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American Sanctions on China’s Space Program: Effective Economic Statecraft?

Paul J. Bolt

American economic statecraft as a tool to manage competition with China’s Space Program is likely to remain contentious as it amplifies enduring debates in U.S. foreign policy: i) the tension between international realism and American liberalism; ii) the questionable benefit of government involvement in picking winners and losers from the private sector; and iii) the difficulty of defining long-term success in foreign policy outcomes.

Economic statecraft has been foundational to American interactions with the People’s Republic of China. After the communist victory in China’s civil war in 1949, the United States restricted trade with China. After the PLA killed citizens in Beijing in 1989, the US imposed an arms embargo that continues to this day. More recently, the US has increased tariffs on China, restricted imports from Xinjiang, sanctioned Huawei and other Chinese companies, sanctioned leaders affiliated with the crackdown on Hong Kong, limited Chinese investments in the United States, and restricted the sales of advanced microchips and equipment using American technology that can produce semiconductors.1 China has reciprocated with its own sanctions against the US.

This paper presents a case study of American policies regarding China’s space program. Such policies have consisted of a confused mix of incentives, sanctions, and outright prohibitions. There is clearly an economic component to this policy, as space launches, satellite production, communications, and GPS technology generate large profits. However, with the dual use nature of space technology (military and civilian purposes) as well as the cutting-edge character of such technology, there are national security, strategic, scientific, and reputational components to American economic statecraft as well. Moreover, segments of the space industry are still financially dependent on government, lessening the distinction between national security and private business interests. American policy has at times been driven by multiple pressures, bureaucratic actors with competing interests, and inconsistent objectives. As a result, the American approach has been more chaotic than rational, although policy has become more consistent in recent years with increasing restrictions on China’s space program beginning in the early 2000s.

SHIFTING AMERICAN POLICY TOWARD CHINA’S SPACE PROGRAM:
COMMERCIAL, POLITICAL, BUREAUCRATIC, AND NATIONAL SECURITY INTERESTS

Geopolitics has played a major role in Sino-American relations and subsequently cooperation in space. One of the initial motivations for Nixon’s opening to China was to build a partnership against the Soviet Union during the Cold War and utilize China’s help in ending the

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1 For a comprehensive list of stories on American sanctions on China from the South China Morning Post, see https://www.scmp.com/topics/us-sanctions-china.
Vietnam War. During the Carter and Reagan administrations, the US saw China as a quasi-ally against the Soviets, shaping American policy towards China’s space program specifically and technology transfers more broadly. So, for instance, in 1979, shortly after normalization, Jimmy Carter and Deng Xiaoping signed an Agreement between the Government of the United States of America and the Government of the People’s Republic of China on Cooperation in Science and Technology. One of the areas included under the agreement was space.\(^2\)

In September 1988, President Reagan permitted American-produced communications satellites to be launched on Chinese rockets under conditions specified by three memoranda of agreement between the US and China written, in part, to protect American technology. Reagan justified the move as enhancing American security and furthering trade, and export licenses were approved for the launch of three Hughes communication satellites in 1989. However, major debates preceded the decision. The explosion of the space shuttle *Challenger* in 1986, along with subsequent failures of Titan and Delta rockets, left US satellite makers with few options due to a lack of available rockets to take satellites into space. Thus, while satellite manufacturers lobbied to allow satellites to be launched in China, rocket manufacturers in the United States and Europe fiercely opposed the move. Within the administration itself, the Transportation Department opposed Chinese launches on national security grounds and to protect the competitive interests of American rocket manufacturers, while Commerce and State gave qualified support to the proposal.\(^3\)

The 1990s proved to be an eventful decade in US-Chinese space relations. It was characterized first by battles in Washington over US satellites launched on Chinese rockets, with sanctions placed on Beijing over human rights concerns and missile proliferation and presidential waivers to such sanctions. The political battles occurred both within administrations and between the president and Congress, with debates on whether it made more sense to cooperate with the Chinese in space or exclude them to protect American technology and questions over who should have the authority to approve satellite exports. There were continued lobbying efforts by rocket manufacturers to restrict satellite launches and satellite manufacturers to allow them, accompanied by substantial political donations. There were successful launches of American satellites in China but also spectacular failures where people were killed. The assistance that American companies gave in improving China’s rocket systems in the wake of these disasters ultimately led to investigations and loud accusations that Americans gave too much technology to a rising China. All of this took place in the context of debates over the importance of military versus commercial considerations in space.

