protect our national security and technological superiority." |
| Spring 1990 | Spring argues for the continuing importance of technology export controls amidst Soviet decline, contending that they are necessary for continued military power and economic preeminence. He recommends some continuity in COCOM and limited reforms. "Given the fact that the Soviet Union retains an extremely potent military force," Spring writes, "Western superiority in military technology is still essential." |
| Mastanduno 1992 | This in-depth study of COCOM traces the organization's history throughout the Cold War, touching on the evolution of U.S. policy, the Bucy report, the revival of sanctions during the Carter and Reagan administrations, and the future of COCOM in the post-Cold War world. |
| Crawford 1993 | This work considers the relationship between interdependence, economic vulnerability, and security. Crawford includes case studies of imports and the Soviet military and economy, as well as an examination of the Soviet-European energy trade. Her conclusion is that "State-imposed trade restrictions . . . are not always the only or best way to reduce vulnerability." |
| Henshaw 1993 | Henshaw offers a detailed account of COCOM's institutional procedures and history and gleans a number of lessons learned from the Cold War experience, |

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| | including “the dangers of the politicization of export controls, the futility of unilateral controls, and the importance of common goals in the imposition of export controls.” He then scrutinizes the Missile Technology Control Regime. |
| Lundberg 1994 | This exhaustive case study of U.S. intelligence and the demise of the Soviet Union, prepared by the Kennedy School of Government’s Case Program, contextualizes the longstanding debate over assessments of the Soviet economy. |
| Weiss 1996 | This is an account of Soviet technological espionage in the 1970s and the U.S. response, written by a national security insider. Weiss details the Farewell Dossier—revelations of Soviet industrial espionage by a defector—and alleges an U.S. campaign of supply-chain sabotage. |
| Andrew and Mitrokhin 1999 | When former KGB archivist Vasili Mitrokhin defected to the United Kingdom, he brought with him a vast collection of copied KGB archival documents. This landmark study has valuable information on Soviet foreign intelligence operations to collect scientific and technological information (Directorate T and Line X). It also demonstrates the limitations of the Soviet system in integrating plundered technology. |
| Weinstein and Vassiliev 1999 | This major work derives from rare access to KGB archives. It contains some details on early Soviet military-industrial espionage in the United States during the 1930s. |
| Sibley 1999 | Sibley explores how Soviet spies in the 1930s and 1940s provided Moscow with intelligence on military electronics, steel production, submarine technology, chemicals, aircraft, radar, and other subjects. |

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| Jackson 2000 | This study documents the Eisenhower administration's role in the reformulation of U.S. embargo policies and shows how Winston Churchill played a key role in driving the loosening of U.S. export controls. |
| Macrakis 2004 | Macrakis provides a detailed account of the Stasi's industrial espionage campaign against the United States, West Germany, and other allied countries during the Cold War. She emphasizes that even when the Stasi was able to acquire valuable intelligence, the East German state could not necessarily implement the acquired technology effectively. The reliance upon theft also led to dependence and disincentivized domestic innovation. |
| Engel 2005 | Engel discusses the "China Differential" and differing British and U.S. views on foreign economic policy toward China during the Cold War. He argues that tougher U.S. views and harsher embargo policies resulted from the belief that economic hardship "might so pain the Chinese people that they would rise up in revolt against their own regime." Conversely, Engel writes, the United Kingdom believed that trade would not only benefit British businesses, but that "[M]ounting satisfaction among an increasingly affluent Chinese populace might help temper their government's more belligerent tendencies." |
| Dobson 2005 | Dobson analyzes the Reagan administration's economic policies toward the Soviet Union, showing that they were not always as stringent as some officials' rhetoric implied. While hardliners initially held greater influence in pushing tough policies, moderates eventually gained sway. Dobson stresses that Reagan personally aimed to negotiate with the Soviet Union, not to topple it; there was no "overarching strategy to implement all-out cold economic warfare." |

