

**CHINESE SATELLITE DIPLOMACY: CHINA'S STRATEGIC WEAPON FOR SOFT
AND HARD POWER GAINS**

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By

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ABSTRACT

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Chinese Satellite Diplomacy: China's Strategic Weapon for Soft and Hard Power Gains

China signed its first turn-key communication satellite contract with Nigeria in 2004. The contract stipulated that China would design, build, integrate, launch, and complete in-orbit checkout for the Nigcomsat-1 communication satellite and then transfer control over to Nigeria. By 2018, China had contracted and launched another six communication satellites for various foreign customers. The customers, who are foreign governments, are geographically dispersed throughout South America, Europe, Africa, and Asia. The satellite sales have occurred during China's unprecedented economic growth, a time in which China has been granted additional foreign policy options as its power increases relative to others. This thesis utilizes lateral pressure theory to suggest that China has strategically signed contracts with foreign governments for the sale of communication satellites to further its foreign policy objectives. Examination of China's space history, its foreign policy goals, and key variables shed light on China's intentions and possible future actions.

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Chapter 1: China's Foreign Policy and Space Program

China has evolved into a leading global space player and continues to design, build, integrate, launch, and complete in-orbit checkout of communication satellites (COMSATs) and remote-sensing satellites for foreign customers.¹ As of January 2018, China had successfully exported seven COMSATs and two remote sensing satellites to foreign government customers around the globe and currently has at least two contracts signed for future in-orbit deliveries of COMSATs and remote sensing satellites. The first satellite agreement was for the purchase and delivery of Nigcomsat-1, a COMSAT for Nigeria. The satellite agreement was signed in 2004 and the satellite was launched in 2007. Since Nigcomsat-1, China has continued to market its satellites to international customers and the sales have increased. Purchasing countries are not limited to a single geographic region; rather, they are scattered throughout Central and South America, Europe, Africa, and Asia. Since 2004, this is a relatively new phenomenon, and one that demands our attention.

While much has been written about China's future global intentions, little analytic effort has been dedicated to understanding China's strategic motivations and reasons for engaging in such satellite sales, particularly how and why those customers are selected. Does China simply want to guarantee access to cheap natural resources? Initial research suggests China's leaders sign favorable deals with resource rich countries as a means to secure access and rights to other

¹ A communications satellite (COMSAT) is an expensive radio-frequency (RF) repeater in space. The satellite's purpose is to receive, translate, and retransmit signals between users on earth. An RF signal is very weak after traveling 22,500 miles to the geosynchronous Earth orbit (GEO) belt, the orbit around the Earth's equator. This requires the satellite to amplify the signal and transmit the signal at lower frequency and a different polarization. The separation in frequency and polarization isolates the transmitted RF signal to avoid injecting interference into the signal. COMSATs are most commonly used for satellite television broadcasts, very small aperture terminal networks (VSATs) communication networks, and mobile communications.

markets.² This answer is insufficient; however, China's satellite diplomacy almost certainly meets a specific Chinese policy goal and serves a larger objective than making a sale to earn a wage or to hope for access to foreign natural resources. China very likely leverages foreign satellite sales as a means to exercise both hard and soft power abroad. The research question in this thesis, at its most basic level, is: to what ends do Chinese satellite sales serve to further China's foreign policy agenda? How do these sales advance China's foreign policy objectives? Beijing's leaders will almost certainly continue to sign satellite agreements to foreign customers in the future, so understanding these ideas will support a greater understanding of Chinese aspirations abroad, especially foreign satellite sales.

Realist assumptions and Lateral Pressure Theory

Realism is the most applicable theory underpinning China's satellite sales. Realist assumptions and system level theories have great explanatory power for this research question. Levy conducts a review of the major theories used by international relations scholars. Levy expounds on Morgenthau's realist assumptions.³ First, the international system is anarchic and states are the primary actors. Second, states are rational unitary actors with well-defined interests. Third, state interests are dominated by security and power is a zero sum game. A state's gain is at the expense of other states. These assumptions are readily accepted by realist scholars. Levy describes the central proposition of realist theory is "the distribution of power in the system determines the behavior of individual states within the system."⁴ This is essential to China's rise.

² Tiezzi, Shannon. 2013. "China's Space Diplomacy." *The Diplomat*. <http://thediplomat.com/2013/12/chinas-space-diplomacy/> (October 5, 2017).

³ Levy, Jack S. "Theories and Causes of War." *The Handbook on the Political Economy of War*. pg. 224-225.

⁴ Ibid.

As China's power increases relative to others, China is afforded a greater number of behaviors and options.

The most appropriate system level theory within realism is lateral pressure theory, developed by Choucri and North in 1975. "Lateral pressure refers to any tendency (or propensity) of individuals and societies to expand their activities and exert influence and control beyond their established boundaries, whether for economic, political, military, scientific, religious, or other purposes."⁵ Choucri explains that lateral pressure theory is about relationships between a state's characteristics and its international behavior. A state that expands its activities beyond its own boundaries is driven by a number of capabilities and motivation; and often, said state will encounter other states also being pushed outward for a number of its own reasons. Where the motivations and spheres of influence of each outwardly expanding state intersect is where future conflict will arise, according to lateral pressure theory. Choucri and North suggest "the strength of a country's lateral pressure correlates positively with its capabilities and power."⁶

Lateral pressure theory, as described by Levy, suggests a state's "increasing population and advancing technology generate increasing domestic demands for resources, demands that cannot generally be satisfied by a state's domestic resource endowments or by existing levels of foreign trade."⁷ As a result, the resource demands generate 'lateral pressure' for access to markets and political control elsewhere. The push to move beyond a state's borders and into other foreign markets generates an increase in military spending and alliance formations. According to this theory, expansionist ventures will likely lead the state to encounter conflicts with other foreign actors because they will react to the increased foreign ventures with their own

⁵ Choucri, N., & Agarwal, G. 2016. The Theory of Lateral Pressure Highlights of Quantification & Empirical Analysis. *SSRN Electronic Journal*. doi:10.2139/ssrn.2859712. Pg. 3.

⁶ Ibid.

⁷ Levy, J. op. cit., pg. 258.

set of countering actions. Lateral pressure theory is contested by others, who suggest the original analysis that generated the theory was flawed. Zuk argues that Choucri and North did not adequately factor in resource access into their test, despite arguing that resources are the major catalyst for outward expansion.⁸

Lateral pressure theory also relates to China's use of satellite sales and its One Belt, One Road initiative, seen as the centerpiece of Xi Jinping's foreign policy.⁹ One thought put forward by Tiezzi is China seeks to create satellite deals with resource rich countries.¹⁰ This notion is supported by lateral pressure theory. Satellite deals are signed with resource rich states, so China would be attempting to guarantee access to those materials through the sale. Following this theory, one could reasonably expect China to continue the sale of satellites to foreign partners as its power continues to increase relative to others. Access to political control of external populations directly ties into China's use of soft power and public diplomacy.

Soft and Hard Power Defined

When considering states' foreign policy objectives, an adequate understanding of each form of power is required. Some contend that power has two primary components: hard power and soft power. The two different types of power are used to achieve different foreign policy goals and each has different and lasting effects.

⁸ Zuk, Gary. 1985. "National Growth and International Conflict: A Reevaluation of Choucri and North's Thesis." *The Journal of Politics* 47(1): pg. 269–81.

