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Table of Contents

Letter from the Editor

Since the previous edition of the SAIS China Studies Review was published, the perils of trying to predict China policy have once again become all too clear. In the final weeks and months of 2022, the infectious Omicron variant brought the years-long zero-Covid policy to an abrupt end, causing China's nationwide but characteristically fragmented system of epidemic control to collapse under the weight of its own contradictions. The open expression of discontent with the policy by citizens from Ürümqi to Shanghai shocked many observers outside China. Perhaps more shocking was the Central leadership's complete abandonment of the policy in response. Many outside observers interpreted the elevation of Li Qiang, responsible for strictly implementing the Shanghai lockdown over the summer, to the Premiership at the 20th Party Congress in October as indisputable evidence that personal loyalty to Xi Jinping had become the paramount criterion for political promotion in China, and that the zero-Covid policy was here to stay.

The Congress itself formalized Xi Jinping's consolidation of power over Party and state, but former CCP General Secretary Hu Jintao's sudden exit from the otherwise highly choreographed event produced abundant speculation among outside observers. Was Hu's removal evidence that Xi still faced resistance within the Party? Or did it represent the final blow to Hu's collective leadership? The volume of speculation generated from this brief incident underscores the growing difficulties of observing China from the outside, highlighting the urgent need for empirical analysis of China. Only through analysis grounded in empirical observation rather than speculation can a more comprehensive, nuanced understanding of China and its role in the international community be gained. This is precisely the analysis that the authors of the ninth volume of the China Studies Review seek to provide.

The Review begins with **Yunyi Huang's** insightful analysis of China's contradictory foreign and domestic coal policies through the lens of Chinese political-economy. Huang extends the literature on concepts including fragmented authoritarianism and state capitalism to explain China's contradictory foreign and domestic coal power policies. Next, **Hiromitsu Higashi** examines signals from the Chinese central government to assess how the legal status of China's "Great Firewall" has evolved since 2018. Higashi uses an original model to incorporate technical upgrades, official signaling, legal changes, and punishments of individuals circumventing the Great Firewall into a comprehensive analysis of how the CCP's most infamous censorship regime has expanded in unexpected ways.

Turning to China's role as an international actor, **Max Rappoport** delves into China's evolving engagement with the Kingdom of Saudi Arabia and the United Arab Emirates in the context of major regional developments since 2018. Building on the historical nature of Chinese and U.S. relations with these key Gulf states, Rappoport identifies indicators U.S. policymakers should monitor to assess the impact of China's deepening engagement in the Gulf on the United States' strategic interests. Next, **Matthew Bernard** reveals the

strategic ambitions underlying China's efforts to develop a world-class fleet of aircraft carriers and identifies the sensitive maritime zones where these carriers are likely to conduct regular operations. Bernard's analysis provides a detailed historical account of the evolution of China's carrier program and strategy and links this with China's modern defense doctrine, the country's investments along the "Maritime Silk Road," and the technical features of China's aircraft carriers to identify specific sea lanes and ports where defense planners can expect to encounter China's carriers.

Examining China's current and future role in clean energy supply chains, **Nicholas Munves** uses the framework of comparative advantage to argue that China and the United States are likely to play complementary roles in the supply chains of critical minerals mined from the ocean's depths. Munves argues that policymakers in both capitals will be hard-pressed to defeat the market forces against decoupling in this sector that is crucial to a global clean energy transition. The ninth volume concludes with **Jake Grover's** quantitative analysis of China's motivations for its allocation of foreign assistance. Grover updates and expands on the literature on China's allocation of foreign aid with new data and by including key variables such as governance type and strategic alignment with China to find that—contrary to accusations that China engages in "debt-trap diplomacy"—China's motivations for its foreign aid allocations conform to those of other providers of bilateral aid including the United States.

I am indebted to the student authors and editors whose hard work made this publication possible and whose insights and expertise broadened my knowledge of and interest in China and its people, institutions, and politics. To readers, we appreciate your interest and would love to hear from you with any thoughts, questions, or concerns. You can reach us at saischinastudiesreview@gmail.com. We accept short submissions for our blog on a rolling basis. We would love for you to contribute.

Jackson Martin 马丁

Washington, D.C.

Discrepant Paces of Decarbonization: Political Economy of China's Domestic and Overseas Coal Power Policies

Yunyi Huang

Executive Summary

As the world's largest consumer of coal, China's coal power policies are critical to the success of domestic and international decarbonization and clean energy transition efforts. Despite China's pledges to peak carbon emissions by 2030 and achieve carbon neutrality by 2060, however, its overseas and domestic coal power policies have developed in starkly different directions. China promotes continued reliance on coal domestically while pledging internationally to reduce coal use. The reason behind this discrepancy lies in the distinct rationales and logics that the Chinese government follows in the domestic and foreign policy-making process at both the ministerial and local levels. Motivated by its ambition to lead international decarbonization efforts, China prioritizes decarbonization in its international energy strategy. In contrast, China's domestic energy strategy prioritizes short term energy security, achievable by continued reliance on coal. These different energy strategies impart conflicting incentives to domestic actors, diminishing China's ability to adopt a consistent policy on promoting coal power at home versus abroad. Bureaucratic fragmentation allows local and ministerial stakeholder preferences for continued reliance on coal to prevail over central government priorities to reduce domestic coal use, further undermining China's ability to adopt and consistently implement policies to reduce domestic coal use. However, because stakeholders responsible for China's overseas coal policy are less fragmented, China is able to successfully implement its policy to cease support for overseas coal and support the central government's decarbonization commitments. Conflicting interests between state and business actors also hinder China's ability to adopt and effectively implement policies to reduce reliance on coal in its energy mix. This results in China's continued reliance on coal power despite its decarbonization pledges.

Introduction

As the largest coal-producing and coal-consuming country in the world, China's coal power policies have long been scrutinized by global environmental campaigns. Environmental advocates regard China's coal policies as playing a decisive role in the success of both domestic and global decarbonization efforts. In recent years, China has stepped up efforts to play a leadership role in international climate negotiations and has made commitments to phase out coal as its primary source of energy. In particular, China's commitment to peak carbon emissions before 2030 and achieve carbon neutrality before 2060 sparked a policy push that accelerated the adoption of renewable energy.[1]

However, China's overseas and domestic coal policies have developed in starkly different directions since 2021. Despite President Xi Jinping's public commitment to cease investments in overseas coal-fired power plants in September 2021, China's domestic coal power production was reemphasized in the Chinese Communist Party's (CCP) 14th Five-Year Plan (2021–2025), both at the central and local levels. The situation is puzzling: Chinese leaders

publicly promote decarbonization efforts at the international level while continuing to promote coal domestically. What accounts for this stark difference between China's domestic and international coal policies?

This paper finds that in the case of policies toward coal power infrastructure, the Chinese government has different rationales and logic in the domestic and foreign policy-making process, at both the ministerial and local levels. Moreover, domestic stakeholders and foreign policy-makers have conflicting incentives that undermine China's ability to consistently implement policies to reduce coal use both at home and abroad. China's divergent domestic and international energy strategies, fragmentation between and among central and local governments, and China's unique state-business relations are the key factors contributing to this phenomenon.

Specifically, China's ambition to compete with the United States and the European Union for international climate leadership motivates China's central leaders to discourage coal use overseas. Meanwhile, bureaucratic fragmentation in China's domestic politics—at both the ministerial and local levels—prevents policies discouraging coal use from being widely adopted. Finally, even in cases where national-level policies aimed at reducing domestic coal use have been adopted, conflicting interests in state-business relations impede state actors' ability to effectively implement these policies.

The rest of this paper proceeds as follows. The next section briefly reviews the relevant literature on interactions between China's domestic and foreign policy-making—including in the sphere of environmental governance—to identify possible explanatory factors for the cleavage between China's overseas and domestic coal power policies. Then, it analyzes the effects of these factors on policies discouraging coal use from being widely adopted. Finally, it concludes with a discussion of the theoretical and policy implications.

Literature Review

The literature on Chinese political economy has identified key domestic political attributes that explain the trajectory of reforms in and gradual internationalization of China's domestic economy. Two key components in this literature should be highlighted to help explain the cleavage between China's overseas and domestic coal power policies.

First, China's unique model of state capitalism has a direct impact on the formation and implementation of particular market reform policies including industrial upgrading, ownership reforms, and the adoption of a multilevel regulatory system.[2] The Chinese government's high degree of intervention in the domestic economy also influences China's outward investment, as domestic investors seek to exploit foreign economic policy initiatives, like the Belt and Road Initiative (BRI), to pursue private gains.[3] Ye (2018) describes BRI as a phenomenon of "state-mobilized globalization" to sustain China's high economic growth rate and support social and political stability.[4] In this context, national leaders with geopolitical ambitions may use outward investment as a tool to project state power or as an extension of statecraft to further China's strategic and foreign policy interests.[5] These examples illustrate how China's state-capitalist model directly influences the formation and implementation of market reform policies and outbound investment decisions. Crucially, they also demonstrate the close linkage between China's domestic political-economy and its foreign economic policy. This paper will therefore examine the effects of China's state-capitalist model on its domestic and overseas coal policies.

Second, fragmented authoritarianism plays a critical role in understanding the inconsistencies between policy adoption and implementation.[6] Given that China's economy is highly decentralized, the notion that China's overseas investment is the result of a top-down policy dictated by a unitary central government cannot explain the inconsistent implementation of China's foreign economic policies.[7] Rather, the varying incentives of subnational actors within and outside the Chinese Party-State apparatus as facilitators and agents of foreign economic policies make fragmentation particularly acute.[8] Furthermore, gaps between central and local leaders and competition among leaders in different localities—who are incentivized by potential political promotion to spur economic development—greatly increase the difficulty of implementing a cohesive foreign economic strategy.[9] This paper will assess the effects of bureaucratic fragmentation—divergent interests between and among domestic, subnational stakeholders—on China's capacity to implement the necessary domestic policies to support international pledges to decarbonize.

The literature on China's climate change policy offers both domestic and international factors as explanations for China's newfound willingness to lead international climate change efforts. Lewis (2013) argues that China's ambition to play a leading role in international climate policy was the direct result of domestic institutional reforms that successfully reduced China's energy intensity.[10] This development increased China's capacity to deliver on international emissions reduction commitments and allowed it to make new commitments on which China could under promise and over deliver. This furthermore gave China's leaders both the capacity and incentive to take unilateral action on climate issues, whereas prior to the reforms China's willingness to make unilateral commitments had often been contingent on the United States' climate policy.[11] Tamara and Zusman (2011) also find that domestic institutional reforms facilitated a shift in China's climate policy from fragmented and reactive to a more coherent and proactive approach.[12] Domestically, the central government emphasizes the slogan "ecological civilization" to underscore the alignment of China's international climate commitments with China's development interests.[13] These examples reveal two key facts relevant to this paper. First, they show that the direct link between China's domestic political-economy and its foreign policy also extends to its environmental policy. Second, they demonstrate the importance of domestic factors in China's capacity and willingness to be an international climate leader.

However, domestic political-economic factors can also represent a significant barrier to implementing sustainable domestic environmental policies. Divergent goals and policy preferences among bureaucratic stakeholders can undermine China's ability to effectively implement environmental policies that require action from a diverse range of subnational actors. Ran (2013) argues that the lack of incentives for local officials to properly implement central government policies results in pervasive implementation "gaps" of environmental policies.[14] Eaton and Kostka (2014) find evidence that state-led green economic initiatives are hindered by the frequent rotation of local leading cadres, which undermines the advantages of China's model of environmental authoritarianism.[15] Political pluralization and policy entrepreneurship are also domestic factors that result in inconsistent implementation of central government policy. Van der Kamp et al. (2017) cite inter-jurisdictional competition between local officials to foster economic growth to explain the tendency for cities with weaker revenue bases to respond more slowly to centrally mandated environmental transparency regulations.[16] Similarly, other scholars use fragmented and decentralized authoritarianism to explain variations in hydropower policy outcomes and electricity market reforms, respectively.[17] Each of these factors may hinder the consistent

and successful implementation of sustainable domestic environmental policies.

Explanations for divergences in Chinese policy-making and implementation processes have been comprehensively studied within the context of China's unique pattern of domestic market reforms. However, there has been inadequate discussion about cleavages between China's domestic and foreign policies. Preference divergence among central ministries and local governments alone cannot explain these cleavages. The impact of fragmented authoritarianism on the interaction between China's domestic and foreign policies—and on the preferences of different stakeholders—also depends on the policy sector.

This paper explores three possible causes for discrepancies between China's foreign and domestic coal policies: 1) conflicting priorities—demonstrating climate leadership internationally versus ensuring short-term energy security domestically—in China's international and domestic energy strategies; 2) varying degrees of bureaucratic fragmentation at both the ministerial and local levels that shape stakeholders' overseas and domestic coal policy preferences; and 3) conflicting interests between the state actors responsible for adopting and implementing coal policies and the enterprises affected by those policies. Together, these factors account for the observed cleavage in overseas and domestic coal policies.

This analysis focuses on China's coal power policies because the divergence between domestic and foreign policies in this sector is more explicit than in other sectors. China's plans to phase out coal have been unsuccessful because principals and agents at each administrative level vary significantly in how they prioritize and implement central government policies to reduce coal use. This analysis will demonstrate that this variation derives from the different positions of these actors in the domestic bureaucratic structure and the relations among them.

Evidence is drawn from primary interviews with Chinese environmental policy experts, primary official documents, and secondary sources. Interviews with two practitioners in the environmental sector from independent non-governmental organizations provide first-hand accounts of how China's inconsistency on coal-fired power policies since 2020 was interpreted from within the Chinese environmental governance apparatus.

Analysis

Background: China's inconsistent domestic and overseas coal power policies

China's energy supply has long been dominated by traditional fuels, primarily coal. Coal has played a key role in China's economic growth over the last four decades, literally fueling the country's "economic miracle." The relationship between coal and economic growth has made the Chinese government hesitant to adopt policies to change the country's energy layout, since doing so would run the risk of slowing the economic growth that the CCP views as central to its legitimacy. Nonetheless, international pressure to decarbonize and greater flexibility in international climate negotiations, resulting from reductions in China's energy intensity, have gradually increased the importance of climate change on the agenda of Chinese leaders.

President Xi Jinping has regularly sought to demonstrate his climate leadership since assuming office in 2012. During a presidential summit meeting in 2014, China and the United States jointly announced steps each country would take to combat climate change and worked closely to ensure the agreement was adopted at the historic COP 21 in 2015. Domestically, China's 12th Five-Year Plan (2011–2015) included an explicit goal to reduce carbon emissions for the first time.[18]

At the UN General Assembly (UNGA) in 2020, President Xi announced China's commitment to peak carbon emissions before 2030 and achieve carbon neutrality before 2060. Accordingly, China began toning down its outlook on coal. In April 2021, President Xi announced that China would strictly regulate coal consumption until 2025 and gradually phase it down thereafter.[19] In September 2021, the central government announced that it would "strictly control coal consumption" over the 14th Five-year Plan (FYP) period and would "phase down coal consumption" over the 15th FYP period.[20]

President Xi took another bold step in 2021 when he announced to UNGA that China would not build any new coal-fired power projects overseas.[21] As a result of Xi's pledge to end financing for overseas coal-fired power plants, China's two global policy banks provided no new energy finance commitments outside China for the first time since 2000. These policy announcements—which neither external observers nor domestic energy officials anticipated—were lauded by environmentalists for their contribution to decarbonization efforts.

However, since 2021, Chinese domestic actors have prioritized and implemented policies that increase China's reliance on coal, undercutting Xi's commitment to the UNGA in 2020 and offsetting the impact of China's commitment to end financing for overseas coal-fired power plants. By the end of 2021, energy security and shortage concerns caused China to backtrack on the central government's commitment to "strictly control coal consumption." China's annual coal output hit a record high in 2021 and consumption rose by 4.7 percent, demonstrating the coal policy reversal due to a surge in energy demand.[22]

The emphasis on continued reliance on coal in the short and medium terms at the "Two Sessions" in March 2022 provides further evidence that the central government's plans to phase out coal have been deprioritized. During the session, President Xi emphasized that coal would be the "mainstay" of China's energy layouts for the short term and achieving China's climate ambitions must be based on this "national reality."[23]

The domestic policy reversal and reprioritization of coal in China's energy policy is also evident in the government's attitude toward domestic stakeholders. A non-governmental organization (NGO) leader interviewed for this paper disclosed that relevant officials summoned environmental NGOs supportive of the coal phase-out in China and warned them against public advocacy on phasing down coal power.[24] Such restriction reflects the Chinese government's conservative position on advancing decarbonization efforts.

China's dramatic coal policy reversal was primarily driven by growing concerns about energy security and social stability following widespread power shortages in 2021. In order to shore-up short-term economic growth and energy security,

The impact of fragmented authoritarianism on the interaction between China's domestic and foreign policies—and on the preferences of different stakeholders—also depends on the policy sector.

domestic policy makers turned to coal because of its stable supply and its reliability in powering China's national grid. Compared to renewable energy projects, coal power supply can be flexibly scaled to stabilize the power grid during energy crunches. This implies that the construction of coal power plants is also more reliable for quickly boosting economic growth and maintaining employment in regions with a significant share of the population employed in the coal sector.[25]

The reasons for China's dramatic return to coal after multiple public commitments to phase it out can be better understood by examining differences in China's priorities in its international and domestic energy strategies. The following sections will use the factors identified in the literature review to explain China's policy shift from decarbonization to the return of coal power, and why it is inconsistent at home and abroad.

National energy strategies: different priorities at home and abroad

China's energy strategies at home and abroad are built around different priorities. Internationally, China prioritizes decarbonization efforts so that it can be a leader on combatting climate change. The timing of President Xi's carbon neutrality pledge at the UN—minutes after President Donald Trump's speech condemning the Paris Agreement and China's environmental record—was interpreted by Chinese climate policy experts as demonstrating Xi's "interest in leveraging the climate agenda" in the geopolitical competition with the United States for leadership on climate issues.[26] President Xi's dismissal of the EU's attempts to extract a similar commitment during a virtual EU-China leaders' meeting a week before the UN speech underscores the significant geopolitical value Xi sees in China's ability to take unilateral action on climate issues.[27]

In addition to its carbon neutrality pledge, China also took advantage of the UNGA platform to announce its plan to stop financing overseas coal. The decision to make these announcements at a high-profile multilateral forum supports the notion that China's prioritization of decarbonization in its foreign energy strategy is driven by its geopolitical ambition to lead on climate issues.

Interviews with industry experts also suggest China's decision to announce the carbon neutrality pledge was driven more by top-down interests to serve diplomatic ends rather than by bottom-up support from environmental advocates. Even technocrats in the Ministry of Ecology and Environment—ostensibly the most relevant central ministry responsible for environmental policy—were not expecting China to pledge such drastic actions in the short run, let alone provincial-level bureaucrats.[28] It was not until President Xi announced the goals at the UN that ministerial and local bureaucrats began to formulate the roadmaps and action plans to implement the central government's climate ambitions.

... varying levels of fragmentation in the Chinese bureaucracy account for differences in how highly domestic actors prioritize national-level coal policies and how effectively they implement them.

The failure to consult with internal experts and communicate with policy implementers prior to the announcement strongly suggests Xi's geopolitical motivations.

The decision to cease investment in overseas coal-fired power projects could come with tradeoffs for China in its relations with the Global South. For example, some of China's developing country neighbors—which may lack the financial and technical capacity to invest in renewable energy—could face an energy supply gap without Chinese financing for new coal-fired power plants. For example, China's no-coal-overseas pledge could leave a sizable hole in Cambodia's power development plan.[29] However, concerns about negative diplomatic effects of this nature did not prevent China from backtracking on its commitment to end new investment in overseas coal infrastructure, a result of China's prioritization of decarbonization leadership to score geopolitical points in its international energy strategy.

Since 2021, however, China has reoriented its domestic energy strategy to emphasize energy independence and security. Domestic electricity shortages and household blackouts partially motivated this shift. The war in Ukraine and the energy supply crisis in European countries in 2022 also compounded the government's concerns.[30] Like many European countries that have deprioritized decarbonization in the face of acute energy shortages, China has prioritized a stable and flexible energy supply in the short run. China has adopted domestic policies to boost coal infrastructure, including the construction of more coal-fired power plants.[31] China did not, however, reverse its commitment to end financing for overseas coal-fired power plants; these plants primarily provided energy for host countries rather than China and were thus unaffected by China's prioritization of energy independence and social stability in its domestic energy strategy.

China's climate leadership is once again being challenged as the United States re-engages in international climate issues under President Joe Biden. The U.S. climate policies will pressure China to continue to prioritize decarbonization in its overall energy strategy if it wants to maintain its leadership role. After announcing its decarbonization goals, China will be judged on an increasingly level playing field with the U.S., the EU, and regional powers like Japan, rather than simply being rewarded for engaging. This will require China to adopt and implement more concrete policies to phase out coal power, which China is struggling to do because of domestic energy security concerns, along with the effects of bureaucratic fragmentation and conflicting state-business interests on domestic coal policy.

Despite the shared geopolitical landscape, China's approach to energy has resulted in contradictory coal policies at home and abroad. On the one hand, China has pledged to decarbonize its economy and reduce its carbon footprint on the global stage. On the other hand, domestically, there has been a significant increase in coal production and consumption. The next section explains that these are rational choices for policymakers operating in a fragmented bureaucracy.

Policy formation: different levels of fragmentation in the bureaucratic systems

China's domestic political-economic context inevitably shapes how subnational actors create and implement the national-level coal policies that are motivated by geopolitical considerations. Following President Xi's carbon neutrality pledge, ministries across China's administrative hierarchy needed to quickly draft roadmaps and action plans to achieve the carbon emission targets, despite their unpreparedness. Within the context of fragmented authoritarianism, ministerial and local level officials sometimes have

vastly different preferences regarding the specificities of those policy roadmaps. Varying levels of fragmentation in the Chinese bureaucracy account for differences in how highly domestic actors prioritize national-level coal policies and how effectively they implement them.

At the central level, China's overseas coal investments are primarily supervised by the National Development and Reform Commission (NDRC), the Ministry of Commerce (MOFCOM), the Ministry of Foreign Affairs (MOFA), and the Ministry of Ecology and Environment (MEE). In March 2022, these institutions jointly issued guidance on promoting the green development of the Belt and Road Initiative, encouraging businesses to increase investment and engagement in global cooperation to develop green infrastructure and environmental impact assessment standards.[32] The guidance—the most recent follow up to the 2021 commitment to stop overseas financing of new coal-fired power plants—represents the alignment of all relevant central ministries on coal power policy. Although the guidance failed to clarify regulations on contracting activities other than investment, such as engineering, procurement, and construction (EPC) services, it at least shows that the NDRC and other central ministries are aligned on the policy direction because they are highly centralized and thus face relatively little fragmentation.

In comparison, domestic energy policy at the central level involves more parties and is more complicated and fragmented.[33] The State Council is a key stakeholder in domestic coal policy because it is responsible for managing environmental action plans, air pollution, and monitoring local officials' environmental records. The National Energy Administration (NEA) also has a strong interest in domestic coal policy—it formulates industrial policies and standards for fuels, including coal. The Ministry of Industry and Information Technology (MIIT) is also a crucial stakeholder, as it seeks to guarantee energy supply for the business sector to support macroeconomic planning. The State Taxation Administration (SAT) is also involved in the formation of domestic coal policy because energy consumption contributes to tax revenue. Conflicting interests among these central ministries and offices pose obstacles to the decarbonization of China's electricity market and result in the formation of inconsistent domestic coal power policies. While MEE might prefer policies that reduce coal use to accelerate the clean energy transition and control pollution, NEA's top priority is to ensure energy supply and security—meaning it is more receptive to the central government's prioritization of short-term energy security and thus supports continued reliance on coal in the short term.

There may also be agencies within these ministries with competing interests and divergent preferences. For example, within the NEA, the Division of Planning usually prioritizes long-term energy sustainability and works to be better prepared for phasing out coal power. The Division of Coal—also within the NEA—is understandably less enthusiastic about policies to phase out coal in China's energy mix. When it comes to drafting policies to reduce coal use, the Division of Coal's interests are inevitably opposed to those of the Division of Renewable Energy.[34] Ultimately, China's top-down policy priority to phase out coal from its energy mix could not overcome the dizzying amount of fragmentation and divergent preferences between domestic central government stakeholders. As a result, domestic energy security concerns prevailed over policies that would have gradually phased out coal power.

Less fragmentation and preference divergence at the local level leads to higher compliance with the central government's overseas coal policies. Unlike the manufacturing or agriculture sectors, investment in overseas coal-fired power is not a significant issue at the provincial level and below. Although some regional state-owned

enterprises (SOEs) are engaged in EPC contracts related to the construction of overseas coal-fired power plants, most coal investment is still dominated by state-owned power giants—which are the equivalent of central government ministries in China's bureaucratic structure. The competition among localities seen in other overseas investment sectors is less intense in overseas coal power investment.[35]

As for local-level compliance with the central government's domestic coal power policies, however, energy security concerns take priority over decarbonization as a result of more bureaucratic fragmentation. Driven by political incentives to support national energy planning, provinces with coal resources (e.g., Inner Mongolia, Shandong, and Shaanxi) have committed to increasing coal-fired power projects for self-consumption and outward transmission and emphasized the role of coal as a backup supply source in the 14th FYP. Although profits from coal-fired electricity production have decreased in recent years due to rising coal prices, a stable and flexible energy supply has become a common priority for local governments that outweighs commercial gains and environmental impacts. The sudden spurt of power plant approvals in March 2021 shows that local governments were keen to soften the economic impact of the pandemic by stabilizing investment and spurring the economy.[36]

On the other hand, major net energy consuming provinces are concerned about the economic losses of electricity blackouts if their energy layouts cannot respond flexibly to climate disasters (e.g., droughts and heat waves). Under the central government's current arrangement, consumer provinces should rely mainly on electricity imported from western provinces. However, many local governments in provinces which are net energy consumers resist this arrangement because they want to avoid becoming too dependent on external energy supplies. These local governments are also reluctant to import electricity because the GDP created by increased coal demand, and hence production, will be recorded by other provincial officials competing for similar promotions.[37] Sichuan—a major net energy exporter—was mostly spared from the coal-shortage-induced nationwide power cuts in 2021, but the droughts in the summer crippled Sichuan's hydroelectric power supply, putting pressure on Sichuan's ability to guarantee electricity supply even within the province. As a result, some consumer provinces including Zhejiang, Guangdong, and Jiangsu—which suspended approvals for new coal-fired projects since 2017—have shifted their energy outlook and restarted the administrative procedures to support a return to coal.[38]

Political incentives to ensure stable electricity supply and support industrial output during economic slowdown induced both net energy producing and consuming provinces to prioritize short-term energy security and economic stability—by boosting investment in coal-fired power projects—over long-term goals to reduce coal use and decarbonize China's economy. In other words, the preference for energy security supersedes top-down decarbonization pressure and its supporters at the local level.[39] In contrast, central and local preferences regarding overseas coal power policy are less divergent than domestic policy—fewer stakeholders with less vested interest in overseas coal among local governments enabled the center's policy to end outward coal investment to be adopted with little resistance. As such, the different degrees of bureaucratic fragmentation can partially explain the gap between China's coal power policies at home and abroad.