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| Macrakis 2008 | Macrakis uses archival documents to explore the Stasi's sophisticated and often successful efforts to acquire foreign technology. |
| Lu 2008 | Lu details how the U.S. embargo against China during the Cold War led Washington to attempt to block Indonesian rubber exports to China. |
| Dobson 2010 | Dobson reviews the history of U.S. export controls against the Soviet Union. Although the embargo initially had distinct strategic aims, Washington realized by the 1960s that the measures were largely ineffective at "hindering the Soviet Union's war-making capacity." The embargo thereafter served mostly symbolic purposes, besides during the early years of the Reagan administration. |
| Long 2018 | This is a review of recent academic studies on the perennial question of U.S. intelligence analysis of the Soviet economy during the Cold War. Long notes that "[B]y the mid-1980s, policymakers were well-informed that the Soviet defense burden was becoming unsustainable." He also considers the role of Washington's counterintelligence and export control efforts. |
| Jensen-Eriksen 2019 | A case study of Finland as a neutral state caught in the middle of the Cold War. Jensen-Eriksen traces the role of Finland in the U.S. effort to curb reexports of strategic technology to the Soviet Union. His article covers export control controversies involving Nokia and submarines, showing how Washington pressured Helsinki as Finnish policymakers sought to balance between the superpowers. |

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| French 2020 | This long-form article explores the life and work of Gus Weiss, who played a notable role in U.S. economic warfare and technology transfer policies during the Cold War. It examines notable incidents such as the Farewell Dossier and the mythical Siberian pipeline sabotage incident. |
| Colbourn 2020 | Colbourn explores NATO's internecine tensions in the early 1980s over American sanctions against a Soviet pipeline. She highlights the United Kingdom and Canada's attempts to help resolve the quarrel. |

## Strategic Economic Competition and Export Controls after the Cold War

COCOM may not have lived long after the end of the Cold War, but the debate over export controls continued after the fall of the Berlin Wall. As the United States found itself at the head of a unipolar world, questions of national security and economic competitiveness became increasingly relevant. For example, observers pondered whether the need to maintain U.S. technology companies' dominant position outweighed the imperative to keep cutting-edge supercomputers out of adversaries' grasp. This section includes post-Cold War writings discussing export controls on a variety of sensitive products, from encryption software to GPS. Of particular interest are export controls on space-related technologies, intended to counter China's space and ballistic missile programs. This section also includes sources analyzing COCOM's successor, the Wassenaar Arrangement.

Table 3: Selected Publications on Strategic Economic Competition and Export Controls after the Cold War

| Publication | Summary |
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| Webster 1989 | Director of Central Intelligence William H. Webster acknowledges "a universal recognition that economic strength is key to global influence and power." He notes that "Our political and military allies are also our economic competitors" and discusses the trade deficit and technological competition with Japan. |
| Moran 1990 | Moran warns of the dangers to the United States' defense-industrial base as a result of globalization, declaring that "[T]he contemporary movement toward globalization opens the door in peacetime to foreign influence, foreign control, and foreign domination." He discusses the neo-mercantilist outlook on globalization |

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| | and defense industries, which focuses on “nationality of firms” and “location of production sites.” |
| Oliver 1992 | Oliver details the problem of economic espionage, describing its underlying drivers and methods. She also suggests that “many Americans” are especially susceptible to the threat due to being talkative, ambitious, and sometimes lacking foreign language skills. |
| Davis 1994 | In her testimony to Congress, the under secretary of state for international security affairs describes how sweeping global changes demand reforms to U.S. export control regulations. She describes the efforts to create a successor to COCOM and outlines the draft Export Administration Act. |
| Evans 1994 | This article reviews export controls on encryption software, the regulatory process, and policy debates. Evans argues that “[M]ass-market encryption software is not enough of a threat to the security of the United States to justify current export controls . . . [It] should be restricted only under the mechanisms currently established for most software products.” |
| Tarlowe 1995 | Tarlowe discusses the liberalization of U.S. export controls toward Russia, contending that Washington must “limit deregulating export controls to Russia because . . . [its] . . . current state . . . continues to pose threats to U.S. security interests.” |
| Lachow 1995 | RAND Corporation analyst Irving Lachow explores GPS, GPS technological proliferation, and military implications. He notes that there are some economic benefits to U.S. international leadership in GPS, and that the United States is attempting to control GPS dissemination (via the Standard Positioning Service), but the controls are likely inadequate. Lachow also observes that “GPS is a |

