

The Digital Yuan and the BeiDou Satellite System: China's Increasing Structural Power in an Interdependent World

By

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ABSTRACT

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For decades, concerns over a rise of a powerful China have dominated mainstream media. China's unprecedented economic ascent, growing voice in global decisions, and publicized industrial plans like Made in China 2025, have propelled the nation to the center of the world stage. In my thesis, I break down this subject to examine how China is attempting to increase its structural power and create new interdependencies through the buildup of certain networked technologies. Guided by foundational international political economy literature regarding structural power and interdependence, I explore the implications of two technological advancements: China's digital yuan (DCEP), and the BeiDou satellite system on global interdependency structures. Although faced with limitations regarding international buy-in, China's use of both the BeiDou satellite system and the DCEP systems poses credible threats to the postwar power systems dominated by the United States and could redistribute global power.

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INTRODUCTION

Western hostility towards China encourages the paranoia and strengthens the domestic political position of the paranoiac... We should be skeptical of Chinese intentions, without falling into hostility. We should maintain a dialogue with China, even if the tone is not always cordial. We should regard China as a complex and contradictory nation, one likely to be alternately partner and adversary. China is not a villain... but rather an ambitious nation that is becoming the behemoth in the neighborhood. One of the oldest problems in international relations... has been how the international community can accommodate the ambitions of newly powerful states. It is rarely a question of right or wrong, but rather of the instability that is inevitable as the previous military, economic and political balance must be recalibrated. If China is able to sustain its economic miracle, then this readjustment of the scales will be one of the most important – and perhaps dangerous – tasks in international relations in the coming decades.

Nikolas Kristof, 1993

Over the past 40 years, China has transformed from an isolated nation into the world's largest economy. In colloquial Chinese, this kind of change is referred to as, 麻雀变凤凰; “from sparrow to phoenix.” The World Bank described China's economic trajectory as “the fastest sustained expansion by a major economy in history.” This economic transition has raised China's prominence and influence in global relations. China's dominance in the international sphere is not unique to the twentieth century. On the contrary, for most of recorded history, China has been far more developed, technologically sophisticated, prosperous, and civilized than the west. Only in the last half-millennia has Europe managed to pull ahead and dominate global economic and cultural spheres. For decades, the western perspective has been one that sees China's backwardness as inevitable, its government and ideologies incongruous with market dominance. However, surges in economic growth and increased political and social influence indicate that China is regaining the global dominance it lost during the years of western industrialization. Throughout the 1990s, some academics warned that the international

community was not granting adequate consideration to the implications of the rise of a powerful China. While the business community may have taken notice, it seemed as though political leaders were either preoccupied with other concerns, or skeptical of China's ability to rise to the top. Furthermore, Western governments operated under the notion that China would seamlessly join and uphold the international world order dictated by the United States.

China's accession to the World Trade Organization in 2001 was taken as preliminary evidence that China would open its economy and democratize its politics. However, much to the dismay of hegemonic powers, the Chinese government and economy have increased in dominance without full market liberalization. Xi Jinping's administration, beginning in 2012, has made it clear to the world that the Chinese state will not decouple from its economy, rather continue to move forward with attention towards the nation's legacy of socialism. Moreover, Xi's rise to power has indicated China is charting its own path, one that seeks to reshape, alter, and redefine elements of the existing world order to better fit the nation's values and interests. China does not want to play by the rules, it wants to make them. The world has caught on, and nations across the globe have turned their attention east. China now dominates global news. News stories across the globe warn China is emerging as a dangerous hegemon, one capable of challenging or overthrowing the United States' postwar regime.

Fears of China's rise are grounded in the contemporary realities of living in an interdependent world. While the world may seem polarized ideologically, it is increasingly connected structurally. Global networks of trade, telecommunications, and finance link international actors in unprecedented ways, and it is through those networks that certain nations may gain advantages, whether structural or relational, in the global economy. For most of recent history, globalization has offered the United States and Europe significant leverage over shaping

the contours of the international political economy. The literature surrounding structural power, beginning with Susan Strange in the 1980s, attempts to explain how certain nations and actors gain influence in the international political economy due to their command of global institutions, networks, and systems. Political theories of interdependence emerging in the second half of the 20th century shed light on how relationships between nations, businesses, and institutions affect international relations, and how asymmetrical power relationships can be used both as a collaborative force and a tool of destruction. These two bodies of work shed light on the political, social, and economic forces that shape modern state power. Both literatures settle on the idea that the United States and other powerful countries have maintained their status as global hegemony due to their unique control over international finance, information networks, core technology, and the centrality these systems and technologies have in the current economy.

China knows well that centrality in the international political economy is more than market size or production capacity. The networks (both information and financial), core technologies, and major international institutions a nation exerts influence over are also determinative of a nation's power, and some countries' share of this power is greater than others. With this in mind, China is surging forward with new industrial plans to advance its position in the global hierarchy. Grand plans like Made in China 2025, which aims to turn the nation into a high-tech industrial superpower, and the Belt and Road Initiative, which expands Chinese physical and digital infrastructure throughout the east are tangible examples of Beijing's ambitions. However, published state plans are not the only route towards success. China is also investing in technologies with high levels of interdependence.

My research focuses on two new areas of technological development, both with deep implications for China's structural power and global interdependency networks: digital currency

and satellites. China's digital yuan, projected to launch as soon as this year, has the potential to undermine U.S. structural power in international finance by offering countries an alternative to U.S. and EU-dominated financial networks like the Society for Worldwide Interbank Financial Telecommunications. If accepted by the international community, the digital yuan could rise in status as the next international reserve currency, and grant raises China's centrality in the international financial system. China's BeiDou satellite system, which was declared fully operational this past summer, marks a significant achievement in China's space program. The BeiDou system also serves important functions for both China's military and throughout the Belt and Road Initiative. These case studies were chosen due to both technologies' high levels of interdependence and cutting-edge nature, making them representative of China's overall geostrategic aims.

The structure of this paper is as follows: I begin with a discussion of China's economic trajectory, an outline of some of the most pressing challenges to Chinese growth, and China's new industrial strategy. The conversation in Chapter 2 is then grounded in a lengthy literature review of interdependence and structural power. In addition to clarifying both fields, I also compare the two disciplines and determine areas of overlap. Chapter 3 is split into two case studies: the digital yuan and BeiDou satellite system and what they can reveal about China's status in the global economy.

CHAPTER 1

China's Economic Growth and Industrial Trajectory

For a generation, China has been the manufacturing center of the globe. In 2015 alone, China produced or assembled 28% of the world's automobiles, over 90% of the world's mobile phones, 80% of its computers, 41% of its ships, 24% of its power, and nearly half of the world's steel.¹ In 2018, the United Nations National Statistics reported that China accounted for 28% of global manufacturing output (Richter 2020). What is made clear in MIC2025 is that China is no longer content with being the world's factory, and with good reason. China's production in these industries remains low value-adding and energy-intensive, which not only weakens China's position in advanced markets but also contributes heavily to global pollution.² Furthermore, China is keenly aware of the middle-income trap (when economic growth levels off and stagnates before high GDP per capita is achieved). In 2019, China's GDP per capita rose to \$10,261.679, an almost 1000% increase from the year 2000. However, China still falls far behind advanced economies like the U.S. whose GDP per capita measured \$65,297.518 in the same year.³ Chinese and international policy experts agree that if China is to achieve high-income status, its future economic development must be driven by innovation, rather than credit.⁴

Furthermore, China is aging, and its eligible workforce (people aged 15 to 59) is shrinking. The one-child policy, introduced in the 1980s to control population growth and reduce poverty, has effectively stymied China's birth rate. In 2016, Beijing reformed its "family

¹ European Union Chamber of Commerce in China, 2020
<file:///C:/Users/Marina/Downloads/China%202025%20EU%20Chamber%20of%20Commerce%202017%20Report.pdf>

² European Union Chamber of Commerce in China, 2020

³ The World Bank <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=US>

⁴ European Union Chamber of Commerce in China, 2020

planning” policy, allowing parents to have two children. Although leading to an 8% increase in 2016, birth rates fell 3.5% in 2017 and continue to decline. The future of China’s family planning practices now hangs in the balance as policymakers are being forced to confront the repercussions of a smaller workforce. In January of 2019, the Chinese Academy of Social Sciences released a report projecting China’s population to peak at 1.44 billion in the year 2029, suggesting that by 2030, China will begin to see negative population growth (Campbell 2019). By 2050, the country’s population may decrease to 1.364 billion, with 330 million Chinese over the age of 65.⁵ By 2065, China’s population is projected to fall back to 1996 levels at approximately 1.248 billion. China’s unprecedented economic ascension was built upon labor-intensive manufacturing facilitated by a large population. However, with a declining workforce, and no social safety net for the elderly, China’s push to get rich before it gets old is not unwarranted; it is dire.

China’s desire to move up the global value chain is coinciding with a profound period of technological advancement. Global advancements in digitization and machine learning have caused many scholars to suggest we are entering into a new phase of industrialization, akin to the waves of industrialization occurring since the 18th century. Industrial progress has progressed in waves. The first industrial revolution began in the 18th century and was characterized by mechanical production driven by steam and waterpower. The second revolution occurred in the 19th century when the electrification of machines enabled assembly lines and mass production. The third revolution began in the late 1970s when computers gave way to industrial robots, programmable logic controllers, and IT-based production management. Today, production in industrial countries hinges mostly on tools and technologies created during the 3rd revolution.

⁵ <http://en.people.cn/n3/2019/0104/c90000-9534837.html>

However, scholars are currently pointing to a fourth disruption, Industry 4.0. Industry 4.0 is characterized by the combination of advanced internet and communication technologies embedded systems, and intelligent machines.⁶

The aforementioned topics all influence the new direction Beijing is taking in terms of foreign and domestic policy. Industrial plans like Made in China 2025 (MIC2025) and the Belt and Road Initiative (BRI) show China's desire to improve its domestic technology industry as well as expand its influence across the globe. Furthermore, Beijing's promotion of cutting-edge technology including next-generation telecommunications infrastructure, satellites, and digital currency supports the notion that Chinese officials are targeting certain networked industries in their pursuits of gaining more power in the international order.

1.1 Overview of Made in China 2025

While China's ascension to global dominance is not guaranteed, the Chinese government is taking steps to ensure its upswing amidst economic maturation. In 2015, Chinese state officials launched an initiative to promote the development of advanced industries and technologies. Entitled China Manufacturing 2025, or "Made in China 2025" the program aims to transform the country into an industrial superpower. Made in China 2025 targets emerging high-tech industries such as the automotive industry, aviation, machinery, robotics, energy-efficient vehicles, advanced maritime and railway equipment, information technology, medical equipment, and other industries pivotal to growth in advanced economies. By setting ambitious goals for "smart manufacturing," and systematically intervening in its domestic markets, China aims to substitute foreign expertise with Chinese enterprises and move towards "self-

⁶ European Union Chamber of Commerce in China, 2020

sufficiency.” Most of the information regarding MIC2025 was taken from the 2020 European Union Chamber of Commerce in China report.