Policy implementation: different levels of interest conflicts in state-business relations

Additional obstacles to the consistent implementation of central policies can arise when the political interests of the state conflict with the commercial interests of

investors. The barrier to consistent implementation created by this misalignment of state and business interests becomes especially acute when outward economic activities are used as tools of statecraft.[40] Fierce competition between SOEs with sometimes irreconcilable interests in China's domestic power sector makes it difficult to implement domestic decarbonization policies. Relative to the domestic sphere, implementation of China's no new coal power overseas pledge has been more successful because the interests of the central government and other stakeholders, such as financiers and constructors, are less divergent.

Major state-owned power companies—driven by overcapacity—are the primary domestic stakeholders in market-based overseas coal investments. These investments are sometimes supported by policy banks but are more often funded by financiers outside China. Specifically, China's five state-owned power giants collectively accounted for 50 percent of China's global public finance commitments in overseas coal-fired power plants from 2013 to 2018.[41] These organizations include China Energy Investment Corp. (now called State Power Investment Corp.), China Huaneng Group Co., China Datang Group Co., China Guodian Group Co., and China Huadian Group Co. National commercial banks and policy banks, such as the Export-Import Bank of China and the China Development Bank, are also involved as financiers.

Despite producing huge amounts of electricity, the profits from overseas coal investments are not really substantial. Even before the no-coal pledge, SOEs encountered pushback against coal-fired power projects in some developing countries. For example, local communities protested the Lamu Coal-fired power plant in Kenya—supported by three Chinese SOEs—over the plant's negative environmental and cultural impacts. The project was eventually cancelled after the Industrial and Commercial Bank of China—a major financier—pulled out.[42] Other countries, such as Pakistan, also adopted an ambitious target of achieving 30 percent renewable energy in power generation by 2030, thereby lowering international demand for coal-fired power plants.[43] As such, even before President Xi's pledge, Chinese banks already sought to reduce investment in overseas coal after suffering losses due to local opposition and decreasing demand.

It is therefore not surprising that China's pledge to build no new coal power overseas encountered little resistance from SOEs or policy banks. In fact, the principals of the five power giants admitted that they were informed of the policy shift before Xi's announcement. This move to consult and coordinate with key business sector stakeholders further demonstrates the close alignment of interests between the state and business sector on overseas coal policy. Due to their state ownership, SOEs and official policy banks basically canceled or permanently ceased their overseas coal-fired projects, and new investment has been successfully eliminated.[44]

However, the pledge doesn't necessarily represent a huge success for decarbonization, nor does it mean that SOEs have incurred economic losses as a result. For SOEs that are highly dependent on overseas EPC and thus hope to continue investing in overseas coal infrastructure, the policy is sufficiently vague so as to allow these companies to exploit loopholes. In several cases, overseas coal projects were unaffected by China's announcement—in cases where the plant was already under construction, at an advanced stage of development, or not a Chinese investment.[45] While China is the largest public financier of overseas coal plants, 87 percent of total—public and private—financing for China's overseas coal plants is actually provided by entities outside China, which are not restricted by China's no coal pledge and can continue to support coal plant construction.[46] This suggests that the interests of SOEs and the state's priorities are not in huge conflict—SOEs do

not need to sacrifice commercial benefits and can still profit while the government turns a blind eye to EPC activities.

The five electricity groups mentioned above also dominate domestic energy supply. Compared with their largely commercial interests in foreign coal investments, their rationales and motivations at home are more politically driven because of the importance of electricity to citizens' daily lives and industrial activities. By 2021, renewables have already become the main source of profit for the largest electricity groups, giving them little reason to invest in coal power.[47] However, faced with stagnating economic growth and power shortages, local governments requested these groups to launch more coal-fired power projects to bolster local construction employment and short-term energy supply.[48] Apart from the five giants, the State Grid Corporation of China is also a crucial player in domestic energy supply. This SOE is in charge of maintaining the stability of China's national grid and thus has a strong preference for coal as China's primary energy source, regardless of profit margins or longer term decarbonization goals.

The central government body that oversees SOEs also has different preferences regarding investment in overseas versus domestic coal infrastructure. The State-owned Assets Supervision and Administration Commission (SASAC) essentially performs the role of an investor in SOEs while supervising the preservation of state-owned assets and supporting the strategic adjustment of the state economy.[49] Overseas, SASAC strives enforce SOE compliance with the directive to cease coal investments. SASAC could have played a pivotal role in defending the growing commercial interests of SOEs in the renewable energy sector against demands form local governments to launch more coal-fired projects, should it view the transition to renewable energy as more promising. However, according to interviews with environmental NGO strategists, SASAC's objective of maintaining the value of state-owned assets and prioritizing domestic energy security has led it to push for domestic electricity market reforms—such as instituting capacity prices to ensure stable coal-fired energy supply—that would increase China's reliance on coal.[50]

Divergent preferences also exist among SOEs, depending on the mindsets of their top executives. Some SOE executives realize that China will eventually need to phase out coal and have accordingly developed strategies to benefit from the transition to renewables. These companies continue to reduce their dependence on coal despite the central government's prioritization of short-term energy security.[51] Other SOEs are unwilling to abandon coal-fired projects because lower coal output will weaken their bargaining power with SASAC and undermine their capacity to provide a stable and flexible electricity supply compared to SOEs with more input in coal-fired power. Therefore, the degree to which SOEs support central policies to divest from coal—either domestically or overseas—depends on the costs and benefits individual SOEs will incur from doing so.

Conclusion

By examining China's coal power policies, this paper finds that the discrepancy between China's decarbonization commitments and the reemphasis of coal power in China's domestic energy mix is the result of interactions among various inextricably linked political and economic factors.

Faced with the same geopolitical landscape, national and subnational policymakers have different rationales and responses at home and abroad. Despite China's public commitments to decarbonize, geopolitical and economic forces have altered the consistency with which the policies to support those commitments are implemented at the domestic and foreign levels. Overseas decarbonization targets have been achieved relatively easily because they

encountered less preference divergence within the bureaucratic system and because state and business interests were more aligned. Domestic policies to reduce coal use, on the other hand, have had mixed success because they face conflicting interests across ministries and within state-business relations.

China's domestic coal policy reversal jeopardizes its ability to achieve its decarbonization targets. If China fails, it is possible the data will be manipulated to indicate success. This would exacerbate the vicious cycle that impedes domestic and international decarbonization and clean energy transition efforts. It would also weaken China's international credibility.

The implications of this paper are twofold. First, the central leadership's global climate ambitions must be navigated to incentivize better decarbonization performance. Policy advocates in the global community have proposed new decarbonization policy mechanisms such as the Carbon Border Adjustment Mechanism, yet more research is required to determine how China's bureaucratic fragmentation can be overcome to achieve its purported decarbonization goals.

Second, decarbonization policy advocates need to have a better understanding of Chinese political economy to communicate with different stakeholders more effectively. Although the strategic insights of SOE executives also matter, their rational choices are driven by political incentives in the context of China's fragmented bureaucratic system and high degree of state intervention in the economy. The preferences and motivations of ministries and provincial governments are not explicitly stated on their websites, but rather shaped by interactions with other stakeholders and adjusted according to the central leadership's policy priorities. With that in mind, and now that decarbonization has been established as a standard of political correctness in China, environmentalists can work to develop more useful approaches to rally official support for decarbonization even though the fundamental political landscape cannot be altered.

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Beijing's Great Firewall Policy since 2018

Hiromitsu Higashi

"Arise!
Those who refuse to be slaves!
With our flesh and blood,
let's build our new Great Wall!"

– March of the Volunteers,
National Anthem of the
People's Republic of China

Executive Summary

This paper examines changes in Beijing's policy intent regarding the Great Firewall since 2018. It invents the CCP-GFW Model, a descriptive analytical framework comprised of four metrics: technological upgrades, official interpretations, legal updates, and punishments. By applying the model to Chinese domestic affairs in the last five years, this study concludes with moderate to high confidence that Beijing has been strengthening its control over cross-border internet traffic. The findings are in logical alignment with Beijing's policy positions in global internet governance and the Xi regime's totalitarian turn, which demands systematic state control over key information pathways.

Introduction

The mainland People's Republic of China (from now on, "China") has the world's most sophisticated and technologically advanced internet censorship system, known as the Great Firewall (GFW). The Chinese Communist Party (CCP) deploys the GFW to monitor China's cross-border internet traffic and filter out information deemed detrimental to Beijing's regime stability; aid propaganda organs in influencing Chinese public opinion; and, combined with legislative efforts, shield domestic tech firms from foreign competition.[1] As a result, Chinese domestic internet users are unable to access popular websites such as Google, Facebook, and Twitter.

However, the GFW is by no means impermeable. Chinese internet users can employ an array of technical tools—mainly Virtual Private Networks (VPNs)—to circumvent the GFW and access banned websites. In Mandarin, "… this is known as *fanqiang* (翻墙, climbing over the wall)." In 2017, over 30% of China's 770 million internet users used VPNs on a regular basis.[2] The resulting paradox is quite obvious. On one hand, Chairman Xi's consolidation of power since 2013, especially his unopposed removal of presidential term limits in 2018, has relied in part on reducing spaces for Chinese citizens to voice opposing views. The central government has come to see the digital sphere, and the large number of Chinese citizens who regularly access it, as a potential breeding ground for dissidents. As a result, China's internet model has become even more restrictive with enhanced censorship and strengthened control of tech firms operating in China. This logic is solidified by geopolitical and economic issues, as China's deteriorating foreign relations with the West and slowing economic growth rate bring new threats to Beijing's broadly-defined state security. On the other hand, despite recent setbacks and the CCP's concerted efforts to insulate China's economy, globalization continues to integrate China into the global economic system and knowledge network. From accessing digital libraries and university websites to sending emails via a Gmail account, the millions of international students, scholars, and businesses that form the backbone of China's prospects for long-run economic development simply

cannot operate successfully in an information-driven global economy when trapped in China's digital silo.

The dilemma begs a critical question: **How exactly does Beijing want to handle the Great Firewall?** Will Beijing work to strengthen its censorship system, maintain the status quo, or gradually loosen its grip? This is perhaps one of the most consequential issues in the study of information security and internet governance for three major reasons. First, China's role and standard-setting power in global internet governance continue to grow. Whether through the promotion of the concept of "cyberspace sovereignty" at the International Telecommunication Union (ITU) or the export of digital infrastructures embedded with censorship mechanisms to developing countries under the Digital Silk Road (DSR) initiative, how China governs the internet at home underlines the ongoing techno-ideological clash with the West as China exports physical censorship equipment as well as techno-authoritarian ideas. Second, due to the interconnected nature of the internet, the GFW directly affects the global internet ecosystem. As explored later in this analysis, measures such as domain name system (DNS) cache pollution and distributed denial-of-service (DDoS) attacks against VPN service providers threaten internet users across the globe. Third, as China continues its digitalization drive, the CCP's decision to either strengthen or dismantle the GFW is fundamental to Beijing's legitimacy and regime survival. A major policy misstep could potentially damage the legitimacy of the CCP state and weaken its control over Chinese society, leading to political turmoil and domestic and international economic instability.

Literature Review

There has been substantial research on what the GFW is, when and why it was established, and how it works. As early as 2006, internet historians Jack Goldman and Tim Wu documented China's then nascent censorship system and warned against its further expansion.[3] Conversely, Lena Zhang's 2006 study on Beijing's internet policy, which drew from extensive interviews with CCP lawmakers and bureaucrats, painted a somewhat hopeful picture of a controlled but liberalizing Chinese internet. As the GFW continued to consolidate over the years, Hong Kong-based journalist James Griffiths revisited the history and evolution of the GFW with an in-depth account of the rationale behind its creation.[4] A more recent and nuanced look at the issue is provided by Wang Yuyang, a law graduate and an independent researcher in China. From 2019 to 2021, Wang wrote extensively about the GFW from a domestic legal perspective, shedding light on the persecutions and punishments faced by GFW circumvention tool users that Wang deemed unjustified.[5]

On the policy side, studies of the Great Firewall are supplemented by an immense volume of political science literature on the relationships between authoritarian regimes, the internet, and information flow in general, as well as debates on the liberalizing power of the internet.[6] On the technical side, research on the mechanics of the GFW began as the GFW was implemented and has continued as the system has evolved. Technical studies employ open-source tools to test what content is being filtered by the GFW, including IP addresses and domain names.

Most studies of recent developments in Beijing's GFW policy tend to focus on the technicalities, political and economic impacts, and the reasons behind the creation of the GFW.[7] However, there has yet to be an up-to-date study that assesses the intent behind and trends in Beijing's Great Firewall policy through the lens of an interdisciplinary framework that combines and draws from the studies of technologies, law, and China's domestic political dynamics.

Methodology: The CCP-GFW Model

Any study of China's internet governance should be grounded in the fact that China is an authoritarian party-state with a weak rule of law foundation. The lack of independent and transparent legal processes in China necessarily reduces the availability of authoritative information, posing significant challenges to open-source investigation. Because the Chinese legal system has neither formally acknowledged the existence of the GFW nor clearly defined whether *fanqiang* violates the law, the GFW exists in a legal grey zone. To address the unique legal status of the GFW, this study introduces the CCP-GFW Model, an original analytical framework comprised of four different metrics to measure the changes in the CCP's attitude and policy regarding the GFW:

Technological upgrades. This metric explores recent upgrades (or downgrades) to the GFW's defensive and offensive capabilities including technical improvements to deep packet inspection (DPI) and probing mechanisms.

Official interpretations. This metric examines the explanations of the CCP's GFW policy given by institutions with strong or explicit ties to the government. Two types of institutions are studied: state media and law enforcement. Law enforcement includes police departments, People's Courts, and People's Procuratorates, all of which are legal agencies responsible for prosecuting and investigating criminal actions on behalf of the state.[8] The authoritarian nature of Beijing's regime dictates that the leadership does not directly communicate with its citizens nearly as much as in open democracies. State-controlled media and influencers hence become vehicles for the Party to communicate policy positions to the general population.

Legal updates. This metric involves qualitative analysis of developments in Chinese law with regards to the GFW. Despite the unpredictability of the Chinese legal system, changes in law may still reflect Beijing's intentions, as the rule of law remains a concept the CCP ostensibly attempts to promote.

Punishments. This metric analyzes the number of people who suffer legal punishments for either trying to circumvent the GFW or providing tools to circumvent the GFW.

The design of the CCP-GFW Model is inspired by John Kirton's analytical framework to empirically evaluate G7(8) Summit performance.[9] Kirton's model employs six different indicators to measure the extent to which a particular G7(8) Summit fulfills its core functions, from decision-making to post-summit compliance, for a comprehensive assessment of summit outcome. Kirton's multi-dimensional approach reflects the difficulty in measuring the performance of a single entity amidst diverse, politically interdependent international fora. The author's attempt to empirically assess the CCP's intention in policymaking similarly demands such a multidimensional model, albeit for vastly different reasons: the shortage of accountability mechanisms allows Beijing's authoritarian regime greater leeway in taking actions inconsistent with what is encoded in law or in what it communicates to the public. This understanding, combined with the limits of open-source research due to low government transparency and the absence of existing models on this particular topic, demands the creation of a multi-dimensional framework that relies not on a single metric, but a set of indicators that covers what the CCP publicly says, what the CCP writes in law, and how the CCP imposes its will on the ground, thereby enabling both quantitative and qualitative assessments of policy. The CCP-GFW Model was created by the author and the four proxies were selected according to this logic.

This study consists of two parts. First, existing studies are summarized to provide an overview of how the GFW functions in practice. Second, it applies the CCP-GFW Model to China's relevant domestic affairs since 2018 to draw conclusions about the likely future direction of the CCP's GFW policy. 2018 is chosen as a starting point for this analysis for three reasons. First, the *Cybersecurity Law of the People's Republic of China (zhonghua renmin gongheguo wangluo anquan fa,* 中华人民共和国网络安全法*)* with the aim of enhancing cybersecurity, data protection, and data localization was enacted in 2018.[10] The first Chinese law to create a consolidated framework for internet governance, it is criticized for requiring unrestricted government access to the data of private enterprises. Some of the most controversial clauses, such as Article 28 that demands "network operators" assist state security organs when needed, have been frequently cited as part of the rationale behind the West's technological decoupling with China (e.g., the Trump administration's decision to ban Huawei).[11] Simultaneously, the *National Intelligence Law of the People's Republic of China (zhonghua renmin gongheguo guojia qingbao fa,* 中华人民共和国国家情报法*)* was enacted in 2017. Article 7 of the National Intelligence Law mandates that Chinese businesses "support, assist, and cooperate with national intelligence efforts in accordance with law."[12] Second, in March 2018, the Central Leading Group for Cyberspace Affairs was changed into the Central Cyberspace Affairs Commission, the executive arm of which, the Cyberspace Administration of China (CAC), is equipped with broad jurisdictional power over policies on internet censorship.[13] In the Chinese legal system, the elevation of status from "leading group" to "commission" signals the formalization of an organizational structure and the expansion of functional scope and authority. Third, Beijing has seen major political-economic and security shocks since 2018. Ranging from the trade war with the United States, the Hong Kong anti-extradition protests, increased media attention in Xinjiang, to border conflicts with India and the COVID-19 pandemic, domestic and international crises might have prompted Beijing to seek stronger information control and strengthen its cybersecurity apparatus.

Great Firewall Overview

First implemented in the early 2000s, the Great Firewall is not a typical firewall in computer science terms. Rather, it is a combination of technologies and legislative efforts employed by the Cyberspace Administration of China, one of the CCP's internet governance organs, to monitor and censor China's domestic internet. There are five main techniques by which the GFW regulates internet traffic, each complementing the others, and some with alarming collateral effects on the global internet ecosystem:

IP Blocking: GFW blocks the IP addresses of undesired websites

Devices connected to the internet—including phones, computers, and the servers that host websites—locate each other across the web via Internet Protocol (IP).

In China, there are three public-facing internet service providers (ISPs), all state-run: China Unicom (中国联通), China Mobile (中国移动), and China Telecom (中国电信). ISPs have the legal mandate to process all internet traffic, including managing backbone routers—key devices that connect different networks via Border Gateway Protocol (BGP)—with an embedded IP blocklist. When a user sends a packet to a blacklisted IP address, once the packet passes through a pre-configured backbone router, the traffic is immediately dropped.[14] Such measure is known as BGP hijack and results in null routing.

DNS Tempering: GFW interferes with DNS resolutions to prevent access to websites.

When a user types a human-memorable domain name such as "google.com" in a browser, a User Datagram Protocol (UDP) request is sent to a DNS server (usually the one managed by the user's ISP), which resolves the request by returning the name's corresponding IP address for the computer to access the website via Hypertext Transfer Protocol (HTTP) or HTTP Secure (HTTPS).

The GFW also inserts false entries into DNS records (i.e., DNS cache poisoning).[15] While the DNS continues to function for unrestricted websites, whenever a request packet is detected to be requesting the IP of a prohibited site, the DNS server is configured to return an invalid or false IP address to the user's computer, preventing access to the website. In March 2010, users in the United States and Chile were unable to connect to social networking websites because their DNS requests were randomly assigned by their ISPs to a Beijing-based DNS root server with a poisoned cache, which responded with incorrect IP addresses.[16]

Keyword Filtering: GFW devices catch sensitive content in packets to stop TCP connection

Routers constitute some of the most important nodes of a network and Transmission Control Protocol (TCP) enables devices to exchange messages over a network.

Because circumventing IP blocking is easy to accomplish, as website operators can always change their IP addresses, the GFW also deploys a distributed intrusion detection system (IDS) at the router level.[17] The IDS devices are attached to backbone and border routers with optical splitters that copy unencrypted packet streams to search for forbidden keywords. The majority of these IDS devices are placed in the proximity of the three international gateways in Beijing, Shanghai, and Guangzhou.[18] The filtering mechanism is further enhanced by the introduction of deep packet inspection (DPI).[19] Powered by machine learning, the GFW IDS devices look into packet payloads to achieve more precise content blocking.

Active Probing: GFW seeks out and blocks providers of VPN, Tor, and proxy servers

For Chinese internet users, the most common way to circumvent the GFW is to leverage network intermediaries such as VPN. Users first connect their computers to VPN servers, which then send requests to destination websites on behalf of the connected users. Many VPNs also encrypt data transmitted between the servers and the users via Socket Security Layer (SSL), Transport Layer Security (TLS), or other tunneling protocols. This way, the GFW can only detect that a user is connected to a seemingly innocent IP address (which belongs to a proxy) but cannot inspect the transmitted packets. Tor, or "The Onion Router," is also used, albeit less commonly. Tor works similarly to a VPN but adds more nodes between the user and the destination server.

In response, the GFW sets up thousands of prober computers.[20] When it detects a suspicious connection that may be linked to a proxy (i.e., when it detects that a user is connected to a VPN), the probers send requests to that IP address (as if they were other users) to confirm its suspicion. Once confirmed, future traffic to the address is dropped.

Cyberattacks Against Foreign Sites: China attacks providers of tools to circumvent the GFW

To employ circumvention tools, Chinese users usually must download them from certain websites, unless, say, the installation programs are directly sent to their emails. Therefore, China has launched cyberattacks against websites that provide these tools.

In a high-profile case in March 2015, the GFW allegedly injected a malicious code into the JavaScript file of Baidu Analytics,

Figure 1: OSI Model and Communication Protocols

Source:
http://web.archive.org/web/20220517015343/https:/www.routexp.com/2020/03/osi-model-vs-tcpip-model.html

OSI Model	TCP/IP Model	Protocols
Application Layer	Application Layer	DNS, DHCP, FTP, HTTP, IMAP, LDAP, NTP, POP3
Presentation Layer		JPEG, MIDI, MPEG, TIFF
Session Layer		NrtBIOS, NFD, PAP, SCP, SQL, ZIP
Transport Layer	Transport Layer	TCP, UDP
Network Layer	Internet Layer	ICMP, IGMP, Ipsec, IPv6, IPX
Data Link Layer	Link Layer	ARP, ATM, CDP, FDDI, Fram-Relay, HDLC, PPP, STP, Token Ring
Physical Layer		Ethernet, DSL, ISDN, Bluetooth

supplied by Baidu, China's biggest search engine, and used by websites to monitor web traffic.[21] When a visitor accessed a website that used Baidu Analytics, the code would cause the computer to load two GitHub pages, one of which was a mirror of GreatFire.org, a website that provides GFW circumvention tools. The redirected traffic became a massive DDoS attack, turning visitors into unwitting accomplices and flooded GitHub with requests that knocked it out of service.

A close inspection of the GFW leads to two major observations. First, per the Open System Interaction (OSI) model, which provides a framework to categorize the devices and protocols within a computer network, the GFW's interventions—from DNS cache poisoning, IP blacklisting, BGP hijack, TCP RST attack, to DDoS attacks—occur at Layer 3 (network), Layer 4 (transport), and Layer 7 (application) (Figure 1). The only exception is DPI, which can be invoked to operate from Layer 3 to Layer 7.[22] On the other hand, circumvention tools such as VPN and Tor that establish client-proxy connections and encrypt data can be expected to operate on Layer 3, 4, 6 and 7.

Second, the GFW is strictly a cyber-offensive system. While it may be classified as a traditional firewall in that it prevents unwanted data from coming in, it achieves this by actively attacking foreign servers and domestic devices that enable the internet access of Chinese users—from routers to DNS servers, the proper functioning of which Chinese users are entitled to after paying their ISPs. More importantly, the entire GFW system was put in place without the knowledge or consent of Chinese internet users. After all, to say that the IP blacklist was created in response to popular demand is hardly a defensible proposition.

… the GFW is strictly a cyber-offensive system. While it may be classified as a traditional firewall in that it prevents unwanted data from coming in, it achieves this by actively attacking foreign servers and domestic devices that enable the internet access of Chinese users…

Research Findings: Applying the CCP-GFW Model

The CCP-GFW Model is an analytical framework comprised of four metrics to measure and evaluate the direction of the CCP's policymaking regarding the Great Firewall. This section applies the CCP-GFW model to China's domestic affairs concerning the GFW since 2018, drawing conclusions from and stating the limitations of each individual metric.

Technological Upgrades

Technological upgrades to the GFW since 2018 seemingly demonstrate the CCP's efforts to strengthen the GFW and to erect barriers to accessing and using circumvention tools. Starting with DNS tempering, the GFW has undergone numerous technical enhancements over the years to improve the effectiveness and precision of blocking and censorship.[23] For example, the number of fake IPs observed in poisoned DNS cache, for example, has increased from nine in 2010, 28 in 2011, 174 in 2014, to more than 1,500 in 2019.[24]

In July 2020, it was discovered that the GFW started blocking HTTPS traffic encrypted by new technologies such as TLS 1.3 and Encrypted Server Name Indication (ESNI).[25] The GFW continued to allow HTTPS connections based on older encryption technologies such as SSL, TLS 1.1, TLS 1.2, and SNI, because the older protocols could not prevent the censors from inferring what domain a user was trying to connect to.

In November 2021, the Citizen Lab at the University of Toronto published research on the GFW's DNS interference behavior.[26] The research team also launched GF Watch, a large-scale, longitudinal measurement platform capable of measuring and tracking the cumulative number of blocked domains. According to GF Watch, the number of censored base domains increased from 66,000 to 163,000 and that of the non-base domains from 109,000 to 1.1 million from March 2020 to April 2022.[27]

It is important to note that the GFW's technical enhancement may not reflect the CCP's policy intent—even if Beijing preferred to keep the GFW the way it was, it may have been forced to upgrade it to maintain the status quo due to the proliferation of internet content and circumvention services and methods. For instance, the increasing number of censored domains can possibly be attributed to the fact that the overall number of websites has increased over time.

Nevertheless, more explicit deployment of technologies was also introduced to monitor users' internet use and behaviors. In March 2021, the CCP's public security organs started promoting a new app, "National Anti-Fraud Center".[28] Ostensibly aimed at protecting Chinese citizens against phone scams and malware, the app is extremely intrusive, requiring the user to upload their photo in addition to as many as 29 permissions in the installation process, including access to call logs, contacts, text messages, and photo albums.[29] Furthermore, there have been numerous reports of police forcing people to install the app—those who did not comply were refused entry into concerts, company buildings, and even their own residential communities.[30] On October 20, 2021, a user shared a photo of a message he received from the app, threatening that it detected "illegal" usage of VPN proxies and that further usage would result in fines of 50-5000 yuan and detention of 3-7 days.[31]

The National Anti-Fraud Center (NAFC) app amounts to a new level of government intrusion into the lives of Chinese citizens. More disturbing is that its deployment has been supplemented with brazen physical threats. Enabled by extensive access to phone information, the app allows the regime to detect, identify, and track users' online activities and punish them with surgical precision, making Beijing's surveillance state ever more powerful. However, NAFC is still not a fully convincing indicator of the Party's GFW policy. Its main goal remains anti-fraud and civil service-oriented, and it is easily circumvented—many cellphone users installed the app in front of the police but uninstalled it immediately after. Additionally, aside from the aforementioned incident of NAFC sending a warning message to the VPN user, this study found limited evidence to suggest that the NAFC was deployed as part of an intentional strategy to strengthen the GFW.

Official Interpretations

Chinese state media and law enforcement have issued conflicting interpretations regarding the legality of using GFW circumvention tools to the public. Beginning in 2020, however, official narratives appear to have clearly shifted toward the illegality of using GFW circumvention tools.

Chinese media and law enforcement organizations have rarely openly discussed the GFW and the legality of using or providing circumvention tools. For this metric, this study performed Baidu searches of combinations of keywords such as "VPN," "*fanqiang*," and "violating the law" within the time frame of 2018 onward, collected relevant results that were linked to state institutions such as state-affiliated media and influencers, police departments, procuratorates, and courts, and sorted relevant results in chronological order for qualitative analysis. This study also visited China Digital Times' digital archive of removed posts on Chinese social media. Due to limited available resources, this study cannot guarantee that the information collected and presented in this section represents the totality of relevant information.