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| | dual-use system by design; no previous technology has provided such significant benefits to both military and civilian users simultaneously." |
| Arquilla 1996 | Arquilla discusses export control policies on high-performance computers, considering strategic trade-offs and using historical examples. He concludes that "[A] hybrid policy, mixing open and closed elements, has the best chance to foster commercial competitiveness without unduly compromising the national security." |
| Cupitt and Grillot 1997 | This scholarly article reviews COCOM and its successor, the Wassenaar Arrangement, through an international relations theoretical perspective to determine why multilateral cooperation increased after 1989. The authors "find that the emergence of a liberal community identity among COCOM members" best explains this phenomenon. |
| Bonomo et al. 1998 | This monograph cautions that "[I]t is extremely difficult to estimate the financial effect . . . [of] technology transfers . . . on the United States." The authors also warn of the hazards of curbing technology transfer and include a study of the optoelectronics sector. |
| Johnston 1998 | Johnston reviews U.S. export controls on high performance computers from 1989 onwards, considering regulatory standards and debates between trade and nonproliferation advocates. He also chronicles controversies sparked by computer diversions in Russia and China for military purposes. |
| Craft and Grillot 1999 | Craft and Grillot offer a gloomy view of the Wassenaar Arrangement, arguing that the inadequacies of the American, British, French, and German export control systems bode poorly for the institution. |

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| Lipson 1999 | This article offers a historical overview and theoretical analysis of the Wassenaar Arrangement, arguing that constructivism best explains Wassenaar. Lipson concludes that "[C]onstructivism can account for . . . the main organizational features of the WA." |
| Howes and Singh 2000 | This edited volume covers a variety of economic topics, including the U.S. trade deficit, the discussion over crafting effective industrial and technology policy, and how to revitalize the U.S. manufacturing sector. |
| Grimmett 2001 | Grimmett provides an overview of export controls on encryption products, as well as discussion of legal/constitutional issues and proposed legislation. |
| U.S. Congress 2001 | Experts from the General Accounting Office discuss recent changes to the export control framework concerning high-performance computers. They cover technical details, the role of the Wassenaar Arrangement, and more. |
| Kan 2001 | A detailed chronology of U.S.-China export control controversies regarding satellites, from the Loral/Hughes and Long March cases to the Cox Report. |
| McLoughlin and Fergusson 2005 | This report reflects perennial issues in export control debates, including discussions of economic harm versus national security interests and the obsolescence of regulatory standards. It also includes background and a history of export controls on high performance computers. |
| Van Atta et al. 2007 | This massive study fails to find convincing evidence that export controls are hurting the U.S. market share in satellites and machine tools. However, the effects may be |

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| | more subtle, and there is a risk of export controls diminishing U.S. firms' competitiveness—including through "ITAR-tainting." Similarly, semiconductor firms did not suffer from export controls, but they could be affected by expanded export controls. However, the report concludes that "The current US export control system appears to be out of step with today's world of global manufacturing, technology development, and capital flows." |
| Galama and Hosek 2008 | This report counters some pessimistic views of U.S. international competitiveness in science and technology, examining areas such as education, workforce, research and development investment, employment, and patents. The authors conclude that "[T]he U.S. S&T enterprise is performing well. . . . [T]he United States leads the world in S&T and has kept pace or grown faster than the rest of the world in many measures of S&T." The study recommends immigration reform, increased international scientific and technological collaboration and exchange, and improved education. |
| Center for Strategic and International Studies 2008 | This briefing is a negative appraisal of space-focused export controls: "The grand strategic intent of the space export controls is not being achieved." The export controls are hurting U.S. competitiveness, restricting "access to foreign innovation and human capital," and making international cooperation challenging. Foreign market share in the space industry is growing steadily. Moreover, the export controls could be tweaked without harming national security. |
| Chao 2008 | Chao offers a review of export control and technological competitiveness issues, surveying numerous think tank and government studies. He argues that the "increasing . . . volume of licenses," globalization, and technological innovation/complexity demand reforms of the export control system. Chao points out that control lists are |

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| | outdated and inflexible, also urging greater international cooperation. |
| Sargent 2008 | Sargent reviews U.S. policies on nanotechnology, provides statistics on global nanotechnology competition, and notes different perspectives on governmental involvement. He also details disagreement on whether the government should pursue an active role sponsoring nanotechnology development, or whether such efforts are contrary to free-market values (or whether nanotechnology itself is too dangerous to pursue). |
| U.S. Congress 2010 | This hearing features testimony from academics and scientists describing how export controls impede research involving foreign nationals and certain sensitive sectors, thus harming the United States' human capital. The testimony also describes the detrimental impacts on high-tech manufacturing. |
| Kuntz 2013 | Kuntz asserts that the low number of convictions secured under the Economic Espionage Act of 1996 is the result of "narrow judicial interpretation." She also notes that "[T]he EEA does not punish or deter the roots of the problem: foreign governments that solicit and benefit from economic espionage." |
| Dreyfuss and Lobel 2016 | The authors critique the Economic Espionage Act of 1996, arguing that it may dampen the innovation needed for American economic competitiveness. |