MIC2025 is one route China is taking to transition from a low-value-adding, labor-intensive production economy to the forefront of global innovation. In President Xi Jinping’s words, “China’s foundation for science and technology is still not firm. China’s capacity for indigenous innovation, especially original innovation, is still weak. Fundamentally, the fact that we are controlled by others in critical fields and key technologies has not changed.”⁷ At its core, this is what MIC2025 aims to change. The plan seeks to gradually replace foreign with Chinese technology and increase Chinese market share of core technologies. By positioning itself at the center of high-tech, China aims to simultaneously reduce its reliance on foreign enterprises and increase international dependencies on Chinese technology. The policy even has a clear goal for this, aiming to increase the domestic market share of Chinese suppliers of “basic core components and important basic materials” to 70% by 2025. This shift is meant to be accomplished by breaking down institutional barriers and improving coordination between government, academia, and industry. The exact definition of ‘indigenous’ in MIC 2025 is unclear and often at odds with initial definitions set by the Chinese government. In the past, it was found to refer only to products and technologies developed in China, defined as “enhancing original innovation through co-innovation and re-innovation based on the assimilation of imported technologies.” Now, it is unclear whether that definition will expand to include foreign innovation in China.

⁷ European Union Chamber of Commerce in China, 2020

The MIC2025 initiative identifies ten key sectors of special interest. In the order listed in the original plan, they are:

- Next generation IT
- High-end numerical control machinery and robotics
- Aerospace and aviation equipment and high-tech maritime vessel manufacturing
- Advanced rail equipment
- Energy-saving vehicles and NEVs
- Electrical equipment
- Agricultural machinery and equipment
- New materials
- Biopharmaceuticals and high-performance medical devices

1.2 Implementation Strategies of MIC2025

Achieving the goals outlined in MIC2025 will require intensive political campaigning and financial support from the Chinese government. China is taking various approaches to implement MIC2025. The Congressional Research Service outlined six main strategies in its August 2020 report for U.S. Congress. The first are tax, trade, and investment measures. The Chinese government is using tax preferences as incentive for foreign firms to shift their production and R&D to China. In addition, the Chinese government uses domestic standards, IP, competition, and procurement policies to solicit foreign knowledge while using Chinese suppliers for key components. The second tactic is forced joint ventures (JVs) and partnerships. China forces JVs through formal regulations and informal certifications that require businesses to

have a Chinese partner. For example, in aerospace, China leverages its status as a major purchaser to press for joint ventures and technology transfer which helps develop indigenous capabilities. Third, the Chinese government, by means of its government guidance funds (GGFs) provides generous state subsidies to its domestic companies. The report notes that as of March 2018, an estimated \$426 billion dollars was funneled collectively through 1,800 GGFs linked to MIC2025. Fourth, GGFs target and fund strategic foreign acquisitions. GGFs look to acquire firms whose IP, talent pools, ties to suppliers and customers, and corporate expertise would build Chinese capabilities. Lastly, Chinese firms both encourage the return of qualified expatriates and recruit foreign talent. The recruitment of foreign expertise is not unique to MIC2025, but rather a trend in Chinese R&D. Many of China's largest technology firms (e.g. Alibaba, Baidu, Tencent, and TikTok) have U.S. based R&D centers that partner with universities and leverage U.S. talent.⁸

The U.S. is not the only international player noting concern over China's MIC2025 implementation strategies. Three years before the publication of the Congressional Research Service report, in 2017, the EU Chamber of Commerce released its assessment of MIC2025. It lists 10 key policy tools, and mimics similar areas of concern, namely:

1. Forced technology transfers in exchange for market access.
2. Market access and government procurement for FIEs
3. Standards
4. Subsidies
5. Financial policy

⁸ Congressional Research Service, 2020 <https://fas.org/sgp/crs/row/IF10964.pdf>

6. Government-backed investment funds
7. Support from local government
8. Technology-seeking investments abroad
9. State-owned enterprises: mergers and politicization
10. Public-private partnerships

The policies, goals and context surrounding of MIC2025 illustrate China's determination to rise to the top of the global value chain. Although not the sole focus of this paper, MIC2025 provides a tangible entry point to the discussion of China in terms of structural power and interdependence. Malkin (2020) argues that via MIC2025, China is raising its latent capacity to go beyond relational power (defined in Malkin as "the power to work within the structural of global order overseen by the U.S.") raise its productive power (broken down into four categories: market power, centrality in global value chains, ownership of assets, and technological standard setting) to shape the structural contours of global order (Malkin 2020, p.5). While Malkin suggests that U.S. hegemony remains constant, his empirical evidence suggests that recent IPE scholarship is too quick to dismiss China as a real challenger of U.S. structural power.

Other scholars do not share these optimistic views about China's future as the next global hegemon. While the China's economic statistics and industrial plans are impressive, they are not a conclusive measurement of the nation's hegemonic potential in the twenty-first century. Mingtan Liu and Kellee Tsai apply a comparative and historical account of the Chinese economy to explain the dynamics affecting China's growth in the contemporary era. Liu and Tsai claim that interactions among three types of capital: state, private and foreign, produce developmental dynamics that constrain China's growth. Those dynamics include compromised competitiveness

of China's corporate sector due to the domination of SOEs, limits on Chinese firms' ability to develop leading transnational corporations (TNCs), and early openness of and continued dependence on foreign capital (Liu and Tsai 2020, p.1). Tsai and Liu's key argument is, although state-capitalism and openness to foreign capital helped spur China's growth, the dynamics of the growth process itself, combined with the changing nature of the global economy have generated structural constraints on China's capacity to develop strong TNCs and resulted in strong backlash from Western industrial nations. As further discussions of new interdependence will illuminate, this is of serious concern in an age where such corporations play a dominant role in the global economy.

Liu and Tsai's article is particularly useful in that it both historicizes China's economic development as well as applies and critiques certain theories of structural power. Their discussion of China's development provides important context for my discussion of MIC2025, the digital yuan, the BeiDou program, and the backlash these decisions have had from the international community. Particularly helpful context is that throughout the Reform Era, the goal of the CCP was to maintain political power. This led to the bolstering of formidable SOEs at the expense of private enterprise, and an openness to foreign capital that reduced the bargaining power of domestic private capital. The party's reform strategy has been to "empower the market to save itself," which, in turn, leads to a delicate balancing act between the interest of capital and maintaining state control over strategic sectors. Therefore, MIC2025 and increased state involvement in next-generation technology are of particular importance. The question will be whether promoting indigenous innovation to move up the global value chain, will lead to the state favoring of less productive SOEs over private business and throw the nation into a "partial

reform equilibrium” whereby the state acts as a political barrier to the nation’s capital accumulation.

China’s state-centric model is not only a potential deterrent to the economy but has significant political ramifications. Liu and Tsai use Robert Cox’s theory of structural power and hegemony to anchor this argument analytically. Cox defines hegemony as encompassing both strong structural power and the ability to generate consent and exercise leadership in the global political economy. Referring to their structural constraints and empirical evidence regarding the productivity of China’s SOEs, the authors explain why this view of hegemony proves more fruitful than traditional structural power literature. Liu and Tsai claim that authors like Strange equate preponderant structural power with hegemony. What this does is fail to distinguish between the ability and the will to rule. Cox’s account, however, is more encompassing, in that he argues hegemons should be perceived by other major powers as (more or less) representative of global interest, and that perception should expand beyond subjective sentiment and offer tangible benefits to other countries under the hegemon’s leadership. To be a global hegemon, Tsai, Liu, and Cox suggest one must have both qualities. China, however, does not fit perfectly in this model. China’s state-centric tendencies raise concerns from the international community as it would be incongruous to assume that a protectionist state has the best interest of the international community in mind. However, what Liu and Cox fail to demonstrate is that China is making efforts towards expanding tangible benefits to its allies.

If Malkin’s propositions hold ground; then China is working towards increasing its structural power via networked infrastructural technology such as telecommunications, digital currency, and satellite technology. These technologies hinge upon advancements made through Industry 4.0. Industrial programs like MIC2025 articulate China’s desire to move up the global

value chain and reconfigure its position in both the international economy and hierarchy. In order to determine whether these examples are truly indicative of a shift in interdependence or structural power requires extensive discussion of the two literatures.

CHAPTER 2

INTERDEPENDENCE AND STRUCTURAL POWER LITERATURE REVIEW

2.1 Interdependence Literature

Interdependence, the mutual dependence between nations resulting from international transactions, was brought to the forefront of international political economy literature by Keohane and Nye in their 1977 book, *Power and Interdependence*. Keohane and Nye were reacting to a rapidly changing political and technological environment in which international relations seemed increasingly complicated, and the business of nations increasingly intertwined. At the time, academicians were torn between two dominant perspectives regarding interdependence and the evolving nature of global politics. Modernists who proposed advancements in travel and telecommunications technology were creating a “world without borders,” clashed with traditionalists who insisted upon the continuity of the nation-state and the permanence of military interdependence. Keohane and Nye created a new analytical framework of interdependence, one that more thoroughly evaluated the multidimensional economic, social, political, and ecological interdependence through models (Keohane and Nye 1977, p.4). Keohane and Nye refer to interdependence as situations characterized by reciprocal, although not always equivalent, effects among countries or among actors in different countries (Keohane and Nye 1977, p.5). Two main questions guided their work. The first being, what were/are the major features of world politics when interdependence, particularly economic interdependence, is extensive? (Keohane and Nye 1977, p.5) And the second, why and how do international regimes change? It is important to note that while these are the two major questions outlined in the book Keohane and Nye the umbrella question beneath they operate beneath, is simply the age-old question of politics “who gets what?”

It is undeniable that our world has become increasingly interconnected since the end of the Second World War, and that the international transactions between nations – flows of money, goods, people, and messages across state boundaries – have brought about complex relationships between nations large and small (Keohane and Nye 1977, p.8). Keohane and Nye aptly distinguish between interconnectedness and interdependence, stipulating that interdependence relationships depend on constraints and associated costs, while interconnectedness refers to transactions without significant costs. For example, they argue a country that relies on oil imports from another nation will be more dependent on a continual flow of oil than one importing luxury goods. These discrepancies in value influence Keohane's and Nye's rejection of the modernist assumption of mutual benefit. By expanding the bounds of interdependent relationships beyond situations of mutual benefit, Keohane and Nye suggest that interdependent relationships will always require costs (since interdependence restricts autonomy) yet do not always specify a priori whether the benefits of the relationship will exceed its costs (Keohane and Nye 1977, p.8). Furthermore, they throw away the assumption that measures to increase the joint gain from a relationship are exempt from distributional conflict.