⁹ McBride, James. 2015. "Building the New Silk Road." Council on Foreign Relations. <https://www.cfr.org/backgrounder/building-new-silk-road> (February 4, 2018).

¹⁰ Tiezzi, Shannon. 2013. "China's Space Diplomacy." *The Diplomat*. <http://thediplomat.com/2013/12/chinas-space-diplomacy/> (October 5, 2017).

“Soft power” is a concept coined by Joseph Nye in 1990.¹¹ Nye describes soft power as “getting others to want the outcomes that you want – co-opts people rather than coerces them.”¹² Nye describes how soft power is different from influence. He suggests “influence can also rest on the hard power of threats or payments. And soft power is more than just persuasion or the ability to move people by argument, though that is an important part of it. Simply put, in behavioral terms soft power is “attractive power.” In terms of resources, soft-power resources are the assets that produce such attraction.”¹³ The concept has been widely debated since its introduction; however, Hook uses the definition provided by Joseph Nye and describes soft power as “the expression of its political values and cultural dynamism in ways that other societies and governments may find appealing.”¹⁴ Soft power suggests a state is an idea in and of itself that attracts others to said state. This concept is often associated with the United States; however, the term can also apply to other states and can affect their foreign policy. Much of the discussion on soft power is US centric. Many argue about the impact and effectiveness of soft power. Some believe the concept is an effective extension of a state’s power and others believe the concept is outright worthless.

Patalakh and Blechman have responded to Nye’s concept and evaluated the usefulness of the term. Blechman is critical of soft power. According to Blechman, soft power has inherent limitations.¹⁵ He suggests soft power cannot be deployed in specific foreign policy situations or be controlled and shaped in a meaningful way by the US government. Blechman agrees that soft power is a contributing factor to foreign policy success, but that other sources of hard power will

¹¹ Nye, Joseph S. 1990. *Bound to lead: the changing nature of American power*. New York: Basic Books.

¹² Nye, Joseph S. 2004. *Soft Power: The Means to Success in World Politics*. New York: Public Affairs. Pg. 5.

¹³ Nye, op cit., pg. 6.

¹⁴ Hook, Steven W. 2008. *US Foreign Policy: the Paradox of World Power*. Washington, D.C.: CQ Press. Pg. 9.

¹⁵ Blechman, Barry M. 2004. “Soft Power: The Means to Success in World Politics by Joseph S. Nye.” *Political Science Quarterly* 119(4): 680–81.

continue to be the dominant form of power. Patalakh discusses how the concept has evolved since its initial conception in 1990. Patalakh suggests the most narrow understanding of soft power is “the power of attractiveness, a capability to get others to want what you want.”¹⁶ He continues by putting forth the main issues and concerns with soft power. First, it is not government controlled. Second, it is hard to measure its effectiveness. Third, it is very difficult to measure and quantify. Since soft power is dependent on the recipient, the impact of soft power will vary greatly from state actor to state actor. Patalakh suggests some have discarded the concept as a whole, but the notion that improving your international reputation likely leads to better expected outcomes is logically consistent.¹⁷

Much of the discussion on soft power has been dominated by the US, as the term was coined during US primacy in the international system. The term was a means to explain US power abroad and, as a result, most soft power discussion has been US centric. The US has structures and freedoms that inherently limit the impact of soft power. China, on the other hand, can likely control its strategic state messaging much more effectively than the US, since China’s state power is more centralized than in the US. This, on the surface, suggests China would likely be able to manipulate soft power in a way the US could not. Patalakh discusses how Nye mentioned four mechanisms for transmitting soft power: public diplomacy, broadcasting, exchanges, and assistance.¹⁸ The Chinese government has much more control over those channels for transmitting soft power than the US. So even though it is acknowledged that soft power can take time, China might be able to accelerate that timeline. The common theme among those analyzing soft power is that analysts understand its utility, but also acknowledge its

¹⁶ Patalakh, Artem. 2016. “Assessment of Soft Power Strategies: Towards an Aggregative Analytical Model for Country-Focused Case Study Research.” *Croatian International Relations Review* 22(76). pg. 88.

¹⁷ Ibid.

¹⁸ Patalakh, op. cit., pg. 97.

limitations. Soft power cannot be deployed to solve a specific policy issue, even if its aggregation over time benefits the state. Lastly, soft power is not controlled by the state, but the ‘client’ who is on the receiving end.

Hard power is described by Campbell as “the application of military power to meet national ends- that is, the deployment of ground troops, naval assets, and precision munitions to secure a vital national objective.”¹⁹ The definition by some has come to include an economic element, but at its core it is understood as the capacity of state “A gets B to do something that it would not otherwise do.”²⁰ This logic leads to another prevailing theme between hard and soft power: soft power is co-optive and hard power is coercive. Wilson provides a very similar definition of hard power, but expands upon the definition by providing means to deliver said power. Wilson suggests hard power “strategies focus on military intervention, coercive diplomacy, and economic sanctions to enforce national interests.”²¹ The prevailing theme between readings on hard power is unanimous: hard power is coercive.

Hard power is generally considered tangible. One can measure a state’s total economic output or create a military order of battle. China’s satellite sales, and the economic incentives that come with the sales, would be a tool of hard power. The hard power tools grant China more influence, but as Nye noted, influence is not akin to soft power. In this study, the soft power component will likely take priority over hard power. Public diplomacy has increasingly become the focus of the Chinese government. Chinese public diplomacy is attempting to “redress the so-

¹⁹ Campbell, Kurt M., and Michael E. O'Hanlon. 2006. *Hard power: the new politics of national security*. New York: Basic Books. pg. 7.

²⁰ Bilgin, Pinar, and Elis Berivan. 2008. “Hard Power, Soft Power: Toward a More Realistic Power Analysis.” *Insight Turkey* 10(2): pg. 5–20.

²¹ Wilson, Ernest J. "Hard Power, Soft Power, Smart Power." *The Annals of the American Academy of Political and Social Science* 616 (2008): 110-24. <http://www.jstor.org.ezproxy.libraries.wright.edu/stable/25097997>.

called Chinese threat, and make the world accept the rise of Chinese power.”²² Despite not being coercive in nature, I would argue satellite sales are an extension of China’s hard power. The satellite sale and economic incentives are both tangible and measureable – with both being extensions of China’s power sources (economy and military).

Chinese Governmental Structure

China is an authoritarian single-party communist state, described by the CIA World Factbook as “a system of government in which the state plans and controls the economy and a single - often authoritarian - party holds power.”²³ The Chinese Communist Party (CCP) has governed China since 1949, when the Red Army declared victory in the Chinese Civil War over the Nationalist Party (or Kuomintang) following the conclusion of World War II.²⁴ The CCP attempts to maintain tight control over China’s citizens and exhibits several characteristics of single-party authoritarian regimes described by Geddes. According to Geddes, single-party authoritarian regimes are the most likely authoritarian regime types to endure (when compared to personalist and military authoritarian regimes), are more likely to weather the death of a leader or founder, are more likely to be open to loyal citizens, and are less susceptible to endogenous sources of instability.²⁵ Many of Geddes’ claims about single-party authoritarian states apply to the CCP. In this sense, China and the CCP are no different from other authoritarian states. In

²² Wang, Yiwei. "Public Diplomacy and the Rise of Chinese Soft Power." *The Annals of the American Academy of Political and Social Science* 616 (2008): 257-73. <http://www.jstor.org.ezproxy.libraries.wright.edu/stable/25098003>.