## Economic and Technological Competition: U.S.-Japan

Although trade tensions between the United States and Japan were hardly new at the time, the 1980s saw the emergence of profound concern in Washington over the economic rise of Japan and its potential to overtake the United States. Much literature focused on diagnosing the root causes of the economic conflict, from statist development policies and exchange rates to declining U.S. competitiveness and different economic philosophies. Some warned of calamity—such as the outright collapse of the free-trade system—or offered deeply pessimistic forecasts of "U.S. decline and dependence on Japan," as technology researcher Charles H. Ferguson put it. To be sure, other analysts counseled moderation and suggested more modest outcomes. The latter were effectively vindicated when the Japanese economic bubble popped in the early 1990s. More recently, observers have compared the earlier Japan scare with the contemporary China challenge, pointing out key similarities and differences between the two phenomena and attempting to discern lessons learned.

Table 4: Selected Publications on Economic and Technological Competition: U.S.-Japan

| Publication | Summary |
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| Ogata 1980 | Ogata reviews Japan's economic history and relations with Washington, writing that "[T]he relationship . . . has undergone considerable strain because of recurring economic disputes." |
| Basiuk 1982 | This study focuses on Japan and Europe and assesses U.S. competitiveness in electronics, computers, and machine tools. Basiuk describes Japan as the larger challenge, particularly in semiconductors and computers; another problem is U.S. defense dependence upon Japanese technology. Basiuk warns that "If present trends continue . . . the Japanese will take over leadership |

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| | from the United States in a number of key areas of power-relevant technology . . . [B]y the year 2000, a significant change in the world balance of power will take place." |
| Bergsten 1982 | Bergsten assesses the various theories purporting to explain "U.S.-Japanese economic conflict," including Japanese protectionism; "periodic export surges . . . benefit[ting] 'unfairly' from government support and exclusion of foreign competition"; Japan's savings prompting capital export problems; "Lagging Japanese economic growth . . . [causing] major export offensives"; declining U.S. productivity and rising inflation; and "exchange-rate misalignment." The author ultimately concludes that the latter is the key underlying factor. |
| Okita 1982 | Japan's former foreign minister counters U.S. charges of unfair trade practices and Washington's concerns over the trade deficit. He suggests that "[H]igh U.S. interest rates . . . in combination with U.S. inflation have undervalued the yen and overvalued the dollar," leading to export disputes. |
| Cabinet Council on Commerce and Trade 1982 | This report touches on major factors important for technological competitiveness, including the domestic economy, capital cost and supply, research and development, technology transfer, human capital, and industrial policies. It warns of state-driven and protectionist policies—especially by Japan—that are harming U.S. market share in high-technology industries. |
| Office of Technology Assessment 1983 | This research report focuses on color TVs, semiconductors, and computers. It finds that U.S. electronics firms are overall performing strongly but are under increasing pressure from Japan. Competitiveness in consumer electronics "*has declined precipitously since the 1960's*." In computers and semiconductors, U.S. |

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| | companies are in better shape. The report offers a range of industrial policy options, including education, research and development investment, and economic reforms. |
| Caccamise et al. 1983 | This study of U.S. military dependency on foreign-produced semiconductors is particularly concerned with the rising Japanese semiconductor market and the lack of military accounting for its use of foreign semiconductors. |
| Zysman and Cohen 1983 | Zysman and Cohen discuss challenges to the international free trade system, including the (Japanese) developmental state, state-managed surplus, "state trading and barter," and U.S. industrial decline. The authors warn of "a real struggle about international economic position and the economic role of the state . . . [that] will result in an unmanageable burst of mercantilism that will undermine the liberal system and threaten the stability of the international political order." |
| Hatter 1985 | This report analyzes international competition in high-tech trade, particularly the involvement of Japan and Europe in the electronics, aircraft, chemical, and materials industries. |
| Johnson 1987 | Johnson writes that Japanese "institutions of capitalism . . . differ fundamentally from those encountered in American capitalism." In his view, Americans see the market "as a source of efficiency," while Japan sees the market "as a source of growth." This is the root cause of tensions between the United States and Japan. Johnson advocates better STEM training, better trade policy, and economic reforms, as well as "open[ing] Japan's markets." |
| Ferguson 1989 | Ferguson proclaims that "[T]he long-term structural patterns of U.S.-Japanese interaction in finance and high technology imply a future of U.S. decline and dependence |