In 2018, state-run media and state-affiliated influencers occasionally hinted at the notion that individual use of VPN was tacitly allowed. On December 17, 2018, Zhang Weiwei—professor of international relations at Fudan University, prominent CCP ideologist, and an internet star—briefly talked about the GFW at a public event. He said the GFW symbolized the wisdom of Beijing's governance to counter U.S. cyber-enabled information operations and the GFW would "lose its meaning to exist once 5G becomes commercialized and widely adopted."[32] The logic was confusing, and Zhang did not explain how the commercialization of 5G would incentivize Beijing to remove the GFW.

One week later on December 25, 2018, however, the police department of Zhuhai City, Guangdong province, released an article titled, "Bad Use of VPN Violates the Law."[33] The article emphasizes the illegality of selling VPNs and the use of VPNs by private firms for commercial activities without permission and concludes that existing laws "have no impact on those law-abiding corporates and individuals."

The following year, on August 18, 2019, in response to the raging Hong Kong anti-extradition protests, *People's Daily*, the CCP's mouthpiece and China's largest newspaper, published an opinion piece praising the pro-CCP activist movement *"Di Ba Chu Zheng,"* or *"Di Ba's Crusade"*.[34] "Di Ba" is a hyper-nationalist sub-forum of Baidu Tieba, a Chinese internet forum under Baidu (A Di Ba can be likened to a subreddit on Reddit). The "crusade" entailed millions of Di Ba members using VPNs to access popular social networks such as Facebook and Instagram to bombard the comment section of posts that were supportive of the Hong Kong protest (and hence anti-CCP) with pro-CCP comments and memes. *People's Daily* lauded the actions of the "crusaders," stating: "They are China's present, and they are China's future." The message seemed clear: if the country's most influential state media organization not only condoned but openly supported such behavior, *fanqiang* must be, at least tacitly, allowed.

A month later on September 17, 2019, Hu Xijin, then editor-in-chief of Chinese nationalist state media *Global Times* and a Weibo star influencer with over 22 million followers, complained on Weibo that "Accessing the foreign internet has become extremely difficult, even affecting the work of Global Times. Personally, I think this is going a bit too far . . ."[35] He later deleted this post, presumably to avoid backlash for voicing an opinion critical of state regulations.

A unification of the official narrative on the legality of VPN usage seems to have begun sometime in the first half of 2020. On May 19, 2020, the police department of Hanbin district, Ankang City, Shaanxi province arrested a man for using VPNs to access foreign websites and fined him 500 yuan under Article 6 of *Provisional Management Regulations*.[36] The district police then made a post about the arrest on Weibo which stated that the branch's "intelligence center" detected *fanqiang* activities on May 17, 2020. Shortly after, Hu Xijin reposted the post and commented that he opposed such punishment, "[Chinese] society needs regulation, but also needs flexibility and vibrancy." But Hu's post was deleted afterwards, either by Hu himself or by Weibo moderators.

After this incident in May 2020, Chinese law enforcement agencies seemed to double down on punishing VPN users, spreading their hardline messages through social platforms with a higher degree of clarity. On June 12, 2020, the Huangpu Procuratorate in Huangpu county, Guangzhou City, Guangdong Province, released an article titled, "'*Fanqiang*' to access the Internet, Legal or Not?"[37] The article mentioned the recent arrest of an individual VPN user, which "sparked heated discussion among netizens," and stated, "As such, our country explicitly prohibits '*fanqiang*'," citing Article 6 of the *Provisional Management Regulations*. This appears to be the first-ever article from a law enforcement agency to take such a clear stance on the legality of GFW circumvention.

Following this vein, on August 12, 2020, the Shaanxi Procuratorate in Shaanxi Province posted an article on Weibo titled, "Only Now Do I Know, '*fanqiang*' to Access Foreign Websites Breaks the Law?".[38] The article wrote, "As long as you used *fanqiang* software in the country, regardless of your purpose—be it to learn English or to do research—you are breaking the law," and again referred to Article 6 of *Provisional Management Regulations*. The article was widely shared by other procuratorates, sparking massive outcry among Chinese netizens, effectively dismantling the

argument that *fanqiang* is legal so long as the user does not visit "sensitive content" defined as pornography and political materials in the Chinese context.

In 2021, official interpretations of the legal status of GFW circumvention by individuals became even more clear. On July 15, 2021, Dachong Public Security in Dachong Town, Zhongshan city, Guangdong Province, released an article titled, "What?! Using VPN to '*fanqiang*' Risks Detention?"[39] The piece reaffirmed the illegality of both the sale and individual use of VPN in a definitive tone.

On November 17, 2021, the Intermediate People's Court of Ganzhou City, Jiangxi Province, released an article on WeChat titled, "A Ganzhou Student was Jailed for Selling '*fanqiang*' Software, Court Opinion: 'Fanqiang' to Watch Entertainment Video or Do Research is Still Illegal."[40] While the piece was prompted by the arrest of a seller of GFW circumvention tools, the article also wrote, "Even if I '*fanqiang*' just to watch entertainment videos, am I still breaking the law? Same for visiting websites and conducting research? Yes." This appeared to be the first time a judicial organ issued an interpretation of the legality of GFW circumvention.

The shift in official interpretations—from ambiguous to clearly illegal—continued to consolidate in 2022. Narratives from regional and local police departments and procuratorates had become much more coherent and consistent. On February 23, 2022, the official WeChat account of People's Court of Khorchin District in Tongliao City, Inner Mongolia Autonomous Region (IMAR), released a strongly worded article titled, "'*Fanqiang*' is Illegal. These are the Fundamentals You Must Know."[41] The first paragraph of the article set the tone, "Without question, whatever forms '*fanqiang*' activities take, they are all illegal." The article also displayed a list of icons of software that are "prohibited from downloading," including Facebook, Chrome, and YouTube.

Finally, on April 15, 2022, the Supreme People's Procuratorate of the People's Republic of China published on its official website a blog post titled, "Raising Risk Prevention Capacity, Collectively Protect National Security."[42] The article wrote, "*Fanqiang* means accessing web content on foreign servers by getting around our country's internet regulations. Such behavior damages cybersecurity and threatens national security." It is safe to assume that this message—issued by China's highest prosecutorial agency—serves as definitive evidence of Beijing's thinking about the GFW.

Prior to 2020, a close inspection of official interpretations reveals only a chain of inconsistent and conflicting accounts from Beijing about the legal status of individual GFW circumvention and leads to nothing short of confusion. Another testament to the absence of rule of law in China, the incidents discussed in this section appear to suggest that the decision to issue more definitive interpretations regarding the legality of GFW circumvention was politically-driven—there are times where the state encourages *fanqiang*, should it align with the party's interests. After 2020, the narrative became clearer and more coherent. Law enforcements consistently rejected the claim that individual users could get away with using VPN to access foreign websites, and it is reasonable to assume that the interpretations issued by law enforcement agencies more accurately reflect the central government's attitude than interpretations issued by state-affiliated media and influencers. At the time of writing in April 2023, a keyword search on Baidu yields a list of results confirming the illegality of GFW circumvention.[43] To better understand Beijing's policy position on the GFW, it is useful to revisit the legal landscape of 2018-2022 to explore the driving force behind this clear shift in official interpretations.

Legal Updates

The legal basis of the GFW was considerably weak before 2021. A new legislative proposal in 2021, if implemented, would strongly suggest that the CCP is intent on strengthening the GFW.

Prior to 2018, even with the passage of the National Cybersecurity Law and National Intelligence Law in 2017, CCP never acknowledged the existence of the GFW, nor had China's legal system clarified the legality of individuals using GFW circumvention tools. This study finds that the vast majority of legal charges against sellers and individual users (which first appeared in 2016 and 2018, respectively) have been based on two articles in two laws:

Provisional Management Regulations for the International Connection of Computer Information Networks of the People's Republic of China.[44] Effective in 1997, Article 6 states, "No work unit or individual may establish their own or use other information channels for international connection."

Cybersecurity Law of the People's Republic of China.[45] Effective in 2017, Article 27 states, "Individuals and organizations must not engage in . . . [or] provide programs, or tools specifically used in network intrusions… or engage in other acts endangering cybersecurity."

Nevertheless, the criminalization of VPN usage under these laws remains highly ambiguous according to the nature of the GFW itself. So-called "information channels" are defined in the law as "physical information channels required for international networking."[46] Anything "physical" per the OSI model would be submarine fibre-optic cables (Layer 1), modems (Layer 2), or routers (Layer 3). Using VPN or not, the users will always have to go through these networking devices to connect to the internet, unless a user lays a cable to connect to a foreign network, which is too costly to be practical. As this study has also established, the GFW is an intrusive, cyber-offensive system. Circumvention tools such as VPN and Tor are defensive in nature as they shield users from DPI and other attacks, and thus by definition not "specifically used in network intrusions." Despite the conceptual mistake, the two laws remained the legal basis for GFW-related prosecutions from 2018, until the introduction of new legislation in 2021.

On November 14, 2021, the Cyberspace Administration of China released a draft of the Online Data Security Management Regulations to solicit public comments and input.[47] Though the draft has yet to be enacted as law, Article 41 provides the most precise legal definition of GFW to date: "The State establishes a cross-border data security gateway, to interrupt the transmission of information originating from outside the People's Republic of China, of which law and administrative regulations prohibit the dissemination or transmission… No Individual or organization may provide software, tools, lines etc., used to penetrate or circumvent the cross-border data security gateway; they may not provide Internet access, server contracting, technical support, dissemination and marketing, payment settlement, application download, and other such services for the penetration or circumvention of the cross-border data security gateway."

The GFW is termed as a "cross-border data security gateway" that "interrupts" unwanted traffic; notably, the provision of tools to "penetrate or circumvent" the gateway is also strictly prohibited. The new law is still in its draft form, but if enacted, it would strongly suggest the CCP's intent to strengthen the GFW by formally codifying its enforcement into law. While the CCP has long been able to filter internet traffic via the GFW in a legal grey zone, the codification of GFW into law may signal the CCP's determination to separate general Chinese netizens from the global internet—now done in a much more open and transparent manner—and allow law enforcement

greater leeway in criminalizing GFW circumvention. Questions remain, however, in that the law explicitly criminalizes only the provision of circumvention tools but not the usage of them per se. Will punishment of individual users continue to occur and be grounded on the old law, the rulings of which are undeniably flawed from a technical perspective? The situation is further complicated by the weakness of rule of law in China, for which this metric alone cannot provide a definitive solution. It is thus necessary to also assess how the law is enforced on the ground.

Punishments

Reported cases of individual users suffering legal punishments for circumventing the GFW drastically increased after December 2018, but the visibility of such cases on the Chinese internet appeared to fall after 2020. On December 27, 2018, Zhu Yunfeng in Shaoguan City, Guangdong Province, was fined 1,000 yuan for using the VPN "Lantern Pro."[48] This was the first-ever reported instance of an individual being punished for using GFW circumvention tools. Punishments for sharing or selling circumvention tools started earlier with much heavier penalties. For example, on August 24, 2016, Deng Jiewei in Dongguan, Guangdong, was captured by police for selling VPN. He was fined 5,000 yuan and sentenced to 9 months in jail.[49]

On September 4, 2020, independent researcher Wang Yuyang released an article with an alarming title, "*Fanqiang* Breaking the Law is an Irrefutable Fact: 18 Cases of Administrative Punishments for 'Individual *fanqiang*' in August Alone in Zhejiang Province (60 Cases for the Entire Year)."[50] Zhejiang provincial government's website contained a log of "administrative punishments" against individual circumvention tool users: in Zhejiang alone, 5 users were punished in 2019, and 57 by August in 2020. The most common reason given for the charges was, in confusing wording, "without authorization, establishing, using illegal information channels for international connection."

Wang's article gained massive traction and was widely shared and reposted across the Chinese internet. For some reason, Zhejiang provincial government's website removed all the case information at some point after October 2020.[51] At the time of this study, a keyword search on the website only returned one result: a person named Yu Jun who, arrested on September 22, 2020 for "using illegal information channels," had his charges dropped for "push errors." According to Wang, the Zhejiang government's website is one of the few in China that provide a keyword-based search engine with a relatively high level of transparency and openness for public inspection.

After 2020, searchable cases of punishment significantly decreased, with only a few scattered across time and space. Was the drop in cases due to a decline in persecution or because cases were no longer being reported and released to the public? This question, the answer to which may be indicative of changes in the CCP's GFW policy, highlights the limits of open-source research, hampered by the lack of transparency in the Chinese legal system. The metric itself is also limited in that, even though an increase in the number of punished users may indicate Beijing's intent to strengthen the GFW, those punished nonetheless remain an extremely small portion of the tens of millions of Chinese VPN users.

Summary of Findings

Applying the CCP-GFW model, this study concludes with moderate to high confidence that Beijing has been intentionally strengthening the GFW since 2018. The deduction drawn from each metric on the CCP's policy direction, and the relative strength of those metrics can be summarized as the following:

Figure 2: Policy Indication and Strength of Each of the Four Metrics of the CCP-GFW Model

Metrics	GFW Policy	Strength of Indicator
Technological Upgrades	Strengthen	Low
Official Interpretations		Moderate
Legal Updates		High
Punishments		Moderate

Technological upgrades. The GFW received several seemingly moderate technical upgrades, but this study cannot rule out the possibility that such upgrades might aim at merely catching up with the rapid expansion of internet content and new circumvention methods. The introduction of NAFC was found to have the ability to detect VPN installation and usage, but related incidents appeared rare. Overall, this study considers this metric to be a weak indicator of Beijing's intention to strengthen the GFW.

Official interpretations. Before mid-2020, Beijing's state-affiliated media and law enforcement organizations issued somewhat conflicting interpretations regarding the legality of individual use of GFW circumvention tools. After mid-2020, official narratives more clearly and consistently declared the illegality of individual GFW circumvention. Still, what the media and local law enforcement say may not be the best indicator of what the central government in Beijing, which has the same characteristics of opaqueness and unpredictability as other authoritarian regimes, thinks and wants to implement. Overall, this study considers this metric to be moderately indicative of Beijing's intention to strengthen the GFW.

Legal updates. The CAC's proposed Online Data Security Management Regulations in 2021 was the first-ever attempt to move the GFW out of a legal grey zone and codify it in law. This metric strongly suggests Beijing's intention to strengthen the GFW.

Punishments. Publicly available records show that the arrests of individual VPN users first started in 2018, but the number of arrests—or the visibility of arrests—appeared to decline after 2020. The number of individuals punished also appears exceedingly low relative to the large number of VPN users in China. This study considers this metric to be moderately indicative of Beijing's intention to strengthen the GFW.

*This study draws the three following conclusions with **moderate to high confidence**:*

1 Beijing seeks to expand its GFW policy through three core methods: upgrading the GFW, choking off the supply of GFW circumvention tools, and discouraging—not banning—the personal use of such tools through official signaling and occasional prosecution.

2 Beijing understands that it is too politically risky to completely crack down on the demand side due to either the large number of VPN users or the necessity of foreign site access for the country's businesses, scholars, and diplomatic work. This thinking is evidenced by both the introduction of the *Online Data Security Management Regulations* legislation in 2021, which only explicitly prohibits the sale and distribution of GFW circumvention tools and the relatively low number of arrests of VPN users. Only in official interpretations did Beijing explicitly target the individual use of circumvention tools.

3 Beijing itself has been rather conflicted about the GFW—at least before 2020. There appears to be substantial disagreements among different arms of the regime, from propaganda departments to law enforcement, on how China should handle the GFW.

*This study draws the three following conclusions with **low to moderate confidence**:*

1 Something seems to have happened between late 2019 and early 2020 that shifted Beijing's position on the GFW. Since 2020, Beijing appears overall more open and hardline about enforcing internet censorship and curbing anti-censorship measures.

2 The drastic increase in publicized arrests of circumvention tools users in 2020, and subsequent decline after 2020, might be the result of Beijing adjusting its GFW policy in response to public outcry to focus more on the supply side of the equation.

3 Law enforcement seems to possess a high degree of autonomy when it comes to punishing circumvention tool users. One possible explanation is that Beijing expressed disapproval of GFW circumvention tools at some point, and police throughout China responded based on their own interpretations, resulting in the difference in intensity of action across regions. Beijing's directive, the vagueness of which led to different interpretations among state organs themselves, again reflects Beijing's own uncertainty regarding the specifics of the GFW's future. With regards to the sporadic, seemingly restrained arrests of VPN users, it is possible that law enforcement agencies were trying to reach a "sweet spot" where the threats of prosecution were large enough to discourage the use of VPN, but small enough not to trigger public backlash.

Conclusion

On September 14, 1987, a computer lab in Beijing sent the first-ever email from China, "Across the Great Wall we can reach every corner of the world."[52] The Great Wall was once constructed to prevent invaders from coming in. But 30 years after the internet was brought into China, a digital Great Wall was erected to prevent users from going out.

The gap between a law's adoption and its implementation is a manifestation of the CCP's weak rule of law, posing challenges for observers to understand Beijing's policy intention. In response, this study develops and applies the CCP-GFW model, a descriptive analytical framework comprised of four metrics: technological upgrades, official interpretations, legal updates, and punishments, to China's domestic affairs since 2018 for a comprehensive assessment of Beijing's GFW policy. The model indicates that Beijing

has been building up the GFW, through improving the GFW's censorship technologies, cutting off the supply of GFW circumvention tools, and discouraging the personal use of circumvention tools via official signaling and law enforcement action. The efforts to impose stronger control over digital information flows is in line with the CCP's totalitarian turn under Xi. Behind the current policy, however, exists a degree of uncertainty and conflict, leading to deep disagreements both between and within different factions and branches of Beijing's regime.

The Great Wall was once constructed to prevent invaders from coming in. But after 30 years since the internet was brought into China, a digital Great Wall was enacted to prevent users from going out.

The findings are concerning, especially for those in support of a global and open internet. Should the current policy trajectory continue, circumventing the GFW will only become riskier, more costly, and more difficult for Chinese internet users; on the other hand, to legitimize and enhance the GFW, Beijing will redouble its efforts to push for normative changes in global internet governance and, in particular, to promote its concept of cyberspace sovereignty—a notion clearly opposed to a global, open internet. The global internet will be rendered increasingly fragmented and stray further from its founders' libertarian vision under ever-expanding government control, resulting in the transformation of a medium some hoped would unite the world into an embedded element of tension in the techno-ideological division across the world.

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Firewall" by Jacob Wallis et al. analyzes Chinese influence operations on social platforms.

8 It is important to note that the Chinese government does not follow the liberal democracy-style separation of power into executive, legislative, and judicial branches. In this study, "law enforcement" refers to any agencies in charge of enforcing Chinese law in society, though each of these agencies may appear more executive or judicial in terms of functions per the Western categorization. Grouping police department, procuratorates, and courts under the umbrella term of "law enforcement" allows simplicity in analysis, given the reality that entities of the "police-procuratorate-court" system [公检法] often act in a coordinated fashion to implement state and party justice policies and that their narratives can be assumed to be more authoritative than those from state-run media and state-affiliated influencers.

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Maintaining U.S. Interests in the Arabian Gulf: The Need for Vigilance in the Face of China's Rising Political Influence

Max Rappoport

Executive Summary

Relations between the United States and the Kingdom of Saudi Arabia (K.S.A.) and the United Arab Emirates (U.A.E.), two key Gulf Arab states, have been largely structured around the trade of oil and regional security issues, particularly in the context of the U.S. war on terror and containment of Iran. Loss of U.S. security influence to China, which maintains strong diplomatic and trade relations with Saudi Arabia and the U.A.E., would pose significant risks both to the U.S. regional security strategy and global power projection capabilities. This paper argues that the United States must remain vigilant of key developments in China-Saudi and China-U.A.E. relations that would fundamentally shift the region towards Chinese geopolitical influence. March 2023's China-brokered Saudi-Iran rapprochement is the latest in a series of regional political developments that represent a shift in both China's regional political influence and in the United States' ability to maintain partnerships with Gulf states primarily based on security. To maintain strategic relations with Saudi Arabia and the U.A.E. in the context of a China that is determined to broaden the scope of its historically trade-based diplomatic relationships with Saudi Arabia and the U.A.E., U.S. policymakers should consider adopting the following approaches: overcome the "U.S. fatigue" among Saudi and Emirati partners; exploit opportunities to create strains between China and its Gulf partners; closely monitor Saudi and Emirati support for China's positions in international forums; understand the limits to U.S. engagement in the Gulf; and recognize the effects of U.S. Gulf policy on U.S.-China relations.

Introduction

On March 10, 2023, the Saudi Press Agency captured a photo of Saudi Minister of State Musaad bin Mohammed Al Aiban and Iranian Secretary of the National Security Ali Shamkhani shaking hands following the landmark announcement that their countries planned to restore diplomatic relations.[1] Seven years earlier, after Saudi Arabia cut ties with Iran stemming from Iranian protests over the Saudi Arabian government's execution of a Saudi Shiite cleric, this photograph would have seemed inconceivable. Equally inconceivable, however, was that Wang Yi, China's top diplomat, would be standing between the two Gulf leaders. The announcement—hosted by China in Beijing—to restore diplomatic relations represents a public demonstration of China's growing influence in the Arabian Gulf. It also represents a warning sign to U.S. policymakers that a possible shift in regional alignment—wherein U.S. security ties would be less valuable to Gulf partners—is well within the realm of possibility.

However, the China-brokered Saudi-Iran rapprochement should not be seen as the end of the United States' influence in the Gulf. Such a perception would be a misunderstanding of both the United States' and its Gulf partners' mutual interest in continued partnership and would ascribe too much significance to the nascent

normalization talks. China's role in this rapprochement does, however, expose three key weaknesses of the U.S. approach to leading Gulf states: the tensions created by the United States' liberal internationalist diplomacy and "strings attached" arms trade; the precarious overreliance of the United States' regional foreign policy on an anti-Iran coalition; and cultural and diplomatic misalignments between the United States and its Gulf partners.[2]

Loss of regional security influence to China would pose significant risks both to the United States' regional security strategy and global power projection capabilities. The United States must remain vigilant of key conditions that might fundamentally shift Saudi Arabia and the U.A.E. towards greater preference for China as a long-term strategic partner. It should adopt concerted approaches to stabilize U.S.-Gulf relations and stave off a rising China that sees opportunities where U.S. influence has faltered.

The United States' and China's relations with the Kingdom of Saudi Arabia and the United Arab Emirates (U.A.E.), moreover, highlight the dynamic nature of both great powers' influence. U.S.-Saudi and U.S.-U.A.E. relations have been largely structured around regional security issues, particularly in the context of the U.S. war on terror, containment of Iran, and the sensitivity of the global economy to oil supply volatility. Specifically, the United States has long depended on the sale and transfer of sophisticated military equipment and defense technology to maintain strong ties and aligned security interests with Saudi Arabia and the U.A.E.[3] Neither the United States nor Saudi Arabia and the U.A.E. are under any expectation that deep bilateral security cooperation precludes the latter two from forming and maintaining relations with other global powers. However, as China seeks to broaden its relations with these leading Gulf states beyond trade relations to also include deeper diplomatic and military partnerships, the United States should be concerned about the viability of continuing to rely primarily on military assistance to further its regional security objectives. This article analyzes the United States' and China's relationships with Saudi Arabia and the U.A.E. and recommends key actions for U.S. policymakers to maintain the United States' strategic interests in the Gulf. It is structured into six sections:

Shared Interest, Different Markets

Among Arabian Gulf states, Saudi Arabia and the U.A.E. are top priorities for both the United States and China. While the United States and China both share an interest in maintaining strong relations with these leading Gulf states because of the latter's influence over the region's oil resources, each has traditionally sought to build and maintain these relations in unique ways. The United States has focused on arms sales and security cooperation, while China has dominated in the trade of commercial goods and services.

The Gulf Perspective: The Appeal of China and "U.S. Fatigue"

For Saudi Arabia and the U.A.E., China represents a partner that will not allow domestic governance issues to influence political or economic relations and that can offer opportunities to increase Saudi and Emirati political leverage vis-à-vis Iran. U.S.-Saudi and U.S.-U.A.E. relations, on the other hand, have grown increasingly strained in recent years to the point of "U.S. fatigue."[4]

Have Roles Shifted?

The Saudi-Iran rapprochement represents a turning point in great power relations in the Gulf, but observers should not expect China to dramatically increase its military or diplomatic activity beyond what is required to support stable Saudi-Iran relations. However, one can expect China to continue its efforts to weaken the United States' regional position by increasing commercial and defense technology trade, and

its proclaimed policy of "non-interference." Relative to China, the United States' relationship with its Gulf partners may become further strained as U.S. arms exports—the hitherto primary lever for strengthening bilateral relations—loses its appeal as both Saudi Arabia and the U.A.E. seek to diversify their military procurement and grow their domestic defense industrial capabilities.

Defining China's Strategy in the Gulf

For China, increased cooperation with Saudi Arabia and the U.A.E. presents opportunities to accrue support for its international territorial claims and tacit endorsement of its domestic ethnic policies, which may strain the United States' relationship with its Gulf partners, particularly through China's willingness to sell arms without the burdensome end-use restrictions that accompany U.S. arms sales.[5] China has also wielded its diplomatic policy of non-interference strategically towards Gulf partners in recent years.

What to Expect as the "New Normal"

While the Saudi-Iran rapprochement points to an uncertain future for U.S. security interests in the Gulf, the security landscape—with the United States as the main security partner of both K.S.A. and U.A.E.—will not fundamentally shift until there is a tangible reduction of Saudi-Iran diplomatic and military tensions. As long as the United States' strategy in the Gulf remains overly reliant on arms sales and vulnerable to China's low-risk, high-reward diplomatic, military, and commercial activities, U.S. policymakers will struggle to maintain strong ties with Saudi Arabia and the U.A.E.

How U.S. Policymakers Should Respond

In addition to broadening the scope of engagement with Saudi Arabia and the U.A.E., the United States would also benefit from weakening China's position in the Gulf. U.S. policymakers must recognize potential shifts in Saudi and U.A.E. preference towards China and take measures to demonstrate that the United States remains a more reliable long-term partner. At the same time, the United States must acknowledge possibly irreconcilable tensions in its relations with Saudi Arabia and the U.A.E., as well as the effect that U.S. actions in the Gulf have on U.S.-China relations and opportunities for bilateral cooperation.