²³ “References :: Definitions and Notes.” *Central Intelligence Agency*. <https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html> (October 3, 2017).

“The World Factbook: CHINA.” 2017. *Central Intelligence Agency*. <https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html> (October 3, 2017).

²⁴ “The Chinese Revolution of 1949.” *U.S. Department of State*. <https://history.state.gov/milestones/1945-1952/chinese-rev> (October 3, 2017).

²⁵ Geddes, Barbara. 1999. “What Do We Know About Democratization After Twenty Years?” *Annual Review of Political Science* 2(1): 115–44.

recent years, Chinese leadership has sought to increase loyalties to the CCP as a means to ensure party survival.

Xi Jinping, the current General Secretary of the CCP and the President of the People's Republic of China (PRC), assumed the top leadership position of the CCP in November 2012. One of his most prominent campaigns, part of his "China Dream," is the crackdown on corruption within the CCP. The Chinese Dream is Xi's "vision of a stronger nation based on the Chinese path, the Chinese spirit, and Chinese strength."²⁶ By purging the CCP of more than a hundred thousand corrupt officials, Xi intended to restore and reestablish the mission of the CCP to Chinese citizens.²⁷ Overall, Xi sought to increase loyalty to the party over other interests – a critical component of his China Dream. Xi determined loyalty to the CCP was of paramount importance, since his analysis of the collapse of the Soviet Union determined Mikhail Gorbachev, the former General Secretary of the Communist Party of the Soviet Union, relaxed political control of the Soviet society before the country experienced economic reform.²⁸ This resulted in loyalties to parties other than the Soviet Communist party, and a failure of the state to adequately defend the communist party when defense was required. Xi wishes to avoid a similar fate. The cleansing of corrupt officials has an added bonus: it consolidates Xi's power within the CCP and rids the party of many potential rivals that may challenge Xi in the future.²⁹ As a result, Xi, as the leader of CCP, has virtual control over all foreign policy decisions within China.

²⁶ "Profile: China's President Xi Jinping." 2017. *BBC News*. <http://www.bbc.com/news/world-asia-pacific-11551399> (February 4, 2018).

²⁷ Allison, Graham. 2017. *Destined for War: Can America and China Escape Thucydides's Trap?* New York: Houghton Mifflin Harcourt. Pg. 116.

²⁸ Allison, op. cit., pg. 119.

²⁹ Osnos, Evan. 2017. "Rise of the Red Prince." *The New Yorker*. <https://www.newyorker.com/magazine/2015/04/06/born-red> (February 4, 2018).

Views of Chinese Foreign Policy Goals

Chinese foreign policy has been written about in length by Sutter, Handberg, Pillsbury, Christensen, and Kerr, among others. There are two distinct groups of scholars who analyze Chinese motivations. The first, exemplified by Pillsbury, contends that Chinese foreign policy goals are sinister in nature and China is motivated to become the leading superpower in Asian and world affairs. If achieved, this will produce a dramatically different reality than the one we currently experience. The second view, represented by Sutter, suggests that China is primarily driven by economic growth and stability at home, and that China is following the route of previous rising powers. Neither set of motivations fully realize Chinese foreign actions, and China almost certainly combines elements of each set. The motivations result in different outcomes and provide different explanations for Chinese actions.

According to Pillsbury, China's current strategy has nine principle elements. These elements, if correctly followed, will allow China to ultimately become the preponderant regional power broker in Asian and global affairs. Pillsbury's stratagems are derived from Chinese texts that date back to China's 'Warring States' period and are considered the "manual for statecraft."³⁰ The nine elements, loosely summarized, describe how China should act to supplant the current hegemon (Table 1). The elements are not fact, but rather Pillsbury's analysis of historical Chinese texts. These elements, while useful to this analysis, can be debated, but nonetheless they provide a useful launching point for analysis of China's strategic intentions.

³⁰ Pillsbury, Michael. 2015. *The hundred-Year marathon: Chinas secret strategy to replace America as the global superpower*. New York, NY: Griffin. Pg. 34-46.

Statecraft Elements	Characteristics
Induce complacency to avoid alerting your opponent	Mask your true intentions until the perfect opportunity, premature provocation can prove to be disastrous
Manipulate your opponent's advisers	This attempts to "turn the opponent's house in on itself"
Be patient – for decades, or longer – to achieve victory	In the Warring States period (475-221 BC), victory was only sometimes achievable after decades – this is no different
Steal your opponent's ideas and technology for strategic purposes	Theft for strategic gain
Military might is not the critical factor for winning long term competition	Economic power is the key to long-term success, collapse of USSR proves this
Recognize that the hegemon will take extreme, even reckless action to retain its dominant position	Expect the US to become emboldened as their power relative to China fades
Never lose sight of Shi	Deceiving others into doing your preferred actions, and maximizing opportunity
Establish and employ metrics for measuring your status relative to other potential challengers	Measure power during peace and war – across all dimensions, not just military
Always be vigilant to avoid being encircled or deceived by others	China's greatest strategic fear is encirclement

Pillsbury stresses China's desire to become a primary power broker in an eventual Chinese-led world order. By using the same stratagems that Chinese emperors used in the Warring States years, China can quietly achieve its goals over the course of several decades. He forecasts a world that looks much different than now, in which Chinese values replace American values. Individual rights are stripped and human rights activists are constantly under attack; free speech will be censored, and China will continue to oppose democratization.³¹ Most importantly, Pillsbury suggests that China will continue to ally with American adversaries to pursue agendas contrary to US interests.³²

³¹ Pillsbury, op. cit., pg. 179-180.

³² Pillsbury, op. cit., pg. 183.

Allison describes a less sinister Chinese foreign policy vision, that could take decades to achieve, if not longer, but ultimately ends with Chinese primacy in Asian and global affairs. Allison describes four overarching objectives for Beijing.³³ First, China returns as the preponderant power in Asian affairs. Second, China reestablishes control over “territories of ‘greater China’” (to include Xinjiang, Tibet, Hong Kong, and Taiwan).³⁴ Third, China will seek to recover “its historic spheres of influence along its borders and in the adjacent seas so that others give it the deference great nations have always demanded.”³⁵ Fourth, China will command global respect from other states and great powers. Allison later describes actions that China, and more specifically Xi Jinping, is currently undertaking to help reach its overarching objectives.³⁶ Xi is aggressively cleansing the CCP of corruption and revitalizing the party, reviving Chinese nationalism, attempting to engineer a third economic revolution, and restructuring the People’s Liberation Army (PLA).

Sutter suggests China’s foreign policy motivations in the 21st century revolve around two key domestic issues: a focus on domestic stability and economic growth.³⁷ This is a stark contrast to the steadfast realist views of Pillsbury and Allison. Sutter describes Chinese leaders that are acutely aware that an international crisis can negatively impact the success of economic modernization or the public faiths and loyalties instilled in the CCP. As such, equal priority is granted to domestic issues and foreign issues alike, since the two are inextricably linked. Following the end of the Cold War, China came to view the US as both its primary threat and its most important partner. As China’s economic and military capabilities continue to grow, Beijing

³³ Allison, G. op. cit., pg. 109.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Allison, G. op. cit., pg. 116-117.