Keohane and Nye propose that interdependent relationships are most often asymmetrical and that it is these asymmetries that provide the politics of interdependence; the situations and conflicts that arise when less dependent actors leverage their relationships as bargaining power. Keohane and Nye argue that global politics is not the difference between a “zero-sum” (where one side's gain is the other side's loss) and “non-zero-sum” game. States and actors do not always act rationally in situations of economic and ecological interdependence; cooperating in certain situations while competing in others, even if large net benefits could be expected from cooperation. (Keohane and Nye 1977, p.8).

Interdependence, much like structural power, is intricately connected to definitions of power. Keohane and Nye look beyond the traditionalist view that military strength is the dominant form of power in the international arena and that states with the most military power control global affairs. As we know well in contemporary politics, and Keohane and Nye observed in the 1970s, the resources that produce power capabilities are much more complex than military might. The proposition that military and economic power were not the sole determinants in state behavior was a radical challenge to the fundamental principles of traditional and structural realism, and an analytical shift in understandings of power (Keohane and Nye 1977, p.9). When Keohane and Nye suggest that asymmetric interdependence can be a source of power, they refer to power as “control over outcomes, or the *potential* to affect outcomes.” The less dependent actor in an interdependent relationship has significant political resources because changes in the relationship, which could be leveraged or imitated by the less dependent actor, will be less costly to that actor than its partners. Keohane and Nye make two key distinctions regarding the role of power in interdependence: the difference between vulnerability and sensitivity. Sensitivity in interdependent relationships refers to an actor’s liability to ensue costly effects imposed from outside factors before policies are altered to change the situation. Vulnerability, on the other hand, is defined as an actor’s liability to suffer costs externally even after policies are altered (Keohane and Nye 1977, p.11). In other terms, an actor is less sensitive if they can reasonably respond to outside effects quickly, and with relatively little costs, and less vulnerable if they can alter policies or find reliable alternatives. The concepts of sensitivity and vulnerability expand beyond military capabilities and are further explored in discussions of complex interdependence.

Keohane and Nye's theory of complex interdependence has been referenced, reconstructed, and frequently critiqued by the new wave of interdependency scholars. However, it is important foundational base and a central component of the neoliberal perspective, and therefore is deserving of an introductory discussion. Keohane and Nye articulate three main characteristics of complex interdependence: 1) state policy goals are not arranged in stable hierarchies, but are subject to trade-offs, 2) the existence of multiple channels of contact among societies expands the range of policy instruments, limiting the capacity of foreign officers to tightly control governments' foreign relations; and 3) military force is largely irrelevant (Keohane and Nye 1987, p. 738). Table 2.1 in *Power and Interdependence* lists five sets of political processes expected to differ under conditions of complex interdependence. Those are: goals of actors, instruments of state policy, agenda formation, linkages of issues, and the role of international organizations (Keohane and Nye 1977, p. 37). A significant aspect of complex interdependence is its combination of two opposing views, integrating both elements of power politics and economic liberalism. Keohane and Nye argue that states are not as sovereign nor unitary as realists believe. This observation leads to one of the most principal contributions of *Power and Interdependence* which is its systematic attempt to analyze the process now known as globalization.

The subjects and puzzles presented in *Power and Interdependence* have shaped our perceptions of “globalization, international trade, regime formation and change, non-state actors as well as the nature of power and military force in the global realm” (Walker 2013, p. 148). However, like any foundational text, its principles have been re-evaluated throughout the decades. Some critics of the neoliberal view of interdependence suggest that military significance cannot be underplayed as a causal factor or deciding tool in international relations

(Rana 2015, p. 297). Others point to a lack of analysis of the underlying structures dominating world politics (Farrell & Newman 2019). It is important to note that more recent scholarship is reacting to a new world. This “new school” analyzes the realities of globalization. The world has changed dramatically since the 1970s. Even in the years following the 2003 U.S. invasion of Iraq, world trade, currency flows, foreign direct investment (FDI), and other methods of economic globalization have grown at extraordinary rates. Furthermore, today’s emerging global powers (China, India) have deep and complex commercial interconnections with the U.S. and Europe, unlike the superpowers of the second half of the last century (Newman and Posner 2010, p. 590). Globalization, combined with the third, and proposed fourth industrial revolution (Industry 3.0 and 4.0) have created complex global networks and changed modern understandings of power and interdependence.

In 1999, a few decades after the publication of *Power and Interdependence*, columnist Thomas Friedman declared the end of the Cold War geopolitical system. He argued the world had “gone from a system built around walls to a system increasingly built around networks.” He suggested an era of harmony was soon approaching, and states’ main worries would be how to manage market force rather than entanglements with one another. Recent interdependence literature often has sinister tone towards globalization and the dissolution of state jurisdictional boundaries. With markets and networks escaping from confinement, those who wield regulatory and other forms of power (whether that be sensitivity/vulnerability) over those structures play a significant role in the global hierarchy. In 2019, Farrell and Newman describe this new terrain:

*Instead of liberating governments and businesses, globalization entangled them.
As digital networks, financial flows, and supply chains stretched across the
globe, states—especially the United States—started treating them as webs in*

which to trap one another. Today, the U.S. National Security Agency lurks [2] at the heart of the Internet, listening in on all kinds of communications. The U.S. Department of the Treasury uses the international financial system to punish rogue states and errant financial institutions. In service of its trade war with China, Washington has tied down massive firms and entire national economies by targeting vulnerable points in global supply chains. Other countries are in on the game, too: Japan has used its control over key industrial chemicals to hold South Korea's electronics industry for ransom, and Beijing might eventually be able to infiltrate the world's 5G communications system through its access to the Chinese telecommunications giant Huawei (Farrell and Newman 2019, p.1)

Globalization, rather than liberating governments and businesses, proved to be a new source of vulnerability, competition, and control. Recent interdependence literature accepts that globalization coupled with technological advancement have brought about complex networks from which countries cannot easily escape. Farrell and Newman (2019) go as far as suggesting globalization makes the Cold War seem simple. Today's global economic networks have increased security consequences, not only because they are creating interdependencies between states that were previously relatively autonomous, but also because the financial, information, and trade networks linking multiple nations are so complex that policy makers often cannot fully comprehend them, which increases the risk of ill-informed decisions leading to dangerous conflicts (Farrell and Newman 2019, p.1).

One of the biggest changes brought about by globalization is the decreasing relevance of geographic boundaries. Markets and networks expand well beyond the jurisdiction of any one

state. Newman and Posner (2010) explore how changing jurisdictional boundaries effect and interdependent relationships. Newman and Posner revisit the question: when does cross-border economic interdependence become a source of power? Their approach attempts to answer this question by synthesizing market size, market scope, and jurisdictional boundaries to produce a model that decouples geography with authority. Their analysis uses three variables: relative mobility (the idea that an actor's ability to change and or succeed in markets relies on individual characteristics combined with parameters set by political authorities), changing jurisdictional boundaries (the notion that boundaries of jurisdictions are not congruent with state lines, illustrated through regional trade networks and governance networks), and a combination of the latter variables with market scope.

Alongside providing four models of global interdependencies, Newman and Posner also introduce the concept of regulatory power. Regulatory power refers to the “potential of authorities and corporations based in one jurisdiction to influence the decisions and arrangements made in another” (Farrell and Newman 2019, p. 594). Regulatory power is introduced as ‘structural’ variable, meaning it has the potential to shape patterns between units across many different instances of a phenomenon and is not necessarily determinative of outcomes in one specific case (Farrell and Newman 2019, p. 595). Motivated by the desire to integrate a then relatively neglected concept in interdependence and power, jurisdictional authority, Newman and Posner's work marks a shift in conceptions of market influence and an increased focus on the international regulatory environment.

2.2 The New Interdependence Approach:

The new school of interdependence, emerging in the 2010's, shares a complex relationship with literature of its past. In many ways, new approaches to interdependence, like

that of Farrell and Newman (2016) are reviving interdependence traditions while pushing back against some of the many theories that erupted in the wake of globalization i.e. structural realism, Open Economy Politics and rational institutionalism. This new approach to interdependence operates on base assumptions entirely different from previous IPE literature. First, the focus of this new literature shifts from determining economic underpinnings towards articulating economic and institutional transformations. Secondly, rather than viewing globalization as an exogenous shock, Farrell and Newman (2016) propose globalization is an endogenous process. By viewing globalization as an endogenous process, new interdependence breaks free of state-centric models and focuses more deeply on changing jurisdictions and the consequences global interactions can have on domestic institutions and policies. New interdependence views institutions as points of contention rather than “rules of the game.” Lastly, what is novel about new interdependence is that it stresses the importance of specific types of power asymmetries and dispels the myth that countries with large market size will always dominate in power disputes, rather it is regulators who enjoy power resources that will be in an advantaged position to shape rules in others’ jurisdictions (Farrell and Newman 2016, p. 725).

Using international accounting regulations and surveillance as case studies, Farrell and Newman articulate a framework for new a new approach to interdependence analysis (Farrell and Newman 2015). This theory is then developed more thoroughly in their 2016 piece, “The New Interdependence Approach: Theoretical Development and Empirical Demonstration.” Farrell and Newman’s “New Interdependence Approach” (NIA) focuses on how political processes shape two outcomes: the rules and principles that govern behavior of global market actors and domestic institutions. The NIA claims interdependence leads to three key analytic concepts: rule overlap, opportunity structures, and asymmetrical power.

Rule overlap is the idea that globalization and the interpenetration of markets create situations in which multiple authorities (e.g., state regulators, private actors, and international institutions) each have their own set of requirements. In situations of overlapping authority, global regimes clash with each other, and have consequences for private actors. The consequences of overlapping jurisdictional authority can be both positive negative for actors in the global market. On one hand, overlapping authorities open some across to punishment as they may violate the rules of some jurisdictions and not others, yet on the other, this creates new routes for actors to play off the arbitrage opportunities between different rule systems (Farrell and Newman 2016, p. 722).