The first event to interrupt the launch of American satellites on Chinese rockets was the killing of Chinese citizens by the PLA as soldiers fought their way through Beijing to Tiananmen Square on 3-4 June 1989. Congress prohibited satellite export licenses, but allowed waivers if China made human rights progress. President Bush issued a waiver in December 1989 for three satellites that had been earlier approved. Additional sanctions were imposed in

\(^2\) The signed text of the agreement can be found at https://www.energy.gov/sites/default/files/pi_iec/098b7ef980003cff.pdf.

1990, and Bush again issued waivers. As a result, an American satellite, the Hughes-built Asiasat-1, was launched into space on a Chinese Long March rocket by the China Great Wall Industry Corporation on 7 April 1990. In the same year, the Bush administration also permitted Soviet rockets to also launch American satellites.\(^4\)

The launch of the next two American satellites, the Optus B1 and B2, were delayed by a different issue. In June 1991, the Bush administration imposed sanctions on supercomputers, missile technology, and satellites due to China providing M-11 short range ballistic missile (SRBM) technology to Pakistan. Thus, while the original sanctions on American satellite launches were due to human rights issues, the new sanctions were aimed at Chinese missile proliferation. The sanctions were waived in March 1992, and the Optus satellites were launched in August and December. Additional sanctions on satellites were imposed by the Clinton administration in 1993 due to China’s transfer of M-11 equipment to Pakistan, and these were waived after a nonproliferation pledge by Beijing in 1994. Later during the George W. Bush administration, the US sanctioned Chinese companies for missile proliferation by banning satellite export licenses in 2001 and 2003.\(^5\)

Another issue that played out during the 1990s centered on which agency had the authority to approve satellite exports as well as satellite technology and components, demonstrating the importance of bureaucratic politics to American economic statecraft. This was vital not only for the US-China space relationship, but also American allies. Until 1992, the United States controlled the export of satellites as if they were munitions, thus requiring that stringent State Department criteria be met before approval for export to China or any other country. However, in 1992 the Bush administration agreed to allow less advanced communication satellites, measured by nine criteria, to be exported under licenses granted by the Commerce Department with less restrictive requirements. This made it easier to export American satellites and components, although satellite technology and manufacturing methods remained on the munitions list. This move was beneficial for the American satellite industry. The Clinton administration further relaxed the rules in allowing communication satellites to be licensed by Commerce, a move that State fought against and lobbied Congress to change.\(^6\)

The question of which agency approves satellite exports is an issue of bureaucratic politics, with different agencies trying to expand their power. However, there are also fundamental philosophical and national security issues at stake. First, are satellites primarily about national security or commerce? The answer changes as technology advances, the number of satellite producers increases, and national power ratios change. Second, is American national security best promoted by a robust satellite industry that is economically competitive abroad, or by a policy that protects American technology at the cost of commercial gains?\(^7\)

The United States signed commercial launch agreements with China in 1995 and 1997.

\(^4\) Reddy, 237-238; and Zhang and Seely, 4-5.
\(^7\) Lewis makes the case that restrictions hurt both security and commerce.
Throughout the 1990s, 26 waivers were granted for satellites to be launched on Chinese rockets, with the last waiver issued in 1998.\(^8\) These included satellites from Motorola, Hughes, and Loral. Chinese rockets aided the American satellite industry by lifting satellites into orbit relatively inexpensively when other options were limited. However, there were also launch failures and disasters. In December 1992, a Chinese rocket carrying a Hughes communication satellite exploded, and Hughes conducted a seven-month review to assess the cause of the accident. In January 1995, a Chinese rocket that carried the Hughes Apstar 2 satellite exploded on the launch pad, killing six workers and leading to another investigation. Then in February 1996, a Long March 3B crashed onto the launch tower, destroying a $200 million Loral satellite and killing numerous people. A review led by Loral consisting of team members from seven satellite companies ensued.\(^9\)

At this point actors in the United States government began to fear that accident investigations were transferring rocket technology to China in a manner that could harm US national security by aiding Chinese missile programs. The technical assistance provided by American companies to China’s space programs after these disasters led to enhanced scrutiny of satellite exports and new concerns that American corporations were aiding the Chinese military. These fears were bred in part by the fact that there is little distinction between China’s civilian and military space programs.