³⁷ Sutter, Robert G. 2016. *Chinese Foreign Relations: Power and Policy Since the Cold War*. Lanham, UK: Rowan & Littlefield. pg. 27.

increasingly viewed the international system to be moving away from unipolar dominance towards a multipolar world. This perception led Chinese leadership to be more assertive in their foreign policy objectives. The more assertive actions led to increased tensions between China and other East and Southeast Asian countries. The increased tensions did not yield fruitful results or results that were in China's best interests. As such, China moved away from its more assertive approach and began a more accommodating and moderate approach until conditions are more favorable to Chinese actions.³⁸ China reaffirmed its peaceful development policy after the unsuccessful foreign policy ventures paved the way for more assertive Chinese soft power pursuits.

Kurlantzick also described Chinese foreign policy differently from both Pillsbury and Allison.³⁹ Kurlantzick asserts that China's coining of the term 'peaceful rise', later to be called 'peaceful development' was part of a Chinese foreign policy objective that showed China's rise would not be at the expense of other nations. This objective would allow China to build its economic power and avoid the fate of the Soviet Union all the while presenting the image of a benign international actor. Peace and stability are essential to China's rise, since Chinese markets demand stable trading partners for imported products. By 2007, China was positioned to become the largest consumer of oil and was already the largest consumer of copper, platinum, iron ore, aluminum, and badly needed timber. A growing economy only exacerbates the market demands.

Christensen's thoughts somewhat echo Kurlantzick's view. Christensen believes China's rise is different than previous great powers that ascended to global primacy. First, Christensen contends that the forces of globalization will limit China's military ventures in Southeast Asia

³⁸ Sutter, op. cit., pg. 36.

³⁹ Kurlantzick, Joshua. 2008. *Charm Offensive: How China's Soft Power is Transforming the World*. New Haven, CT: Yale University Press. Pg. 40.

since states are now more economically connected than before. Second, the international institutions created by the US following their rise to global primacy benefitted China and others, not just the US. Third, China is a rising nuclear power in a world where other nuclear powers exist.⁴⁰

The multiple views held by scholars on China's foreign policy illustrate diversity of thought on China's priorities and intentions, but all agree on China's objectives. China almost certainly seeks to achieve continued economic growth and eventually unify China's disputed territories under CCP government sovereignty. This is all the while granting China more power relative to other global actors – giving China a more assertive global role.

China's Foreign Policy Goals

China has mixed foreign policy motivations that cannot be explained fully by a single author. Instead, I offer a blended motivation and set of foreign policy objectives. International relation theories exist to clarify and forecast the actions a state actor will take at the global scale and according to realist assumptions, China will acquire additional foreign policy options in the future. The “central proposition of realist theory is that the distribution of power in the system determines the behavior of individual states within the system.”⁴¹ This is essential to China's rise. As China's power increases relative to others, particularly the United States, the preponderant power broker in the current international system, China is afforded a greater number of behaviors and options. Under this assumption, China's foreign policy positions and goals are expected to become loftier and increasingly assertive in the coming years as its sources of power continue to grow. China will continue to act in its best interests (which are often

⁴⁰ Christensen, Thomas J. 2016. *The China challenge: shaping the choices of a rising power*. New York: W.W. Norton & Company.

⁴¹ Christensen, op. cit., pg. 225.

counter to US interests) and compete with the US on a range of foreign policy issues and objectives. Therefore, China has several overarching foreign policy objectives. These policies are centered on economic growth and domestic stability, territorial reunification, and achieving regional and global power status on par with the US.

- China will continue to place emphasis on economic growth and domestic stability. This supports the ‘peaceful development’ idea and masks true intentions until the perfect opportunity, as outlined in China’s manual for statecraft.⁴² The Chinese state has stood the test of time. It is the oldest civilization in the world. China has existed. China exists. China will continue to exist. China will not cease to exist. Under this condition it is entirely acceptable for China’s peaceful development to take decades or centuries to materialize and come to fruition. By placing economic development as the top priority, China will avoid the fate of the Soviet Union and the CCP will retain the support of the people. A strong economic core will allow China’s elite to continue to be legitimized and grant China increased influence abroad. Economic growth ensures the CCP survival, which is ultimately the number one priority of PRC leadership.
- As China’s economic power continues to grow, China is afforded additional foreign policy influence and options. This, coupled with a modernized PLA and an increasingly technologically sophisticated society, will position China as the primary regional power broker in Southeast Asian affairs. The economic and military capabilities will provide China with a suite of carrots and sticks to persuade or dissuade rivals and affect its adversaries’ foreign policy calculus. China will almost certainly experience an economic slowdown at some point in the future. At this time, China’s leaders will almost certainly

⁴² Pillsbury, op. cit., pg. 34-46.

control the narrative and shape the story in a fashion that is favorable to the CCP. The economic slowdown, relative to double digit annual growth, will likely come as China pivots from an export based economy to one that is dependent on domestic consumption.

- At some point, China will be forced to reconcile with nationalist cries for the territorial unification of Taiwan, and, to a lesser degree, Chinese claims of sovereignty in the South China Sea, East China Sea, Yellow Sea, and disputed claims regarding India.⁴³ Territorial reunification is considered an overarching objective that all Chinese leaders share. China might attempt to wait out its adversaries until reunification is all but unavoidable, but it is also possible China could attempt to reunify as a means to distract the Chinese population should Beijing suffer a significant economic slowdown.

According to Pillsbury, China's foreign policy objectives regularly run counter to US interests. Johnston agrees with Pillsbury and argues that Beijing leaders have often had views and interests that are opposed to US views and interests. Johnston cites specific examples of "Chinese assertiveness" prior to 2010, like the EP-3 incident or PLA missile exercises in 1995-96 along the Taiwan Strait.⁴⁴ Johnston argues that China's current anti-US policy positions are not new phenomena, but rather a continuation of past foreign policy habits and "there is no obvious pattern of new assertiveness" by China against the US.⁴⁵ Critics of Johnston's work suggest his definition of assertiveness is too narrow. Chen defines assertiveness in three ways: offensive assertiveness, defensive assertiveness, and constructive assertiveness.⁴⁶ Chen argues that Beijing leaders maintain past positions of defensive and constructive assertiveness, but there

⁴³ "Full Text: China's Military Strategy." *Ministry of National Defense The People's Republic of China*. http://eng.mod.gov.cn/Press/2015-05/26/content_4586805.htm (February 4, 2018).

⁴⁴ Johnston, Alastair Iain. 2013. "How New and Assertive Is Chinas New Assertiveness?" *International Security* 37(4): pg. 11-12.

⁴⁵ Johnston, op. cit., pg. 14.

⁴⁶ Chen, Dingding, Xiaoyu Pu, and Alastair Iain Johnston. 2014. "Debating Chinas Assertiveness." *International Security* 38(3): 177.

is no evidence of an increased effort of Chinese offensive assertiveness, which Chen describes as “a great power’s use of coercion to expand its interest and influence without provocation from other countries.”⁴⁷ Ultimately, Chen agrees with Johnston in that China is no more aggressive than it has previously been, but Chen also provides a more thorough definition of assertiveness than was provided by Johnston. Realist assumptions suggest power is a zero-sum game; China’s gain is at the expense of the US, and vice versa. By opposing US foreign policy objectives and limiting US gains in Asian affairs, China can reject some degree of US encirclement – a key component in China’s manual for statecraft. As China continues its rise to great power status, we can reasonably expect China to increase its offensive assertiveness – which would be a change from the current status quo.