The NIA is characterized by the idea that collective actors working for, or below, the level of nation-state increasingly participate *directly* in global politics. Overlapping jurisdictions and the need to resolve the problems associated with them create new opportunities for collective actors beneath the level of “unitary nation-state” to make a mark on global politics. Farrell and Newman use the term “opportunity structures” to articulate the ways in which some actors can jointly engage in political processes and transform domestic institutions and global rules. Farrell and Newman’s 2015 article applies this theory to show how European security officials, frustrated with blockages in their domestic political system, negotiated with U.S. officials to create a new “transnational layer of trans-Atlantic institutions that partly subverted European privacy rules that the security officials proposed” (Farrell and Newman 2016, p. 723). Farrell and Newman cite Tana Johnson’s (2016) research regarding the relationship between international organizations, NGOs, and civil groups to show how informal clubs of state and international regulators can also offer opportunities of influence to non-state actors. Overall, because political

contestation takes place in overlapping venues, opportunity structures arise that are not necessarily controlled by national governments.

Lastly, the final theme in the NIA is that the combination of rule overlap and opportunity structures results in asymmetric power distributions. The key focus of the NIA is how the combination of rule overlaps and opportunity structures provide certain actors a unique opportunity to reshape domestic institutions (Farrell and Newman 2016, p. 725). Other IR approaches identify the importance of power asymmetries. The NIA claims to be different in the specific kinds of asymmetries it identifies. Rather than assume states with the largest market size will “win” regulatory disputes, the NIA focuses on specific collective actors rather than states and incorporates differences in their power resources. The idea that collective actors are not equally empowered by the world that trade built helped the authors articulate three key empirical propositions for further study:

1. Interdependence induced rule overlap creates uncertainty that destabilizes collective actor commitments to existing market rules.
2. National regulators facing rule overlap will seek to externalize their rule set as to minimize uncertainty pressures.
3. Collective actors dissatisfied with their domestic policy status quo may seek out transnational alliances with other collective actors (Farrell and Newman 2016, p. 726).

Although claiming to be a revival of more traditional interdependence theory (i.e., Keohane and Nye), the NIA is distinct from traditional interdependence in few, but important ways. Foremost, earlier literature focused on interdependence as the source of asymmetric power; those nations or actors with less dependencies have significant leverage over more dependent nations (giving way to concepts like sensitivity and vulnerability). The NIA is much

more structural in nature. Rather than focusing on the interdependencies themselves, its zeros in on the political channels, institutional changes, and the networks they create as sources of power. It is less about the ability to mitigate costs and damages (that would assume institutions as a fixed concept) and more so the ability to rewrite or influence the rules of the game (institutions as malleable).

However, the changes brought about by recent surges in populism and nationalism have interesting implications for the NIA; an analytical system which hinges upon international cooperation. The authors suggest that the NIA is most applicable in situations of high levels of interdependence, such as: product and process regulation, environment and climate policy, consumer safety, and financial regulation and investment (Farrell and Newman 2016, p. 725). They do not anticipate the NIA to be applicable in situations of high market competition. Rather, NIA is more useful in middle zones: areas of activity between those that are “not so heavily marketized as to undermine politics, and those that are not politically over-determined as to render outside opinions irrelevant.” This point will be of particular interest in this paper’s discussion of US-China policy, as many dimensions of international relations between the two nations is framed as a matter of security. There is growing reason to think that international cooperation may not be the best force to analyze in this era of protectionism and shifting global power structures. In this next section, I observe how these ideas have changed even throughout the past half-decade.

New-New Interdependence: Protectionism and Weaponization

More recently, scholarship has been concerned with the degrees to which international networks can be leveraged or ‘weaponized’ by privileged actors. The rise of nationalism, populism, and protectionism has brought new attention to how global networks have both

entrapped and advantaged nations. The first step in understanding these processes is deconstructing the term ‘network.’ Farrell and Newman in *Weaponized Interdependence* (2019) make two central assumptions about networks. First, they understand networks in a sociological sense, meaning they shape what actors can or cannot do. In the long term, networks are subject to change, however in the short to medium term, “they are self-reinforcing and resistant to efforts to disrupt them” (Farrell and Newman 2019, p. 49). Second, Farrell and Newman reject the liberal claim that networks lead to fragmentation, diffused power relations, and ready cooperation – rather they lead to “specific, tangible, and enduring configuration of power imbalance” (Farrell and Newman 2019, p. 49).

In contrast to Keohane and Nye’s predictions, Farrell and Newman suggest that networks have evolved into “hub and spoke” systems with important consequences for international power relations. They break down networks into two main component parts: “nodes” and “ties” (Farrell and Newman 2019, p. 50). Nodes represent a specific actor or location within a network; and ties (or edges) act as connections between the nodes, channeling information, resources, and other forms of influence. The pattern of nodes and ties create the structures underlying a network. Asymmetric growth associated with globalization has influenced network development, leading to network systems favoring certain actors. Farrell and Newman describe how inequalities arise in networks. A combination of: models of preferential attachment (which suggest that new nodes are slightly more likely to attach to established nodes with many ties), network effects (the value of a certain service to its users increases as a function of the number of users already on the platform, leading to convergence on established networks) and leaning-by-doing effects (central nodes in networks can access more information and relationships than other members, allowing them to link preferentially to maintain access of learning processes), all have the potential to

generate “rich-get-richer” effects over the short to medium term.. The networks they generate are structural in that they are both resistant to change and have the capacity to lock-in individual actors (Farrell and Newman 2019, p. 51).

Farrell and Newman advance interdependency literature by expanding conceptions of the types of power that may result from economic interdependence. In addition to market size and bilateral economic interactions, asymmetric global economic networks are distinct and consequential sources of power in the international arena. Although today’s economic networks were not constructed as tools of statecraft, rather they were more influenced by capitalistic economic principles, they allow some states to “weaponize interdependence on the level of the network itself” (Farrell and Newman 2019, p. 54). Farrell and Newman identify two forms of weaponization: the “panopticon effect” and the “chokepoint effect” (Farrell and Newman 2019, p. 55). The “panopticon effect” references Jeremy Bentham’s architectural arrangement and refers to the ability to gain critical knowledge from information flows. The panopticon is chosen as a title because this form of power occurs when states that have physical access to or jurisdiction over hub nodes use their position to obtain information passing through those hubs, like how Bentham’s prison is organized. This phenomenon is not unique to the twentieth century, rather it is reminiscent of the first era of globalization when Great Britain leveraged its position as the center of global trade, finance, and insurance to get a unique perspective into the ins-and-outs of global flows of strategic goods. As technology has developed, so has the ability of states to obtain information about their rivals. The internet, cell phones, telecommunications technology, and centralized banking systems (i.e., SWIFT) are all examples of technological networks susceptible to this kind of power.

The “chokepoint effect” refers to privileged states’ “capacity to limit and penalize use of hubs by third parties” (e.g., other states or private actors) (Farrell and Newman 2019, p. 55). Because hubs are self-reinforcing and efficient, it is extremely difficult to circumvent them, meaning the states that control hubs have considerable coercive power over those who do not. States can use a range of techniques to achieve chokepoint effects. To start, states may have sole jurisdiction over key hubs, offering them legal authority to regulate market use. This concept plays hand-in-hand with earlier discussions of regulatory power. States require appropriate legal and regulatory institutions if they are to exploit hubs. In cases where hubs are scattered across jurisdictions, states may work together to exploit coercive benefits. Farrell and Newman’s account emphasizes the importance of economic network structures in determining coercive efforts. When there are a limited number of hubs, actors can more easily block or deter access to the entire network. Farrell and Newman’s underlying argument in “Weaponized Interdependence” is that states’ variable ability to employ forms of coercion (panopticon and chokepoint effects) depend on a combination of the structure of the underlying network and the domestic institutions of the states attempting to use them (Farrell and Newman 2019, p. 58). Their empirical analysis of global finance (SWIFT) and the internet demonstrates how key actors weaponize interdependence.

2.3 Structural Power Literature

Early interdependence literature, promoted by Keohane and Nye, was primarily concerned with relationships between nations or actors and the effects of changes in those relationships on international affairs. Keohane and Nye’s approach was relationship-based, focusing primarily on bilateral arrangements. Contributions to the field made by scholars such as Posner, Farrell and

Newman expand traditional neoliberal conceptions of interdependence beyond bilateral arrangements to discussion of network and internet structures between multiple nations. In this sense, recent interdependence literature shares characteristics with the field of structural power. Structural power scholars, originating with Susan Strange in the 1980s, were equally dissatisfied with realist explanations of power distributions among states. Much like interdependence, structural power emerged as an alternative to realism and proposed that power in the international arena was more influenced by control of international systems and structures rather than market size or military strength.

In the 1980s, around the same time as Keohane and Nye, Susan Strange noted the difficulties scholars faced in the field of political economy. In her view, the conflict scholars face in IPE boil down to the very nature of economics and politics. While economics is often defined as the study of scarce resources for unlimited wants, politics, in theory, is about providing order and public goods often through government. Scholars of politics tend to assume the maintenance of order is the central, if only, *problematique*. Strange suggests that the consequence of such diverging foci result in each discipline taking the other for granted. In her principal text, *States and Markets*, Strange attempts to converge the two disciplines in the context of the global society of her time. Writing in a period of rapid technological and political transformation, Strange reconfigures our understanding of hegemony and state power and puts forth the argument that power is less about “power from resources” and more about “power over structures.” A state or firm’s position in relevant international structures, intentionally or unintentionally, determines its influence in the global sphere. Furthermore, Strange claims that this type of power has shifted in the hands of markets rather than state actors. While Strange’s conclusions are difficult to apply in

an analytical and operable framework, her observations are nonetheless important and worthy of discussion.

Strange seeks to answer the same fundamental question as Keohane and Nye: “who gets what?” but turns to structural power for explanation. Structural power, as defined in *States and Markets*, refers to an actor’s ability to decide how things shall be done, or an actor’s power to shape frameworks within which states relate to each other, relate to individuals, or relate to corporate enterprises. Strange’s conceptions of power are notable because unlike realist accounts, she contends power does not shift between states and markets, or markets and authority, rather it determines the relationship between the two. By saying that power is structural, she moves beyond relational power (the ability of A to do to B what B otherwise might not do) and towards a more multifaceted understanding of the term. Using American power as an example, Strange articulates four sources of structural power: the capacity for the provision of security for oneself and for international actors (security), dominance in the production of goods and services, i.e. the ability to determine the locus, mode and content of wealth-creating activity (production), the ability to offer, withhold, and demand credit in the international finance arena (finance), and lastly, the ability to influence ideas and beliefs and to control through language those who access and communicate that knowledge (knowledge). Those four interlocking structures: security, production, finance, and knowledge provide certain nations powerful advantages in terms of international politics. A key theme emerging with Strange is the idea of both the intended and unintended consequences of power. If power is derived from control of structures, then it is not simply an asset to be brandished at will, it has an inherent value. This is a key distinction from early interdependence literature that stressed bilateral power arrangements and leveraging of shared structures.