In 1998, Congress created a select committee to investigate US-built satellites being launched in China, as well as other issues related to American security vis-à-vis China, demonstrating the importance of domestic politics on US economic statecraft. The committee was headed by Representative Christopher Cox. The unclassified version of the committee report charged that US companies had funded Chinese military modernization and ultimately strengthened Chinese ballistic missile capabilities. The report asserted that sensitive information was not protected at launch sites and improper information had been shared with insurance companies. The committee concluded that the work done for China by Hughes and Loral had enhanced China’s military capabilities in violation of the International Traffic in Arms Control Regulations (ITAR). Moreover, working with Western companies had also aided China in learning diagnostic processes. The committee noted a variety of other ways in which the work of western companies harmed US security interests, such as Lockheed Martin assisting China with a kick motor for a satellite. The Justice Department began its own investigations, and Lockheed Martin settled with the government for $13 million in 2000. Loral agreed to a $20 million settlement, while Hughes and Boeing reached a $32 million settlement with the State Department for violating ITAR.\(^10\) While some analysts disagreed with the conclusions of the Cox committee and believed they were unfair, the report set the tone for further restrictions on

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\(^8\) Reddy, 238-239; and Kan, “China and Proliferation,” 51.


space cooperation with China.11 At the same time, there were growing American concerns over Chinese industrial espionage. These fears later intensified with widespread evidence of the loss of American intellectual property to China.

Political struggles between Republicans and Democrats exacerbated the national security debate. There were claims that Chinese citizens linked to the space industry had illegally funneled money to the Democratic Party, while the chief executive of Loral was the biggest donor to the Democrats in 1996. Opponents of President Clinton argued that American policy on the export of satellites to China was based on political considerations rather than national interest. The Justice Department and both houses of Congress launched investigations on the export of satellites for launch.12

From this point on, American economic statecraft towards China’s space program consisted of further restrictions on cooperation. The Strom Thurmond National Defense Authorization Act of Fiscal Year 1999 moved satellites back to the US Munitions List, thus shifting the responsibility for export licenses from the Commerce Department back to the more restrictive State Department. The State Department then declared that even fundamental research on satellite technology counted as munitions, stifling cooperative research efforts between American and international universities. The Act also required the president to notify Congress 15 days before any export of missile equipment or technology, certifying that such exports do not violate specific American interests. With this, Congress dampened the prospects for cooperation not only with China but also other states, including European allies and Japan.13 While new rules in 2014 eased controls for European and other states, the rules did not change for China.

The issue of space was contentious during the George W. Bush administration as it was during the Clinton administration, although there was notable space diplomacy. In 2004 the head of the Chinese National Space Administration (CNSA) visited NASA, and in 2005 CNSA’s vice administrator gave a presentation at the National Space Symposium in Colorado Springs. In 2006, NASA administrator Michael Griffin visited CNSA in China.14 However, the administration’s abrogation of the Anti-Ballistic Missile Treaty and the militant tone of the 2006 US Space Policy alienated Beijing. The Bush space policy emphasized American control of space, freedom of action, and preventing adversaries from using space capabilities viewed as

detrimental to American interests. Moreover, China’s 2007 debris-generating anti-satellite test shocked the United States. During the Obama administration, NASA administrator Charles Bolden visited China in 2010 and in the same year the administration’s National Space Policy outlined a more cooperative space doctrine. However, in 2011 Congress acted to forestall any serious bilateral engagements with China in space. The Wolf Amendment, named after former Congressman Frank Wolf and renewed every year since 2011, prevents funds allocated to NASA or the Office of Science and Technology Policy (OSTP) from being used in bilateral cooperation with China or Chinese-owned companies. This severely restricts any partnership between the US and China in space. Although the Wolf Amendment does not specifically ban cooperation among private companies, it has a chilling effect.

Nevertheless, the ban does not apply to working with China in multilateral organizations, such as the Inter-Agency Space Debris Coordinating Committee (IADC), which includes NASA, CNSA, as well as eleven other space agencies. There have been other limited areas of cooperation between China and the United States. For example, there was data sharing related to the Chang’e lunar mission, and in 2014 the US National Academy of Sciences and Chinese Academy of Sciences held meetings relevant to space. There has also been cooperation in earth observation and shared meteorological data. Further, during the Obama administration, the US Air Force Academy’s Eisenhower Center held Track Two discussions with the Chinese on space activities under the sponsorship of the Defense Department’s Office of International Security Affairs.