China’s ‘One Belt, One Road’ initiative is *how* China seeks to achieve its foreign policy objectives. The initiative, unveiled by Xi Jinping in 2013, is China’s attempt to create a modern day version of the ancient ‘Silk Road’ and connect Asia, Europe, and Africa through investments in trade through a network of pipelines, ports, and telecommunication infrastructure. The original Silk Road existed during China’s Han dynasty (206 BC – 220 CE), some 2000 years ago, and was China’s push westward via trade routes through central Asia and, at its height, Europe. The Silk Road was an avenue for Chinese goods to access foreign markets. Similarly, the modern day Silk Road is a means for Chinese leaders to export excess goods and industrial capacity to access central Asian markets – while posturing and executing a more assertive foreign policy (see figure 1 for China’s proposed Silk Roads).⁴⁸

⁴⁷ Ibid.

⁴⁸ McBride, J. op. cit.



Figure 1. China's Proposed New Silk Roads⁴⁹

China is providing substantial funds to the One Belt, One Road initiative. Reports of the actual value of the initiative vary, but all are in agreement that China is pouring significant amounts of funding into the project. According to the *New York Times*, China is “promising more than \$1 trillion in infrastructure and spanning more than 60 countries.”⁵⁰ And according to Chinese press, the total investment in the project may exceed \$4-8 trillion.⁵¹ The funds will be used for a number of infrastructure projects: roads, railroads, pipelines, telecommunication services, etc; and the One Belt, One Road countries are a means for surplus Chinese goods to access foreign markets. The initiative is likely serving multiple foreign policy objectives. First, the initiative supports China's continued economic growth at home. Economic growth goes hand

⁴⁹ Ibid.

⁵⁰ Huang, Jane Perlez And Yufan. 2017. “Behind China's \$1 Trillion Plan to Shake Up the Economic Order.” *The New York Times*. <https://www.nytimes.com/2017/05/13/business/china-railway-one-belt-one-road-1-trillion-plan.html?mcubz=1> (October 4, 2017).

⁵¹ Ryder, Marcus. 2017. “One Belt, One Road, One Trillion Dollars – Everything You Need to Know in One Essay.” *CGTN*. https://news.cgtn.com/news/3d63544d3363544d/share_p.html (October 4, 2017).

in hand with domestic stability. Second, it is a means for China to improve its image abroad. China building roads and aiding the development of poorer states give credence to the notion that China is attempting a peaceful rise and is acting as a responsible international stakeholder. Third, a Chinese gain in any of the One Belt, One Road countries is at the expense of the US and other western powers.⁵²

China has used its One Belt, One Road initiative as a springboard into other regions not initially included in its foreign policy plans. The original Belt and Road plans focused primarily on connecting Asian, African, and European markets, but it has expanded to include Latin American and Polar regions. Latin American states were invited to join the One Belt, One Road initiative at the Community of Latin American and Caribbean States (CELAC) in January 2018. The invitation lacked specifics, but it would likely include Chinese funded infrastructure projects that improved connectivity.⁵³ China is also pursuing its Polar Silk Road. The Polar Silk Road would open new arctic shipping routes to deliver Chinese goods to foreign markets. Polar shipping routes would trim nearly 20 days off of the traditional transit time through the Suez Canal.⁵⁴ China's 2018 Arctic policy white paper actively calls for stronger international cooperation for the operation of Arctic Sea routes and for all parties to adhere to and act in

⁵² Albert, Eleanor. 2017. "China's Big Bet on Soft Power." *Council on Foreign Relations*.

<https://www.cfr.org/backgrounders/chinas-big-bet-soft-power> (October 4, 2017).

Griffiths, James. 2017. "Just what is this One Belt, One Road thing anyway?" *CNN*.

<http://www.cnn.com/2017/05/11/asia/china-one-belt-one-road-explainer/index.html> (October 4, 2017). Henry, Caleb.

2017. "China Satcom poised to support China's 'Belt and Road' trade initiative." *SpaceNews.com*.

<http://spacenews.com/china-satcom-poised-to-support-chinas-belt-and-road-trade-initiative/> (October 4, 2017).

McBride, J. op. cit.

⁵³ Cambero, Fabian, and Dave Sherwood. 2018. "China invites Latin America to take part in One Belt, One Road."

Reuters. <https://www.reuters.com/article/us-chile-china/china-invites-latin-america-to-take-part-in-one-belt-one-road-idUSKBN1FB2CN> (February 4, 2018).

⁵⁴ Wen, Philip. 2018. "China unveils plan for 'Polar Silk Road' across the Arctic." *The Independent*.

<http://www.independent.co.uk/news/world/asia/china-polar-silk-road-arctic-xi-jinping-shipping-global-warming-a8178891.html> (February 4, 2018).

accordance with international law. China's expansion of its One Belt, One Road will likely continue to challenge US foreign policy interests as its scope increases.⁵⁵

Foreign Policy Formulation

China's Ministry of Foreign Affairs (MOFA) is charged with handling diplomatic affairs between China and other states and executing tasks given by the Communist Party's Central Committee and the State Council.⁵⁶ MOFA does not have much say in the foreign policy of China; rather it is the mechanism within China to implement foreign policy goals and objectives that are created by the Central Committee (especially by the Politburo Standing Committee (PSC)). The seven member PSC is China's most senior decision making body and is the entity within China that manages all the consequential foreign policy decisions. The PSC responds to international crises or emergencies and is chaired by Xi Jinping (Xi is also the only member of the PSC that explicitly has foreign policy responsibilities). If a foreign policy decision is far reaching with potentially drastic effects, then the issues can be taken up with the twenty-five member Politburo, though this infrequently occurs. A significant change in strategic foreign policy direction also requires consent from the 205 member Central Committee, but rarely does the Central Committee challenge decisions made by the PSC and Politburo.⁵⁷

China's foreign policy is also influenced by the presence of Leading Small Groups (LSGs). A LSG is essentially a committee that is created to support and advise Chinese leaders

⁵⁵ "Full text: China's Arctic Policy." 2018. *The State Council The People's Republic of China*.

http://english.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm (February 4, 2018).

⁵⁶ "Main Responsibilities of the Ministry of Foreign Affairs of the People's Republic of China." *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zyzz_663306/ (February 7, 2018).

⁵⁷ Jakobson, Linda, and Ryan Manuel. 2016. "How are Foreign Policy Decisions Made in China?" *Asia & the Pacific Policy Studies*. <http://onlinelibrary.wiley.com/doi/10.1002/app5.121/pdf> (February 7, 2018).

Lawrence, Susan. 2013. "China's Political Institutions and Leaders in Charts ." *Federation of American Scientists*. <https://fas.org/sgp/crs/row/R43303.pdf> (February 7, 2018).

on an important issue or interest. A LSG can exist for a variety of issues, but the importance of a LSG is derived from the most senior individual within the LSG and the rank of the body that directed the creation of the LSG. Foreign policy related LSGs are attached to the Central Committee and report directly to the PSC. They are also always headed by the General Secretary (Xi Jinping), meaning they are the most powerful LSGs within China and provide another mechanism for Xi to direct foreign policy within China.⁵⁸ The structures within China's political system and the CCP give President Xi vast foreign policy responsibilities.