Shared Interest, Different Markets

The reason for focusing on China's and the United States' relations with Saudi Arabia and the U.A.E. is that these two countries represent the most significant examples of converging strategic interests for both superpowers in the Gulf. Saudi Arabia and the U.A.E. are two of only five states in the Middle East and North Africa (MENA) region to maintain a Comprehensive Strategic Partnership with China, which is the highest official designation that China assigns for its bilateral relationships in terms of strategic importance. Iran is the only other Gulf Arab state with this designation.[6] Compared to their Gulf Arab neighbors, both Saudi and the U.A.E. trade far more with China and maintain far higher contract values for construction projects with China.[7, 8]

The United States' prioritization of Saudi Arabia and the U.A.E. over other Gulf states stems primarily from shared security interests. Beyond accounting for significantly higher volumes of U.S. arms imports than their Gulf Arab neighbors, Saudi Arabia and the U.A.E. are key partners in supporting anti-extremist efforts and countering Iran's regional influence.[9] Importantly, each has demonstrated their commitment to supporting these U.S. strategic objectives with concrete action, including by, in the latter case, suppressing the Iran-backed Houthi rebellion in Yemen. Saudi Arabia and the U.A.E.'s commitment to growing their domestic defense industrial capacities, including through partnerships with U.S. manufacturers, also distinguished them

as important U.S. partners.[10] Saudi Arabia and the U.A.E. are not the United States' only regional partners, however: Bahrain hosts a U.S. naval installation, Qatar hosts a U.S. air wing and U.S. Central Command's (CENTCOM) Combined Air Operations Center, and the United States has also brokered high volumes of arms sales with both Qatar and Kuwait.[11] Nevertheless, the depth and scope of Saudi and Emirati security cooperation with the United States and the importance of their cooperation to the achievement of U.S. regional security strategy—highlighted by their willingness to commit to military action in support of U.S. regional security strategy, appetite for U.S. arms imports, and relative alignment with U.S. policy to counter Iran—mean these countries stand alone in the Gulf.[12]

In terms of Saudi and Emirati trade relationships with the United States and China, China dominates in commercial goods and services and that the U.S. dominates arms trade. For example, the United States accounted for 85.5 percent and 75.8 percent of Saudi Arabia's total arms imports in 2020 and 2021, respectively. In comparison, China accounted for just 1.6 percent of Saudi arms imports in 2020, and 3.7 percent in 2021 (Figure 1). For the U.A.E., the United States accounted for 35 percent of arms imports in 2020, and 64 percent in 2021, while China accounted for two percent of arms imports in 2020, and zero percent in 2021 (Figure 2).[13] Notably, countries including Russia, Sweden, and Turkey were among the top arms importers—each accounting for more than ten percent—to the U.A.E. in 2020. This fact underscores the U.A.E.'s pursuit of diversified arms imports.[14]

In non-military commerce, China is the top overall exporter to both Saudi Arabia and the U.A.E.[15] Its exports to both countries are comprised primarily of electrical equipment, machinery, furniture, plastics, apparel, and metals such as iron and steel.[16] In fact, China's arms exports to Saudi Arabia in 2021 made up less than 0.25 percent of its $30.32 billion in total exports.[17] Similarly, of $43.82 billion in Chinese exports to the U.A.E. in 2021, only $293,000 worth were classified as military arms.[18]

Oil production from Saudi Arabia and the U.A.E., leading members of the Organization of the Petroleum Exporting Countries (OPEC), is also a key aspect of both the United States' and China's relations with these countries. China imports 55 percent of its crude oil from OPEC countries, according to 2019 statistics. Of China's total oil imports from OPEC, sixteen percent came from Saudi Arabia.[19] Relative to China, the United States is less reliant on Saudi Arabia or the U.A.E. for oil imports. Canada surpassed Saudi Arabia as the United States' largest source of crude oil imports in 2000 and comprised 61.5 percent of U.S. crude oil imports in 2021 compared to only 5.8 percent for Saudi Arabia.[20] However, the relatively small share of U.S. oil imports from Saudi Arabia does not diminish Saudi Arabia's strategic significance to the United States—the Kingdom's position in OPEC gives it immense price-setting power in global crude oil markets. While relying more on Canada than OPEC for oil imports, the United States has an enduring interest in maintaining favorable relations with these key OPEC countries to retain some influence over OPEC's crude oil production quotas to keep fuel prices stable for American consumers and firms.[21]

Given the importance of stable energy prices to the global economy, it is key to understand the differences in how the United States and China have developed their broader economic relationships with these major oil producers. While both the United States and China are active traders in Saudi Arabia and the U.A.E., they have traditionally prioritized and come to dominate different sectors—the United States primarily relies on arms sales, and China primarily on commercial goods. Given the United States' historical dominance in arms sales market share, however, recent spikes in Chinese arms imports are

Figure 1: Global Arms Exports to Saudi Arabia (%)

Source: Stockholm International Peace Research Institute (SIPRI)

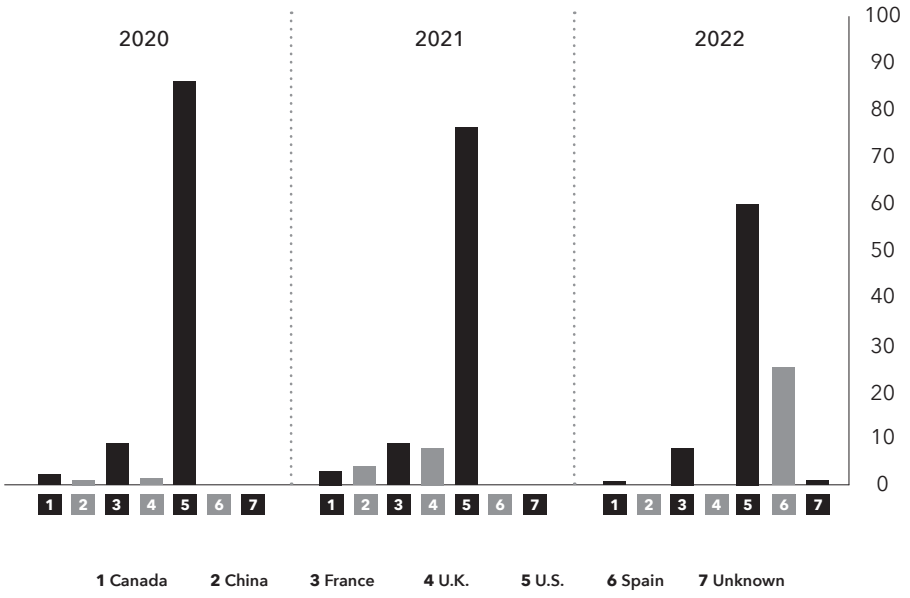
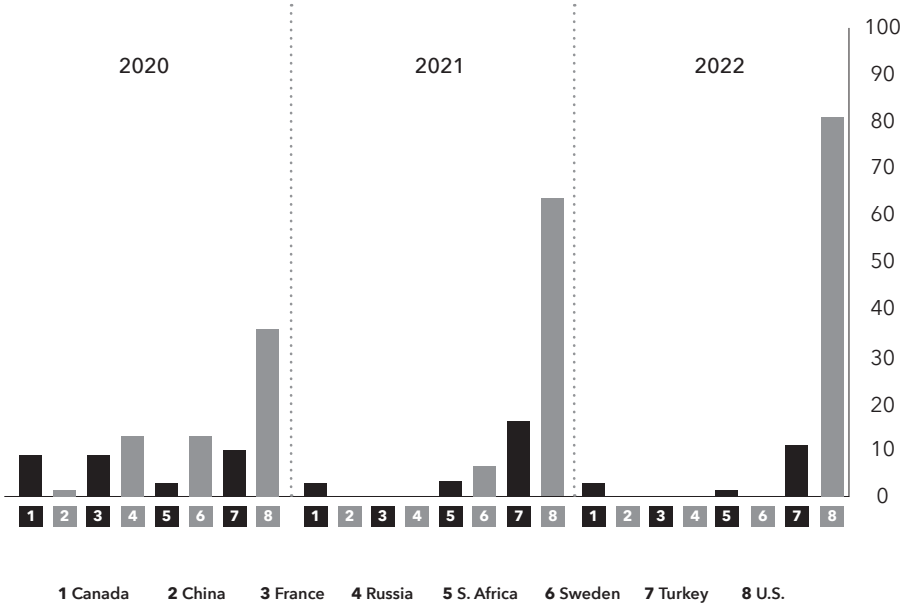


Figure 2: Global Arms Exports to United Arab Emirates (%)

Source: Stockholm International Peace Research Institute (SIPRI)



notable. For example, between 2016 and 2020, China's arms transfers to Saudi Arabia and the U.A.E. increased by 386 percent and 169 percent, respectively, compared to 2011 to 2015.[22] U.S. arms imports still dwarf Chinese imports by total volume, but Chinese activity in Saudi and Emirati arms sales is nevertheless notable because of its implications for U.S.-China great power competition. The next section will further analyze recent cases where Saudi Arabia and the U.A.E. have shown their preference for China's style of trade and diplomacy over that of the United States and assess the implications of a rising China for the United States' regional security strategy and global power projection capabilities.

The Gulf Perspective: The Appeal of China and "U.S. Fatigue"

China's role as a potential alternative security partner to the United States in the Gulf can be traced back to 1986 when Saudi Arabia circumvented the United States' refusal to sell it missiles by instead clandestinely purchasing 36 CSS-2 Dong Feng-3 (东风-3, East Wind-3) intermediate-range ballistic missiles and nine launchers from China.[23] As Greer (2022) notes, China's arms sales to Gulf countries, while low in volume compared to the United States, are highly effective in that they can either "goad the United States into selling advanced weapons to Saudi Arabia," or can serve as an easily procurable alternative when the United States imposes end-use conditions on its arms sales.[24]

Several instances between 2018 and 2023 highlight China's ability to exacerbate strains between the United States and its Gulf partners. Following the murder of Washington Post journalist Jamal Khashoggi in 2018, Chinese President Xi Jinping was one of the few leaders to offer public support to Saudi Crown Prince and de facto leader Mohammed bin Salman (MBS).[25] Xi has consistently expressed strong diplomatic support for Saudi Arabia, including by choosing Saudi Arabia as his first post-Covid diplomatic visit in December 2022.[26] President Biden, on the other hand, promised during his presidential campaign that as President, he would make Saudi Arabia "pay the price, and make them in fact the pariah that they are." This caused a temporary rupture in U.S.-Saudi relations that the President would later be forced to fix in a bid to stabilize global oil markets following Russia's invasion of Ukraine.[27] While Khashoggi's murder was undoubtedly heinous, the dramatic—from the perspective of Saudi Arabian leaders—U.S. response increased tensions and stood in stark contrast to China's position of support and policy of non-interference.

Another event that highlighted differences between the United States' and China's approach to bilateral relations is the breakdown of the U.A.E.'s negotiations to purchase American F-35 fighter jets in 2021. As several sources reported, U.S. officials were unwilling to transfer the fighter jets as long as the U.A.E. maintained Huawei-controlled 5G mobile networks near F-35 bases and operating areas.[28] In addition to the U.A.E.'s refusal to disband its Huawei networks, the United States' strict end-use conditions on the F-35s strained negotiations. These conditions included embedded software restrictions that would prevent the aircraft from violating U.S. interests. The United States' insistence on imposing restrictions on fully sovereign operation of the aircraft were a key factor in the U.A.E.'s suspension of F-35 procurement negotiations.[29]

These examples draw out two important stylistic distinctions between China and the United States in terms of their approach to bilateral relations with Gulf partners: China's policy of "non-interference" in contrast to the United States' liberal internationalism, and China's "no strings attached" arms trade in contrast to the United States' strict pre-conditions and end-use conditions in arms sales.[30]

Saudi Arabia and the U.A.E. have generally reciprocated China's commitment to refrain from criticizing its partners' internal affairs. Following the Khashoggi incident, MBS visited China and expressed support for China's "anti-terrorism and de-extremization measures for safeguarding national security," apparently endorsing China's mass internment of Muslim Uyghurs in Xinjiang.[31] Saudi Arabia and the U.A.E. are also disinclined to take sides between the U.S. and China. Top U.A.E. diplomat Anwar Gargash (2021), for example, has emphasized that "the idea of choosing [between the United States and China] is problematic in the international system," and maintained that "the United States is our predominant strategic partner, but China is our number one or two—with India—economic partner."[32] While the United States conducts arms trade with implicit expectations of strategic alignment, China's dealings are free of similar obligations.

The United States' strict conditionality in diplomacy and arms sales, including heavy-handed admonitions over human rights issues (such as Khashoggi's murder), as well as restrictive arms trade conditions, has contributed to what observers have termed "U.S. fatigue," or a "trust deficit" with the United States among Gulf Arab states.[33] The consequences of this trust deficit for U.S. regional interests and influence in Riyadh and Abu Dhabi become all too apparent when directly contrasted with China. Given their aversion to foreign interference in domestic affairs and disinclination towards taking sides, Saudi Arabia and the U.A.E. increasingly prefer China's style of foreign policy and therefore may increase Chinese arms imports relative to U.S. "strings attached" imports.[34]

Have Roles Shifted?

Has the Saudi-Iran rapprochement fundamentally altered either China's or the United States' role in the Gulf? Scobell and Nader argued in 2016 that China is "driven primarily by economic interests" in the Gulf but avoids extending itself militarily and diplomatically. They asserted that China prefers to be a "friend to all and enemy of none" and fears entanglement in regional tensions.[35] Moreover, Scobell and Nader noted that China has maintained a policy of non-interference in other states' domestic affairs, choosing instead to remain cordial to trade and development partners and reap the benefits of mutual growth.[36] China's role in brokering the Saudi-Iran rapprochement demonstrates that China has the capacity and intention to build on these strengths to expand its diplomatic influence beyond what Scobell and Nader described in 2016.

U.S. arms imports still dwarf Chinese imports by total volume, but Chinese activity in Saudi and Emirati arms sales is nevertheless notable because of its implications for the U.S.-China great power competition.

Should U.S. policymakers now expect increased Chinese military and diplomatic activity in the Gulf? Will Saudi Arabia and the U.A.E. demonstrate less willingness to assist the United States—through arms trade and military cooperation—in advancing U.S. regional security goals and global power projection strategy? The current "U.S. fatigue" demonstrates a need for U.S. policymakers to adjust their approach towards Saudi Arabia and the U.A.E. If Saudi Arabia

and the U.A.E. perceive that threats by other regional actors—most notably Iran but also potentially Syria—have decreased, they may reduce demand for U.S. arms sales as a result. [37] Both the United States and China have supported Saudi and Emirati efforts to develop their domestic defense industries, but increased self-reliance through domestic production of defense equipment is more damaging to the United States' style of foreign policy towards its Gulf partners than to China's.[38]

The Saudi-Iran rapprochement represents an inflection point in U.S. and Chinese relations with the Arabian Gulf, but observers should not expect China to dramatically increase its military or diplomatic activity in the region beyond what is required to facilitate the Saudi-Iran rapprochement.[39] Rather, observers can expect increased strain between the United States and its Gulf partners as the United States' primary levers for bilateral cooperation and its tolerance for the behavior of its Gulf partners has weakened. Meanwhile, China will continue its strategy of economic cooperation, more frequent yet risk-averse diplomatic engagement, soft power initiatives, and continued efforts to weaken the United States' regional position through commercial and defense technology trade and by contrasting its policy of "non-interference" with that of the United States. The next section further distills and analyzes China's strategic interests in the Gulf.

Defining China's Strategy in the Gulf

Determining how U.S. policymakers should approach Saudi and Emirati relations amid China's growing presence in the Gulf requires an understanding of China's goals in the region and how it intends to pursue those goals while recognizing the United States' longstanding influence. Assessing public Chinese policy papers offers insights into China's strategic interests.

China's 2016 Arab Policy Paper is the clearest public-facing distillation of the country's policy goals for the Gulf. The Arab Policy Paper outlines five broad thematic goals through which the country seeks to engage the 22 Arab states.[40] These five goals include: "Political Cooperation," "Investment and Trade Cooperation," "Social Development," "Culture and People-to-people Exchanges," and "Cooperation in the Field of Peace and Security." China has actively pursued each of these goals in its engagement with Saudi Arabia and the U.A.E. China has maintained high levels of diplomatic exchanges with Saudi Arabia and the U.A.E. (including, notably, President Xi Jinping's first visit to Saudi Arabia in December 2022 to meet with King Salman and Crown Prince Mohammed bin Salman).[41] Both Saudi Arabia and the U.A.E. have joined China's Belt and Road Initiative (BRI), and Chinese officials have stated that economic and infrastructure-related development is the foundation for China's strategy in the region.[42] In terms of "Social Development," China partnered with the U.A.E. to distribute and set up domestic production of the Sinopharm vaccine.[43] China has opened 23 Confucius Institutes in the MENA region since 2021, and both Saudi Arabia and the U.A.E. offer Chinese language classes in their public schools.[44] Though disrupted by the Covid-19 pandemic and the occasional imposition of strict travel prohibitions, Chinese tourism to Middle East states steadily increased in the 2010s, ranking fourth-highest of all countries in the total share of tourists to Dubai in 2018, a 12 percent increase from 2017.[45] While Chinese tourists have not travelled to Saudi Arabia in the same numbers as the U.A.E., Chinese financial and e-commerce firms and the Saudi Tourism Authority have signed agreements meant to boost Chinese tourism to Saudi Arabia, and Saudi officials have emphasized the importance of Chinese tourism to the Saudi economy.[46] Lastly, regarding "Cooperation in the Field of Peace and Security," China has made strides in recent years in the trade and transfer of defense technology. Though still

far from the level of U.S. defense exports, notable Chinese engagement includes China's support for Saudi Arabia's domestic ballistic missile manufacturing; Saudi Arabia and U.A.E.'s acquisition of Chinese Wing Loong drones; and U.A.E.'s agreement to purchase Chinese L-15 fixed wing aircraft.[47] China has also made inroads on counter-terrorism collaboration, holding its first joint counter-terrorism exercise with Saudi Arabia in 2016.[48]

While the Arab Policy Paper contains important aspects of China's Gulf policy, it is important not to view the goals outlined in this public-facing document as the sole representation of China's core interests in the Middle East. China's strategic and economic interests in the Gulf should be understood as the primary drivers for China's various regional initiatives. For example, rather than solely prioritizing "Cooperation in the Field of Peace and Security" as an end in itself, China's arms trade with Saudi Arabia and the U.A.E. serves to weaken U.S. relations with Gulf partners and showcase diplomatic parallels—in terms of diplomatic style and "no strings attached" approach to trade—between China and Gulf states. Other initiatives can also serve several of China's interests at once. For example, China's promotion of Huawei technology is a clear effort to advance commercial trade, but also contributes to the erosion of U.S. political support through the fallout of the U.A.E.'s F-35 acquisition bid. Therefore, U.S. policymakers should focus on China's strategic interests in the Gulf in addition to publicly stated initiatives.

Economic, security, and political factors—both domestic and international—motivate China's activity in the Gulf. Where China's interests in the Gulf have evolved from Scobell and Nader's assessment, however, is in its willingness to wield diplomatic and military activities in ways that create strain between the United States and its Saudi and Emirati partners.[49] China's primary interests in the Gulf can be summarized as:

- Ensuring stable oil trade
- Maintaining and advancing commercial trade
- Improving public perception of China in the Gulf
- Bolstering support for Islam-related issues
- Providing a hedge for relations with Iran
- Eroding U.S. political support within the Gulf

China's interest in deepening engagement with Saudi Arabia and the U.A.E. is largely due to the importance of Gulf oil imports to China's energy security. China's commercial interests in the Gulf are well-documented, not only in terms of the overall trade volume that Gulf states such as Saudi Arabia and the U.A.E. provide.[50] Improving public perception of China in the Gulf reinforces China's oil and commercial interests and is carried out through a "friend to all and enemy of none" policy towards Gulf partners.[51] China's regional interests are also tied to garnering international support for China's oppressive domestic policies toward Muslim minorities and its sovereignty claims over Taiwan. Closer ties with China have discouraged Gulf leaders from criticizing China's persecution of Uyghurs in Xinjiang.[52] China's relationship with Iran, which some scholars describe as "close but complicated," has become less reliable due to Iran's involvement in regional conflicts and the imposition of international trade restrictions and sanctions on Iran.[53] By maintaining ties with Iran's historic foes, such as Saudi Arabia and the U.A.E., China can hedge against threats to its energy security. This also allows China to engage in triangular diplomacy, as witnessed in the recent rapprochement. Lastly, in a region experiencing "U.S. fatigue" and receptive to China's style of diplomacy, China has an interest in leveraging its

economic, diplomatic, and military levers in the Gulf in ways that erode Gulf support of the United States.

Unlike the United States, China is not actively entrenched in regional security conflicts. Nor has it committed itself to shouldering the enormous burden of providing regional security through frequent military operations and cooperation with Gulf states. While China has expanded its use of military and diplomatic tools through arms sales and triangular diplomacy, it remains wary of being embroiled in regional disputes.[54] This suggests that China will pursue its strategic interests in a way that can erode U.S. political support but that remains largely risk averse.

What to Expect as the "New Normal"

The "new normal," following the resumption of Saudi-Iran diplomatic relations, consists of several key dynamics: an increasingly active China in the diplomatic and arms trade arenas; increased strain—a symptom of "U.S. fatigue"—between the United States and its Saudi and Emirati partners; and the increasing ability of Chinese commercial activity in Saudi Arabia and the U.A.E.—such as deployment of Huawei technology—to interfere with the United States' strategic interests. The Saudi-Iran rapprochement, however, is still in an early and uncertain stage, and Saudi and Emirati security dynamics will remain largely unchanged in the near term. Based on these circumstances, this "new normal" will likely include:

- Improved yet cautious Saudi-Iran and U.A.E.-Iran relations
- Increased Chinese diplomacy and soft power initiatives in the region
- Increased diversification of Saudi and Emirati arms imports

The "new normal" will likely ***not*** *include:*

- A dramatic increase in Gulf states' demand for Chinese arms trade and military cooperation
- A dramatic decrease in demand for U.S. arms trade and military cooperation

While the Saudi-Iran rapprochement paints an uncertain portrait for the United States' future security interests in the Gulf, the security landscape will not fundamentally shift until a tangible reduction of Saudi-Iran diplomatic and military tensions. Furthermore, though "U.S. fatigue" may have curbed Riyadh and Abu Dhabi's appetite for arms trade with the United States, their demand for high-quality U.S. arms will not dramatically decrease. Saudi and Emirati procurement agencies will continue to diversify arms sales, but they will not seek increased arms trade with China with the direct intent of creating strain for the United States. Instead, as long as the United States' strategy in the Gulf remains heavily reliant on arms sales and thus vulnerable to

While China has expanded its use of military and diplomatic tools through arms sales and triangular diplomacy, it remains wary of being embroiled in regional disputes.

China's low-risk, high-reward diplomatic, military, and commercial activities, both self-imposed actions and China's willingness to ignore its partners domestic governance issues will result in increased strain for U.S. policymakers.

would threaten U.S. imports. The Saudi-Iran rapprochement has not demonstrated a credible shift in Saudi's need for security assurances against Iran, and both Saudi and Emirati demand for U.S. military equipment will remain high.

The United States can support opportunities for economic cooperation that align with Saudi and Emirati national development goals to enhance U.S. soft power and reduce "U.S. fatigue."

How U.S. Policymakers Should Respond

U.S. policymakers should consider a series of responses amid the current "U.S. fatigue" and China's growing capacity to erode U.S. support in the Gulf. In addition to broadening the scope of engagement with Saudi Arabia and the U.A.E., the United States may also benefit from weakening China's position in the Gulf. Still, the United States must consider the effect that its actions in the Gulf will have on U.S.-China relations and opportunities for bilateral cooperation. Lastly, the United States must recognize both the increased agency of Saudi Arabia and the U.A.E., particularly in regional diplomatic and military activities, and acknowledge that some aspects of its relations with these countries are inherently at odds.

Overcome the "U.S. fatigue"

The United States must improve its approach to arms sales in the Gulf. The United States should continue to provide sophisticated arms exports to Saudi Arabia and the U.A.E. but should ensure that end-use conditions are reasonable and consistent. This includes analyzing whether Chinese assets, such as 5G infrastructure,

However, the United States must also explore new channels for cooperation with Saudi Arabia and the U.A.E. beyond its reliance on arms sales and security assistance. The United States can support opportunities for economic cooperation that align with Saudi and Emirati national development goals to enhance U.S. soft power and reduce "U.S. fatigue." Like China, with its multifaceted Arab Policy, the United States must expand from its historically one-dimensional approach in Saudi Arabia and the U.A.E.

The United States would also benefit from a modified approach when advocating for human rights reform in Saudi Arabia and the U.A.E. Rather than threatening "pariah" status as punishment for human rights abuses, the United States should substitute its use of liberal internationalist rhetoric for one of "deep engagement," that recognizes the limits of excessive democracy promotion in the region. [55] This modified approach should not exclude attempts to improve Saudi and Emirati domestic institutions but should instead be focused on preventing political disagreements from causing public schisms.

Watch for tangible increases in Saudi and Emirati support for China

Saudi Arabia and the U.A.E. benefit from longstanding Chinese reliance on Gulf oil, as well as increased interest in arms sales and China's enhanced involvement in regional diplomatic disputes. However, the extent to which China's ties to Saudi Arabia and the U.A.E. have translated to geopolitical alignment remains unclear. U.S. policymakers must monitor key metrics, such as United Nations (UN) General Assembly and UN Security Council votes on larger, global issues, for an indication of whether Saudi Arabia and the U.A.E. are increasingly willing to support Chinese policy positions when those positions conflict with those of the United States.

Exploit differences between China and Gulf states

While U.S. democracy promotion and liberal internationalist rhetoric may increase strain with Gulf partners, strain between Gulf states and China could be increased by regularly calling attention to China's activities in Xinjiang. Public outrage against China's persecution of Muslim Uyghurs in Xinjiang may compel Saudi and Emirati leaders to publicly voice opposition to China's actions. While China's Gulf partners have so far withheld criticism of its actions in Xinjiang, increased public outrage, including through calls to action from U.S. officials, may help tip the scales.

Understand the implications of U.S.-Gulf strategy in the context of U.S.-China relations

Though efforts to weaken Saudi and Emirati relations with China might benefit the United States' regional security interests, it could also have harmful secondary effects by further eroding U.S.-China relations and further straining relations with Saudi Arabia and the U.A.E. Accordingly, the United States should accept China's increased diplomatic presence in the Gulf as the "new normal," while understanding that China's activity will continue to be largely risk averse. Contrary to Scobell and Nader's observations in 2016, today's China does not seem concerned with maintaining "cordial and cooperative relations with the United States" in the Middle East.[56] However, China still does not seem interested in seeking direct conflict with the United States over Gulf issues. Rather, China sees opportunities to take advantage of U.S. fatigue among Gulf states to enhance its own regional standing. The United States is better served to modify its approach to relations with Saudi Arabia and the U.A.E. rather than confront China directly.

Recognize that certain tensions are not easily fixed

Even with an expanded diplomatic toolkit and reduced "U.S. fatigue," the United States cannot guarantee sustained ties and geopolitical alignment with Saudi Arabia and the U.A.E. The U.A.E., for example, has broken with the U.S. by supporting General Khalifa Haftar in the Second Libyan Civil War.[57] U.S. allies in the Gulf have at times mismanaged and misplaced U.S.-provided military equipment. In 2019, a CNN investigation revealed that Iranian-backed Houthi rebels in Yemen had acquired military technology that the U.S. originally sold to Saudi Arabia.[58] The U.A.E. has shown no intent to disband its integration of untrusted telecommunications infrastructure, and Saudi Arabian leadership has remained resistant to the United States' calls for human rights reforms. Furthermore, Saudi and Emirati efforts to accelerate domestic defense industrial growth should not be discounted. Both countries have made significant progress in developing their own military equipment, under Saudi and Emirati-owned manufacturers and often in partnership with U.S. firms. Although domestically produced defense equipment is still limited in scope and capability, both countries' long-term defense localization goals risk further eroding the United States' appeal as a strategic partner absent an

adjustment in U.S. approach to regional engagement. While Saudi Arabia and the U.A.E. are important partners for regional security, the United States must also recognize disagreements with their Saudi and Emirati partners and continue to weigh the costs and benefits of providing sophisticated military equipment.