Since the Wolf Amendment was first passed by Congress, the political conditions between China and the United States have further deteriorated. The PLA and state corporations tied to China’s military dominate China’s space endeavors, although China has attempted to introduce civil-military integration into the space sector, and there continues to be a lack of transparency in China’s space goals. The general political climate between the United States and China continues to worsen, harmed by disputes over trade, intellectual property, the South China Sea, the Diaoyu/Senkaku Islands, COVID 19, Taiwan, and China’s unwillingness to condemn Russia for its 2022 invasion of Ukraine. American charges of Chinese human rights violations in Xinjiang and Tibet are seen by Beijing as an effort to undermine CCP rule, while the strengthening of the Quad, AUKUS, and NATO’s public concerns about China lead Beijing to believe that Washington is forming an international coalition to counter China’s rise. Continued improvements in PLA and American capabilities fuel a security dilemma. Moreover

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18 Reddy, 244-247.
China’s “Made in China 2025” strategy and American pushback on Huawei and Chinese semiconductor manufacturers make technology an even greater field of competition.

Perhaps most importantly, space is seen by both countries as an arena of strategic competition and a warfighting domain. In September 2016 the US House of Representatives Subcommittee on Space held hearings entitled *Are We Losing the Space Race to China?* where committee members and panelists lamented sluggishness in US space programs and major gains in China’s program.20 In March of 2019, Vice President Mike Pence asserted that the US and China are in a new high stakes space race, with China having an “ambition to seize the lunar strategic high ground and become the world’s preeminent spacefaring nation.”21 Kevin Pollpeter and co-authors, in a report for the US-China Economic and Security Review Commission, assert that “China’s goal is to become a space power on par with the United States and to foster a space industry that is the equal of those in the United States, Europe, and Russia,” although the report also notes that in spite of China’s progress, it is still only a “partial space power.”22 China, Russia, and the United States further engage in satellite maneuvers that involve espionage and perhaps rehearsals of space war tactics.23

China’s English language sources designed for foreign consumption often downplay the element of a space race. For example, Liang Xiao asserts that China is not seeking to compete with the US in space, instead being a cooperative power that sees the universe as belonging to everyone. Liang asserts the US claims of a space race come from the desire for space-related agencies to gain bigger budgets and the colonial ideology of the US.24 As a 2022 RAND report notes, China and Russia both emphasize the need to avoid arms races, including in space, while they engage in such arms races.25 Nevertheless, China’s official mission in space does explicitly include a national security aspect. The space white paper states China’s space mission is: to explore outer space to expand humanity's understanding of the earth and the cosmos; to facilitate global consensus on our shared responsibility in utilizing outer space for peaceful purposes and safeguarding its security for the benefit of all humanity; to meet the demands of economic, scientific and technological development, national security and social progress; and to raise the scientific and cultural levels of the Chinese people, protect China's national rights

21 Kevin Pollpeter, Timothy Ditter, Anthony Miller, and Brian Waidelich, *China’s Space Narrative*, China Aerospace Studies Institute, 2020, 7.
and interests, and build up its overall strength. Moreover, China sees US space activities as threatening to China’s national security. Beijing believes American counterspace capabilities and threats to China’s nuclear deterrent from space-based assets demonstrate hostile American intent.

Chinese strategists clearly see space as essential to national security, discussing space as the ultimate high ground and viewing the US military’s reliance on space as a weakness that can be exploited. China’s focus on space and development of counterspace weapons, illustrated by the 2007 direct ascent anti-satellite (ASAT) test that caused a great deal of space debris, clearly demonstrates that the PLA does indeed treat space as a domain of strategic competition. Chinese sensitivities regarding space are seen in the *Global Times* article where analysts complain about Starlink satellite constellations launched by SpaceX, seeing them as a military threat to China.

However, talk of a space race must be kept in perspective. Both China and the United States are using space as part of their broader political and military competition. Furthermore, China does threaten American space assets. Nevertheless, the United States is still the premier space power. It accounts for over half the satellites in space, almost seven times as many as China. China spent almost $9 billion on space in 2020, compared to $48 billion by the United States. Furthermore, as China’s assets increase in space, it may become more invested in a safe space environment. China has not repeated the 2007 ASAT test, while Russia conducted such a test in 2021, causing significant debris, and India carried out an ASAT test in 2019.