China's Space Program

Mao Zedong officially started China's space program by launching the 5th Research Academy of the Ministry of National Defense October 8th, 1956. China did not launch its first satellite until April 24th, 1970, some 14 years after China's space program's inception, but since then, the program has seen dramatic growth in both on-orbit capability and total number of operational satellites. China is now one of the world's leading space powers, having conducted 21 successful space launches in 2016 and 19 in 2015. The US, in comparison, only had 22 successful launches in 2016 while the Russians had 16.⁵⁹ China's latest space white paper (2016) reaffirms Beijing's dedication to conducting space missions in support of China's overall development strategy and positions the space program to be a critical component of China's foreign policy strategy going forward.

The first Chinese satellite, DongFangHong-1, launched in April 1970, marked China as just the fifth country in the world to independently launch a satellite into orbit.⁶⁰ The satellite

⁵⁸Jakobson, op. cit.

⁵⁹ Koren, Marina. 2017. "China's Growing Ambitions in Space." *The Atlantic*. <https://www.theatlantic.com/science/archive/2017/01/china-space/497846/> (October 4, 2017).

⁶⁰ "NSSDCA/COSPAR ID: 1970-034A." NASA. <https://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1970-034A> (October 4, 2017).

was the heaviest first satellite a country had launched, weighing approximately 173kg (compared to the Soviet Sputnik at 84 kg and the US Explorer 1 at 14kg). The successful launch of DongFangHong-1 (*The East is Red*) into low Earth orbit (LEO) triggered parades throughout Beijing and across China.⁶¹ The Chinese boasted about how China was able to achieve this space launch through its own merits, without any aid, as self-sufficiency had long been important (especially since the Soviet withdrawal in 1956). At the time of launch, China had been experiencing a dire economic situation. Mao leveraged the successful launch as a propaganda tool to demonstrate what his leadership had achieved. It was a tangible success that placed China with other major global powers. The name of the satellite itself was a propaganda tool, inspired by the Maoist saying “East wind prevails over the West wind.” This was a metaphor, suggesting China and socialism will prevail over western nations and imperialism. From its beginnings, Chinese leaders sought to politicize the space program as a means to legitimize the CCP.⁶²

Chinese leaders realized the political potential of its space program following the DongFangHong-1. China sought to follow up the first success with additional spacecraft. The Shi Jian 1 (*practice 1*) launched March 3rd, 1971 into LEO and had a total satellite mass of 221kg.⁶³ The satellite was a modified DongFangHong satellite and utilized nickel-cadmium rechargeable batteries with solar cells. The broadcast payload was swapped out for three scientific instruments: an 11mm cosmic ray detector, a 3mm X-ray detector, and a

⁶¹ Low Earth orbit (LEO) satellites have an altitude between 180 and 2,000km above the surface of the Earth. The satellites have an approximate orbit time of 90 minutes per revolution. This orbital regime has intelligence, surveillance, and reconnaissance (ISR), communications, weather, and scientific and technology demonstrator satellites.

⁶² Handberg, R., & Li, Z. (2012). *Chinese space policy: a study in domestic and international politics*. London: Routledge. pg. 65-67.

Harvey, B. (n.d.). *China's Space Program: From Conception to Manned Spaceflight*. Chichester, UK: Springer. pg. 56-59

“Five momentous moments in China's space probe.” 2016. *China Daily*. http://www.chinadaily.com.cn/china/2016-04/23/content_24779035.htm (October 4, 2017).

⁶³ “Shijian 1.” *National Aeronautics and Space Administration*.

<https://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=1971-018A> (October 4, 2017).

magnetometer. The satellite transmitted its findings through four shortwave antennas on 16 channels. The satellite was almost a failure, as it failed to completely separate from its booster, but after eight days on orbit, the spacecraft separated for unknown reasons. The satellite executed its mission for over 8 years, operating well beyond its designed service life, and verified rechargeable batteries with solar cells as a proven capability. The satellite re-entered Earth's atmosphere on June 17th, 1979.⁶⁴

Following the death of Mao in September of 1976, Deng Xiaoping consolidated leadership of China and in 1978 declared that China would not participate in the Space Race. As a result, funding for the Chinese Space Program was cut dramatically. Deng believed China's needs as a developing country took higher priority than a space program. Despite this declaration, Deng announced four modernizations to take place within China later that year. The modernizations welcomed foreign investment and opened China's economy. One of the four modernizations was science and military technology. The space industry in China was affected by these modernizations and China sought to increase quality control standards. China then joined international space organizations including the International Telecommunications Organization and the UN committee on the peaceful uses of outer space in the early 1980s. The modernizations ended China's isolation from the global space community and opened up forums for China to work for foreign scientists. All the while China continued to design, manufacture, launch, and operate satellites. The overarching theme of this era was economic reform and growth – not investing in manned space or military space programs.

⁶⁴ Handberg, R. op. cit., pg. 60-63.

Economic development within China during this era sparked China's investment in geosynchronous Earth orbit (GEO) telecommunication satellites.⁶⁵ Domestic demands for satellite TV started growing in the late 1970s and China was forced to lease bandwidth from foreign COMSAT providers – who, in China's eyes, would be willing to cut satellite communication (SATCOM) access regardless of China's SATCOM needs in an international conflict.⁶⁶ China sought alternatives to foreign suppliers and invested in its telecommunications infrastructure. COMSATS had economic benefits: they alleviated the need for terrestrial infrastructure in rural areas of China. China could use COMSATS to perform distance education, which would provide education services to portions of the country that suffered from a lack of experienced teachers following China's Cultural Revolution (1966-1976). China's leaders correctly assumed it was cheaper to launch a COMSAT than to hardwire all of rural China, since much of the Chinese state is mountainous. Despite the obvious advantages of satellites, China still did not give priority to the space program (other than select civilian satellite missions that had economic benefits) and other national objectives were pursued more aggressively.⁶⁷

For this analysis, it would be unnecessary to explain in detail all of China's launches in the history of its space program. China launched a number of satellites into LEO following its first two successful programs. It was not until the 1980s that China expanded its spacecraft into GEO.⁶⁸ China's first GEO satellite, the DongFangHong-2 (homage to the DFH-1), provided

⁶⁵ Geosynchronous Earth orbit (GEO), also known as 'High Orbit,' is approximately 36,000km from the surface of the earth. At this distance from the Earth, the satellite will orbit at the same speed as the earth rotates. If a satellite has no inclination or eccentricity in GEO then the satellite will be in a geostationary Earth orbit – giving the appearance that the satellite remains 'fixed' over a certain position on the Earth.

⁶⁶ Handberg, R. op. cit., pg. 93.

⁶⁷ Handberg, R. op. cit., pg. 97-99.

⁶⁸ "Catalog of Earth Satellite Orbits : Feature Articles." NASA.

<https://earthobservatory.nasa.gov/Features/OrbitsCatalog/page2.php> (October 5, 2017).

China telecommunication services from 125 degrees East longitude. The satellite had a launch mass of 916kg, was 2-axis stabilized, and had a communications payload of two transponders.