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| | on Japan." He claims that the U.S. technological decline stems from parochial domestic institutions and foreign competition. Ferguson insists that the United States must pursue both "internal reform and . . . the management of a new strategic balance, namely its technological competition with Japan. If America fails it will encounter something approaching an economic crisis." |
| Fallows 1989 | Fallows believes that Japan's economic practices pose a serious challenge to the United States. In his eyes, the Japanese economy is fundamentally different from that of the United States, leading to major trade disputes and fears of Japanese economic hegemony. |
| Joint Economic Committee 1990 | This lengthy volume contains more than 30 papers on a variety of topics, including Japanese industrial policies, foreign investment, demographics, science and technology, and trade. The introduction states that "Japan's economic challenge to the United States differs from any other challenge that the Nation has faced during the past century. . . . The challenge is not of life and death proportions, yet it affects the daily affairs of Americans in ways that are both obvious and insidious." |
| Office of Technology Assessment 1991 | This is a sober account of declining U.S. competitiveness, especially vis-à-vis Japan. It discusses the notable role of state-driven industrial policies by international competitors. Case studies include the supercomputer and aircraft industries, and European countries' responses to Japan are also detailed. The report suggests policy options for confronting the problem, including public-private partnerships in research and development, trade policy measures, and human capital cultivation. |
| Zysman 1991 | Zysman argues that U.S. industrial and economic decline has led to a multipolar economic system, which will in turn create a "multipolar security system" centered on |

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| | Japan, the United States, and the European Community. He discusses trade patterns, economic development strategies, and military and civilian research and development. In Zysman's estimation, "As economic power increases in importance, the basis for influence shifts from the domain of military force, where America remains strong, to the domain of economics, where its position is weakened." |
| Mastanduno 1991 | Mastanduno reviews American policies vis-à-vis Japan regarding the FSX aircraft controversy, satellites, and high-definition televisions. He concludes that policy debates resulting from "[economic] relative gains concerns" were influenced by "ideology and the institutional setting." |
| Nye 1992/1993 | Nye offers a more nuanced view on the Japanese economic challenge to the United States. However, he points out that perceptions of U.S. decline and Japanese ascendance are influential whether or not they are accurate. He concludes by exploring ways in which Japan could leverage its power for the global good. |
| Tyson 1993 | This work includes case studies of the controversies over the Japanese consumer electronics and semiconductor industries, as well as European competition in electronics and aircraft. Tyson advocates a policy of "cautious activism" that is nevertheless far from outright protectionism. |
| Mastanduno 2000 | Mastanduno describes the rise and fall of the Japanese economic challenge to the United States. He also considers "the end of the Washington consensus . . . and the renewal of US hegemony." |
| Morris 2011 | Morris provides a full account of U.S. anxiety during the 1980s over Japan's economic ascendance, tracing the |

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| | evolution of "Japan-bashing" in the media, public opinion, and policy circles. She also considers the phenomenon's cultural impact and legacy. |
| Lohr 2011 | This article compares the 1980s Japan economic scare with the contemporary China challenge. Lohr points out that the latter is more significant than the former was in important aspects, such as greater U.S. economic entanglement. |
| Miller 2017 | Miller explains "the fear that Japan had beaten the United States at its own game" of free trade. This concern was based on arguments that the United States was being overtaken by an economic rival that held different values, pursued different policies, and took advantage of the American-established global economic order. |
| Foot 2017 | Foot provides a brief history of the U.S.-Japan confrontation in the 1970s and 1980s alongside the confrontations with China from the 1970s and 1990s. She assesses that despite some similarities in the United States' relations with China today and Japan previously, "[T]he differences in the military and strategic dimension of the US–China relationship . . . distinguish it from the US response to the Japan challenge." |
| Landers 2018 | Landers compares the ongoing U.S. trade war with China with Washington's trade disputes with Japan in the 1980s. He highlights how although Reagan obtained some concessions from Tokyo, these contributed to the eventual destabilization of the Japanese economy. |
| Tan 2018 | Tan compares U.S. attempts to counter China's "Made in China 2025" program with previous efforts to gain economic concessions from Japan in the 1980s. She contends that the determining factor is how pressure impacts domestic groups, concluding that "[C]urrent U.S. |