Strange expands on American structural power and makes predictions about the future political landscape in her 1988 article “The Future of the American Empire.” In the late 1980s, there was intense debate over the United States and whether its reign was evergreen. Keohane’s publication *After Hegemony* (1984) proposed that American power was on the decline, and the substitute for American hegemony would be found in international cooperation and the coordination of monetary and fiscal policies. Strange takes the opposite approach arguing that “although there are current weaknesses in the American Empire, they are not irreparable, and they are much less important than its continuing structural power” (Strange 1988, p. 3). Strange’s reasonings shed light on the current debate over rising Chinese power. Strange contends that it is not simply how large or prosperous a nation’s economy is, rather what it specializes in. Strange proposes now what we know to be universal, that it is the information-rich occupations that confer power, much more than the “physical capacity to roll goods off the assembly line” (Strange 1988, p. 5). Manufacturing capacity and the decline of U.S. exports are misleading figures because they are territorial based and are not indicative of the power U.S. executives have. Strange argues:

Worse (manufacturing capacity figures) are irrelevant. What matters is the share of world output – of primary products, minerals and food and the manufactured goods and services – that is under the direction of the executives of US companies. That share can be US-directed even if the enterprise directly responsible is only half owned by an American parent, and even, in some cases of technological dependence, where it is not owned at all but where the license to produce is granted or refused by people in the United States. (Strange 1988, p. 5).

The U.S.' structural power is so great that it maintained dominance despite outsourcing manufacturing. In this argument, Strange lays the foundation for discussions regarding jurisdictional and regulatory power. She makes similar observations as the "new school" of interdependence in that she argues it is the U.S.' non-territorial empire that provides its flourishing economic base and cements its kingpin role. Strange supports her argument through discussions of international finance structures and the centrality of the U.S. dollar as well as the U.S.' (mostly) open market and flourishing customer base. Furthermore, she proposes that the worldwide reach of U.S.-controlled enterprises means the U.S. has greater capacity to exercise extraterritorial influence than any other country. Strange's basic pillars of structural power, however inoperable her critics may deem, provide relevant context to China's recent endeavors in MIC2025, digital currency, and space program.

Structural power has proven to be a difficult concept for IPE scholars. Strange received wide criticism for her lack of an analytical framework for cases of structural power. Writing in the wake of Susan Strange and other prominent authors, Stefano Guzzini strives to clarify the field in his 1993 piece "Structural Power: The Limits of Neorealist Power Analysis." Guzzini returns to the original rift between realism and neorealism, also explored in interdependence literature. Scholars like Strange, dissatisfied with realism, widened the concept of power to include ideas like structural power. Strange, Keohane, Nye and other international relations scholars aided in the creation of a new discipline – the study of international political economy (IPE). While a legitimate reconfiguration of relevant fields of study, these earlier works have at times fallen short of creating operable theories ("theories explain, concepts do not.") (Guzzini 1993, p.468). Guzzini argues that structural power theorists have either overextended the concept of power or omitted particular power phenomena and are therefore unable to provide a coherent

power analysis. For Guzzini, “power” is referred to solely as an agent concept, and his term “governance” represents effects not due to a particular agent, whether individual or collective.

Guzzini’s central claim about the structural power literature of the 1980s and early 1990s (Strange, Caporaso; Caporaso and Haggard, Gill and Law) is that it has widened the concept of power into three different meanings, namely, institutional power, nonintentional power, and impersonal empowering. None of the definitions can provide a framework for power analysis compatible with neoliberalism (Strange’s work falls under the category of nonintentional power). Guzzini outlines three fallacies illustrate the “impossibility” of limiting power to a single concept at either the agent or the structural level. The first is the fallacy of trying to extend an agent of concept to over all phenomena. By overextending power, it becomes difficult to distinguish between intentional and unintentional action. This ties power to actors, rather than to an effect. Furthermore, Guzzini argues that emphasizing foresight is not a good criterion for measurement because it puts too much emphasis on the viewpoint of those in power rather than those who “have to bear its consequences” (Guzzini 1993, p. 468). The second fallacy he calls impersonal empowering and the anomaly of the “free-rider.” In this argument, Guzzini critiques’ Morris’ idea of passive power. Morris tries to avoid the free rider anomaly (the idea that deducing power from positive effects produces free riders, whose interests are furthered by the system but who “nevertheless are at its mercy”). To avoid this fallacy, Morris suggests passive power as the inability to interfere prevent an outcome from occurring. Guzzini accepts it is important to realize how structural bias affects the formation of power relations but rejects it as a concept of *power*. The last fallacy is structural reductionism. When one does not sufficiently stress the fundamental agent of power, the concept of power becomes either synonymous with structural

constraint (rendering structural power a contradiction) or else it becomes “a rather amorphous all-encompassing concept like social control” (Guzzini 1993, p. 469).

Perhaps the most useful observation from Guzzini for this paper is the idea that structures need not be viewed as constraining, but as enabling or facilitating. (Guzzini 1993, p. 470). Furthermore, since the idea of a perfect market is merely that, structures are inherently dynamic and biased. Guzzini conceives structures in a similar way as some interdependence scholars (Farrell & Newman) in that structures constitute power practices that are continually allocating and reallocating agents to categories that are affected differently by market bias. These themes routinely surface in more contemporary accounts of structural power.

Taken together, interdependence and structural power literature provide useful analytical lenses to view contemporary global relations. As discussed earlier, *Made in China 2025* is just one example of how China is making strategic decisions to advance its structural power and capacity to create interdependencies within the global economy. Through the creation of global, networked technology, China is strategically challenging key industries that may result in shifting power relations.

CHAPTER 3

CASE STUDIES: CHINA'S DIGITAL YUAN AND BEIDOU SATELLITE SYSTEM

3.1 China's Digital Yuan

Structural Power in International Finance:

International finance is a perennial subject in both interdependence and structural power literature. Susan Strange, an economist by training, illuminated how certain states – namely the U.S. – have structural advantages in the international monetary system. Strange (1989) dedicates one of her four derivative power structures as the ability to offer, withhold, and demand credit in the international finance arena. Many scholars, including Strange, ground their arguments empirically in the Society for Worldwide Interbank Financial Telecommunication (SWIFT) system, the leading global financial transaction network, and discussions of U.S. dollar centrality. Both disciplines regard the United States as deriving a substantial amount of its global influence through its operation of and ability to garner information through financial systems. Furthermore, nearly a third of all global transactions occur in U.S. dollars. From sanctioning capacity to espionage capabilities, the United States gains tremendously from the centrality the U.S. financial system. The U.S. has enjoyed the privileges of the postwar financial system largely independently (or in conjunction with the UK and other allies). However, current advancements in Chinese financial technology threaten to undermine decades of dollar dominance. This section explores how current financial networks face considerable challenges in the form of the Chinese digital yuan, and how this technology may grant China both significant structural power and the capacity to create and leverage new interdependencies.

For most of recent history, the United States has been the leading economic powerhouse in the global economy. Yet from 1992 to 2017 the United States ran a cumulative current account deficit of \$10.2 trillion (Schwartz 2019, p. 4). These statistics alarm scholars and U.S.-policymakers alike. However, notwithstanding the seemingly precarious state of the U.S. dollar, it has maintained its centrality, and the U.S. still leverages its structural control of the global economy. One of the major structural sources of power for the U.S. and select European countries is the SWIFT banking system. Since the 1970's, nearly all international bank communication has been provided by SWIFT. To this day, SWIFT plays a critical role in authorizing transactions, authenticating parties, and documenting exchanges (Farrell and Newman 2019, p. 59). The invention of the internet reconfigured SWIFT operations. Due to the complexity and size of the internet and its threat on connection speeds, internet exchange points emerged in major cities to facilitate communication across service providers and infrastructure backbones. Most exchange nodes are in the U.S. and Europe. The placements of these nodes means that the U.S. and some European nations have unique access to financial transaction data.

In the wake of the September 11th terrorist attacks, the United States began examining ways in which the global financial system could curtail terrorist financing and track terrorist money supply. The U.S. government determined it could lawfully issue enforceable subpoenas against SWIFT to turn over financial data in the name of national security. The Treasury initiative became referred to as the Terrorist Finance Tracking Program (TFTP) and relied on SWIFT data as a key source of information (Farrell and Newman 2019, p.66). The SWIFT data unveiled complex networks of terrorist financing and was routinely defended by U.S. and the EU officials despite international pushback. Farrell and Newman refer to the U.S. and EU's ability to glean important financial information as a "panopticon" effect.

However, the SWIFT system is not only an observational mechanism, but also has been utilized to exercise power in the global arena. Most notably, the joint ability of the U.S. and EU to inflict sanctions on other states by disconnecting them from the SWIFT network. The weaponization of SWIFT is most clearly demonstrated the U.S.' decades-long sanctions regime against Iran. The conflict began in the 2000s when a group of U.S. policymakers led a private campaign, entitled United Against Nuclear Iran (UANI) to increase pressure on the Iranian regime. UANI identified SWIFT as complicit in assisting the Iranian regime because nineteen Iranian banks as well as twenty-five Iranian institutions relied on the messaging system (Farrell and Newman 2019, p.68). In 2012, UNAI contested that “the global SWIFT system (was being) used by Iran to finance its nuclear weapons program, to finance terrorist activities, and to provide the financial support necessary to brutally repress its own people” (Soloman and Entous 2012). The U.S. and EU both followed up on this threat and passed regulations that prohibited SWIFT from providing services to targeted institutions. Iran’s major financial institutions including its central bank were locked out from the international payment system and the country suddenly felt those consequences. In turn, unwinding the SWIFT measures became a key negotiating tool in the negotiations surrounding the Iranian nuclear program (Farrell and Newman 2019, p. 69).

The case of Iran shows how structural powers can easily be manipulated in an interdependent world. It is also an interesting case because the SWIFT measures were the result of joint pressure from both U.S. and EU policymakers. The U.S. might not have been able to act without the EU given SWIFT’s primary location is Europe. In 2018, when the U.S. withdrew from the Iran deal while the EU remained, tensions between the two powers rose. The U.S. opted to reimpose SWIFT sanctions while the EU resisted the “re-weaponization” of SWIFT (Farrell and Newman 2019, p. 69). Pressure from the U.S. has led some European politicians to discuss

whether the EU needed to start building its own financial payment channels. While it is unclear if the EU could build financial networks that would challenge the U.S., the sentiment behind the statement is important. It indicates the rising frustration of international actors on hegemonic networks.