**HAS THE UNITED STATES ACHIEVED ITS OBJECTIVES?**

Has American statecraft toward China’s space program achieved its objectives? This is a complex question. American objectives have varied over time. They have included pressing China to improve human rights, halting Chinese missile proliferation, protecting the American rocket industry, promoting the American satellite industry, preventing the transfer of American

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27 Blanc et al.
28 Pollpeter et al, *China’s Space Narrative*, 55-64.
technology to China, and isolating China’s space program from international partners. The proper way to use economic statecraft to achieve these goals has been contested – various administrations, Congresses, executive branch agencies, and lobbying organizations for the US space industry have taken different perspectives on economic statecraft. In a world where China has had more than one potential partner for space cooperation, the amount of leverage held by American economic statecraft is also debatable.

American limitations on cooperation with China’s space program have had no discernable effect on Chinese human rights policies. Although Congress imposed sanctions on China’s space program after the Tiananmen Square violence, these sanctions were quickly waived by the president, indicating that space sanctions were not seriously meant as leverage over human rights. Sanctions designed to convince China to end missile proliferation were more long-lasting. Between 1991 and 2009, the US sanctioned Chinese firms and individuals 26 times for weapons or missile proliferation, including bans on satellite exports for launch in China in 2001 and 2003.33 While China’s behavior in terms of proliferation improved as it began to see its own interests differently, it is uncertain if this was tied to the ban on US satellite exports.34

American sanctions have been largely successful in preventing American technology from being used in the Chinese space program. In a report by the Johns Hopkins Applied Physics Laboratory, Matthew Daniels asserts “US and Chinese space technologies and activities are substantially separated today: there are almost no direct links between the United States and China with regard to space technology research, development, and operations.”35 This is due to both American and Chinese policies controlling space technology.

Nevertheless, China has a lengthy list of space achievements in the military, commercial, and civic domains, bolstered by indigenous supply chains.36 While not as advanced as the American program, China’s space program is comprehensive and innovative. For example, China has developed a reusable space plane, has completed its BeiDou worldwide satellite navigation system, has enhanced its space launch capabilities with new rocket developments, and has over 200 satellites in its reconnaissance and remote sensing fleet. Many of China’s communications and remote sensing satellites are of high quality. The PLA has also developed robust counterspace systems.37 In civil space, China has deployed the Tiangong space station,

33 Kan, “China and Proliferation,” 51, 58-64.
34 For an argument that China should be allowed to join the Missile Technology Control Regime (MTCR), see Victor Zaborsky, “Does China Belong in the Missile Technology Control Regime?” Arms Control Today, October 2004, https://www.armscontrol.org/act/2004-10/features/does-china-belong-missile-technology-control-regime. China has agreed to adhere to the regime, but has not become a member.
35 Daniels, 3. For a comprehensive list of the costs and benefits of the separation of the US and Chinese space programs, see 13-16.
37 Office of the Secretary of Defense, “Military and Security Developments Involving the
which may in coming years be the only manned space station if the life of the ISS is not extended. The final module of the space station was launched in October 2022. In 2019 China landed a spacecraft on the far side of the moon, and the following year sent a spacecraft to the lunar surface that picked up rocks and soil and returned them to earth. China also released a land rover on Mars. In 2022 China had 64 orbital launches, second only to the US in tonnage, with similar plans for 2023. China is developing reusable rockets and has plans to send astronauts to the moon and then Mars.\(^{38}\)

In terms of protecting the American space industry, sanctions on China resulted in lost revenues in the past. In 2001, the Satellite Industry Association claimed that the transfer of satellite export controls to the State Department cost California’s satellite industry over 1,000 new jobs and $1.2 billion in potential revenue. Similarly, James Andrew Lewis makes the case that in 1995 US satellite component suppliers had 90 percent of the market, dropping to 56 percent in 2000. In the same timeframe, Europe’s share jumped from under 10 percent to 34 percent. This was caused in large part by US export controls. Export controls create delays while adding expense, uncertainty, and risk.\(^{39}\) In other words, US sanctions on China that extended to the rest of the world created a degree of international isolation for American satellite companies.

Have US sanctions isolated China’s space program internationally? Here the record is mixed. Most notably, China has been kept out of participation in the ISS by American opposition, leading China to develop its own space station. While China has obtained essential technology through foreign cooperation, reverse engineering, and espionage, it is difficult to know what has come from outside sources and what has come from Chinese innovation due to the opaque nature of its space program.\(^{40}\)

Not surprising considering the strength of their overall relationship, there has been cooperation in space between China and Russia. In the 1950s, the Soviet Union assisted China with rocket technology. In the 1990s, Russia provided China with a life support system and docking mechanism that China adapted for its Shenzhou space capsule, as well as trained Chinese astronauts. The two states have integrated their satellite-based navigation systems, GLONASS and BeiDou, and worked together on science projects. China has purchased additional space technology from Russia as well. And in 2021, China and Russia agreed to work together on plans for a moon base, the International Lunar Research Station, although there are

People’s Republic of China 2021,” 66-68.