In March 1986, several Chinese engineers lobbied Deng Xiaoping to invest in high-tech research and development (R&D) to stay relevant and competitive to western powers. This appealed to Deng's proposed "4 modernizations" and his positive views of R&D as a productive force within China.⁶⁹ Later that year, China initiated the National High Technology Research and Development Program (aka the 863 Program) with the purpose of enhancing China's R&D and high-tech abilities and China's space program was injected with additional funds and a sense of purpose. This marked the beginnings of China's "normal" space program. Handberg and Li describe a normal space program as "one where the basic resources are assumed to be in place, both technologically and scientifically, and the question becomes which specific applications or objectives should be pursued."⁷⁰

The boosted China space program led to China opening up its space launch services to the international market. Despite China launching satellites for years domestically, it was a newcomer to the international launch market and had to prove itself as a reliable space launch provider. From 1985 to 1995, China experienced relative success in the commercial launch market. It was not until a string of Chinese space launch failures resulted in complete losses of several foreign satellites in 1995-1996, with some failures resulting in the loss of Chinese lives, that the Chinese space launch program suffered a significant setback. The successive failures triggered an investigation by Chinese and US engineers, as the US wanted to ensure its satellites would launch successfully. China, opening up its space launch vehicle (SLV) program to the US in the mid-1990s, shared technical data with the US, while the US shared technical data about the

⁶⁹ Handberg, R. op. cit., pg. 101.

⁷⁰ Ibid.

satellites set to launch on Chinese SLVs. This triggered a US congressional commission in 1998 to investigate whether US proprietary information was inadvertently shared with the Chinese. The committee determined the Chinese were actively collecting US space program secrets.⁷¹ Following the commission, the US levied restrictions on technology transfers to countries that may negatively impact US national security and banned use of Chinese SLVs for US satellite launches. The loss of US space technologies for China's own satellites, following the tech transfer restrictions may have prompted China's indigenous development of space rated components, an unforeseen consequence of the congressional commission.⁷²

China published its fourth space white paper in December 2016 (the first three published in 2000, 2006, and 2011, respectively).⁷³ The publication describes the current space program's objectives, vision, and principles' while outlining China's strategic goals for the next five years. Major themes within the document are the use of space for peaceful development and the space industry as an integral part of China's overall development strategy. It summarizes China's recent space accomplishments since 2011, highlights international space cooperation, and outlines major tasks China aims to complete in the next five years.

According to China's fourth space white paper, China achieved remarkable space accomplishments between 2011 and December 2016, noting its space program's rapid growth and enhancement of its domestic space capabilities. China's SLVs, the Long March series of launchers, completed 86 launch missions, sending over 100 spacecraft into a variety of orbits, with a 97.67 success rate. The suite of SLVs provides China access to all orbital regimes. The largest Long March SLV, the Long March-5, made its maiden flight in November 2016 and has a

⁷¹ Handberg, R. op. cit., pg. 109.

⁷² Handberg, R. op. cit., pg. 108-111.

⁷³ Lele, Ajey. 2017. "Chinas 2016 Space White Paper: An Appraisal." *Institute for Defence Studies and Analyses*. http://www.idsa.in/issuebrief/china-2016-space-white-paper_avlele_060117 (February 7, 2018).

maximum payload capacity of 25 tons to LEO and about 14 tons to GEO.⁷⁴ China has improved the capabilities of its weather, ocean monitoring, high-resolution, remote-sensing, and mapping constellations.⁷⁵ China is now capable of collecting sub-meter resolution optical images from remote sensing satellites in LEO and has its first GEO high-resolution earth observation satellite, the GaoFen-4 satellite. Chinese COMSATs now provide services to the entire Chinese mainland and surrounding areas, as well as major areas of the world such as Southeast Asia, the Middle East, and Europe. Since 2011, China completed its TianLian-1 data relay constellation. The four satellite constellation provides world-wide coverage and supports near real-time communications between orbiting spacecraft and ground control operators.⁷⁶ The Tiantong-1 mobile COMSAT launched in August 2016. This satellite is a key part of China's space information infrastructure, according to Chinese press.⁷⁷ Lastly, China finished its Beidou Navigation Satellite System (Beidou-2) with the networking of 14 Beidou navigation satellites. The Beidou satellites provide navigation, timing, and short message communication services to the Asia-Pacific region. The summary of Chinese space events from 2011 to December 2016 captures how far China has come since its first satellite launch in April 1970.

Beijing leaders have put forward a robust plan in space for the next five years. Section 3 of the 2016 space white paper outlines broad goals in space that China hopes to achieve.

⁷⁴ Clark, Stephen. 2016. "China launches Long March 5, one of the world's most powerful rockets." *Spaceflight Now*. <https://spaceflightnow.com/2016/11/03/china-launches-long-march-5-one-of-the-worlds-most-powerful-rockets/> (February 7, 2018).

⁷⁵ A remote sensing satellite acquires information of a specific area on earth while orbiting. The sensors can actively illuminate and receive information on the Earth with RF signals or passively collect reflections of naturally illuminated portions of the Earth's surface. Remote sensing satellites are often used by national governments to collect intelligence information on their adversaries and for ocean and natural resource management.

⁷⁶ Barbosa, Rui. 2016. "Long March 3C Launches Fourth Tianlian-1 Spacecraft." *NASA Spaceflight*. <https://www.nasaspaceflight.com/2016/11/long-march-3c-launches-tianlian-1/> (February 7, 2018).

⁷⁷ "China launches first mobile telecom satellite." 2016. *Xinhuanet*. http://news.xinhuanet.com/english/2016-08/06/c_135567667.htm (February 7, 2018).

In the next five years China plans to expedite the development of its space endeavors by continuing to enhance the basic capacities of its space industry, strengthen research into key and cutting-edge technologies, and implement manned spaceflight, lunar exploration, the Beidou Navigation Satellite System, high-resolution earth observation system, new-generation launch vehicles and other important projects. Furthermore, the country is to launch new key scientific and technological programs and major projects, complete, by and large, its space infrastructure system, expand its space applications in breadth and depth, and further conduct research into space science, promoting the integrated development of space science, technology and applications.⁷⁸

The goals are further expanded in individual sections. For instance, China wants to continue to expand its SATCOM capability with an eventual global SATCOM system that provides world-wide coverage. SATCOM is also mentioned as a key area for future cooperation between China and international organizations in the next five years.

In the next five years China will, with a more active and open attitude, conduct extensive international exchanges and cooperation concerning space in the following key areas: Construction of the Belt and Road Initiative Space Information Corridor, including earth observation, communications and broadcasting, navigation and positioning, and other types of satellite-related development; ground and application system construction; and application product development.⁷⁹

This suggests China is making calculated decisions with its space assets to support national economic objectives. China is specifically targeting states within the Belt and Road corridor to be the recipient of Chinese investment in communications and broadcasting.

China's space program as a whole is discussed by Handberg and Li. They assess the likely future of China's space program and address the strategic directions China will take. The space race between the US and the Soviet Union carved out de facto norms and rules. China considers the established norms "as advantaging the presently dominant space power, the United States, and as a consequence limiting the efforts of others."⁸⁰ Despite this, China does not want to disrupt the norms and its goal is to "delay if not prevent significant changes in the regime,

⁷⁸ "Full text of white paper on China's space activities in 2016." 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

⁷⁹ Ibid.