However, it is not just command over the SWIFT system that grants states like the U.S. power in the global economy. Since the advent of the U.S. dollar as the global currency reserve in 1971 through present day, the United States has transitioned from the world's largest creditor to the world's largest debtor. Herman Mark Schwartz explores how the dollar has maintained its centrality despite massive U.S. account deficits and a steadily worsening net international investment position. Schwartz elaborates on Susan Strange's ideas of finance as a source of power, arguing that Strange correctly identifies finance as a key structure but does not sufficiently explore the mechanisms that sustain U.S. economic hegemony. Schwartz claims two main mechanisms provide a structural basis for dollar centrality. The first is that international structures, originating from late development, suppress domestic demand in many major current account surplus countries, making them reliant upon external demand for growth. This demand is met in U.S. dollars and locks nations in continued use of the dollar and reliance on the U.S. Federal Reserve during times of crisis. The second mechanism relates to profits and production. Due to globalization and increased fragmentation of production, U.S. firms have built commodity chains through which they capture disproportionate shares of global profits via control of intellectual property rights. Schwartz argues these two mechanisms "transform the (U.S.) exorbitant burden – current account deficits associated with use of the dollar as the international reserve currency – back into an exorbitant privilege" (Schwartz 2019, p.4)

Many scholars agree that the United States currently has firm hold of the international financial system – for now (Schwartz 2019, Smith 2020, Farrell and Newman 2019). Schwartz puts it this way:

In a world of perfectly mobile capital and low asset specificity, U.S. current account deficits would disappear through currency depreciation and capital flight anticipating and exacerbating depreciation. In our world, however, a set of successful late developers have institutionally rooted domestic demand deficiency that generates current account surpluses. Their accumulation of excess export revenues in turn locks their banking systems into continued use of the U.S. dollar in global credit creation. (Schwartz 2019, p.23)

Schwartz's observations indicate potential cracks in the financial system. In his argument, Schwartz points to open product and financial markets as a threat to U.S. dollar hegemony. He suggests, "if a major export surplus economy were to open its financial and product markets – then some other currency might displace the dollar" (Schwartz 2019, p.24). According to Schwartz, China and the EU are the only economies large enough to create this disruption, and China's intentions, as articulated in 2019 suggest the country is heading down a path of more import substitution and self-reliance. However, what if China could come up with a way to keep its state-centric model while undermining U.S. capital control? The answer may lie in next-generation cryptocurrency and the Digital Yuan.

Cryptocurrencies and Digital Currencies in the International Economy

Since the advent of Bitcoin, a decentralized form of currency created emerging in 2008, international actors have invested in cryptocurrency technology. Cryptocurrencies were a

revelation in the world of finance because innovative block-chain technology allowed for payments to be made across a shared public ledger. Transactions via Bitcoin and similar block-chain backed cryptocurrencies occur anonymously, and without regulation from central banks. Digital currencies have now scaled beyond initial privatized forms to adoption and innovation among major banks, firms, and sovereign governments (Aggarwal and Marple 2020, p. 81). Some of these new forms of currencies include block-chain technology, while some opt for more regulated forms and less technically advanced forms of fiat currency.

For countries dissatisfied with the American-centric liberal international order (LIO), digital currencies offer unique opportunities to subvert traditional economic channels. Nicholas Ross Smith poses that for revisionist countries trying to modify the LIO, “supporting and encouraging the growth of cryptocurrencies might become a tangible policy” direction (Smith 2019, p. 87). Smith outlines two possible ways a revisionist power could weaponize digital currencies. The first is that major powers (i.e. Russia or China) could turn themselves into a haven for independent cryptocurrencies. Smith argues that independent cryptocurrencies offer more anti-hegemonic potential than state-backed currencies because of their decentralized and mostly anonymous nature. This route, although possibly more anti-hegemonic, seems especially unlikely in China. China is ranked as a “mostly unfree” economy according to the 2018 index of economic freedom, and all signs point to stricter economic regulation in coming years (Smith 2019, p.87). The second path is that states can create their own form of cryptocurrency and crack down on alternative independent forms of currency. China has charted their own path. Rather than promote independent cryptocurrencies which are largely decentralized and rely on block-chain technology, China has invented a digital fiat currency which (as of now) does not rely on block-chain and is highly centralized and monitored.

Characteristics of the Digital Yuan

Since 2014, the PBOC has been researching ways to digitize its currency. Now in 2021, the PBOC is gearing-up for a nation-wide rollout of its Digital Currency Electronic Payment System (DCEP) that could occur within the year. The project has been somewhat fast-tracked due to the COVID-19 pandemic (which has increased reliance on the U.S. dollar) and in response to momentum in Facebook's digital currency, Libra. The DCEP is a 100% programmable, traceable, and liquidated form of cash that has the potential to majorly disrupt global financial transactions and international relations – all while granting China greater structural power.

The digital yuan is distinct from the more than 1,600 cryptocurrencies currently in existence in a variety of ways. Its revolutionary technology offers the modernization and concrete benefits many businesses and individuals are seeking in the digital age. The digital yuan is token-based fiat currency, meaning it is designed as a replacement of cash. Initially it will be backed yuan-for-yuan with hard assets and financial institutions will be required to maintain a 100% ratio on the digital yuan. Transactions using the digital yuan occur instantaneously and without the need for banks or intermediary institutions. On a micro-level, payments between two mobile phones may occur without internet via 'touch to touch' technology (Peters 2020, p.1). Transactions can occur in this manner because the currency is vigorously encrypted and tracked on a digital ledger. Theoretically, this approach is much faster, less expensive, and more secure than the SWIFT system, through which transactions can take multiple days to complete. Furthermore, the SWIFT system faces security concerns as it has recently been the target of multi-million-dollar attacks (Murray, 2020).

The distribution of the digital yuan is also unique. As a fiat currency, the digital yuan will be distributed in ways that largely preserve regular institutional channels of cash distribution. The Chinese government will work in conjunction with select banks to each citizen a “digital wallet” in which their money would be stored, limiting the need for a bank account. Electronic payments are nearly ubiquitous in China. Most mobile payments, 93% to be exact, are handled by TenPay (WeChat pay) and Alipay (Alibaba’s platform). Popular methods of payment WeChat Pay and Alipay will remain in use with the digital yuan, however the new program will grant Beijing with greater control and monitoring. In terms of electronic payments within China, Beijing seeks to benefit from the digital yuan. The PBOC is concerned about China’s dependence on apps like platforms like Alipay and WeChat because if those systems were to be compromised or fail in any manner, there is not enough paper currency in circulation to support commerce, running the risk of panic or collapse of the Chinese financial system (Murray, 2020).

However, China’s motivations for creating a digitized currency are by no means confined to the domestic sphere. Although PBOC has claimed the impetus for creating the DCEP is to “protect our monetary sovereignty and legal currency status,” creation of the DCEP is aligned with rumblings of RMB internationalization on behalf of the Chinese government. If China can convince world powers to buy in, it could internationalize the digital yuan and promote it as a reliable and rival alternative to the U.S. dollar. This could potentially allow China to expand its surveillance capabilities, as much like the SWIFT system, the DCEP may provide China a window into and control over the economic activity of its users both home and abroad (Murray, 2020). Even more radical, it may allow China and other member nations, to subvert international sanctions, arms embargos, and money laundering regulations.

Security, Structural Power and Interdependency Implications of the Digital Yuan:

As the concept of the digital yuan becomes closer to reality, conversations over the implications of an internationalized Chinese currency have increased in intensity. Some are even referring to digital currency proliferation as the next Cold War (Aggarwal and Marple 2020). If successful, China's DCEP could challenge the structural power of nations like the United States and rewrite patterns of interdependency. Specifically, the DCEP may challenge the U.S.'s power in borrowing, a privilege the country has leveraged to avoid costly trade adjustment costs, undermine the U.S.'s sanction capacity, and create new debt regimes in conjunction with the Belt and Road Initiative (BRI).

Previous discussion has outlined the U.S. dollar's status as the global reserve currency. Central bank digital currencies, including the digital yuan, stand to threaten the dollar as a globally hegemonic reserve currency, especially if new sovereign digital currencies can produce more liquid money with greater certainty. This is a direct threat to Schwartz' idea of U.S.'s "exorbitant privilege" generated by the nation's ability to avoid costly adjustments through importing goods in its own currency. Aggarwal and Marple contend the consequences of a shift to an internationalized digital currency would be "enormous" because most of the U.S.' domestic and military expenditures are byproducts of its capacity to incur large volumes of debt that it otherwise would not be able to if it weren't for its reserve privileges (Aggarwal and Marple 2020, p. 82). Furthermore, although the bar for fully unseating the U.S. dollar is high, even a regionally hegemonic digital yuan (i.e., East Asia, and Middle East) would introduce substantial constraints on the dollar, vis-à-vis empowering China.

A second facet of the digital yuan that is particularly relevant to the discussion of interdependence is the interoperability and internationalization of the digital yuan. DCEP is

being designed with cross-border payments in mind. Since the digital yuan and many other forms of cryptocurrency operate on their own networks, payments between nations may not be processed through the SWIFT network. As illuminated in prior discussions, the SWIFT system grants the U.S. enormous structural power through its ability to glean important information and impose sanctions on rival nations. If certain nations, like Iran from the previous example, were to avoid the SWIFT system, then the United States would lose some ability to push through its objectives. Aditi Kumar and Eric Rosenbach, writing for Foreign Affairs ask us to imagine this scenario:

Imagine that it is 2022 and the United States has received intelligence from the Mossad that Iran is procuring essential components for nuclear weapons and missile programs. U.S. economic sanctions on Iran remain in place, but Iran has shifted much of its international commerce to a new yuan-based system—a Chinese digital currency that allows Tehran to avoid dollar transactions and thus evade U.S. financial institutions. As a result, Iran’s oil sales to China, India, and Europe are up, providing the Iranian regime with critical revenue streams that U.S. authorities cannot monitor. And when Iran decides to move quickly toward the development of nuclear weapons and new medium-range missiles to deliver them, the United States can no longer turn to sanctions as one of its primary means of responding to the threat.

Although seemingly farfetched, these kinds of scenarios are not implausible. If the digital yuan is rolled out successfully and trusted by international actors, it may circumvent the SWIFT system. Furthermore, if the digital yuan is utilized throughout the BRI, the DCEP’s highly centralized network may provide Beijing with a panopticon ability akin to the U.S. and EU’s use of SWIFT.

Related to the BRI, central bank-backed currencies offer new means of denominating international debt (Aggarwal and Marple 2020, p. 82). Currently, most international debt is stored in U.S. dollars. However, growing discontent among major players (including European allies) over a hegemonic U.S. dollar may mean that countries will be interested in alternative lending parties and instruments. The digital yuan may be particularly interesting to borrowers because it may address liquidity shortfalls associated with traditional lending instruments. The transformation from a dollar-denominated global debt market to one that includes central bank currencies could interfere with the U.S.'s capacity to implement strategic priorities through its lending programs, and conversely increase China's ability to advance its global priorities. China seeks to gain from a scalable state-backed digital currency, especially in the context of the BRI. Chinese firms at the forefront of the digital Belt and Road will capture revenue through facilitating cross-border payments, which could be made more efficient through the new digital currency system (Kumar and Rosenbach 2020).