\(^{39}\) Kan, “China: Possible Military Technology Transfers,” 36-37; and Lewis, 2-3, 7-11.

significant challenges before this becomes a reality.41  

Space cooperation between Europe and China has been particularly interesting. Europe, both the European Space Agency and individual European countries, has taken a different approach from the US, seeking to forge a more cooperative partnership with China that has had mixed results. This approach is rooted in Europe’s longing for strategic autonomy. Europe does not want to be dependent on the United States for its space activities. A report by the European Parliament in 2020 notes that the Galileo global positioning system is an example of strategic autonomy in space because it is an autonomous European system that can enable European armed forces. American ITAR restrictions demonstrate a lack of European strategic autonomy, as the US government imposes rules on European space systems that utilize American technology or parts. The 2020 Artemis Accords exhibit the lack of strategic autonomy as well, as the United States has induced individual European countries to sign on rather than engaging the European Union.42 Similarly, a researcher at the European Space Policy Institute asserted Europe’s best policy option regarding its relationship to China’s space program was to serve as a bridge builder between the US, China, and other states.43 Space cooperation with China has been seen by many European policy analysts as a means to balance the United States in a way that enhances strategic autonomy. Moreover, the limitations of the European space program require it to have international partners.

Individual European companies, as well as the European Space Agency (ESA), have cooperated with China in a variety of ventures. For example, from 2004-2007, the ESA collaborated on the Double Star project, two satellites with Chinese and European instruments, to study the earth’s magnetosphere. The Dragon and Dragoness programs stimulated cooperation on earth and maritime observation. France and China have worked on joint satellites to study the oceans and gamma ray bursts. The University of Surrey in the UK and Tsinghua University in China formed a joint venture to build microsatellites, launching the first one in 2000. Germany and China have worked on space life sciences. Most notably, the ESA and China have been in discussions on European astronauts visiting the Chinese space station. In 2012 the head of ESA’s human spaceflight division noted that some European astronauts were taking Chinese language lessons as ESA considered joint space missions with China. European space officials were frustrated with NASA canceling a US-European Mars project the previous year.44

Chinese-European space cooperation faced a notable failure with the Galileo satellite

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43 Marco Aliberti, When China Goes to the Moon…(Cham, Switzerland: Springer, 2015), 289-300.
navigation project. China and Europe signed a cooperation agreement on Galileo in 2003, at a time when some European countries and the United States were at odds over the Iraq war. There were hopes that this project would deepen a strategic partnership between China and Europe. However, by 2008 Europe had taken over the project completely. Cooperation was ended due to several factors, including concerns over technology transfer to China, European fears that China’s BeiDou system would be a competitor to Galileo, China’s 2007 ASAT test, and American pressure to exclude China from the project.45 Thus, in spite of European desires to cooperate with China in space for strategic reasons, Europeans were stymied not only by American pressure but also Chinese policies that Europeans found objectionable.

Today there continues to be limited space cooperation between China and the ESA. For example, ESA provided ground station support to the Chinese Chang’e-5 and Mars Tianwen-1 missions. The University of Geneva is scheduled to study gamma-ray bursts using the Tiangong Space Station in 2025.46 However, political relations between China and the EU have been worsening over human rights issues in China, Chinese political pressure on European states, and especially the Ukraine war, likely limiting European-Chinese space cooperation in the short to medium term.

China touts its international cooperation in space. Approximately one-third of China’s 2021 Space White Paper is devoted to international cooperation, noting that since 2016, 19 countries and regions, as well as four international organizations, have signed memoranda of understanding or space cooperation agreements with China.47 China often refers to its launch services, BeiDou satellite navigation system, and satellites as a Space Silk Road, under the umbrella of Xi Jinping’s Belt and Road Initiative, implying that China’s space activities help link mankind and benefit all states. Beijing also created the Asia-Pacific Space Cooperation Organization (APSCO) in 2008, whose members include Bangladesh, China, Iran, Mongolia, Pakistan, Peru, Thailand, and Turkey. APSCO is a vehicle through which China shares training, ground stations, and satellite development projects with members, in turn gaining diplomatic benefits as well as a market for space services and access to data that enhances space situational awareness.48