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| | demands effectively strengthen the hand of Chinese agencies and officials who oppose market liberalization.” |
| Urata 2020 | Urata surveys U.S. trade disputes with Japan, which extended as far back as the 1950s and involved products such as textiles, steel, cars, and semiconductors. He notes similarities and differences compared to the contemporary China challenge; the political challenges are far more significant today, and the United States is more intertwined with China than it was with Japan. |

## Strategic, Economic, and Technological Competition: U.S.-China

The ascendance of China as a twenty-first-century global power and its economic and technological challenges to the United States have generated a colossal and growing literature. This section surveys some of the key points, including the contemporary history of U.S. export controls and technology transfer regulations toward China and China's technonationalist policies. Much of the literature analyzes China's technology transfer methods, its future prospects in its ongoing competition with the United States, and Beijing's use of economic statecraft. A range of technologies is discussed in this context, from aircraft and artificial intelligence to autonomous vehicles and mobile data networks. More recently, as discussion of U.S.-China "decoupling" has grown, observers have generally agreed that some decoupling might be beneficial for U.S. security, but wholesale detachment would be impossible and economically destructive. Numerous analyses have explored how decoupling might proceed.

Table 5: Selected Publications on Strategic, Economic, and Technological Competition: U.S.-China

| Publication | Summary |
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| CIA Directorate of Intelligence 1983 | This CIA intelligence report assesses China's economy, concluding that human capital limitations, lack of incentives, planning difficulties, and military-focused priorities impede China's use of foreign technology. |
| Nimmo 1984 | Nimmo reviews U.S. export control/technology transfer policies toward China, policy debates, institutions, and Reagan-era developments. She notes the dilemma between accruing trade benefits by conducting business with China and supplying a potential adversary with useful technologies and goods. |

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| Chiang 1987 | Chiang states that if China uses advanced foreign technology for economic development, it poses little threat because the country is far behind on this front. However, if China uses technology for military purposes, it could pose a significant challenge. |
| Yuan 1996 | Yuan chronicles U.S. export controls toward China from 1989. He details Washington's restrictions on trade, technology transfer, and other economic exchanges following Tiananmen; proliferation sanctions; and influences on policy, such as economic interests, the aim to engage China, and the challenges of national and multilateral export controls. Yuan finds that the key factor behind technology transfer policy regarding China is "concern over the direction and stability of post-Cold War bilateral relations and how to manage them in changing domestic and external environments." |
| U.S. Congress 1999 | The controversial and influential Cox Report examines Chinese government acquisition of key U.S. technologies, ranging from nuclear weapons data and computers to rocket technology. |
| Papayoanou and Kastner 1999/2000 | The authors write that engaging China "empowers more cooperative economic internationalists . . . while a rigid containment policy would probably weaken those forces and might bring to the fore more conflictual political and economic interests." They add that limited U.S. economic interests in China will not hamper Washington if the U.S.-China relationship becomes more confrontational. The article includes case studies of French-Russian relations around the turn of the twentieth century and Germany's economic relations prior to World War I. |
| Feigenbaum 2000 | Feigenbaum analyzes the history of Chinese technonationalist industrial policy, from Mao to the |

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| | present day. He notes the emphasis on technological acquisition and indigenization, but considers their limitations (the tendency to "leapfrog" and the necessity of integrating in order to indigenize). |
| Segal 2004 | Amidst concerns over American trade in sensitive goods with China, Segal advises "maintain[ing] the embargo on the sale of military items and a small but very crucial handful of dual-use items, while relaxing controls on most advanced commercial technologies." He points to the need to keep U.S. firms competitive, also arguing that Chinese dependence on American technology is advantageous for Washington. |
| Suttmeier 2004 | Suttmeier outlines differing views on China's technological prospects, from skepticism to deep concern. He emphasizes the role of Beijing and its "techno-nationalist vision of using political power to advance scientific and technological development." |
| Gilboy 2004 | Gilboy argues that the United States has successfully engaged China and helped it become a stakeholder in the international economic system. Moreover, the country remains reliant "on foreign technology and investment," which limits its potential threat. Gilboy analyzes the Chinese economy and Chinese technological innovation, advocating "strategic engagement . . . to bolster U.S. technological, economic, and political leadership." |
| Drezner 2009 | Drezner scrutinizes claims that Beijing could use its holdings of U.S. debt as a tool of economic influence. Reviewing the literature on economic coercion, Drezner asserts that "[T]he power of credit between great powers has been exaggerated in policy circles." His article also includes a detailed study of China's involvement in the 2008 financial crisis. |