Additionally, a digital yuan could raise China's power in institutions like the International Monetary Fund (IMF). The IMF is very much aware of trends in digitization and has indicated interest in central bank digital currency. As states begin to utilize digital currency technologies, issues of standard-settings and interoperability will inevitably be raised at global forums. If China successfully rolls out one of the first internationalized state-backed digital currency, it could play an important role in determining global standards and regulations surrounding new digital currency networks. Power through global institutions is another premise of both structural power arguments and interdependence literature. The NIA, in particular, points to institutions as points of contention, rather than "rules of the game." If China's DCEP is

positively received by the international community, it may grant China greater bargaining power in global institutions.

Many of the arguments in this chapter hinge on the condition that international actors trust the both the DCEP itself and the Chinese government. Applying Cox's ideas of hegemony to the situation of digital currency, China needs to be perceived by other powers as representing a greater global interest, as well as provide concrete benefits to other countries under its hegemonic leadership. It could be argued that through the digital yuan, China would both represent global interest in breaking apart U.S. dollar hegemony and offer concrete benefits via increased cash liquidity, payment speeds, and subversion of the SWIFT network. However, China's state-centric ideology raises national security questions for many global leaders. It is possible that competition between state-backed digital currencies increases throughout the next decade, resulting in a large and decentralized network of individual currencies. Currently, Facebook is promoting its digital currency, Libra, to the U.S. government. Nations like Iran and Russia are also engaging in conversations surrounding new forms of digital currency. Nonetheless, China's development of the digital yuan is a clear example of the state's attempts to increase its structural power and challenge current interdependency structures through networked technology.

The case of China's digital yuan aligns with theories of structural power. Structural power literature, beginning with Susan Strange in *States and Markets* has repeatedly turned to the international finance system as a source of power for privileged states. While it is the interdependent nature of global trade that provides the need for networks (the need to transfer money between nations), it is the actual network structure and location of hubs that grant power to certain states. There is overlap, of course, between interdependence and structural power

literature. Farrell and Newman, speaking from the perspective of interdependence, discuss the U.S.'s panopticon ability derived from its joint control (with the EU) of the SWIFT system. This ability, however, is reliant upon the initial framework. If the international community, or even certain key states "buy in" to China's digital yuan, China may derive a similar form of structural power through control of the network of currency transfer. However, again referring to Cox's theory of hegemony, there is reason to question whether China's structural power would be as great as the U.S.'s due to growing international distrust of the Chinese government, particularly from the West.

3.2 "Serve the World and Benefit Mankind": China's BeiDou Global Navigation System

On July 31st, 2020, after nearly twenty years of research and development, China declared its version of Global Positioning Signal (GPS) fully operational. Known as BeiDou (meaning 'north star' in Chinese), China's Global Navigation Satellite System (GNSS) now consists of 35 active satellites – the most of any GNSS orbiting the earth. China's BeiDou system, which was designed to rival the U.S.-owned GPS, offers free and precise location accuracy for international and domestic users. The slogan "Serve the World and Benefit Mankind," serves as the motto of China's pioneering navigation system, as the satellite system poses to both connect the world and inspire technological innovation.

Despite its philanthropic motto, BeiDou's purpose is not purely benevolent. GNSS technologies serve numerous military, diplomatic, and economic objectives for leading nations. For China, BeiDou represents yet another piece of its grand ambitions of becoming a high-tech world power and its maturing outward FDI strategy. China is marketing BeiDou as an integral

part of the BRI, offering incentives to nearby countries to build a network of differential ground stations through Asia. BeiDou also serves as an example of China's growing interest in both preserving its national security interests and creating new opportunities for Chinese-led networks in high-interdependency areas. If successful, BeiDou is likely to bring prestige to the nation, as well as enhanced opportunities for diplomatic, and economic growth, and increase Chinese influence in several international and regional organizations that deal with satellite navigation issues.

China's BeiDou system timed with fears of an increasingly militarized "space race" posit valid concerns from international actors. The most overt of which have to do with China's military capabilities, and most obscure, with the extent to which China could 'weaponize' such a system in support of its domestic strategy. All the while, BeiDou and GNSS systems are a relatively neglected subject in interdependence and structural power literature. This section will focus on exploring the satellite navigation industry and China's BeiDou system through the lens of structural power and interdependence to determine its implications for China's position in the world order.

A Brief History of GNSS

The GPS system we know today originated as a military technology. In the 1970s, the U.S. Department of Defense launched a system of satellites that offered precise ground locations for both defensive and offensive purposes (Kaplan 2006, p. 696). The U.S. GPS System was initiated in 1978 and achieved global coverage by 1995. GPS receives signals from at least four satellites at different points in the GNSS constellation to calculate accurate information regarding the receiver's location, velocity, and local time (Wilson 2017. p. 3). The U.S. most notably used GPS as an offensive mechanism during the first Persian Gulf War in 1990-91. Since then, and in

conjunction with cooperative ventures between civilian, military, and commercial interests, GPS has become an omnipresent technology, utilized in nearly every mobile phone, and available in devices like cars, watches, and PDAs (Kaplan 2006, p. 696).

These initial advancements by the U.S. GPS system paved the way for current GNSS. GNSS are intensive systems requiring expert R&D and industry knowledge. BeiDou poses to be one of only for four global CNSS systems in operation. Those include: The United States' GPS, Russia's Global Navigation Satellite System (GLONASS) (initiated in 1978 and achieved global coverage in 1996, and again in 2011 after system failures), the European Space Agency's Galileo system (initiated in 2005 and projected to achieve global coverage by 2020), and now China's BeiDou (initiated in 1994 and achieved global coverage July of 2020).

In the decades following their launch, GNSS systems have had revolutionary commercial impacts. Since the United States' ended its practice of intentionally downgrading its GPS signals to the public in 2000, the world has witnessed rapid downstream developments in consumer industries. From personal navigation assistants, in-dash GNSS systems pre-installed in automobiles, smartphone applications, GNSS-equipped wearable technology, to autonomous vehicle navigation, GNSS downstream applications are a billion-dollar industry. The GNSS downstream industry can be divided into three sectors.

1. Component manufacturers, which produce receivers for either stand-alone use or integration into systems.
2. System integrators, which integrate CNSS capability into larger products like electronics, vehicles, and personal navigation assistants.

3. Value-added service providers, which deliver GNSS-enabled software such as maps, telecommunications, and location-related data downloads (i.e., Google Maps, Google Weather, Uber, Waze, DiDi, Skype and many more applications) (Wilson 2017, p. 4).

Like many globalized technologies, interoperability is a main component of satellite systems. As the world becomes more integrated through mobile devices, the global downstream industry is moving rapidly towards “multi-constellation” devices, built to receive signals from multiple or even all four of the world’s GNSS systems. This trend is a product of multiple technical, economic, and political factors including providing consumers with greater reliability and accuracy, achieving greater interoperability of GNSS systems, and encouraging the use of foreign PNT services to “augment and strengthen the resiliency of GPS” (Wilson 2017, p. 4). Nonetheless, China seeks to gain from domestic downstream technological innovations through the form of increased revenue for Chinese businesses.

Characteristics of the BeiDou GNSS and China’s Objectives

For the past two decades, China has been heavily investing in its BeiDou satellite system. As one of 16 “megaprojects” in China’s 2006-2020 Medium- and Long-Term Plan for Science and Technology Development. The BeiDou project is regularly referred to as one of China’s top space projects in its government white papers. With 35 satellites, BeiDou is the largest of the four global GNSS and will offer position accuracies of under ten meters worldwide, and up to one meter and even within centimeters in some areas of China. From 1994 to 2012, China reportedly spent \$2.57 billion on the BeiDou program and in 2013, and indicated it would spend an additional \$6.41-\$8.02 billion from 2013-2020 (Wilson 2017, p. 2). The BeiDou satellite system will be deeply integrated in the domestic market. Much like how European cars are

embedded with Galileo navigation systems, vehicles, and smartphones (like Huawei, Xiaomi, and OnePlus) manufactured in China are all BeiDou compliant (Chen 2016).

BeiDou has some unique characteristics not largely featured in current GNSS systems. One being BeiDou's ability to offer short messages. Unlike GPS, BeiDou offers a short messaging service which can transmit messages up to 120 characters to other BeiDou receivers. This service would allow Chinese fishing vessels to sound "instant alarms" to fishing department in case of emergency, while a complementary "vessel management system" allows them to request assistance from nearby ships. As described in a 2017 U.S. – China Economic and Security Review Commission staff report, "this feature is particularly relevant to the ongoing disputes in the South China Sea, where fishing rights are at stake and where China's maritime militia—a quasi-military force of fishermen that are tasked by and report to the PLA—plays a key role in advancing Beijing's claims" (Wilson 2017, p. 6). This is one example of BeiDou's two-way communication abilities. In short, BeiDou's two-way communication system allows it to identify the locations of receivers and accept data from BeiDou-compatible devices. A China CCTV state broadcaster in June of 2020 explained the capability like this: "in laymen's terms, you can not only know where you are through BeiDou but also tell others where you are through the system" (Xie 2020).

China has numerous reasons to invest in satellites despite existing free access to navigation systems. For decades, the U.S. has been the leading GNSS provider with the GPS system and has used its system for security purposes. China's BeiDou is driven by similar militaristic intentions. As described in a 2015 U.S. – China Economic and Security Review Commission Annual Report to Congress:

The PLA has considered [its] dependence on a foreign PNT (Position Navigation and Timing) system to be a strategic vulnerability since at least the mid-1980s. These fears were exacerbated during the 1995–1996 Taiwan Straits Crisis. According to a retired PLA general, the PLA concluded that an unexpected disruption to GPS caused the PLA to lose track of some of the ballistic missiles it fired into the Taiwan Strait during the crisis. He then said that “it was a great shame for the PLA ... an unforgettable humiliation. That’s how we made up our mind to develop our own global [satellite] navigation and positioning system, no matter how huge the cost. BeiDou is a must for us. We learned it the hard way.”⁹

China has clear objectives through the proliferation of the BeiDou system. The 2017 U.S. – China Economic and Security Review Commission Report nicely summarizes China’s ambitions into three clear goals: 1) to end military reliance on GPS, 2) to build a commercial downstream satellite navigation industry and take advantage of a rapidly expanding market, and 3) to bolster domestic and international prestige by fielding one of four global navigation systems. These three goals fit into China’s grand plans of becoming a leading power in space and opening the door to international cooperation activities.