CONTEMPORARY DEBATES

Moving forward, there is some debate over American policy but little chance of short-term substantive change. Congress has not seriously debated the Wolf amendment or changing our relationship with China’s space program. The links between China’s military space programs, civil space programs, and state-owned firms are still problematic from the American perspective. Other issues include Chinese cyber-espionage, human rights violations, growing counterspace capabilities, and the fact that space is part of the larger strategic competition between the US and China. Some suggest tightening restrictions on China on overall

45 Pollpeter et al, “China Dream,” 29-30; and Aliberti, 266-269.
48 See 2019 Report to Congress, 368. The APSA website is at http://www.apsco.int/.
technological cooperation. More stringent restrictions, some of which have already been implemented, include making it more difficult for Chinese direct investment in American companies, limiting discussion on space with China in multilateral forums, erecting stronger barriers against cyber theft of American technology, and limiting visas for Chinese students and scholars. In 2023 there was even discussion of allowing the 1979 US-China Science and Technology Agreement to expire.

However, there are also voices suggesting that the United States needs to cooperate more deeply with China. Two types of cooperation are envisioned – scientific or technical cooperation in space, and policy cooperation to make space a safer place for all countries’ space assets. John Logsdon notes that renewing the Wolf amendment each year means there is not even a debate in the United States on cooperating with China. The US needs to begin probing whether collaborative work might be beneficial to both parties. Damon Coletta is more forthright. He argues that securing American power requires a strong focus on science, including scientific collaboration between American and international scientists. American export restrictions isolate the US from China and other countries, including US allies. Coletta compares such policies to import substitution, which ultimately leaves a country with lower levels of technology. Refusing to cooperate on basic space science projects with the Chinese ultimately harms American science and thus international leadership.

Similarly, the Secure World Foundation argues that US export controls did not hurt China, but instead damaged the American space industry. It asserts “By isolating China from...cooperative efforts in space, the United States has pushed China to launch its own space capabilities. Furthermore, this forced separation has allowed China to use its space program to create its own relationships with countries the United States has long ignored, particularly in Latin America and Africa.” The Foundation recommends that the Wolf amendment be modified to allow for limited cooperation with China, with priorities being space science, data sharing on orbital debris and weather, and robotic space exploration. In a very similar vein, the National Research Council argues that including China as an international space partner is in the interests of the United States. China’s financial and technical capabilities can enhance human space exploration. Cooperation with China can bring transparency, mitigate China’s development of

49 See Are we Losing for the views of space experts and members of Congress on continued restrictions on China.
50 Daniels, 10-11.
53 Damon V. Coletta, Courting Science: Securing the Foundation for a Second American Century (Stanford: Stanford University Press, 2016), 134. For a broad discussion of scientific cooperation in space, see all of chapter 6.
55 National Research Council, Pathways to Exploration: Rationales and Approaches for a U.S. Program of Human Space Exploration (Washington, DC: The
its own technology, and result in cost sharing on expensive projects.\textsuperscript{56} Cooperation with China could also help the United States understand China’s space bureaucracy, procedures, and capabilities.

Some advisors to President Biden have advocated limited cooperation with China. Basic scientific research may be an attractive initial agenda as it involves little danger of technology transfer and scientific discoveries would be beneficial to all.\textsuperscript{57} The 1995 docking between an American Apollo spacecraft and Soviet Soyuz capsule and the joint conducting of experiments by astronauts and cosmonauts are often pointed to as an example of space cooperation between rivals that can both advance science and ease political tensions.\textsuperscript{58}

Others are less interested in scientific cooperation and emphasize instead political cooperation that can make space safer and reduce the chances of war, as well as potentially improve political relations between China and the United States. For example, Peter Loftus in \textit{Air and Space Power Journal} argues that “space presents an excellent opportunity for cooperation between Washington and Beijing, with potential engagement including standardized rules for space, cooperation on space governance, an agreement banning kinetic strikes in space, and agreement not to disrupt spy satellites.\textsuperscript{59} In \textit{War on the Rocks}, Craig Kafura proposes a resumption of the US-China Civil Space Dialogue and Space Security Exchanges, neither of which has met since 2017. Such dialogues, in addition to forcing US government agencies to develop a common view of space norms, would be useful for helping Beijing and Washington understand each other, preventing accidents in a crowded domain, and minimizing conflict if space accidents do occur.\textsuperscript{60} Dealing with space debris is of common interest to both China and the United States as both sides have suffered from the effects of debris. For example, in 2022 a Chinese satellite collided with a piece of Russian space debris and was destroyed. In 2009 an American Iridium satellite collided with an obsolete Russian satellite.\textsuperscript{61} Still other