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| Friedberg 2010 | Friedberg lays out a preliminary assessment of the impact of the Great Recession on U.S.-China relations. He suggests that "[E]conomic issues are likely to become a source of increasing friction . . . The belief that China's rise is inevitable and may be accelerating . . . is likely to intensify impulses toward balancing." |
| Beckley 2011/2012 | In this contrarian essay, Beckley argues against the "conventional wisdom . . . [that] the United States is in decline relative to China . . . [and that] much of this decline is the result of globalization . . . and the hegemonic burdens the United States bears to sustain [it]." He contends that conventional net assessment measures, such as GDP analysis, are not helpful. In Beckley's economic and demographic analyses, the United States has strong advantages over China. |
| Scissors and Subramanian 2012 | Scissors and Subramanian debate the implications of China's rise, with Scissors stressing residual Chinese economic weakness and Subramanian arguing that China will overtake the United States within 20 years. |
| Van Reenen and Yueh 2012 | The authors examine the effect of joint ventures and technology transfer on China's economic growth, finding that "[H]ad China not attracted FDI and IJVs . . . then China's annual GDP growth could have been between one-half to over a percentage point lower . . . over the past 30 years." |
| Hannas, Mulvenon, and Puglisi 2013 | This work explores Chinese government technology transfer efforts, including the bureaucratic infrastructure involved and acquisition through open sources, students, cyberespionage, trade, and more. |
| Bräuner 2013 | Bräuner details EU export controls against China, finding that the EU views relations with China in terms of |

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| | economics, rather than security. Trade, investment, and scientific and technological cooperation are key components of the Sino-European relationship. |
| Marukawa 2013 | Marukawa discusses historical Japanese export controls and contemporary problems of "technology leakage." He assesses that economic factors, not security needs, typically shape Japanese export control and technology transfer policies. |
| Evron 2013 | Evron demonstrates how U.S. pressure led Israel to take a much more restrictive stance on scientific, technological, and defense ties with China. Evron argues that although technology transfers to China require American oversight, civilian technology transfer can occur. |
| Weedon 2015 | Weedon reviews the extent of Chinese government-sponsored cyberespionage, which she notes "consistently target[s] future growth areas" prioritized in Chinese industrial strategy. She states that Chinese domestic concerns, including environmental and healthcare issues, may influence its cyberespionage targeting. |
| Brooks and Wohlforth 2015/2016 | Brooks and Wohlforth analyze military, economic, and technological metrics of China's rise, arguing that while "[T]he United States will long remain the only state with the capability to be a superpower," China is now "an emerging potential superpower." |
| Harrell, Rosenberg, and Saravalle 2018 | Studying Beijing's economic coercion, the authors identify the different types of coercive measures used and the characteristics of Chinese economic coercion. They find that China is learning from the successes and failures of its economic coercion efforts. |

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| Kania 2018 | Kania outlines China's innovation initiatives in emerging technologies, including artificial intelligence and quantum technology, also discussing "Chinese investments, incubators, and acquisitions focused on strategic technologies." |
| Roberts, Choer Moraes, and Ferguson 2018 | The authors describe the emergence of strategic economic competition between the United States and China, as well as the intertwining of economic, technological, and strategic interests. They predict the rise of spheres of influence and note initial steps toward decoupling. |
| Gilli and Gilli 2018/2019 | Gilli and Gilli show that "the growing complexity of weapons systems" makes it extremely hard for upstarts to catch up to predominant powers by replicating their technology. Innovation today depends upon "accumulated experience" and expertise in systems integration. Moreover, it is nearly impossible to simply transfer civilian capacity to military purposes, given the increase in specialization and the importance of expertise. The article includes case studies of Imperial Germany's efforts to catch up to the United Kingdom in battleships and China's development of stealth fighters based on the U.S. F-22 Raptor. |
| Cheung, Lucyshyn, and Rigilano 2019 | This paper identifies the three key steps of China's technology transfer strategy: "introduction, digestion, assimilation and re-innovation." The authors include case studies of the Chinese aircraft industry to highlight the successes and challenges of this strategy. |
| McGeachy 2019 | McGeachy considers China's involvement in standard-setting for 5G and artificial intelligence. She advises that "Washington should take a more active role in |