Conclusion

Navigating relations with Saudi Arabia and the U.A.E. amid China's newly assertive regional presence requires asking tough questions about the United States' long-term interest in and methods for sustaining relations with its Gulf partners. Some of the recommendations that this article provides to U.S. policymakers are more germane to U.S. culture, values, and typical diplomatic style than others. For example, policymakers must grapple with interagency and domestic pressures to promote human rights reforms in the Gulf while recognizing that China, the United States' pre-eminent great power competitor, adopts a fundamentally less interventionist—and, accordingly, less strain-inducing—approach towards the same Gulf states. While stability in the Middle East and counterbalancing against a volatile Iran are vital to U.S. interests, the extent to which U.S. policymakers can de-emphasize liberal internationalist diplomatic tendencies could be limited.

As long as the United States sees the Arabian Gulf as fundamental to its regional security strategy and global power projection capabilities, however, U.S. policymakers should recognize both the existing "U.S. fatigue" and China's increasing diplomatic and military activities in the Gulf and take concrete steps to sustain Saudi and Emirati partners' security commitments. U.S. policymakers must understand China's strategic interests in the Gulf, and how China's various linkages to Gulf partners, such as commercial telecommunications technology, can strain U.S. relations with Gulf states. U.S. policymakers must also understand the extent to which the recent Saudi-Iran rapprochement has—and has not—shifted Saudi and Emirati demand for U.S. arms trade. While the rapprochement indicates China's increased willingness to take a leading role in Gulf diplomacy, the nature of China's regional interests does not indicate China intends to fully assume the United States' role in providing regional security. Saudi and Emirati demand for sophisticated U.S. military equipment will likely remain high, as indicated by both countries' August 2022 purchase of more than $5 billion in U.S. military equipment to defend against "persistent Houthi cross-border unmanned aerial system and ballistic missile attacks on civilian sites and critical infrastructure."[59] At the same time, China will continue to seek gains from eroding U.S.-Gulf relations partly as a result of its various proactive commercial, diplomatic, and military activities. Thus, the United States must take active measures to repair and diversify its approach to relations with Saudi Arabia and the U.A.E., while decreasing its vulnerability to China's activities that further erode U.S.-Gulf relations.

Analysis of Selected Current Events (2018 - 2023)
for Potential Impact on Gulf-U.S. and Gulf-China Relations

Date	Development	Effect on relations with United States	Effect on relations with China
October 2018	Murder of Jamal Khashoggi, and subsequent international reaction.	**Negative (Saudi Arabia)** U.S. condemnation increased resentment from Saudi officials.	**Positive (Saudi Arabia)** President Xi was one of the few leaders to offer support to MBS.
2018-ongoing	Increased domestic defense R&D and production efforts in Saudi Arabia and the U.A.E.	**Neutral-Positive (Saudi Arabia & U.A.E.)** United States is supportive of localization projects, including through Gulf-based American defense manufacturers, but arms trade restrictions impede technology transfers.	**Positive (Saudi Arabia)** China provided support to Saudi Arabia to develop the domestic production of ballistic missiles through transfer of Chinese technology in 2019.[60]
2018-2021	Houthi drone launches and strikes in Saudi Arabia and U.A.E.	**Positive (Saudi Arabia & U.A.E.)** Increases Saudi and U.A.E. commitments to U.S. military assistance. For example, following a 2021 Houthi drone strike in Abu Dhabi, U.S. Central Command pledged to provide air support and additional training to U.A.E. Armed Forces.	**Neutral-Negative (U.A.E.)** While not directly involved, may have strained China-Saudi and China-U.A.E. ties due to China's relations with Iran, which backs the Houthi rebels.
December 2020	Chinese Vaccine Diplomacy, through supply and domestic production of Sinopharm vaccine in U.A.E.	**Neutral-Positive (U.A.E.)** Potential positive effect for United States after public realization in the U.A.E. that Chinese vaccines have lower efficacy than American counterparts.	**Positive (U.A.E.)** Increased China-U.A.E. health diplomacy, boosted Chinese soft power.
November 2021	U.A.E. shut down Chinese military facility after U.S. pressure.	**Positive (U.A.E.)** Reflects U.S. influence on U.A.E. leadership decision-making.	**Negative (U.A.E.)** China loses strategic development project, more significantly is public example of U.S. influence outweighing China's.

Continued:
Analysis of Selected Current Events (2018 - 2023) for Potential Impact on Gulf-U.S. and Gulf-China Relations

Date	Development	Effect on relations with United States	Effect on relations with China
December 2021	U.A.E. indicated intention to purchase French Rafale fighter jets, suspended talks to procure American F-35 fighter jets, indicated intent to maintain Huawei networks.	**Negative (U.A.E.)** U.S. military and diplomatic leaders frustrated by U.A.E.'s preference to maintain services with Huawei.	**Positive (U.A.E.)** China able to benefit from U.A.E. distancing (even if temporary) from U.S. trade talks, particularly from continued implementation of Huawei in the U.A.E.
February 2022	U.A.E. announced intention to purchase L-15 trainer jets from China.	**Neutral (U.A.E.)** Underscores U.A.E.'s aversion to dependency on U.S. arms trade.	**Positive (U.A.E.)** China to benefit from U.A.E. diversification of military equipment.
February 2022	Russian invasion of Ukraine	**Negative (Saudi Arabia & U.A.E.)** Gulf partners reluctant to publicly condemn Russian invasion, language generally de-escalatory. Shows the limit of U.S. hard power in region.	**Positive (Saudi Arabia & U.A.E.)** Exposes rift between Gulf states and United States. Potential opportunity for China to take advantage of limited Russia. Export capacity, increase exports to Gulf.
August 2022	U.A.E. ambassador to return to Iran, marking first step in re-establishing relations.	**Neutral (U.A.E.)** While this development is clearly positive for the United States' overall de-nuclearization and reform efforts towards Iran, U.A.E. taking a softened stance towards Iran would potentially weaken U.S. coercive power over U.A.E. in the form of military arms sales.	**Positive (U.A.E.)** While this development would potentially limit China's ability to mediate between the two countries, it serves to benefit from potential synergies of a China-Iran-U.A.E. alliance, economically or otherwise.
October 2022	White House accused Saudi Arabia of siding with Russia to cut oil production.	**Negative (Saudi Arabia)** Damages trust between Saudi Arabia and Biden administration.	**Positive (Saudi Arabia)** Exposes rift between Saudi Arabia and United States.

Continued:

Analysis of Selected Current Events (2018 - 2023) for Potential Impact on Gulf-U.S. and Gulf-China Relations

Date	Development	Effect on relations with United States	Effect on relations with China
December 2022	President Xi conducted first post-Covid diplomatic visit to Saudi Arabia, meeting with King Salman and Crown Prince Mohammed bin Salman.	**Neutral-Negative (Saudi Arabia)** Potential erosion of U.S. diplomatic influence in Saudi Arabia, in favor of China.	**Positive (Saudi Arabia)** Strengthens diplomatic ties and provides additional channels for China-Saudi Arabia economic cooperation.
February 2023	China announced opening of Joint Lab in U.A.E. to explore aerospace collaboration; successful signing of contract to supply L15 trainer jets; UAE ordering of AR3 missile launchers from Chinese company Norinco.[61]	**Negative (U.A.E.)** Creates increased risk for U.S. defense technology transfer to U.A.E. and erodes trust in U.A.E.'s commitment to U.S. regional security objectives.	**Positive (U.A.E.)** Strengthens China's military ties with U.A.E. and erodes U.S.-U.A.E. relations.
March 2023	Saudi Arabia and Iran agreed to restore diplomatic ties, in an agreement mediated by China.[62]	**Neutral-Negative (Saudi Arabia & U.A.E.)** Has overall benefit of easing regional tensions, but creates potentially reduced need for Gulf deterrence strategy against Iran, which is a key aspect of U.S.-Gulf relations.	**Positive (Saudi Arabia & U.A.E.)** Provides a low-risk, high-reward opportunity for China to exert regional diplomatic leadership. Portrays China as solving regional diplomatic tensions that the United States was unable to address.
April 2023	Saudi and Iranian foreign ministers hold talks in Beijing.[63]	**Neutral-Negative (Saudi Arabia & U.A.E.)** Again, has overall benefit of easing regional tensions, but creates potentially reduced need for Gulf deterrence strategy against Iran, which is a key aspect of U.S.-Gulf relations.	**Positive (Saudi Arabia & U.A.E.)** Highlights -the success and significance of China's role in facilitating the Saudi-Iran rapprochement.

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China's Carrier Silk Road: Examining China's Maritime Silk Road Investments & Their Impact on Aircraft Carrier Operations

Matthew Bernard

Introduction

In the wake of Speaker Nancy Pelosi's 2022 visit to Taiwan, the People's Republic of China (PRC) displayed a rare show of maritime strength by deploying both of its aircraft carriers, the *CNS Liaoning* and *CNS Shandong*, to the waters near Taiwan. The United States deployed the *USS Ronald Reagan* and the *USS Tripoli* in the vicinity as a response.[1] The simultaneous deployment of these four aircraft carriers to the South China Sea illustrated how the Pacific's already heavily militarized waters are set to grow even more congested over the next decade as China continues to expand its aircraft carrier program. There are many competing theories about China's motivation for developing world-class aircraft carriers and about where these carriers will operate. As China's nascent aircraft carrier capability has grown over the last decade, most analysts have focused on China's use of aircraft carriers in a conflict over Taiwan.[2] Others assert that because China's aircraft carriers are not aligned with its anti-access/area-denial strategy, its carrier program issolely for national prestige.[3]

A close examination of China's published defense doctrine, Maritime Silk Road (MSR) investments, and the capabilities of China's aircraft carriers strongly suggest that China is developing its aircraft carrier program with grand strategic objectives in mind, rather than for exclusive use in conflicts over Taiwan or for national prestige. Based on this analysis, defense planners can anticipate with relatively high confidence that China's formidable carrier strike groups will conduct operations near the Strait of Malacca, the Strait of Hormuz, and the Bab-el Mandeb to secure China's vital geopolitical and economic interests in the region.

The addition of multiple People's Liberation Army Navy (PLAN) carrier strike groups to the ocean's most politically sensitive areas should cause concern for all navies. Carrier strike, consisting of numerous ships and aircraft, take up a considerable amount of space, raising risk of collision between vessels in areas vital to global shipping. Defense planners and policymakers can use this strategic assessment to develop mitigation strategies for maritime collisions

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National Prestige and a Taiwan Conflict

When China's ambitions to integrate aircraft carriers into its naval arsenal became apparent after it acquired its first carrier, many scholars believed that the acquisition was motivated more by national pride than strategic purposes. Although purchasing large, expensive aircraft carriers for national prestige is not unprecedented, China's continued development of its carrier program suggests that it has other motives. Countries solely interested in national prestige tend to abandon these expensive vessels when maintenance and operation costs exceed the strategic value provided by the vessels themselves. For example, Brazil and Thailand each purchased an aircraft carrier for the associated prestige but never expanded their fleets beyond a single carrier. Eventually, Brazil and Thailand abandoned or repurposed the vessels.

In 1997, Thailand acquired its aircraft carrier, *HTMS Chakri Naruebet*, which was built in a Spanish shipyard in 1993.This carrier, capable of carrying the AV-8 harrier, was unique to Southeast Asia and brought significant prestige to Thailand. While plans to equip this carrier with AV-8 harriers fell through, Thailand still maintains the carrier as an "offshore patrol helicopter carrier" and has used it for several offshore rescue operations.[4] Brazil had even less success with its *NAe São Paulo* aircraft carrier. Brazil purchased the 1960s-era French-built *NAe São Paulo* in 2000. The carrier was decommissioned in 2017 due to maintenance issues and sank in an inglorious fashion in the Atlantic, bringing the aircraft carrier chapter of Brazil's naval history to a close.[5] The short-lived Thai and Brazilian forays into aircraft carriers demonstrate that, while carriers are a source of national prestige, carriers must also provide significant strategic value. If countries are motivated to acquire aircraft carriers solely to boost national prestige, their carrier programs will remain limited in scope or be abandoned entirely.

When China developed its second aircraft carrier, it became clear that the objective of China's carrier program went beyond national prestige. Based on high-level PLAN statements, analysts at the time had good reason to believe that the further development of China's aircraft carrier program was geared exclusively toward conflicts over Taiwan. Long before China's initial foray into aircraft carriers, Admiral Liu Huaqing, former Vice Chair of China's Central Military Commission (CMC) and an outspoken advocate for acquiring carriers, stated explicitly that China required carriers "to solve the need for a struggle against Taiwan [independence] and to resolve the dispute over the Nansha [Spratlys] Archipelago."[6]

This logic—that China needed carriers for a Taiwan conflict—was compounded by the deployment of two U.S. aircraft carriers to the Taiwan Strait in the 1995 Taiwan Strait Crisis. When China staged military exercises off the coast of Taiwan in response to Taiwan's first popular presidential election in 1995, the United States responded with a show of force by deploying the *USS Independence* and the *USS Nimitz* to the area.[7] The strong show of force by the United States underscored the wide capabilities gap between the U.S. and Chinese navies. Based on senior PLAN leaders' statements and the United States' deployment of carriers to the Taiwan Strait, it would be logical to conclude that China's primary motive for acquiring carriers was to close the gap with the U.S. Navy in any conflict over Taiwan. However, the continued development of China's carrier fleet, China's published naval strategies, and Maritime Silk Road investments support the conclusion that China's carriers are intended to serve a broader purpose.

China's Carrier Program

Key technical innovations in China's carrier designs suggest a specific and distinct set of missions for PLAN carriers and offer clues as to where these carriers will operate. If China was looking for a symbol of maritime strength and national pride, the PLAN could have stopped with the construction of the *Liaoning* and *Shandong*. Instead, the PLAN learned the limitations of the first class of carriers and innovated their design to meet future operating requirements. Specifically, the designs for China's newest class of carriers emphasize endurance, which is not essential for near-seas operations or a Taiwan scenario.

China's aircraft carrier program began in 1998 with the purchase of the *Varyag*—an incomplete Soviet Union hull from Ukraine. China initially claimed the *Varyag* would be used as a floating casino rather than an operational carrier. While China and Ukraine agreed to $20 million for the hull, China was far more interested in the blueprints than the ship itself, signaling China's desire to build more carriers in the future.[8] Following China's concerted efforts to assuage the international community about its intended use for the vessel, the *Varyag* was delivered to the Dalian shipyard in 2002. After 2002, China sought to downplay its acquisition, hoping to limit global concern over China's shift towards a carrier-capable Navy and the corresponding change in the PLAN's strategic designs. Following years of maintenance and relative political stillness, the *Varyag* was rechristened as the *CNS Liaoning* and entered service in 2012.

If China's first carrier took decades of waiting, designing, and building to acquire, China has not been as patient in developing the rest of its carrier fleet. China's second carrier, the *CNS Shandong*—indigenously built based on blueprints acquired with the *Varyag*—entered service in 2019. Undeterred by Western scrutiny of the *Varyag* purchase, China began building the *CNS Shandong* in 2013 and completed construction after only six years. Only slightly larger than the *Liaoning*, the *Shandong's* features—such as the "ski-ramp" flight deck—resemble those of the first carrier.[9] This distinctive flight deck, which aids the take-off of jets, is a rudimentary technology and far less advanced than steam-powered or electromagnetic catapults.

China has continued to innovate its carrier program. The latest Chinese aircraft carrier designs feature significantly improved endurance and larger strike packages, which are essential for operations in locations distant from China. Construction on the *CNS Fujian*—China's second domestically built carrier and third overall—began in 2021 and is estimated to be completed by 2024. The *Fujian*—considered the third generation or Type 003 Chinese carrier—will be larger than the *Liaoning* and *Shandong* and will be equipped with an electromagnetic catapult launch system instead of the ski-jump ramps used by its predecessors.[10] This particular innovation will allow aircraft launched from the *CNS Fujian* to carry larger payloads during take-off. Based on satellite imagery, *CNS Fujian* appears to have a similar displacement to that of U.S. carriers, which typically weigh around 100,000 tons. According to leaked plans, China will likely build more Type 003 class carriers.[11]

In addition to expanding its conventional diesel-powered carrier fleet, China's plans to build a nuclear-powered Type 004 class carrier show that the PLAN intends to develop a carrier capable of deploying to waters far beyond the South and East China Seas. Nuclear-powered ships can endure at sea for extended periods, travel greater distances, and rely less on forward-based fuel stores than conventional carriers. Moreover, China's ambition to build, maintain, and operate nuclear-capable aircraft carriers—substantially more complex than conventional carriers—is further evidence that China's carriers serve strategic interests beyond prestige and a Taiwan conflict.

Figure 1: Possible PLAN Carrier Force Design by 2031

Name	Class	Aircraft Launch System	Propulsion	Commission	Displacement (Tons)
CNS Liaoning	Type 001	Ski-Ramp	Conventional	2012	60-66,000
CNS Shandong	Type 002	Ski-Ramp		2019	60-70,000
CNS Fujian	Type 003	Electro-magnetic		2024 (estimated)	100,000 (estimated)
TBD	Type 003	Electro-magnetic		TBD	100,000 (estimated)
TBD (rumored)	Type 004	Electro-magnetic	Nuclear	TBD	TBD

Budget-informed estimates conclude that China could have five aircraft carriers by 2031 and significant logistics and firepower support to make the PLAN a power projection Navy with extra-regional aspirations.[12] Faced with the potential of five additional carriers operating in an increasingly congested and contested maritime environment, it is essential to know where and how China's carriers will operate so that other navies can mitigate potential incidents at sea. With this understanding of how the PLAN has developed its carrier force to support China's ambitions to project power far beyond the Taiwan Strait, defense planners can examine China's published doctrine and its investments along the Maritime Silk Road to forecast where PLAN carriers will operate and adjust accordingly.

Historical Naval Strategy

China's plans to develop carriers capable of operating far from China's (and thereby Taiwan's) shore coincide with a shift from near-seas operations to a new emphasis on far-seas operations in PLAN naval strategy.

In this context, "far-seas" means anything beyond the "near-seas," and includes a broad area stretching from the northwest Pacific Ocean east to the Indian Ocean. Far-seas operations are intended to help protect China's overseas interests and to take on new missions abroad. This latest shift in strategy demonstrates how the motivations driving China's development of its carrier fleet have evolved beyond the desire to bolster national prestige and achieve parity with the United States in a Taiwan Strait conflict.

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The arguments that China is developing its carrier program solely for national prestige or a Taiwan scenario originate from China's historical views on carriers. Indeed, previous PLAN leaders such as Admiral Liu Huaqing, the PLAN commander from 1982 to 1988, emphasized these as critical reasons for China's carrier development. According to former Naval War College Professor Nan Li, PLAN strategy can be separated into three distinct periods based on the geographic scope of China's naval operations. Before the mid-1980s, the PLAN focused on "near-coast defense." After the mid-1980s, the PLAN emphasized "near-seas active defense," before shifting to "far-seas operations" in the mid-2000s.[13] The "near-coast defense" strategy focused on the waters immediately adjacent to China: the 9,000-mile coastline, the Strait of Taiwan (and its "reunification"), the Strait of Bohai, and the Hainan Strait. From the 1950s onward, China's threat vectors were the Taiwan-based Kuomintang forces and, later, the land border with the Soviet Union. Accordingly, PLAN operations focused on countering amphibious-landing operations and defending naval bases, harbors, and coastal airfields.[14]

Beginning in the mid-1980s, China's naval strategy expanded from "near-coast defense" to "near-seas active defense." Admiral Liu Huaqing was the driving force behind this strategy shift. As PLAN commander, Liu made two assessments regarding China's national defense. First, China's primary threat vector was the Soviets to the North. Second, China's growing economy enabled it to devote more resources to near-seas defense. As such, the operational bounds of China's naval strategy expanded to include the first island chain, the three near seas (the Yellow Sea, the East China Sea, and the South China Sea), and the waters adjacent to the first island chain. The near-seas active defense strategy focused on Taiwan reunification, protecting China's maritime resources, strategic nuclear deterrence, and securing major sea lines of communication. Even when the PLAN was focused primarily on near-coast defense under Liu Huaqing's leadership, China still recognized the value an aircraft carrier would bring to the force. Even after his tenure as PLAN commander, Liu reportedly stated, "Defending the South China Sea, peacefully reuniting with Taiwan, safeguarding [China's] maritime rights and interests—all require aircraft carriers."[15]

Most recently, after significant progress in modernizing PLAN forces under Liu Huaqing and Deng Xiaoping, the PLAN transitioned to a "far-seas operations"

strategy under the leadership of Jiang Zemin and Hu Jintao. The latter declared the need for the PLAN to "make the gradual transition to far-seas defense, enhancing the far-seas maneuvering operations capabilities."[16]

While the shift in strategy from "near-seas defense" to "far-seas operations" did not occur until the early 2000s, the strategic drivers for this change truly began with Deng Xiaoping's Reform and Opening policy in 1978. Since economic reform, China has become increasingly integrated into the global economy, with sea-borne trade through strategically important sea lanes and foreign investment becoming key pillars sustaining China's economic growth "miracle" and, by extension, CCP legitimacy. In parallel with the change in strategy, Hu Jintao tasked the PLA with "New Historic Missions," including the defense of China's expanding interests, sea-borne trade, and its citizens overseas.[17] In other words, the Chinese economy's growing dependence on stability in foreign markets and investments was a significant driving force behind the shift to far-seas operations in PLAN strategy. These shifts in PLAN naval strategy are also reflected in Chinese defense doctrines.

Published Defense Doctrine

China's published defense doctrines from 1995 to 2019 reveal the change in China's thinking about national security—from a regional to a more global focus. Importantly, these shifts coincided with China's decision to purchase the *Varyag* and the subsequent expansion of its carrier fleet. Combined with the above analysis of China's naval strategy and innovations in PLAN carrier designs, the doctrines contain information essential for determining where and for what purposes China's future carriers will operate.

Since 1995, China has become more active in seeking to reassure others about its military strategy by releasing unclassified strategic white papers that outline China's thinking about military power and the development of its military from a regional, continental force to a world-class fighting force. The 2015 Chinese Defense White Paper was the first such white paper released after the PLAN procured its first carrier, and therefore includes important information about how China wants the international community to interpret its carrier program. For understanding where China's aircraft carriers will operate, the most notable addition to the 2015 document is a new PLA strategic task "To safeguard the security of China's overseas interests." The 2015 strategy elaborates on this new task:

> *It is necessary for China to develop a modern maritime military force structure commensurate with its national security and development interests, safeguard its national sovereignty and maritime rights and interests, protect the security of strategic SLOCs and overseas interests, and participate in international maritime cooperation, so as to provide strategic support for building itself into a maritime power.*[18]

In a significant departure from the 2008 white paper, the 2015 Chinese Defense White Paper emphasizes the need to protect China's "overseas interests." The 2015 white paper notes that as China's overseas interests continue to expand, its armed forces must be able to protect those interests and participate in international security cooperation. In contrast, the 2008 white paper did not use the term "overseas interests" and focused more on defending China's territorial integrity, sovereignty, and domestic security.

The 2015 white paper defines China's "overseas interests" as its citizens, investments, and infrastructure abroad. It states that China's armed forces should be prepared to protect these interests through operations such as maritime escort, evacuation

of citizens, and humanitarian assistance.[19] The most recent white paper—China's National Defense in a New Era—expanded on the 2015 Chinese Defense White Paper and explained how the PLAN carrier force would integrate into China's larger National Security Strategy.[20]

Even though the Chinese military strategy evolved from a near-coast defense to a far-seas operations naval strategy, all three elements are still evident in the current strategy. The fundamental goals for Chinese national defense—outlined by the Chinese leadership in the 2019 white paper—clearly illustrate this point:

- To deter and resist aggression (**Near-Coast Defense**)
- To oppose and contain "Taiwan independence" (**Near-Coast Defense**)
- To safeguard national sovereignty, unity, territorial integrity, and security (**Near-Seas Active Defense**)
- To safeguard China's maritime rights and interests (**Near-Seas Active Defense**)
- To safeguard China's overseas interests (**Far-Seas Operations**)
- To support the sustainable development of the country (**Far-Seas Operations**)

Near-coast defense and near-seas active defense are well understood, and the geographic scope of the operations they entail are clearly delineated. What is less understood is the extent of China's "far-seas operations." Several statements from the 2019 white paper provide a clearer picture of how China defines "far-seas operations" (emphasis added by author):

> *"China's overseas interests are endangered by immediate threats such as international and regional turmoil, terrorism, and piracy. Chinese diplomatic missions, enterprises and personnel around the world have been attacked on multiple occasions . . . To address deficiencies in overseas operations and support, it builds far seas forces, develops overseas logistical facilities, and enhances capabilities in accomplishing diversified military tasks. The PLA conducts* ***vessel protection*** *operations, maintains the* ***security of strategic SLOCs****, and carries out* ***overseas evacuation and maritime rights protection*** *operations."*[21]

Analysis of Chinese defense white papers reveals that the acquisition of China's first carrier was quickly followed by the elevation of the security of China's overseas interests to the level of national security. This change in doctrine must also be understood in the context of recent innovations in China's naval capabilities and the rapid expansion of its overseas interests. Analyzing these developments together reveals how China intends to integrate its growing carrier force into its grand strategy. Focusing on the PLAN carrier force, it can be concluded that the total force will be deployed to support the three main areas of China's naval strategy. To predict the boundaries of "far-seas operations," defense planners should examine where vessel protection operations, security of SLOCs, and overseas evacuations coincide with Chinese development projects and investments abroad.

Maritime Silk Road Investments

Policymakers' strategies and public statements often do not align with the ground truth of operations. Therefore, examining the port facilities that could enable carrier operations is essential to knowing what waterways and sea lanes the PLAN prioritizes. While this analysis cannot cover all of China's Maritime Silk Road (MSR) projects, an examination of China's port projects known as the "string of pearls"

(Hambantota, Gwadar, and Kyaukpyu), and international ports that China's state-owned enterprises (SOE) have a controlling stake in reveals where China has both the *interest* and the *capacity* to operate.

The Maritime Silk Road is a strategic initiative to promote economic and trade ties between China and countries in Southeast Asia, Africa, and Europe. Its name is meant to evoke comparisons to China's previous economic empires. In practice, MSR involves the provision of Chinese financing for the development of ports, shipping lanes, and other infrastructure to facilitate maritime trade and investment along maritime trade routes vital to China's strategic interests. These maritime routes—which run through the Strait of Malacca, across the Indian Ocean, and beyond—connect China to the global economy and satisfy its increasing demands for natural resources.