\begin{itemize}
  \item \textsuperscript{58} See, for example, Joan Johnson-Freese, “China’s Space Ambitions: It’s Not All About the U.S.,” \textit{Georgetown Journal of International Affairs} 15, no. 1 (Winter/Spring 2014): 146.
  \item \textsuperscript{60} Craig Kafura, “Renew Space Dialogue with China,” \textit{War on the Rocks}, 10 February 2022.
  \item \textsuperscript{61} “Breakup of China’s Yunhai-1 (02) Satellite Linked to Space Debris Collision,” \textit{Space News}, 11 January 2022.
\end{itemize}
analysts focus on the importance of diplomatic engagement between Russia, China, and the US to limit the weaponization of space.\textsuperscript{62}

CONCLUSION

In sum, economic statecraft toward China’s space program was somewhat cooperative from the Reagan administration through the Clinton administration, although there was always conflict within the executive branch and between administrations and Congress. By the time of the George W. Bush administration, economic statecraft toward China was mainly punitive, dominated by the desire to protect American technology and slow China’s growth as a space power. Today there is some debate between those who want to maintain (or harden) American policies and those who seek some degree of cooperation, although there is little political will in the US to change policies considering growing competition with China. This case generates lessons on economic statecraft. First, policymakers split in ways similar to broader debates in the international relations literature. Those that take on a realist perspective see conflict between the US and China as inevitable across a broad range of domains, including space. The best policy prescription is to protect one’s own technology to the greatest extent possible. Those who take the opposite perspective suggest that economic and space cooperation can lead to political benefits. Cooperation in the technical sphere may stimulate cooperation in the political sphere. At the very least, limited cooperation in space can result in scientific breakthroughs and a much better understanding of how the Chinese think and operate.

Second, the application of economic statecraft in the United States is contentious because it creates winners and losers, both economically and bureaucratically. Restrictions on satellite launches in China hurt US satellite manufacturers and benefitted rocket manufacturers. Imposition of export controls also damaged economic ties between the United States and European allies, leading some European manufacturers to seek to build ITAR-free products unconstrained by US export controls. Bureaucratic agencies contended with each other over the regulation of space exports, most notably the State Department and Department of Commerce.\textsuperscript{63}

\textsuperscript{62} See, for example, Paul B. Larsen, “Outer Space Arms Control: Can the USA, Russia, and China Make this Happen?” \textit{Journal of Conflict & Security Law} 23, no. 1 (2018): 137-159. For an argument that the United States needs a whole-of-government approach in partnership with other actors to seriously assess the need for developing space weapons, see Michael P. Gleason and Peter L. Hays, “A Roadmap for Assessing Space Weapons,” Aerospace Corporation Center for Space Policy and Strategy, October 2020, \url{https://aerospace.org/sites/default/files/2020-10/Gleason-Hays_SpaceWeapons_20201005_1.pdf}.

\textsuperscript{63} Despite tightened restrictions on the export of high technology products to China in 2018, the Commerce Department blocked only a small percentage of US tech exports to China in 2020 and 2021. See Kate O’Keefe, “US Approves Nearly All Tech Exports to China, Data Shows,” \textit{Wall Street Journal}, 16 August 2022, \url{https://www.wsj.com/articles/u-s-approves-nearly-all-tech-exports-to-china-data-shows-11660596886?page=1}. 

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while conflict over economic statecraft was reflected in rivalry between the executive and legislative branches.

Finally, the outcomes of economic statecraft can be difficult to measure. When the United States allowed American satellites to be launched on Chinese rockets, did assistance from American companies after launch failures significantly enhance Chinese missile capabilities? The experts were divided. If the United States had allowed China to join the coalition building and operating the International Space Station, would China have more or less technological knowledge than it does now after striking out on its own? We can’t know for sure. Ultimately however, it is difficult to identify discernible changes in Chinese space policy that can be linked to American statecraft. China has maintained a consistent space program shaped by its economic capabilities, security considerations, and quest for commercial gain.

As a result, future acts of international statecraft will remain contentious. Economic statecraft provides the hope of advancing important national interests without resorting to violence. Nevertheless, the complexity of the outcomes and the domestic costs for certain actors
mean that it will be controversial. This controversy is broadly seen across numerous sectors of the economic relationship between China and the United States and is only intensifying as China is perceived by Americans as a greater threat.

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