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| | international standards-development and signal . . . [its] value . . . in addressing growing technology competition." |
| Lim and Ferguson 2019 | Lim and Ferguson point out that decoupling undermines the longtime U.S. goal of using economic leverage to convince China to liberalize economically. |
| Toner 2019 | Toner explains the transformative potential of artificial intelligence, the dangers that "a restrictive approach" poses to U.S. innovation, and the importance of data and standard-setting. |
| Lewis 2019 | Lewis outlines a strategy to protect U.S. technology from acquisition by China. He advises developing "new end-user controls . . . for emerging technology," international collaboration on investment screening, updated export controls, and expanded counterintelligence efforts. However, he cautions against restricting Chinese employees and students from working and studying in the United States, or imposing an outright embargo against China. |
| Boustany and Friedberg 2019 | This report advocates reaching a "ceasefire in the current tariff war," limiting critical technology flows (in both directions) and susceptibility to technological vulnerabilities, domestic investment in education and technology to ensure competitiveness, and international engagement with allies. |
| Ortega 2020 | Ortega discusses major issues concerning the technological competition involving the United States, China, and Europe, including investment screening, data standards, 5G, artificial intelligence, semiconductors, web services, and regulation. |

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| Farrell and Newman 2020 | Farrell and Newman demonstrate the evolving view of globalization and interdependence as weapons and vulnerabilities. They write that "Under chained globalization, states will be bound together by interdependence that will tempt them to strangle their competitors"; however, decoupling is not a viable option. |
| Drezner 2020 | Drezner complains that calls for decoupling ignore the economic harm caused by the loss of comparative advantage benefits from trade and offshore supply chains. He is skeptical of the prospects of industrial policy, given that policymakers do not understand the issues at hand. |
| Kennedy 2020 | Kennedy charges that Washington's campaign against Huawei might erode the U.S. technological lead in semiconductors, harm U.S. security interests, and "[accelerate] China's technological independence." He recommends a multilateral approach to Huawei that includes "fair-trade tools" and avoids wholesale decoupling. |
| Scissors 2020 | Scissors offers a roadmap for how the United States could decouple from China, based on economic analyses. He urges a focus on Chinese state subsidies, supply chain regulation, investment screening, and revamped export controls. |
| Xiong 2020 | Xiong reviews recent incidents of Chinese government economic coercion from Japan to Australia, noting that this tactic "can backfire by prompting countries to reduce their mutual dependence and accelerate the process of decoupling." |

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| Kania and Laskai 2021 | Kania and Laskai debunk common misconceptions about Chinese military-civil fusion, including its novelty, its strategic significance, and its scope. They warn that these false notions may drive decoupling policies that would be “deeply damaging to American competitiveness.” |
| Rasser and Lamberth 2021 | Rasser and Lamberth use historical examples to explain lessons for U.S. science and technology policy. They advocate for augmenting multilateral cooperation, raising research and development investments, investing in human capital and digital infrastructure, revising visa policies, and defending against foreign technological acquisition. |
| Wagner 2021 | Wagner cautions against restricting collaboration with Chinese scientists and shunning Chinese students from the United States, writing that “Closing doors inhibits the very trait that makes the U.S. innovation system the envy of the world.” |
| Mulvenon 2021 | Mulvenon summarizes the current U.S.-China technological standoff and offers policy suggestions, including prioritizing export controls, reforming CFIUS, and promulgating data standards. |
| Eurasia Group 2021 | This report reviews Chinese autonomous vehicle policies, including investment and standards-development, but underscores the challenges of talent retention, U.S. countermoves, and semiconductor shortages. |
| Kastner and Pearson 2021 | Kastner and Pearson review the literature on Chinese economic influence, pointing out potential analytical and empirical gaps and encouraging further study. |

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| Center for European Policy Analysis 2021 | This discussion, featuring experts such as Edward Lucas and Bryce Barros, covers concerns over Chinese investments in European countries from Spain to Romania. |
| U.S. Department of Justice 2021 | A compendium of prosecutions with a China nexus, including military-industrial espionage, economic espionage, the Thousand Talents Program, cyberattacks, and more. |

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## Endnotes

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