China's development project in Hambantota, Sri Lanka, puts its non-interventionist rhetoric to the test. Three of the Hambantota terminals can host a Type 002 *Shandong*-class carrier. China also has economic leverage over the port, implying there is little to stop China from using these three *Shandong*-capable terminals to its military advantage.[22] Priced at $307 million for the first development phase alone, the Hambantota port project has been criticized as economically unnecessary given its proximity to the Colombo port. Unable to repay the Chinese loan, Sri Lanka gave China a controlling stake and a 99-year lease for the port in 2017.[23] While Sri Lankan officials have made public statements claiming that Hambantota will not be turned into a Chinese military base, the port already hosted a Chinese submarine in 2014 and potentially a Chinese spy ship in 2022 (China claims it is a research vessel and not a military vessel).[24]

Sri Lankan public officials who support the investment in Hambantota point to the port's strategic location along the vital shipping route that connects Asia with Europe and the Middle East. The port's presence along these vital shipping routes will enhance China's energy security and secure China's access to these essential energy supply routes, through which about half of China's oil imports flow. The Hambantota projects also bring significant economic benefits to Sri Lanka and improve the standard of living for its people. Other officials criticize China's investment, despite Chinese officials' insistence that the port projects are purely commercial. Nihal Rodrigo, a former Sri Lankan foreign secretary and ambassador to China, claims that intelligence collection and strategic military priorities were at the heart of the deal. Shivshankar Menon, former Indian Foreign Secretary, echoed this sentiment: "The only way to justify [China's] investment in Hambantota is from a national security standpoint—that [China] will bring the People's Liberation Army in."[25]

Although China has a potential interest in using the Hambantota port to support carrier operations, this may not be feasible. Aircraft carriers are massive vessels that require specialized infrastructure, including large berths, cranes, and storage facilities. They also require security measures and support services, including maintenance and repair facilities, fuel, and ammunition depots. While Hambantota has been developed to accommodate larger vessels, it is unclear whether it can host a PLAN aircraft carrier because it lacks many of these necessary support services. Nevertheless, further development of these support services would strongly indicate that China intends to use the Hambantota port to support its aircraft carrier operations.

Gwadar, Pakistan, is another significant MSR port project that could double as a potential host to a PLAN carrier strike group to support far-seas operations. This port is the gateway to the larger $62 billion China-Pakistan Economic Corridor, located at the opening of the Persian Gulf and Strait of Hormuz. While smaller than the port in Hambantota, the port in

Gwadar will have three 200-meter-long berths and one roll-on-roll-off facility, with larger container terminals planned.[26] The Gwadar port's proximity to the Strait of Hormuz (less than one day's sail) makes it an ideal facility from which to support the PLAN's "far-seas operations." The presence of PLAN carrier groups at Gwadar would increase China's influence over the security of the Strait, a strategic choke point through which 30 percent of the world's oil travels. Because approximately 45 percent of China's oil reserves pass through the Strait of Hormuz, China has a clear strategic interest in increasing its security presence in the region to prevent disruptions to this vital shipping lane that would cause significant economic pain for China.[27] The possibility of PLAN carriers operating out of Gwadar has the added strategic effect of forcing India to consider a Chinese naval presence on either side of the subcontinent.

China's investment also aims to strengthen its strategic relationship with Pakistan—a key regional ally. According to a retired senior Pakistani diplomat, the 2001 approval of the Gwadar project was initially characterized as a "favor" to Pakistan, implying that the real motivation for the investment was to aid an ally and not for the military advantage that China would gain.[28] China and Pakistan share a history of cooperation, and China sees Pakistan as an important partner in its efforts to counterbalance India's growing influence in South Asia. This strategic relationship, the port's proximity to the strategically important Strait of Hormuz, and significant Chinese investment in Pakistan make the Gwadar port a key priority for any of China's "far seas operations" and a likely host port for a PLAN aircraft carrier.

Finally, the MSR project that most clearly merges China's overseas economic interests and national security concerns is China's development of a deepwater port in Kyaukpyu, Myanmar. Some military analysts, including Maung Aung Myoe, a professor at the International University of Japan, claim that once the port is complete, "Kyaukpyu will be a Chinese naval base… China desperately needs access on the eastern side of the Indian Ocean."[29] Located in the Bay of Bengal, China's primary goal of this project is to reduce its reliance on oil and gas imports through the Strait of Malacca by diversifying its supply routes. This would enhance China's energy security and reduce the risk of supply disruptions caused by geopolitical tensions in the region.

China's domestic laws explicitly link the country's economic investments in these ports to their potential military use.

Those who contend that Kyaukpyu is not likely to become a PLAN hub point to the $2.7 billion investment in an industrial park and a special economic zone that lies at the end of a $1.5 billion oil and natural gas pipeline connecting to China.[30] With this terrestrial pipeline, it could be argued that the deepwater port at Kyaukpyu would not be necessary to control the Strait of Malacca. Additionally, Myanmar's constitution contains specific provisions prohibiting the permanent basing of foreign troops on its soil. This means Kyaukpyu is unlikely to become the equivalent of Djibouti, which houses a permanent PLA presence. However,

Chinese naval vessels could still use facilities at Kyaukpyu, and the sheer importance of solving "the Malacca Dilemma" virtually guarantees some form of continued PLAN presence around the Strait of Malacca.

It may be alarmist to describe every Chinese overseas port investment as intended for purely military use. Indeed, the reality is far more nuanced. China's interest in these investments is a combination of economic, diplomatic, and military factors that make them strategically valuable. However, it is important to note that China's domestic laws explicitly link the country's economic investments in these ports to their potential military use. Indeed, China may use exploitative economic leverage (like in the three examples above) to pressure foreign governments to permit the PLAN to use SOE majority-owned and operated facilities for military purposes.

China's National Defense Mobilization Law and 2017 National Defense Transportation Law are the mechanisms for this. These laws are part of a broader civil-military fusion effort spelled out in China's 2019 defense white paper.[31] The mobilization law mandates that "any organization or individual has an obligation to accept the expropriation of civil resources in accordance with the law" while guaranteeing fiscal reimbursement to local non-military budgets and "rewards for citizens and organizations that have made outstanding contributions in national defense mobilization." The 2017 transportation law requires that "Chinese enterprises (and their overseas agencies) engaged in the international transportation business shall provide for the supply and support of ships, aircraft, vehicles, and personnel of China's military operations."[32] Therefore, for defense planning purposes, it should be assumed that PLAN vessels will be interested in protecting and having the capability to operate out of all facilities subject to either of these laws, including Hambantota, Gwadar, and Kyaukpyu.

While it would be easy to expect China to establish more formal military bases—like the one in Djibouti—as China expands its global footprint, this is unlikely to be the predominant form of overseas naval facilities China will rely on. The mobilization and transportation laws significantly broaden the scope of where a Chinese carrier force can operate. Kardon and Leutert (2022) analyzed Chinese overseas port assets and presented the most detailed look at where PLAN naval vessels could operate. Chinese companies hold a controlling stake in at least one terminal at 96 foreign ports. Of these 96 facilities, 83 meet the essential physical requirement to host a *Shandong* class carrier. According to Kardon and Leutert's analysis, the PLAN has made calls to refuel and resupply in at least one-third of Chinese foreign port facilities and has undergone at least nine "technical stops."[33]

While these numbers seem alarming, these dual-use facilities still lack many of the facilities requirements and accessibility that would make them equivalent to a military base. Specifically, China's potential dual-use facilities lack the hardened facilities, military equipment, and trained military logisticians essential for wartime operations. While the absence of these facilities reduces the strategic value of these ports in wartime scenarios, these dual-use facilities nevertheless provide PLAN logistical resilience without the burdens of foreign basing. Additionally, governments of countries host to Chinese-leased port facilities may resist any Chinese demands to use those facilities for military purposes because permitting foreign military use of host country facilities would also entail a political decision to choose a side in an international conflict.

Where will China's future carriers operate?

Understanding that China is not expanding its aircraft carrier program solely for the purposes of national prestige and a conflict over Taiwan, the question is: Where *exactly* will China's carriers operate? With a possible force of five carriers by the early 2030s and expanding overseas interests, China will be limited in where it can deploy its power projection forces. China's carrier forces are still in the early stages of development, and each carrier will have unique limitations. With a comprehensive examination of each carrier's capabilities and limitations, PLAN defense doctrine, and China's investments in strategically located ports through the Maritime Silk Road, defense planners can draw well-founded conclusions about the regions in which they are likely encounter PLAN carriers. These regions can be grouped according to whether they fall under the scope of **near-coast defense, near-seas active defense, or far-seas operations.**

Based on the age, size, and strike limitations of the *CNS Liaoning* (Type 001), defense planners can expect this carrier to be used for near-coast defense operations (defined earlier as the coastline, the Strait of Taiwan, the Strait of Bohai, and the Hainan Strait). As the oldest of China's carriers, the *Liaoning* will require the most upkeep and maintenance, increasing the logistical complexity of operations further from China's coastline, where support and maintenance facilities are more dispersed. Also, with the smallest flight deck and ski-ramp configuration (and the lower weight requirements associated with this limitation), the *Liaoning* will have limited power projection capabilities compared to the newer carriers. The most effective use of the CNS Liaoning would be in support of the PLAN's mission to "oppose and contain Taiwan's independence."[34] The *Liaoning's* recent deployment to the Taiwan Strait following U.S. House Speaker Nancy Pelosi's visit to Taiwan supports this hypothesis. Beijing used the deployment (along with the *CNS Shandong*) and a simultaneous live-fire show of force to signal its displeasure.[35] Whether a carrier strike force traveling all the way from Qingdao is necessary for a Taiwan scenario remains to be seen. But, as a signaling measure, it is incredibly effective.

The basing locations of the *CNS Shandong* (Type 002) and the CNS Liaoning suggest that these two carriers will split near-seas defense missions. While the PLAN is transitioning from defense on the near seas to protection missions on the far seas, the importance of unresolved maritime disputes in the near seas and China's interest in controlling the resources in these areas means that near-seas defense will continue to be a priority for the foreseeable future. The unique ramp configuration of the *Shandong* and *Liaoning* limits their ability to conduct operations beyond the near seas because they cannot support airborne early warning (AEW) systems, limiting their strike capabilities to a range of about 65 miles. However, KJ-500 AEW aircraft, which are too large to be launched from the *Liaoning* and *Shandong*, can expand the J-15 fighter jet's strike range from 65 nautical miles to over 250 nautical miles with the assistance of surface search radar, thus supporting limited carrier operations in the near seas.[36] To this end, these large aircraft can be forward-deployed to existing Chinese military outposts in the South China Sea—including those at Fiery Cross Reef, Woody Island, Mischief Reef, and Subi Reef—to directly support limited carrier operations in the near seas. Furthermore, the recent 20-day training deployment of the *Liaoning*, which crossed the Yellow and East China Seas and entered the Western Pacific via the Miyako Strait, is further evidence that the *Liaoning* and *Shandong* will likely be deployed to these regions for near-seas active defense operations.[37]

The *CNS Fujian* (Type 003) and nuclear-powered Type 004 will most likely conduct far seas operations because of their larger flight deck, air wing, and

maintenance reliability. Based on China's defense white papers and MSR investments, the term "far-seas operations" almost certainly refers to the Indian Ocean and Persian Gulf regions. Based on China's defense white papers, these far seas operations will focus on SLOC protection, vessel protection missions, and humanitarian evacuations. For SLOC protection, the PLAN will focus on the "maritime lifelines" of the Strait of Malacca, Hormuz, and Bab-el Mandeb. The latter chokepoint is a particularly high-risk zone and will require PLAN protection. Chinese-leased ports at Gwadar, Pakistan, Hambantota, Sri Lanka, and Kyaukpyu, Myanmar, could be further developed to support a continued PLAN carrier presence near these chokepoints.

Humanitarian evacuation missions will most likely be required in areas where Chinese investment is co-located and where many Chinese nationals are most likely to face physical danger. China's overseas investment projects have not been welcomed with open arms by citizens of recipient countries and have even provoked violent nationalist attacks against Chinese citizens in several cases. The best example of this predicament is Gwadar, Pakistan, where Chinese businesses and workers have been targeted in terrorist attacks. In April 2022, a Pakistani mother of two blew herself up outside the Karachi University Chinese Language and Culture Institute, killing three Chinese teachers.[38] Similar attacks have also occurred in African countries such as Nigeria and the Democratic Republic of the Congo. These threats necessitate an advanced carrier force forward deployed in the East African and Middle East regions for evacuation purposes.

Supposing the PLAN follows a Maintenance, Training, and Deployment cycle similar to that of the U.S. Navy, defense planners should expect the PLAN to have two carriers deployed at any given time. This is premised on the assumption that the "far-seas operations" and "near-seas active defense" missions will have different maintenance requirements. Because of the intimate nature of coastal defense and near-seas defense, *CNS Liaoning* and *CNS Shandong* will likely not need a typical training period that ordinarily precedes a long deployment. Their deployment cycle is probably akin to that of the *USS Ronald Reagan*, which is forward deployed in Japan. It makes more frequent but shorter deployments in the local area than all other U.S. aircraft carriers, making much longer and more far-reaching deployments. Foregoing a required training period could enable the PLAN to alternate the two carriers between the maintenance and deployment cycles, with one carrier deployed while the other undergoes maintenance. The "far-seas operations" that the *CNS Fujian (*Type 003) and the future Type 004 will undertake will likely follow a cycle similar to U.S. carriers. U.S. carriers follow a 32-month cycle with a six-month maintenance period, pre-deployment training, and a six-month deployment period, with the option to surge.[39] If this model is applied to China's "far-seas operations" carriers, then defense planners can expect one to be in maintenance, one in training, and one forward deployed in the Indian Ocean or Persian Gulf regions at any given time.

The *CNS Fujian* is expected to be commissioned in 2024 and set sail shortly after that. If the hypothesis discussed here holds, defense planners can expect it to pass through the Strait of Malacca to the Indian Ocean and usher in a new era of PLAN global power projection.

Conclusion

When China purchased its first aircraft carrier in 2002, it was not illogical to conclude that it did so to enhance its national prestige. When China designed and indigenously built its second carrier, it was logical to assume China intended to develop its carrier program to support operations in a conflict over Taiwan. But with a clear picture of China's carrier modernizations,

published defense doctrine, and Maritime Silk Road investments, defense planners can conclude with relatively high confidence that China's future aircraft carrier fleet is also purposely built to support its grand strategic objectives and protect its overseas interests. With this knowledge, we can also accurately predict where China's future aircraft carriers and their accompanying fleets will operate. China's "near-seas active defense" carrier fleets will operate in the South and East China Seas, bringing them close to other carriers, like the Japan-based *USS Ronald Reagan*.

China's "far-seas operations" carrier fleets will routinely patrol the sea lanes of communication and the strategic chokepoints through which China's economic interests flow and upon which China's energy security rests. The prospect of aircraft carrier fleets from two or even three nations converging in the world's busiest sea lanes and most politically sensitive areas is alarming because of the heightened potential for incidents at sea. With more ships and aircraft operating in close vicinity to each other—with no side willing to cede ground—collisions or near-misses at sea could have global consequences.

With this refined understanding of China's carrier operations and the strategic intent that drives them, defense planners from all carrier-capable navies can make plans to mitigate incidents at sea to safeguard increasingly congested sea lanes and strategic chokepoints. Lines of communication between these carrier-capable countries operating around these areas can be established or altered to include routine communications to telegraph large fleet movements and reduce the risk of collisions. Procedures and preplanned responses can be developed so ship captains and pilots can work through possible scenarios to avoid escalating tensions. While there are many steps defense planners can take, a globally capable and motivated PLAN is already here and will remain for the foreseeable future. Now is the time to implement mitigation strategies to enhance the safety of the maritime commons.

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Assessing China's Future Role in Deep-Sea Polymetallic Nodule Extraction and Processing

Nicholas Munves

Executive Summary

China's demand for critical minerals including cobalt, manganese, and nickel is set to boom to support the growth of the country's rechargeable battery industry. Terrestrial reserves of these metals are limited, but undersea deposits of polymetallic nodules may meet China's needs. However, the depth at which these ores occur will preclude commercial extraction in the near term. China is funding several projects to develop commercial polymetallic nodule mining capacity. However, these efforts lag relative to those of Japanese and Western organizations. Chinese firms are unlikely to develop commercially viable polymetallic nodule extraction operations. However, China contains the bulk of the world's cobalt- and manganese-processing capacity, and it is the world's largest consumer of these resources. It is thus probable that Chinese and Western firms will specialize in different segments of the polymetallic nodule supply chain: Western firms will specialize in collecting the nodules from the deep sea, while Chinese firms will specialize in extracting the metals for use in rechargeable batteries and other applications. Such an arrangement would deepen trade ties between China and the United States and its allies at a time of increased political pressure to "decouple." Policymakers interested in reducing the likelihood of Sino-American conflict should thus encourage this trend. Moreover, this arrangement would boost production of rechargeable batteries and thus electric cars and renewable energy infrastructure, thereby accelerating global decarbonization.

Introduction

Rechargeable batteries have emerged as a fundamental component of a green transition. These batteries are necessary for the operation of electric vehicles (EVs) which are currently the prime candidates to replace the hydrocarbon-powered vehicles responsible for much of the world's greenhouse gas emissions. The large-scale adoption of intermittent renewable power sources like wind and solar—also likely essential to achieve decarbonization—may also require the construction of large-scale power storage infrastructure.

In recent years, China has come to dominate the rechargeable battery industry. Given the growing global demand for electric vehicles and renewable-energy infrastructure, estimates suggest that by 2030 China will produce twice as many lithium-ion batteries than the rest of the world combined.[1] This increase in production will require a proportional increase in metal inputs, far exceeding current supply.

The core components of rechargeable batteries rely upon certain metals, such as lithium, cobalt, nickel, and manganese. The chemical properties of these metals allow the battery to absorb, store, and discharge large quantities of electricity. With few exceptions, metals do not occur on Earth in pure form. Instead, they exist in combination with other elements such as oxygen, in rocks called ores. The metal must be separated from the ore through sophisticated but well-established industrial processes. Sometimes this processing happens at the mine site, but sometimes

ores are exported and processed in a faraway country. China happens to be a major center of ore processing thanks to its large industrial capacity, low labor costs, and considerable domestic demand for metals in construction, heavy industry, and electronics manufacturing.

Because cobalt and nickel are of particular importance to rechargeable battery production, demand for these metals will accelerate as efforts to decarbonize the global economy pick up steam. Global cobalt consumption is expected to grow more than tenfold by mid-century.[2] China is currently the leading consumer of the metal, and mostly uses it for battery production.[3] Chinese demand for cobalt will likely grow as China's electric vehicle industry and renewable energy infrastructure both expand. The Chinese government's efforts to peak carbon emissions by 2030 will likely accelerate the growth of these sectors, all but ensuring a sustained increase in demand. However, current annual global cobalt production is 190 kilotons (kt), from a total terrestrial reserve of approximately 8,300 kt.[4] Without the development of new cobalt sources there is likely to be a significant cobalt supply shortfall by mid-century.[5]

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Political challenges and Environmental, Social, and Governance (ESG) risks may make obtaining sufficient cobalt from terrestrial reserves challenging. The Democratic Republic of the Congo (DRC) contains almost half of all known cobalt reserves and accounts for seventy percent of current production.[6] The concentration of the world's cobalt supply in such an unstable country makes the metal's supply chain vulnerable. This vulnerability provides a strong incentive for China—and the West—to diversify its cobalt sources. Outside the DRC, most cobalt is extracted as a secondary product of copper and nickel mining. The rising price of cobalt is prompting the exploration of reserves outside the Congo, but future access to these resources is not guaranteed.

Terrestrial mining is an inherently dirty business. Almost all planned terrestrial cobalt mining projects have significant ESG risks: they pose risks to the local environment, threaten to displace people, disrupt livelihoods, and incentivize corruption and poor governance. Unsurprisingly, many of these projects face local opposition that presents significant barriers to the further expansion of mines. Uncertainties surrounding supply stability from terrestrial cobalt reserves may therefore drive states to seek alternative sources.[7]

The deep sea may provide a more reliable source of minerals for rechargeable batteries. Nickel- and cobalt-bearing ores are found around submarine volcanoes and in lumps of rock—called polymetallic nodules (also referred to as "PMNs" or "nodules")—on the deep-sea floor. Commercial extraction of these ores from the deep sea has yet to begin for two reasons. First, terrestrial deposits of these ores satisfy current demand. Second, collecting the ores from the oceanic abyss is not yet technically feasible. Interest in exploiting polymetallic nodules surged in the early 1970s but waned as the logistical challenges and associated costs of retrieving

the nodules became apparent.[8] This paradigm may change in the coming decades if increasing demand and political obstacles to terrestrial mining raise prices of critical minerals and accelerate innovation in deep-sea mining technology.

Moreover, the environmental and human costs of terrestrial cobalt mining may push operations offshore. While deep-sea mining would have significant (though poorly understood) consequences for marine habitats, policymakers may prefer it to terrestrial extraction because it would have few direct impacts on human health and livelihoods.[9]

Even as countries seek to diversify sources of the critical minerals necessary to meet projected demand growth for rechargeable batteries, China is likely to maintain its position as the world's dominant critical mineral processor, at least over the medium term. U.S. electric vehicle manufacturers continue to invest in joint ventures with Chinese mining and processing firms, despite political headwinds and the rollout of U.S. government policies that incentivize U.S. battery manufacturers to reduce reliance on Chinese firms in critical mineral supply.[10]

In the transition to seabed minerals, China may seek to develop a vertically-integrated mineral supply chain as it would provide China a degree of economic security. Indeed, China has sought to vertically integrate minerals sourced from terrestrial mining. However, pressure to ramp up rechargeable battery production, which comes both from state directives and from market forces, may trump vertical integration efforts and result in bifurcated supply chains, wherein western countries extract ores from the seabed and Chinese firms process them and turn them into batteries.

This analysis begins by evaluating the challenges of polymetallic nodule extraction and China's ability to meet those challenges. It then assesses China's current advantages in the mineral processing supply chain to conclude what role Chinese firms are likely to play in the marine mining industry, and what factors might affect those outcomes.

Polymetallic Nodules

Of all the marine sources of critical mineral inputs for advanced battery and electronics production, polymetallic nodules are the best-characterized and are the primary targets of current exploration and are thus the focus of this report. Polymetallic nodules (PMNs) are potato-sized lumps of metal ore found on the abyssal plains of most oceans below 3,000 meters.[11] Nodule composition varies by region and associated environmental factors, but they generally contain manganese, iron, cobalt, copper, nickel, lithium, gallium, tellurium, and rare earth elements.[12] For example, nodules in the Peru Basin are lower in cobalt but higher in lithium compared to those found in the Clarion-Clipperton Zone (CCZ), a relatively well-characterized region of the Pacific Ocean approximately the size of the continental United States.[13] Cook Islands nodules are largely similar to those of the CCZ,[14] while those of the Central Indian Ocean contain especially high copper concentrations.[15] All these metals have major industrial applications and are subsequently in high demand.

The resource potential is enormous: nodules in the CCZ alone contain a quantity of manganese equal to all known terrestrial reserves, and greater quantities of cobalt, nickel, yttrium, and tellurium than are known to exist on land. Approximately 83 percent of the Earth's cobalt resources lie beneath the ocean.[16] If these resources could be exploited at commercial scale, they could constitute the primary supply of this metal and greatly facilitate the production of rechargeable batteries.

Developing the capacity to extract polymetallic nodules on the ocean floor may help alleviate the projected shortfall between

demand for and terrestrial supply of nickel and cobalt in the coming decades. Nodules in the CCZ are estimated to contain approximately 44,000 kt of cobalt, more than three times known terrestrial reserves.[17] If nodule extraction in the CCZ becomes economically and technically feasible, the area will likely become a major cobalt source. Development of the capacity to extract these nodules at scale would therefore drastically increase the global supply of the metals contained in the nodules.

Commercial extraction of PMNs from the CCZ would increase China's importance in the cobalt industry. Chinese firms possess the majority of the world's cobalt metallurgy infrastructure, a capital expenditure expected to constitute approximately 69 percent of the fixed cost of polymetallic nodule processing.[18] Since these high startup costs pose a significant barrier to entry to Western firms into PMN processing, Chinese firms will likely remain dominant in mineral processing for the foreseeable future.

Challenges of Commercial Nodule Extraction

Marine mining has much economic potential but has yet to begin in earnest. To date, only offshore oil deposits have been exploited at commercial scale, because they lie close to shore in shallow waters, can be extracted from static platforms, and promise a large return on investment. Nodules, while abundant, are not distributed evenly and the seabed over which they are scattered is staggeringly large. Thus, to optimize extraction of a particular metal, the distribution of the nodules must first be mapped. Predictive maps of nodule abundance in a region of interest can be derived by feeding data gathered using highly sensitive sonar equipment into artificial neural networks.[19, 20]

Finding nodules is hard enough, but getting them off the seabed is phenomenally difficult. Nodules lie more than two miles below sea level at pressures almost 400 times that at the surface. Unlike oil extraction, which is performed in shallow waters, the depths at which the nodules occur preclude the construction of offshore platforms. Also unlike oil, whose high concentration makes the construction of static platforms commercially feasible, polymetallic nodules are thinly spread such that a mining system must be able to roam wide areas of ocean to collect a commercially viable quantity. Mining must therefore be done from ships, which limits the size and quantity of equipment that a mining company can bring to the extraction site. A ship is an unstable platform that increases the number of moving parts in a mining operation and thus the potential for equipment failure. Finally, the system must withstand severe storms, which can come almost without warning.[21] Any commercially viable nodule extraction operation must overcome these hurdles.[22] To date, no mining venture from any country has come close to doing so.

The proposed system for polymetallic nodule extraction consists of an autonomous "harvester" vehicle that scoops up sediment and strains out nodules. The harvester then sends the nodules up a hose to the "mothership." For this to be done successfully, the harvester must be able to withstand immense pressures while the hose connecting the harvester to the ship remains intact. No project or system has ever had to contend with these environmental challenges at a commercial level, as all crewed and uncrewed expeditions to these depths have been done for research purposes at a small scale.[23]

Tests done in the 1970s by American, Japanese, Canadian, and German teams demonstrated that such operations were technically, though not economically, feasible.[24] Pilot projects in the private sector have begun in earnest, but commercial operations are far from realization. Technological development has been slow but

steady. In 2017, the Japanese Organization for Metals and Energy Security used a remote-controlled harvester to gather minerals—including zinc, gold, copper, and lead—from the seabed off the coast of Okinawa at a depth of 1,600 meters.[25] This project constituted the largest scale demonstration to date of the technologies required for polymetallic nodule extraction, but it was performed at less than half the depth at which cobalt-bearing nodules are known to occur.

History of Chinese Efforts to Extract Polymetallic Nodules

The International Seabed Authority (ISA) has granted exploration contracts for the CCZ to the China Ocean Mineral Resources and Development Association (COMRA) and the China Minmetals Corporation. The former's contract expired in 2021 while the latter's contract lasts through 2032.[26] COMRA spent the first two decades of the 21st century developing nodule-mapping capabilities. With five active contracts granting it exclusive rights to over 238,000 square kilometers in the CCZ, China has licensed more seabed for nodule mining than any other nation.[27]

Despite China's rights to mine extensive areas of the seabed, Chinese firms have not yet demonstrated that they are close to achieving viable mining operations. In 2010 COMRA launched the *Jiaolong*, a crewed submersible capable of reaching the abyssal zone containing polymetallic nodules.[28] While construction of this vessel indicates that China can send vehicles to the abyssal plain, this vessel will not significantly advance China's deep-sea mining capabilities. It cannot perform the two core components of PMN mining—mapping and extraction—in a cost-effective manner. Nodule mapping can be accomplished by surface ships and extraction is best done by uncrewed vehicles. The *Jiaolong* is a prestige item that does not indicate that China possesses the technology needed for commercial operations.