Structural Power and Interdependency Implications of BeiDou

China’s BeiDou System has many consequences for China’s military capabilities and position in the global economy and order. Both structural power and interdependence literature look beyond military capacity (budget, spending, size) and more towards the weaponization of networks that can have military and economic implications. However, both handle these ideas

⁹ U.S.-China Economic and Security Review Commission, Chapter 2, Section 2, “China’s Space and Counterspace Programs,” in 2015 Annual Report to Congress, November 2015, 302.

slightly differently. In this sense, BeiDou fits uniquely into this discussion. It embodies certain characteristics more aligned with structural power, and others akin to interdependence. This is not uncommon, as the literatures often overlap in certain areas, and these emerging technologies are incredibly complex and far-reaching. The security element of BeiDou is better explained by ideas of structural power, while its integration in across Belt and Road member countries is better illuminated through ideas of interdependence.

i. BeiDou and The Security Structure

Security is a central talking point in structural power literature. One of Susan Strange's four sources of structural power outlined in *States and Markets* is security. Strange defines security as the capacity for the provision of security for oneself and for others. One of BeiDou's central tenets is providing increased security for both Chinese citizens and international allies. There is both a domestic and military aspect of this security. China has marketed an increase in domestic security via the BeiDou system. BeiDou's website devotes a page to 'public security.' The passage below is taken from the BeiDou's website and describes in what capacity the system can be used for public safety:

A large number of public security services such as anti-terrorism, social stability maintenance, social security demand for high sensitivity and confidentiality. Therefore, it is imperative to popularize BDS in the field of public security. A BDS-based public security information system has realized the dynamic dispatch and integrated command of police resources, which has improved the response time and the execution efficiency.

The sector mainly includes the command and dispatch of public security vehicles, the on-site law enforcement management, emergency incident information transmission, public security time service, and other applications. Among them, the emergency incident information transmissions can be implemented by using the unique BDS short message function.¹⁰

As Strange reiterates, in the modern political economy, the security structure is built around the state. The state takes the responsibility for protecting its citizens, and in return, the state claims political authority and the monopoly of legitimate violence. (Strange 1988, p. 50) Through its dictated domestic uses, the Chinese government is attempting to provide a safer environment for its citizens, whether that be faster ambulances, faster police response, or timely public service announcements. However, when states then abandon their responsibility to protect, this service could take a sinister turn. The implications for increased surveillance of Chinese citizens are profound and beg the question of how this technology will be used in high-tension areas like the current crisis in Xinjiang.

BeiDou's security services are not limited to the provision of emergency response vehicles. The satellite system will also serve China's national security and military interests, especially in the case of missile defense. With its new satellite system, China could potentially avoid the circumstance of U.S. interference of global positioning systems to launch long-range missiles. In 1996, China fired three missiles towards Taiwan as a warning. One of those missiles struck the sea approximately eleven miles from a Taiwanese military base. The other two missiles disappeared. China claims that the U.S. interfered with GPS signals and was responsible for the missing missiles (Goward 2020). Having its own sovereign GNSS eliminates the issue of

¹⁰ <http://en.beidou.gov.cn/APPLICATIONS/PublicSecurity/>

relying on other nations for satellite navigation for a precision strike. Although concrete information about China's incorporation of BeiDou into its weapons system is few and far between, it can be reasonably assumed that China would equip its ballistic and cruise missiles to operate with both GPS and BeiDou. If true, Chinese operators would be able to switch between platforms (from GPS to BeiDou) if GPS were denied, and it would also be able to attack an adversary's access to GPS without compromising its own capabilities. Furthermore, China could potentially interfere with adversaries use of the BeiDou network. Just as Americans fear China's monitoring and manipulation of its networks, China fears U.S. intervention. An essential component of feeling secure is being equipped with both information and legitimate elements of protection. BeiDou provides China with greater structural power in its ability to both protect and launch offensive attacks against its rivals.

BeiDou also has the potential to provide security for other nations. A major component of Strange's understanding of the security structure is one's ability to provide for allies. One example of China's use of BeiDou as a bargaining tool is seen in China's relationship with Pakistan. Pakistan and China have deepened their relations over the past half-decade especially as Pakistan's relationship with the United States worsened under President Trump. However, China's investment in Pakistan predates the Trump Administration. Since the beginning of the BRI in 2013, Pakistan has been a flagship site of the BRI, with some \$62 billion in projects planned in the "China-Pakistan Economic Corridor." Pakistan is now the only other country that has been granted access to the system's military service, the one which allows for more precise guidance of missiles, ships, and aircrafts (Abi-Habib 2018). This indicates that China is open to sharing some of its security services with its allies and may eventually serve as a blueprint of China's expansion to other BRI member nations.

ii. *BeiDou and the BRI: New Patterns of Interdependence*

Pakistan is just one of the many member nations participating in the BRI which China is encouraging to adopt the BeiDou system. By implementing BeiDou in countries across the east, China aims to increase integration and interdependency among BRI nations. By 2018, China had signed 121 agreements with 37 countries and four international organizations regarding cooperation in the space sector via the Belt and Road Initiative (Paladini 2019). As of 2019, 30 nations, including Pakistan, Laos, Brunei, and Thailand have connected to the BeiDou system (Cheney 2019. p. 6). The plan is to extend BeiDou systems to all 64 BRI countries. China is suggesting partner nations use the BeiDou system to enhance the efficiency of BRI infrastructure, such as railways and pipelines. The line of thinking is that as nations become more dependent upon the BeiDou system, Chinas influence will grow in BRI nations as they become reliant upon Chinese systems for sustained economic growth. In fact, China has referred to efforts in satellites and space technology as building a “Space Silk Road” (Cheney 2019. p. 7)

BeiDou provides China with a tangible entry point to global institutions and organizations. The 2015 U.S. – China Economic and Security Review Commission Report to Congress argues that BeiDou’s achievement of global coverage could provide Beijing with more influence over PNT-related decisions in several key forums, such as the International Telecommunications Union, the International Committee on Global Navigation Satellite Systems, the Asia-Pacific Economic Cooperation forum, and the International Civil Aviation Organization. (Wilson 2017, p. 9). Satellite and downstream technological innovation represent areas of “rule overlap” as discussed in Farrell and Newman’s New Interdependence Approach. Therefore, China’s voice in these institutions act as “opportunity structures” for China to further its agenda. Furthermore, as illustrated in the case of Pakistan, BeiDou system represents how

countries can work cooperatively to achieve common goals (i.e. circumvent the American system). The proliferation of BeiDou ground systems throughout the BRI represents a broader trend of increasing interdependencies and influence throughout the world. Referring again to Robert Cox's theories on hegemony, it serves as yet another example of how China is attempting to provide tangible benefits to nations across the globe.

In terms of more recent interdependence literature, it remains unclear how BeiDou can be analyzed. Issues of data retrieval and China's burgeoning 'panopticon' ability have been raised. However, at the moment, it remains too soon to tell if the BeiDou system can be 'weaponized' in the same capacity as the SWIFT and other empirical examples. Only time will tell how the Chinese government will handle its new system, and if it will alter interdependency patterns. Furthermore, While Keohane and Nye claim that military force is largely irrelevant, it nonetheless plays an important role in the perception of foreign nations. Even if BeiDou does not constitute a 'weaponized' relationship, it has elevated China's status as an emerging power in space and is incredibly important to the nation.

CONCLUSION

Initial observers of globalization assumed that global integration would lead to increased democratization and free exchange of goods and ideas. While the advent of the internet, telecommunications, and travel have integrated nearly all corners of the world, globalization has not resulted in a democratic “world without borders,” but rather in asymmetrical power imbalances among nations. Now, the most important borders in international relations are not the physical barriers between states, but the command of expanding jurisdictions enabled by new patterns of globalization.

Gaining power in today’s geopolitical climate requires much more than military might, and market size. For decades, the United States and other major powers have reaped the benefits of a globalized world through their strategic command over international networks of trade, information, and finance. The centrality of the U.S. financial system, for example, has provided the country with significant benefits including the dollar’s status as the leading international reserve currency, the ability to observe international transactions, and the capacity to enforce sanctions on its adversaries. This is only one example of a structural power the U.S. gained through an interdependent world, and there are many more.

China enters the contemporary geopolitical climate from a unique position. Although the nation has a thousands years long track record of being an international powerhouse, China spent most of the twentieth century isolated from the global economy. In this context, China’s economic ascent is surely an impressive phenomenon. As discussed in Chapter 1, China is facing limitations to its growth; an aging population, low value-adding economy, and protectionist policy all threaten the stability of the country. Despite rising in international influence, China, like many other nations is still stymied by the “liberal world order” established by nations like

the U.S. and is ready to break free of those holds. China has articulated a new vision for the world order, one in which countries can rise above structural constraints and make their own way in the international system as individuals.

Interdependence and structural power literature both attempt to explain the power dynamics of globalization. These literatures provide important contexts to China's recent shift towards investment in strategic technologies such as digital currency and satellites. As discussed in Chapter 3, China's investment in these new forms of technology is calculated. China's digital yuan serves as a legitimate threat to the American financial system, and the BeiDou satellite system increases China's international prestige, military capabilities, and ability to provide both economic opportunities and security to partnering nations. These two examples are merely pieces of a larger puzzle. What this discussion suggests, is that there is a marked shift in both Chinese industrial policy and in the ways in which China is engaging with the international community. If structural power and interdependence theorists are correct, then China's challenge has incredible potential to disrupt the liberal world order.

I began this paper by chronicling China's economic ascent and explaining some of the most pressing limitations affecting Chinese growth. My primary assumption is that if China is going to sustain its economic miracle, and bolster its status as a hegemon, it needs to reimagine its role in the international political economy. This observation led directly into the ideological and policy implications of Made in China 2025. An in-depth review of both interdependence and structural power literature provided context for why China is ramping up its development of key technologies. Two case studies, China's DCEP and the BeiDou satellite system provide concrete examples of China's investment in areas of high-interdependence and their implications for contemporary power structures.

I do not claim to know whether these examples indicate a new world order is forming in which China is the predominant global hegemon. Nor am I claiming that a loss of American control of key systems results in a proportionate gain for China. On the contrary, a myriad of factors (downstream technological innovation, new alliance structures, and policy decisions) will influence the political developments of upcoming decades. What is significant however, is that despite the rise of populist and nationalist ideologies throughout the globe, integrated networks, whether financial, diplomatic, trade, or technological, will remain key sources of state power. As China continues to evolve its geopolitical strategy in the information-age, it will have interdependence in mind. Therefore, it will be increasingly important for scholars in the upcoming decades to pay close attention to the underlying structures targeted and affected by Chinese policy decisions.

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