For a nodule mining operation to be commercially viable, a firm must collect 360 wet tons of nodules per hour for 250 days per year.[29] The first pilot program—launched in 1978—achieved one-tenth of this extraction rate.[30] Despite over forty years of effort, no venture from any country has come close to achieving this goal, though there has been some progress in the past decade. Two major technological challenges must be overcome before commercial polymetallic nodule extraction can begin. The first is that a mobile collection vehicle must be developed that can quickly and reliably collect nodules from the seabed at depths exceeding 4,000 meters. The second is that those nodules must be quickly transported to the surface, either via a hose or a winched bucket, from these immense depths. The transportation system cannot break. In 2013, a German group successfully operated a collection vehicle at 4,571 meters in the CCZ, though it collected no nodules. COMRA's vehicle, while of similar design, has only been tested at 1,306 meters, and this was only achieved in 2021.[31] Moreover, COMRA has only tested vertical transportation hardware at a depth of 304 meters. A team from the Republic of Korea Institute of Ocean Science & Technology (KIOST) has operated such a system at 1,200 meters, a record depth.[32] In all, these developments underscore that Western, Japanese, and Korean firms are likely to have a sustained advantage over Chinese marine mining ventures. If Chinese firms do not close the gap, they are unlikely to be competitive when PMN extraction begins at commercial scale.

Prospects for Commercial Extraction of Polymetallic Nodules by Chinese Firms

Liu Feng, secretary general of COMRA, has admitted that Chinese firms lag compared with Western and Japanese rivals in

nodule mining, which he attributes to the general technology gap between China and the West. While Liu remains confident that Chinese firms can close the gap, there is reason for skepticism.[33] Evidence from the gas industry indicates that China lacks the West's experience with complex mineral extraction projects. In the early 2010s, U.S. firms dramatically increased U.S. natural gas production by leveraging hydraulic fracturing technology. Given China's possession of shale gas reserves of similar size to the United States and far larger natural gas market, the CCP set a high target for domestic gas production. China attempted hydraulic fracturing using domestic technology and expertise, but by the end of the decade production fell well short of government targets.[34] While there is little technological overlap between shale gas extraction and polymetallic nodule mining, both endeavors require intricate logistics and the integrated deployment of complex, novel technologies that must perform well under extreme conditions. While the PRC obviously does not lack talented engineers, neither its public nor private sector can match the experience of the American, European, and Japanese mineral sectors in carrying out complex mining projects. This fact makes it unlikely that Chinese PMN enterprises will overtake their Western rivals in the short to medium term.

China's Likely Role in Marine Mining Supply Chains

Even if non-Chinese firms dominate the nodule extraction industry, the PRC could still play an important, even paramount, role in the processing of the metals they contain. In some economic models, the processing of nodule ore constitutes the bulk of the fixed cost of polymetallic nodule commercialization.[35] The process of extracting manganese, cobalt, nickel, and other metals from polymetallic nodules is not identical to that required to process terrestrial ores.[36] However, protocols for the extraction of metals from PMNs have been developed since the 1970s and do not differ significantly in technological sophistication from those used for terrestrial ore.[37] While difficult to determine at this point due to the lack of operational nodule-processing plants, operating costs are not likely to be much higher. Nodule-processing plants have yet to be constructed because of the total absence of PMN ore supply. Once such a supply becomes available, regardless of who extracts it, China will likely be its primary destination, as China already possesses the bulk of the world's cobalt processing capacity and will thus be able to transition to PMN processing quickly and cheaply relative to Western countries.

Due to its unrivaled battery industry, China would be the primary destination of purified cobalt, manganese, and nickel even if they were refined elsewhere.

Given the large startup costs, neither the United States nor Europe are likely to achieve parity in the processing sector absent significant government intervention. Moreover, due to its unrivaled battery industry, China would be the primary destination of purified cobalt, manganese, and nickel even if they were refined elsewhere. It is therefore likely that the Chinese metallurgical industry will develop nodule processing capacity once a sufficient quantity of nodule ore comes to market.

Maintaining dominance in this area, which is a major bottleneck in metal supply chains, would give China significant control over the global cobalt, manganese, and nickel industries. This leverage may make forays into marine mining unnecessary for the PRC from a geopolitical perspective.

Given the growing tensions between the United States and China, however, it is possible that China might attempt to develop its own polymetallic nodule mining capacity to secure its supply chains in the face of Sino-American "decoupling." However, for reasons previously discussed, Chinese deep-sea mining ventures are unlikely to be commercially competitive. Even so, the CCP is likely to continue funding COMRA and China Minmetals exploration projects, and to assert China's mineral rights through the ISA regardless of commercial viability. The CCP is attempting to achieve technological parity with the United States on multiple axes. Even if Chinese deep-sea mining technology continues to lag, the Chinese state may back this sector to keep up appearances.

Moreover, China is likely to increase its supply of terrestrially sourced minerals even as ESG concerns become more prominent. In the past two decades, Chinese firms have provided seventy percent of the funding for industrial cobalt mining operations in the eastern DRC.[38] China Molybdenum, a major firm in this region, has announced plans to expand mining operations in the coming years.[39] These projects may reduce China's need for investments in polymetallic nodule extraction. However, the degree to which Chinese firms increase investments in terrestrial mining operations depends on political factors, namely the stability of the countries possessing the mineral deposits and the strength of local opposition.

If polymetallic nodule extraction increases the global supply of cobalt, manganese, and nickel and subsequently lowers the price of these metals, China's domestic rechargeable battery industry will benefit. As mentioned earlier, the large-scale exploitation of PMNs would lower the price of cobalt and other relevant metals, which would benefit China's ore processing, battery, and electric vehicle industries. This development would also reduce China's carbon emissions, thereby supporting the country's efforts to peak carbon emissions by 2030. Fulfilling these objectives would improve the Chinese economy and China's reputation as an environmental leader, thereby boosting the legitimacy of the Chinese Communist Party. For these reasons the Chinese government may be incentivized to allow purchases of polymetallic ore from Western firms, even if Chinese PMN extraction efforts continue to lag.

So long as geopolitical tensions do not force the separation of the Chinese and American economies, Chinese firms are unlikely to develop extensive polymetallic nodule extraction capacity in the short term due to other nations' comparative advantages in this sector. American firms, by contrast, are better positioned to develop PMN extraction capacity and sell the raw ores to Chinese firms for processing. This development would increase U.S. exports to China and boost the American mining industry. China is likely to build on its advantages in ore processing as polymetallic ores come to market. An increase in Chinese cobalt-processing capacity may limit the viability of U.S. ore-processing plants currently under construction. Increased supply of relevant metal inputs will also lower the costs of Chinese rechargeable batteries and electric vehicles, which may also erode American competitiveness in these sectors. Moreover, in the next twenty years new uses for the metals in polymetallic nodules may be found, and Chinese industry will likely benefit from lower input costs.

If the availability of polymetallic nodule ore allows China to increase rechargeable battery and electric vehicle exports, global carbon emissions are likely to fall, and the worst effects of climate change

and air pollution may be avoided. As the world's primary source of the rechargeable batteries critical for a renewable energy transition, China would likely get a reputational boost, especially in the emerging markets where low-cost electric vehicles like the Build Your Dream (BYD) are most viable and which are facing the harshest impacts from climate change.

As stated earlier, if China uses the rise of PMN extraction to entrench its comparative advantage in ore processing, it will tighten its grip over cobalt, nickel, and manganese supply chains. However, the security implications of this arrangement must not be overstated. Given the power of the Chinese state over its private sector, it could hypothetically deprive the United States or its allies of these critical minerals, as it did to Japan after a Chinese fishing vessel was seized by the Japanese Coast Guard in 2010. However, doing so would reduce China's exports, and may incur unpredictable costs as Western nations retaliate. An integrated mineral supply chain would deepen Sino-American "mutually-assured cooperation"[40] and make the "decoupling" of the American and Chinese economies that much more difficult. Policymakers should therefore ensure that these supply chains remain integrated as they develop. Fortunately, given China's comparative advantage in mineral processing and the United States' and its allies' comparative advantage in high-tech mineral extraction, this integration may occur because of market processes—unless significant political barriers appear in the coming decades.

Conclusion

The rise of a global polymetallic nodule extraction industry would bolster China's mineral processing and battery manufacturing sectors, even if Chinese firms are unlikely to perform much deep-sea mining. Unless geopolitical tensions curtail trade between China and the West, China and Western countries are likely to play different but complementary roles in future PMN supply chains: Western organizations will extract raw ore from the ocean floor and sell them to Chinese firms to be processed into metals and used as inputs in rechargeable batteries. Such an arrangement would deepen U.S.-China trade ties and may aid efforts to reduce climate change. However, much of the technology required to perform PMN mining at scale has yet to be developed, making the future of this industry uncertain. That said, given the strategic importance of abyssal resources, developments in the deep-sea mining sector should be closely monitored.

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Motivations for the Allocation of Chinese Aid

Jake Grover

Executive Summary

This study examines the motivations for China's allocation of foreign assistance across a range of factors, including altruism, economic interests, and geopolitics. I exploit AidData's "Global Chinese Development Finance Dataset," which aligns Chinese flows to the standard definition of Official Development Assistance. I find that China is largely motivated by development need and strategic interests, but not by merit or economic interests. China likely considers development need by allocating its aid resources mostly to poorer countries, but it does not discriminate based on democracy or control of corruption. China does not appear to decisively allocate its assistance on the basis of economic interests, either. While China is undoubtedly strategic in its allocation of assistance—particularly when it comes to the recognition of Taiwan—this is in line with traditional donor practice, as traditional donors also allocate their assistance on the basis of strategic interests.

Introduction

Governments provide foreign assistance for a variety of reasons—from altruism to economic interests to geopolitics—and untangling this web of interests can be challenging. An over-arching narrative has emerged, however, that traditional donors are more altruistic and focused on development whereas other, non-traditional donors like China are only motivated by self-interest and strategic considerations.

The Scandinavian countries are held up as examples of the former. These countries have focused on increasing their aid commitments to 0.7 percent of their gross national income (GNI) and have aligned their aid resources with mutually agreed development objectives like the Sustainable Development Goals (SDGs). These countries are cited as being driven by altruism and the development need of recipient countries.[1] In the middle of the spectrum are major bilateral donors with large aid volumes that are driven more by self-interest. This group includes Organisation for Economic Co-operation and Development's Development Assistance Committee (DAC) countries like the United States, Japan, and Germany.[2] At the other end of the spectrum, China is perceived to be a self-interested donor. According to some critics, China is only interested in gaining political and economic influence and is motivated solely by geopolitical factors, not developmental ones.[3] An emerging literature on Chinese aid suggests that this may not be true, or at least that China's motivations are not substantially different from those of other major bilateral donors.

This study examines the motivations behind China's allocation of assistance resources across a range of factors, including partner country need and merit and Chinese economic and strategic interests. The next section reviews the traditional foreign aid allocation literature to better understand the relevant concepts and empirical approaches. I also review the emerging literature on the motivations and interests driving the allocation of Chinese Official Development Assistance (ODA) and Other Official Flows (OOF) and then discuss the contribution this paper makes in updating and advancing the analysis of other researchers. In the third section, I describe the data used for this analysis and then provide descriptive statistics of

Chinese grants and loans. In the fourth section, I describe my empirical strategy and specification and then present regression results across a range of specifications. I conclude by discussing the policy implications of the results.

Literature Review

Traditional Aid Allocation

How donor motivations guide foreign assistance allocations has been a topic of interest for academics as far back as Dudley and Montmarquette (1976).[4] McKinley and Little (1979) first established the donor-interest versus recipient-need model (or DI-RN framework), which initiated a longer literature that distinguished between selfish motivations related to donor self-interest and altruistic motivations related to recipient need.[5] McKinley and Little (1979) showed that the amount of aid a country received was determined largely by bilateral relationships structured by the Cold War-era international system.[6] Schraeder et al. (1998) and Alesina and Dollar (2000) examined the behavior of major bilateral donors during the Cold War and found that aid allocations were determined less by stated reasons of development need (i.e., altruism) or merit and more by political, strategic, and ideological considerations.[7, 8] Economic interests, colonial ties, and diplomatic relationships were also significant determinants.

While geopolitical interests dominated the decision-making process for aid allocation during the Cold War, this started to change after the fall of the Soviet Union in the 1990s as Cold War interests gave way to economic interests and broader foreign policy objectives. Grover (2009) closely examined the United States' experience and found that the U.S. allocation of resources was driven by economic motivations in the 1990s but shifted to geopolitical motivation and development need after 2001. The broader aid allocation literature generally supports the view that traditional donors consider a diverse set of interests in the aid allocation decision-making process. Following Burnside and Dollar's (2000) highly visible work "Aid, Policies, and Growth," the concept of "merit" or "effectiveness" also entered the equation, as it became more common for donors to selectively allocate assistance to better-governed countries.[9] This change was mostly rhetorical, however, as few donors took selectivity seriously (outside of a few outliers like the Millennium Challenge Corporation), but merit nonetheless entered this literature as an additional testable hypothesis.

While strategic interests remained important even after the Cold War, Mosley (1985) argued that the aid process was continually evolving in response to growing international norms for aid.[10] Although there were no explicit rules governing donor behavior, Mosley observed a "bandwagon effect" whereby donors exerted peer pressure on each other to improve the aid allocation process. Over time, increased pressure from the broader "development community" (i.e., a loose coalition of interested observers, including policymakers, researchers, advocates, and others) resulted in allocations of assistance intended to have a greater development impact. In the early 2000s, this push formally manifested as the Millennium Development Goals and aid effectiveness commitments, such as the Paris Declaration on Aid Effectiveness.

Donors claimed to place greater emphasis on aid effectiveness and to have become more responsive to the needs of their country partners after the September 11th attacks and subsequent occupations of Afghanistan and Iraq. During this time, strategic interests also became more important for many major bilateral donors including the United States. Collier (2008) draws out this contradiction by showing that increased altruism in donor rhetoric and more selective criteria for aid allocation based on recipient merit were eclipsed by donor economic and political interests,

Figure 1a: Total Aid by Donor Group ($ Billions)

Source: OECD. Note: Aid is Country Programmable Assistance averaged over 2019-2021

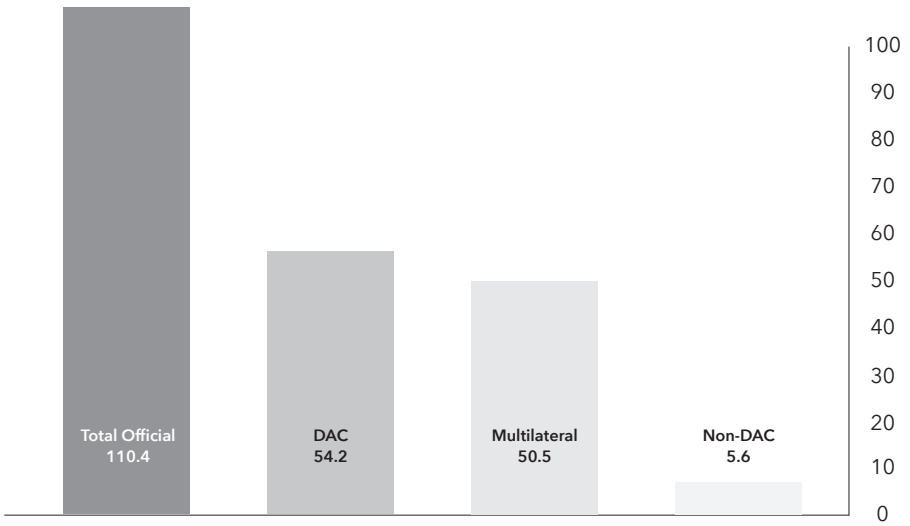
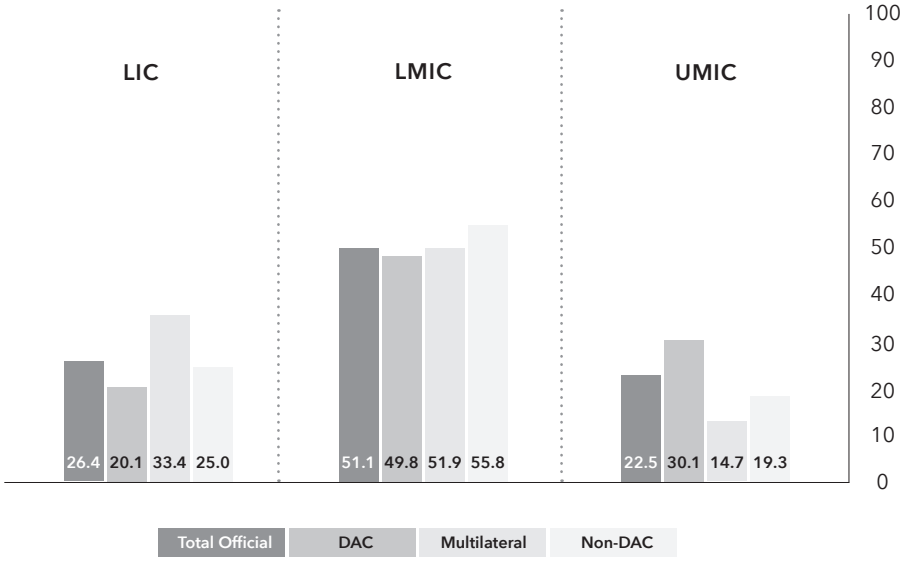


Figure 1b: Aid by Recipient Income Group (% of Assistance)

Source: OECD. Note: Aid is Country Programmable Assistance averaged over 2019-2021



which increased aid allocations to middle-income countries.[11] This finding was recently confirmed by Dissanayake and Tahmasebi (2021), who found that foreign assistance is not allocated to the poorest countries—who would receive assistance if donors were motivated to provide aid based on development need—by showing that more aid goes to middle-income countries than low-income countries.[12] This pattern is also shown in Figure 1b.

Hoeffler and Outram (2011) summarize the post-Cold War literature and find that traditional donors allocate aid due to *both* self-interest and development need, that economic interests are much less important, and that there is little evidence that donors allocate aid according to merit.[13] While a critic of Chinese engagement in development cooperation might expect China's allocation of assistance to be more slanted toward strategic and economic motivations than toward development need or merit, the literature provides similar explanations for the motivations of traditional donors. Therefore, it might be expected that China allocates its assistance similarly. At minimum, it would not be surprising to find that China also allocates assistance based on strategic interest, as this is the norm among many self-interested traditional donors.

Chinese Resource Allocation

Building on this earlier literature, Dreher and Fuchs' (2015) "Rogue Aid?" article conducts an in-depth exploration of the motivations guiding Chinese foreign aid allocations.[14] They examine the "rogue aid" criticism of Naim (2007), which famously asserts that Chinese aid is not guided by partner country needs but rather by naked self-interest.[15] Naim (2007) criticizes Chinese (and other non-DAC) aid for pursuing access to natural resources and geopolitical goals while also claiming that it undermines Western aid, particularly Western efforts related to good governance.[16] Noting that the "rogue aid" criticisms are based solely on cherry-picked case study analyses, Dreher and Fuchs' (2015) analysis of five phases of Chinese assistance from 1956 through 2006 provides useful historical context for analyzing Chinese aid allocation in the post-2006 period.[17] They examine whether the "rogue aid" narrative stands up to close quantitative analysis and find that China's allocation of aid is more in line with traditional donors than it is different. Dreher and Fuchs analyze five phases of Chinese assistance from 1956 through 2006. After describing earlier periods, they characterize the last phase (1996-2006), the one most relevant for this study, as an era of Chinese international expansion that used grants as a fast and flexible form of financing. They mention a turning point toward a greater focus on development need, particularly in Africa, but they do not examine the post-2006 period, which is one of the main contributions of this study.

China emphasizes win-win cooperation that is meant to be mutually beneficial, whereas Western donors often claim they are not pursuing self-interest.

Like earlier studies of traditional donors, Dreher and Fuchs (2015) examine the competing motives of need, merit, and strategic interest in China's aid allocation.[18]

They conduct this analysis across five periods and usefully distinguish different eras of decision-making. This approach is not often employed by earlier studies, although this study and Grover (2009) make a similar temporal distinction.[19] In general, they find that geopolitical considerations play a key role across all five phases. Countries that do not recognize Taiwan and voted similarly to China at the UN received more assistance. They do not find support for the claim that countries with greater natural resource endowments receive more aid, and Chinese commercial interests drive allocations only in the fifth and final phase (1996-2006). They also find some evidence that China is responsive to development need as it allocates more assistance to countries with lower average income. They do not find any evidence that China allocates more aid based on merit, but they also do not find that China favors autocrats or corrupt regimes.

Dreher and Fuchs (2015) observe that China is motivated to allocate aid based on economic and political interests that are not dissimilar to those of other donors.[20] In contrast, they highlight that China does not hide this fact—China emphasizes win-win cooperation that is meant to be mutually beneficial, whereas Western donors often claim they are not pursuing self-interest. Despite this difference in rhetoric, these findings support the notion that China's motivations for aid allocation are strikingly similar to the motivations of traditional donors. Aside from China's strong preference for aid allocation to countries that do not recognize Taiwan, its allocation of resources is driven by similar motivations as DAC donors.

Dreher et al. (2018) extend this analysis through 2013 with their "Apples and Dragon Fruits" paper that also compares aid to less concessional flows to Africa.[21] Over the 2000-2013 period, they find that strategic considerations largely drive aid decisions while economic interests better explain less concessional flows. Like Dreher and Fuchs (2015), they confirm that China's aid allocation depends heavily on the recipient country's non-recognition of Taiwan and UN voting but not on natural resource endowments or corruption. Again, they find that China allocates more aid to poorer countries. This confirms their earlier findings and suggests that there has not been a significant change in China's motivations for aid allocation in the more recent periods. It also usefully distinguishes between distinct types of flows, which this study emulates using the same dataset.

Building on this approach, Guillon and Mathonnat (2020) disaggregate Chinese aid further by looking at the motivations for assistance across different sectors.[22] They find that social infrastructure (e.g., schools and hospitals) and public service provisions are more oriented toward need but also have strategic considerations. Hard infrastructure is more motivated by economic interests and natural resource endowments. Merit or governance is not significant for China's provision of social infrastructure or services, while China tends to provide more economic infrastructure to countries that have weaker institutions. Their approach to disaggregating sectors is an innovation in the broader literature.

Contribution

This study builds on Dreher and Fuchs (2015) and Dreher et al. (2018) with a few key advances.[23, 24] First, an updated and more comprehensive dataset is now available from AidData that encompasses over 13,000 projects worth close to a trillion dollars across 165 countries. The data are now available through 2017, whereas Dreher and Fuchs (2015) only examine aid through 2006. This implies that this research makes a significant contribution as China only became a major donor on the world stage in the first two decades of the 21st century and because traditional donor motivations have shifted post-2001. Furthermore, Dreher et al. (2018) examine more recent data but only focus on China's

development assistance to Africa. As a result, this is the only study that examines the motivations of all Chinese aid in the post-9/11 era across its global portfolio.

Second, many studies of foreign assistance do not distinguish between the wide-ranging objectives for assistance or vastly different modalities, such as grants for public service provisions versus concessional loans to develop public infrastructure. Clemens et al. (2012) provided a critical innovation to the literature by showing that aid type affects the ability to detect a result as well as its timing (i.e., providing short-term relief through grants vs promoting long-term growth through loans).[25] Given the fragmented nature of the Chinese foreign policy apparatus, there are undoubtedly different motivations for providing different types of assistance. Therefore, this study focuses on the forms of assistance that are most developmental—that is, commercial flows such as debt forgiveness or market-rate loans are not included. The focus is on grant assistance and concessional loans that are allocated by other donors *at least partially* based on development need and their potential for development impact. These flows are tagged as "ODA-like" by the researchers that assembled the dataset (described below).

Third, Dreher and Fuchs (2015) employ a simplistic and perhaps misguided measure of "merit" that only considers whether a recipient is an established democracy or not.[26] Although the evidence is not strong that country selectivity is important for aid effectiveness, donors might be compelled to provide assistance to democracies or other well-governed countries as part of a values-driven approach or as an incentive for government transparency. Thus, this study expands the scope of recipient merit by examining whether China allocates assistance to democracies alongside another widely accepted measure of governance: control of corruption. These measures will help to more comprehensively evaluate claims that China favors authoritarian countries with endemic corruption and conducts debt-trap diplomacy in its aid allocation.[27]

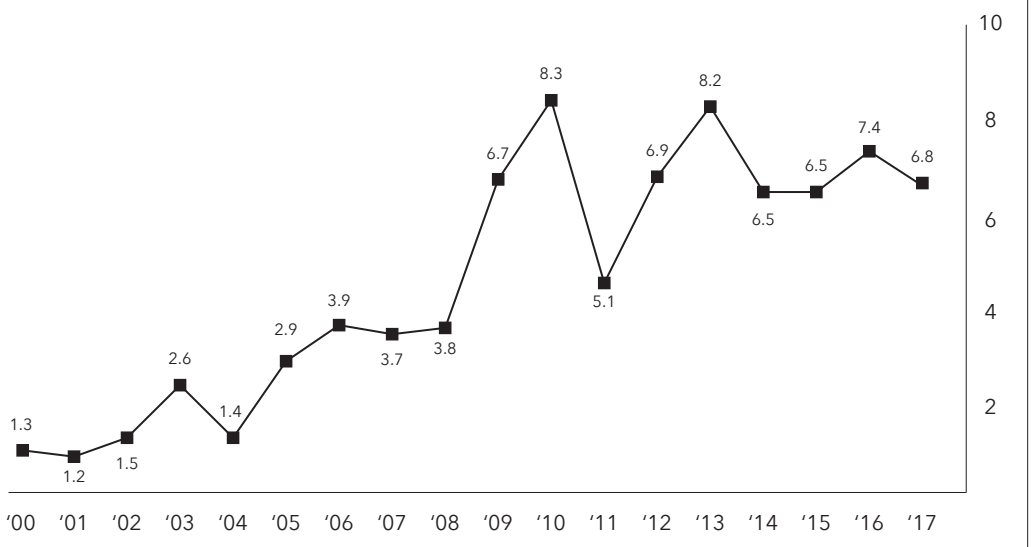
Data

This study obtains its dependent variable from AidData's Tracking Underreported Financial Flows (TUFF) database.[28] The TUFF database specifically tracks official flows from non-traditional donors, like China, that do not transparently report these flows to the standard reporting platforms. Instead of a comprehensive official disclosure, AidData systematically reviews the existing official records across a variety of entities (e.g., China Development Bank and the Ministry of Commerce) and then cross-references and supplements these disclosures with media reporting.[29]

AidData has a sub-set of data that is specific to development finance. The "Global Chinese Development Finance Dataset, Version 2.0" was released September 29th, 2021, and captures 13,247 projects worth $843 billion between 2000 and 2017 across 165 countries.[30] This dataset is unique in that it aligns these scraped data with the OECD definitions of Official Development Assistance (ODA) and Other Official Flows (OOFs), which China does not report. It captures projects implemented by 334 different Chinese entities, from Chinese policy banks to state-owned enterprises to local non-profit organizations. This novel dataset enables this study to contribute to the literature on China's motivations for allocating aid by bringing the data on ODA up to date and providing granular detail on the type of flow.

The AidData dataset uses the TUFF methodology based on DAC guidelines to distinguish between "ODA-like" and "OOF-like" flows. AidData uses three criteria to define "ODA-like" flows. First, the flow must be intended for development, such as for economic development or social welfare. Second, the resource flow must

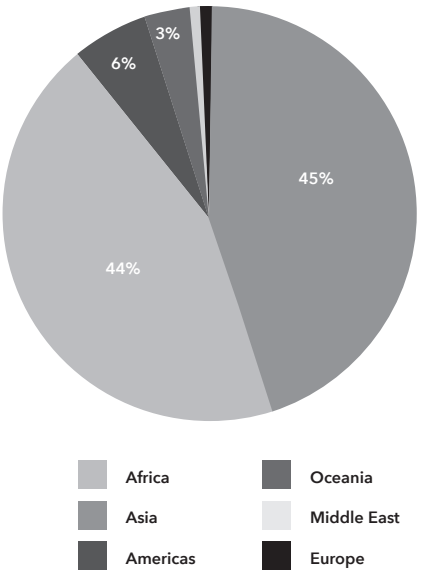
Figure 2: Total Chinese ODA-Like Flows (minus debt) 2000 - 2017 ($ Billions)



be concessional in nature, such as a grant or a loan with at least a 25 percent grant element. Finally, the flow must be intended for a developing country, including low-, lower-middle-, and upper-middle-income countries, and not high-income countries (per-capita GNI of about $12,000 according to World Bank thresholds). This study only utilizes "ODA-like" flows in its analysis, such as grants and concessional loans. I examine the natural log of nominal U.S. dollar flows of both loans and grants separately using the AidData dataset.

For the independent variables, this study exploits the database assembled by Dreher et al. (2021) in their "Aid, China, and Growth" paper.[31] While that article focuses on whether aid translates into economic growth, it also usefully compiles several up-to-date explanatory variables that are relevant to this study. As a control, I use logged population to scale nominal flows to a country's population size. Logged GDP per capita is used as a proxy for development need. Polity IV scores and control of corruption are proxies for merit. The Polity IV project is a now-discontinued measure of democracy that produces a Polity Score on a regime authority spectrum that ranges from hereditary monarchy to consolidated democracy. The control of corruption indicator comes from the World Bank's World Governance Indicators and is a composite indicator that measures whether public power is exercised for private gain, the extent of elite capture, and anti-corruption institutional capacity. I use logged exports from China and a dummy for whether a country is an oil producer as proxies for economic interest. I utilize a dummy variable for whether a country recognizes Taiwan and an index of how closely a country's votes at the UN align with China as the measures of strategic interest. The data also include each country's level of debt-to-GDP. The dataset compiled by Dreher et al. (2021) conveniently covers the entire period of interest across all the explanatory variables needed to test the range of potential interests driving China's ODA-like allocations.[32] All of this study's variables are averaged across three-year periods starting with 1997 through 1999 and ending with 2015 through 2017. The explanatory variables are lagged one period.

Figure 3: Total ODA-Like Flows by Region

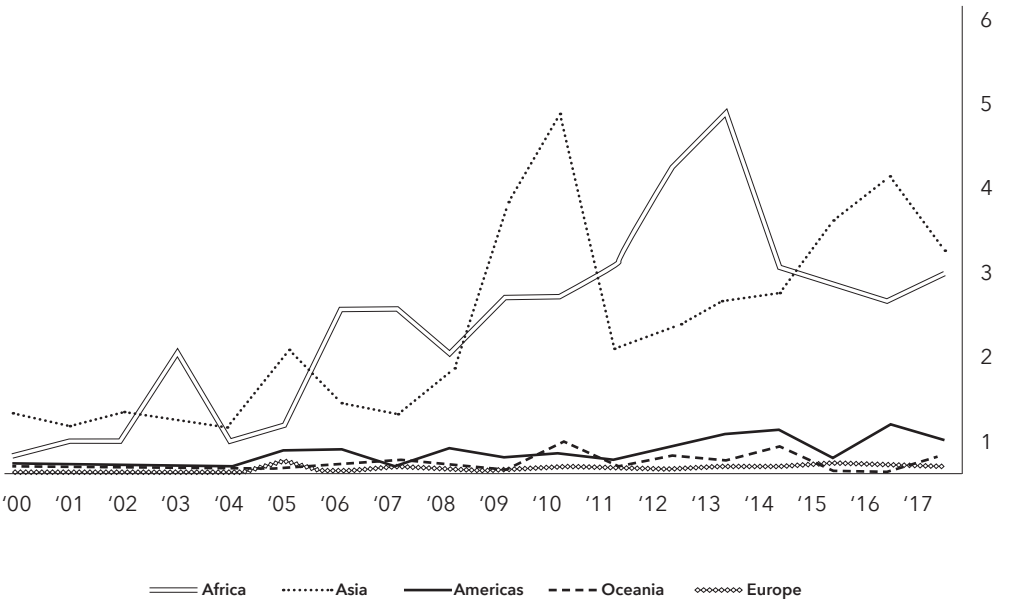


Descriptive Statistics

Examining the TUFF dataset across a few key dimensions can suggest potential hypotheses for the regression analysis. Below, several key trends are described that become evident when examining this novel database.

Figure 2 shows that Chinese ODA-like flows have been increasing rapidly over time. These flows start out at just over $1 billion per year in 2000 and 2001 and peak at over $8 billion in 2010 and 2013. Aid from traditional donors also increased during this time, but the increase was nowhere near as dramatic. The trendline is clearly positive over the sample period, though total ODA-like flows level off after nearly doubling between 2008 and 2009 after the Global Financial Crisis. There is a high level of volatility in the years immediately following that increase, with a large decrease from 2010 to 2011 again

Figure 4: ODA-Like Flows (minus debt) By Region, 2000 - 2017 ($ Billions)



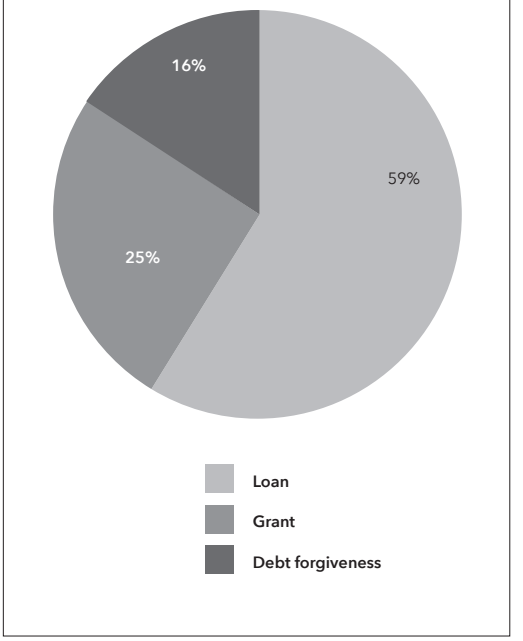
followed by two years of large increases in 2012 and 2013. This highlights the volatility in these flows as China ramped up its grants and concessional loans during this period. The total volume of flows stabilizes from 2014 onward, however, at about $7 billion per year.

Figure 3 shows the distribution of ODA-like flows from China by region. Africa received the highest distribution of flows with 45 percent, followed closely by Asia with 44 percent. This could suggest China's aid allocation is motivated by development need in that Africa has the lowest average income of these regions, followed by Asia. However, this pattern may also suggest China is driven by other non-development interests, as Africa has several large oil exporters and high debt ratios. The large volume of Chinese ODA-like flows to Asia might be explained by strategic interests, since none of China's neighbors recognizes Taiwan and many have extensive trade links with China. The Middle East receives a small share of Chinese ODA-like flows, which might suggest that China places little weight on a county's oil-producer status in its aid allocation decisions, especially as several countries in the region (e.g., Iraq) are major recipients of aid from other traditional donors.

Figure 4 shows how these regional allocations have changed over time. For the entire 18-year sample, Africa and Asia have been the largest recipients of Chinese ODA-like flows, though they have alternated as the top region. Asia experienced a large spike in Chinese aid following the Global Financial Crisis and then fell back to the previous trend, whereas Africa saw a large spike around 2012–2013 but also reverted to the previous trend shortly thereafter. Other regions have received much less aid over the entire period, though the Americas did see a slight increase starting around 2012-2013.

Figure 5 shows the distribution of flows by type. Roughly 59 percent of total flows

Figure 5: Type of Flow 2000 - 2017



were in the form of concessional flows and about 25 percent of the flows were in the form of grants. Another 16 percent were in the form of debt forgiveness. Debt forgiveness is not included in the regression analysis as it is not an actual commitment of new resources, the data are inconsistent, and a handful of cases account for most of the total. In addition, a very small proportion of flows—less than 0.2 percent—was either vague, free-standing technical assistance, scholarships, or training that took place in China. These flows were not counted in the regression analysis due to their indeterminacy, potentially tied nature (i.e., linked to procurements sourced from China), or very small total amounts. Unlike other bilateral donors such as the United States—which provides mostly grants—59 percent of China's ODA-like assistance comes in the form of loans. On the one hand, this may point to potential strategic or economic explanations for the allocation of resources, as China could potentially use debt repayment as strategic, political leverage—essentially the "debt-trap diplomacy"

Table 1: Top 10 Recipients of Total Flows 2000-2017 ($ Billions)

Country	Loans	Grants	Total
North Korea	–	7.17	**7.17**
Ethiopia	6.08	0.19	**6.27**
Indonesia	4.33	0.09	**4.42**
Pakistan	3.12	1.06	**4.18**
Sri Lanka	3.58	0.59	**4.17**
Congo	3.88	0.22	**4.09**
Bangladesh	2.39	0.46	**2.85**
Myanmar	2.24	0.31	**2.55**
Sudan	1.95	0.30	**2.25**
Uzbekistan	2.08	0.16	**2.24**

narrative—or could be pursuing economic interests in utilizing excess capacity and creating markets while still expecting to be repaid. On the other hand, this might more innocuously reflect differences between China and traditional donors in the types of projects targeted for aid allocation. For example, China's ODA-like assistance may be targeted more toward hard infrastructure projects, whereas traditional donors may focus more on funding projects in the social sector through grants. Much multilateral development bank lending for higher-income countries is infrastructure financing that is also non-concessional.

Table 1 shows the top ten recipients of total ODA-like flows from China between 2000 and 2017. The top recipient is North Korea, followed by Ethiopia, Indonesia, Pakistan, and Sri Lanka.[33]

These descriptive statistics paint a mixed picture of the potential motivating factors behind China's allocation of foreign assistance. On the one hand, development need stands out as one potential explanation, with poor regions and countries receiving a large portion of these flows. On the other hand, Asia is of obvious strategic and economic importance to China, and it has

been argued that China is preying on African debt vulnerability to compete with the United States and the West. I will explore which of these explanations dominates in the next section.

Empirical Strategy

Following Dreher et al. (2018), I employ an ordinary least squares approach in my regression analysis.[34] One main specification is applied across both concessional loans and grants for the entire period and then for each three-year period. The specification used across all regressions is as follows:

$$y_{it} = \beta_0 + \beta_1 x_{it-1} \ldots \beta_9 x_{it-1} [+ \lambda_t] + \varepsilon_{it}$$

In the specification above, y is the dependent variable, which represents the log of total commitments of loans or grants, depending on the analysis, to country i in a three-year period t. $\beta_1 x_{it}$ through $\beta_9 x_{it}$ are a set of explanatory variables that are the same throughout. First among these is population, which is standard in the literature to control for larger resource commitments flowing to more populous countries. GDP per capita is used as a proxy for development need, and Polity IV scores and control of corruption serve as proxies for merit. These variables jointly represent the altruistic motivation for allocating resources. Economic interests are proxied by the log of exports that a country receives from China and a dummy variable for whether that country produces oil. Finally, strategic interests are tested using a dummy variable for whether the country recognizes Taiwan, a measure of how closely the country votes with China at the UN, and the recipient's debt-to-GDP ratio.[35] The latter could be lumped into development need (as indebted countries need more ODA-like flows) or economic interests (as highly indebted countries are less likely to pay back loans). However, because critics of China often make claims about debt-trap diplomacy, this study includes this variable with the strategic explanations.

Finally, λ_t includes period fixed effects that are used in the first set of regression analyses covering the entire period of 2000–2017. Period fixed effects control for any overall variation in total flows across three-year periods, including the rise over time. Fixed effects are not included in the later regressions conducted within each period as the annual data are averaged over the period to smooth out the year-to-year volatility for each country's allocations. Importantly, Dreher et al. (2021) compile their explanatory variables through 2014, which is the end of the last three-year period for the lagged explanatory variables that explain the latest period of TUFF data for the most recent period of 2015–2017.[36] The explanatory variables are all lagged one time period. This is standard in this literature as policymakers responsible for aid allocation are necessarily drawing on lagged data in almost all cases. In other words, because official statistics cannot be processed in real time, policymakers are forced to rely on historical data and trends.

Results

Table 2 summarizes the results for the full sample pooling all six three-year periods. For both grants and loans, population is highly significant, as expected, due to the well-known small-population bias of aid allocation.[37] Looking at development need and merit, average income is negative and significant for both loans and grants for the entire period. This means that, like traditional donors, China allocates less foreign assistance to richer countries, on average. While both grants and loans are significant at the one percent level, the relationship is stronger for grants. Assuming the allocation of grants is motivated by interest in recipient countries' development need, China's aid allocation is in line with other traditional donors. On merit, neither democracy (Polity IV) nor control of corruption is significant

Table 2: Total Chinese Grants and Loans, 2000 - 2017
Note: *p < .1, **p< .05, ***p < .01
Source: AidData, Dreher et al. (2021)

Interest	Variable	Grants	Loans
Development Need & Merit	Population	-1.075 (0.228)***	-1.120 (0.347)**
	GDP per capita	-2.773 (0.315)***	-2.455 (0.479)***
	Polity IV Score	0.010 (0.044)	-0.046 (0.067)
	Corruption	0.040 (0.460)	0.290 (0.699)
Economic	Trade	0.406 (0.184)*	0.562 (0.279)*
	Oil	-0.219 (0.582)	-1.361 (0.885)
Strategic	Taiwan recognition	-8.846 (0.788)***	-5.583 (1.198)***
	UN voting	1.023 (4.372)	31.352 (6.648)***
	Debt / GDP	-0.005 (0.004)	-0.025 (0.006)***
	N R^2	615 0.349	615 0.195

at conventional levels. This suggests China does not discriminate on whether a country is democratic (or authoritarian) or well-governed, and it also does not support the narrative that China prefers to work with autocratic regimes or poorly governed countries it can exploit.

Looking at economic interests, trade has a weak relationship with both grants and loans that is significant at the ten percent level, though the relationship is somewhat stronger for loans. China does not appear to favor oil-producing countries with its grants or loans. Overall, this does not suggest a strong argument that economic interests are driving the allocation of Chinese aid.

Turning to strategic interests, recognition of Taiwan has a very large coefficient for both grants and loans that is significant at the one percent level. This means that countries that recognize Taiwan receive almost nine times (–885 percent) less in grants and nearly six times (–558 percent) less in loans on average and all else equal. For grants, UN voting patterns and a country's debt-to-GDP ratio are not significant, but these variables are significant for loans. Alignment to China with respect

Table 3: Chinese Grants by Three-Year Period
Note: *p < .1, **p< .05, ***p < .01
Source: AidData, Dreher et al. (2021)

Interest	Variable	'00 - '02	'03 - '05	'06 - '08	'09 - '11	'12 - '14	'15 - '17
Development Need & Merit	Population	-0.755 (0.621)	-0.788 (0.525)	-1.007 (0.605)	-1.057 (0.575)	-1.729 (0.580)**	-1.380 (0.523)**
	GDP per capita	-3.529 (0.934)***	-3.016 (0.792)***	-3.274 (0.858)***	-2.501 (0.775)**	-2.183 (0.750)**	-2.696 (0.663)***
	Polity IV Score	0.055 (0.123)	0.002 (0.155)	0.014 (0.112)	0.103 (0.106)	-0.037 (0.106)	-0.059 (0.094)
	Corruption	-0.623 (1.315)	-0.077 (1.185)	0.138 (1.213)	0.532 (1.115)	-0.339 (1.098)	0.837 (0.987)
Economic	Trade	0.195 (0.462)	0.548 (0.405)	0.301 (0.494)	0.589 (0.466)	0.619 (0.495)	0.561 (0.454)
	Oil	-0.215 (1.581)	-0.707 (1.424)	-0.166 (1.489)	-1.808 (1.412)	0.136 (1.451)	0.598 (1.293)
Strategic	Taiwan recognition	-9.385 (1.922)***	-10.188 (1.748)***	-5.527 (1.867)**	-7.520 (1.940)***	-13.983 (2.415)***	-9.586 (2.159)***
	UN voting	-2.496 (16.937)	-4.733 (12.057)	20.889 (12.387)	-7.543 (9.938)	3.245 (9.115)	-0.980 (8.002)
	Debt / GDP	-0.012 (0.011)	0.003 (0.010)	-0.011 (0.009)	-0.017 (0.011)	0.009 (0.017)	-0.025 (0.018)
	N R^2	102 0.383	103 0.429	103 0.327	103 0.283	103 0.407	102 0.366

to UN voting has a positive relationship with loans that is significant at the one percent level. The coefficient for debt-to-GDP ratio is negative and statistically significant at the one percent level, suggesting that China is less likely to allocate concessional loans to countries with high debt-to-GDP ratios. This implies that, on the one hand, China strategically allocates loans according to how closely a country's UN votes align with China's. On the other hand, China takes country default risk into account and avoids making concessional loans to countries that are highly indebted.

Table 3 examines how China's motivations for grant allocation may have changed over time. Like in Table 2, the strongest relationships are seen in development need as proxied by average income and strategic interests as proxied by non-recognition of Taiwan. None of the other variables—including both economic variables—are statistically significant at conventional levels. Looking more closely at the two significant variables, the negative relationship with average income (i.e., grants go to poorer countries) weakened over time, and the relationship was stronger in the first half of the full sample (2000–2008) than in the second half of the sample (2009–2017).

Table 4: Chinese Loans by Three-Year Period
Note: *p < .1, **p< .05, ***p < .01
Source: AidData, Dreher et al. (2021)

Interest	Variable	'00 - '02	'03 - '05	'06 - '08	'09 - '11	'12 - '14	'15 - '17
Development Need & Merit	Population	-1.402 (0.787)	-1.270 (0.748)	-0.672 (0.898)	-1.066 (0.881)	-1.533 (0.963)	-0.652 (0.957)
	GDP per capita	-1.699 (1.184)	1.155 (1.128)	-2.064 (1.274)	-3.587 (1.187)**	-3.312 (1.245)**	-3.913 (1.213)**
	Polity IV Score	-0.101 (0.155)	-0.324 (0.163)	-0.154 (0.166)	0.032 (0.162)	0.057 (0.175)	0.155 (0.173)
	Corruption	0.691 (1.668)	-0.175 (1.689)	1.173 (1.802)	-2.352 (1.707)	0.727 (1.822)	0.779 (1.806)
Economic	Trade	0.940 (0.585)	0.236 (0.578)	-0.190 (0.733)	0.453 (0.714)	0.734 (0.822)	1.015 (0.830)
	Oil	-2.105 (2.004)	-0.196 (2.029)	-0.744 (2.211)	-1.549 (2.163)	-2.827 (2.409)	-0.186 (2.366)
Strategic	Taiwan recognition	-4.606 (2.437)	-5.950 (2.491)*	-5.019 (2.773)	-7.048 (2.971)*	-5.667 (4.009)	-5.031 (3.950)
	UN voting	3.615 (21.477)	31.269 (17.181)	46.488 (18.394)*	38.739 (15.223)*	28.928 (15.129)	32.506 (14.640)*
	Debt / GDP	-0.022 (0.013)	-0.004 (0.014)	-0.026 (0.013)*	-0.033 (0.017)	-0.040 (0.028)	-0.022 (0.033)
	N R^2	102 0.120	102 0.208	103 0.219	103 0.359	103 0.240	102 0.237

In contrast, the Taiwan recognition dummy shows no clear trend over time and remains robustly negatively correlated over all time periods.

Table 4 looks more closely at loans over time. Again, GDP per capita has a negative relationship with loans in most periods, but it is statistically significant only in the later periods. There is no significant relationship between average income and concessional loans between 2000 and 2009. This relationship is strongest in the most recent period (2015–2017). Neither democracy nor corruption is significant for any of the time periods. Neither of the economic variables are significant, either. Finally, strategic interests appear weaker as well, as only two of the periods show a negative, significant relationship with recognition of Taiwan and only three periods show a positive, significant relationship with UN voting. Given the strong correlations in Table 2, this may suggest a power issue given that there are only about 100 observations. Unlike in Table 2, the debt-to-GDP ratio is not statistically significant, though the sign on the coefficient is negative for all periods.

The two most closely related studies that examine the motivations of the Chinese

allocation of ODA and OOFs are Dreher and Fuchs (2015) and Dreher et al. (2018), so it is worth comparing my results to their findings as a robustness test.[38, 39] As discussed earlier, Dreher and Fuchs (2015) look at all ODA-like flows over five periods from 1956 to 2006, so comparing with their study is a useful test of whether China's motivations for aid allocation have remained consistent over time or changed in more recent periods. Dreher et al. (2018) examine a more recent period (2000–2012) and distinguish between grants and concessional loans within ODA-like flows. However, the paper only examines aid to Africa, so a comparison may draw out whether Chinese policy in Africa is different than other regions.

The results are similar across all three studies with some notable differences. Population is negative and statistically significant at the one percent level for Dreher and Fuchs (2015) and this study, but not for Dreher et al. (2018), although the signs on their coefficients were all negative.[40, 41] The coefficients on average income (GDP per capita) are also negative across all specifications for all three studies, though Dreher et al. (2018) do not find a statistically significant relationship at conventional levels for loans (and only at the five percent level for ODA and grants). Similarly, this study finds that loans have a slightly smaller coefficient on GDP per capita, though still significant at the one percent level.

In terms of merit, none of the studies find a statistically significant relationship between ODA-like flows and democracy or control of corruption, which suggests that China does not condition its aid on whether a country is democratic or how well it controls corruption. This is an unsurprising finding. Turning to economic motivations, Dreher and Fuchs (2015) find a strong relationship between trade and ODA, but I find only a weak relationship between trade and both loans and grants, whereas Dreher et al. (2018) finds no relationship.[42, 43] Dreher and Fuchs (2015) only find this relationship during the earlier periods, however, and not using the more recent data utilized by Dreher et al. (2018) and this study. None of the studies find a relationship between any of the flows and the dummy for whether a country produces oil.

Turning to strategic motivations, all three studies found a robust negative relationship with recognition of Taiwan that is statistically significant at the one percent level. The magnitudes of the coefficients were all strikingly large, ranging from –415 percent to –885 percent. The other two strategic variables are where the studies start to diverge. Dreher and Fuchs (2015) do not find a statistically significant relationship with UN voting, and neither do Dreher et al. (2018) for all ODA-like flows.[44, 45] When grants and concessional loans are analyzed individually, however, Dreher et al. (2018) find a statistically significant relationship between UN voting and grants at the one percent level. However, this study finds no such relationship but finds a highly significant relationship between UN voting and loans. Looking back at Table 4, the relationship between loans and UN voting does strengthen over time, so perhaps this explains the difference as this study extends Dreher et al. (2018) by four additional years.

Finally, Dreher and Fuchs (2015) do not look at debt-to-GDP ratios, but both Dreher et al. (2018) and this study found a highly significant relationship only with loans.[46, 47]

Policy Implications

This study's finding that China is motivated by development need and strategic interests but not merit or economic interests is consistent with other recent studies of the Chinese allocation of ODA-like resources. This reinforces Dreher and Fuchs' (2015) conclusion that the motivating factors behind China's allocation of ODA-like flows are not dissimilar from those of traditional donors.[48] This section ends by reviewing the findings regarding China's motivation

for aid allocation and comparing them to those of traditional donors to draw out policy implications.

First, this study and others suggest that China considers development need by mostly allocating its ODA-like resources to poorer countries—both grants and concessional lending. This is an important finding in that it pushes back on the notion that China is overtly strategic in its allocation of foreign aid. Although strategic interests certainly play a role in China's decision-making process for aid allocation, China does not exclusively provide assistance on the basis of strategic alignment. While this could still be true of market-rate lending or other engagement, China's ODA-like flows are targeted mainly to poor countries, as is the orthodoxy among traditional donors.

Second, China does not discriminate based on merit. This criticism may be well-founded, though it is not specific to China. China does not appear to allocate more assistance to democratic or less corrupt countries, although it also does not favor authoritarian or poorly governed countries either, as is sometimes alleged. While this does not shine a positive light on China's allocation decisions, it seems highly unlikely that China would favor democracies *prima facie*. The fact that China does not discriminate *against* democracies is perhaps an important finding, as it suggests that China does not appear to favor poorly governed countries or autocracies that it can exploit or draw into its orbit. In addition, there is little evidence to support claims that China practices so-called "debt-trap diplomacy" in its concessional lending. Rather, China shies away from providing loans to countries with high indebtedness. This is consistent with other studies, such as Gelpern et al. (2021), that show that China is more interested in being repaid than in entrapping its partners.[49]

Third, China does not appear to decisively allocate its assistance based on economic interests. This study does provide some weak evidence that China allocates more assistance to countries it exports more to, while other studies provide mixed evidence. Furthermore, China does not allocate more assistance to oil-producing states. On balance, it is hard to make the argument for Chinese "rogue aid." This is also true of most traditional bilateral donors—while economic interests were more common during the late Cold War into the 1990s, these have fallen away more recently, at least for ODA.

Although strategic interests certainly play a role in China's decision-making process for aid allocation, China does not exclusively provide assistance on the basis of strategic alignment.

Finally, China is undeniably strategic in its allocation of assistance, particularly when it comes to the recognition of Taiwan. Studies of the allocation of Chinese assistance unanimously find a statistically significant negative relationship between ODA and the recognition of Taiwan. This is clearly an issue of significant importance for China, and many individual examples—where a country either recognizes Taiwan and loses aid or rescinds its recognition and is showered with assistance—support this finding. For example, the Solomon Islands was recently rewarded for rescinding recognition of Taiwan. One highly visible reward a

new, Chinese-built national stadium in the capital, Honiara, after the Solomon Islands switched its diplomatic ties from Taiwan to China in 2020. In addition, there is some weak evidence that UN voting also sways the allocation of resources, though the findings are mixed. Overall, China does provide more assistance to strategic partners, but this is very much in line with traditional donor practice.

These mixed motivations seem to have held up in the half decade since the end of my sample period. Honduras is an even more recent example of China showering a country with aid after breaking ties with Taiwan—this aid is overtly and undeniably motivated by strategic interests. On the other hand, China has announced a new Global Development Initiative (GDI) that proclaims that "GDI puts development first and the people at the center and seeks to expedite the implementation of the 2030 Agenda."[50] While this could be dismissed as rhetoric to obscure China's strategic motivations, this study has nonetheless shown that China is providing large sums of grant assistance to countries in great need of grant financing that will help to accelerate progress towards the SDGs regardless of China's motivations.

Conclusion

This study examined the motivations for China's allocation of foreign assistance across a range of factors, including altruism, economic interests, and geopolitics. Like other studies, I found that China is largely motivated by development need and strategic interests, but not merit or economic interests. While China is undoubtedly strategic in its allocation of assistance, particularly when it comes to the recognition of Taiwan, this is in line with traditional donor practice. These findings are strikingly similar to those of Grover (2009), who found that U.S. aid allocation is motivated primarily by development need and strategic calculations.[51]

In short, the critiques of Chinese "rogue aid" and debt-trap diplomacy do not hold up, at least for ODA-like flows. There is some truth to the claim that Chinese assistance is self-interested, but this is not unlike other major donors. Thus, China observers (particularly Western donors) should be circumspect in their criticisms of China's allocation of aid resources, as traditional donors allocate their assistance based on the same selfish interests. A more constructive approach might be to encourage China to become a better donor, such as by providing more transparent official reporting on flows, improving standards and protections during project implementation, and focusing more on adherence to international norms related to improving aid effectiveness, such as through joining the OECD/DAC. More broadly, all donors (including China) should re-focus efforts to make ODA more focused on those who need it most and less subject to geopolitics to improve the development impact of these resources.

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Notes

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