⁸⁰ Handberg, R. op. cit., pg. 156.

especially those understandings and formal agreements rejecting actual placement of weapons in outer space – the weaponization of outer space”.⁸¹ China does not wish to disrupt the norm because its leaders understand that a change to the norm would grant the US more power relative to China. By keeping the current regime, the US cannot weaponize space and tilt the scale to favor the US more than it already does. Weaponization is also mentioned in the 2016 space white paper. China reaffirms its commitment to “the use of outer space for peaceful purposes, and opposes the weaponization of or an arms race in outer space. The country develops and utilizes space resources in a prudent manner, takes effective measures to protect the space environment to ensure a peaceful and clean outer space and guarantee that its space activities benefit the whole of mankind.”⁸² China is quick to call out its measures to protect the space environment, as China was accused of being reckless following the 2007 anti-satellite missile test against the Fengyun-1C satellite.⁸³

As is the case with most of China’s space white papers, China only sought to highlight successes of its space program, to admit failures would only show Chinese weakness to potential adversaries and to Chinese citizens. This plan has unintended consequences though, as Handberg points out. By only highlighting the successes of its space programs, China’s adversaries have incomplete information and assume China’s repeated success is signaling a growing Chinese threat.⁸⁴ China suffered successive launch vehicle failures in June and July 2017. In mid-June 2017 China’s Long March 3B/E SLV failed to properly insert Chinasat-9A into orbit, resulting in

⁸¹ Ibid.

⁸² “Full text of white paper on China’s space activities in 2016.” 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

⁸³ Leonard, David. 2007. “China's Anti-Satellite Test: Worrisome Debris Cloud Circles Earth.” *Space.com*. <https://www.space.com/3415-china-anti-satellite-test-worrisome-debris-cloud-circles-earth.html> (February 7, 2018).

⁸⁴ Handberg, R. op. cit., pg. 161.

a shortened operating life for the satellite.⁸⁵ In July 2017 China's Long March 5 SLV failed to place the ShiJian-18 satellite into orbit, resulting in a complete loss of the satellite.⁸⁶ While the Long March failures occurred after the issue of the December 2016 space white paper, the exclusion of events similar to these only serve to provide incomplete information, raising the risk of foreign miscalculations about China's space program.

China Great Wall Industry Corporation (CGWIC) is the sole entity within the PRC responsible for coordinating Chinese commercial space services to foreign customers. All foreign sales of turn-key satellite systems are contracted through CGWIC.⁸⁷ The "company" is responsible for "promoting international cooperation for China's space industry" and is "devoted to the internationalized development of China's space industry."⁸⁸ Handberg notes that Great Wall Industry Corporation (GWIC), an alternate name for CGWIC, "presents the image of privatization to the world but the reality is total government control rather than market judgements. The Corporation's function is to facilitate government policy; profits are an additional incentive but subordinate to the political."⁸⁹ This is evident on CGWIC's public website. The major shareholder is China Aerospace Science and Technology Corporation (CASC). CASC, also known as CASC Fifth Academy, was created by Mao in 1956 and is a

⁸⁵ Barbosa, Rui. 2017. "Long March 3B lofts ChinaSat 9A – third stage issue reported." *NASASpaceflight*. <https://www.nasaspaceflight.com/2017/06/long-march-3b-lofts-chinasat-9a/> (February 7, 2018).

Clark, Stephen. 2017. "Chinese TV broadcasting satellite reaches operational orbit after off-Target launch." *Spaceflight Now*. <https://spaceflightnow.com/2017/07/13/chinese-tv-broadcasting-satellite-reaches-operational-orbit-after-off-target-launch/> (October 5, 2017).

⁸⁶ Barbosa, Rui. 2017. "Long March 5 suffers failure with Shijian-18 launch." *NASASpaceflight*. <https://www.nasaspaceflight.com/2017/07/long-march-5-lofts-shijian-18/> (October 5, 2017).

⁸⁷ A turn-key satellite system is a popular term used within the SATCOM industry for a modularized satellite system to be sold to any customer. China practices the sale of turn-key satellite systems. China provides the customer with all the necessary equipment and training required to operate the satellite system. The customer, upon receiving the training and the equipment (consisting of the satellite and the supporting ground infrastructure), has a fully operational satellite system for their use. This grants the customer access to a satellite system that they do not have the capability to produce indigenously. The customer can then use the satellite to meet its national or commercial objectives.

⁸⁸ "China Great Wall Industry Corporation (CGWIC)." *China Great Wall Industry Corporation*. <http://www.cgwic.com/About/> (October 5, 2017).

⁸⁹ Handberg, R. op. cit., pg. 171.

large state-owned enterprise that “engages in the research, design, manufacture and launch of space systems such as launch vehicles, satellites and manned spaceships as well as strategic and tactical missiles, and also provides international commercial satellite launch service.”⁹⁰ The enterprise has a number of subsidiary companies – one being CGWIC. In short, CGWIC is bankrolled by CASC, a large state owned enterprise that receives its guidance from, and remains loyal to, the CCP.

Another subsidiary of CASC is China Academy of Space Technology (CAST). CAST is a world class spacecraft manufacturer and is the prime contractor for Chinese DongFangHong-4 (DFH-4) satellites. China’s DFH-4 satellite bus is China’s third generation GEO satellite bus and provides China with higher power, larger payload capacity, and an extended service life from GEO than its predecessor, the DongFangHong-3 (DFH-3).⁹¹ CAST has also designed several variants of the DFH-4 satellite: the DFH-4E, an enhanced version of the DFH-4 with a larger payload capacity; the DFH-4S, a smaller version of the DFH-4 with electric propulsion for satellite station keeping; and the DFH-4SP, an all-electric version, including apogee kick motor, of the DFH-4S.⁹² CAST is currently working on the DFH-5 satellite bus, too. The DFH-5 is China’s fourth generation GEO satellite bus and dramatically increases the satellite’s total payload mass and power. China’s first launch of the DFH-5 satellite bus failed to reach orbit, due

⁹⁰ “China Aerospace Science and Technology Corporation (CASC).” *Nuclear Threat Initiative*. <http://www.nti.org/learn/facilities/64/> (October 5, 2017).

“Company Profile.” *China Aerospace Science and Technology Corporation*. <http://english.spacechina.com/n16421/n17138/n17229/c127066/content.html> (October 5, 2017).

⁹¹ A satellite bus refers to the essential and necessary subsystems and infrastructure of a satellite that are required to keep the satellite operational. A satellite bus will support the satellite’s payload.

⁹² “DFH-4SP.” *China Academy of Space Technology*. <http://www.cast.cn/Item/Show.asp?m=1&d=3292> (October 5, 2017).

Perrett, Bradley. 2013. “China Developing Three Commercial Satellite Buses.” *Aviation Week*. <http://aviationweek.com/awin/china-developing-three-commercial-satellite-buses> (February 7, 2018).

Wang. 2012. “Chinese DFH-4 Platform Product Line Improvement.” *63rd International Astronautical Congress 2012*. <http://iafastro.directory/iac/archive/tree/IAC-12/B2/4/IAC-12,B2,4,10,x14084.brief.pdf> (October 5, 2017).

to a SLV failure in July 2017. Collectively, the DFH series satellites provide China with a suite of GEO satellites that can be tailored to meet customer requirements.

China's Current Space Capabilities

As of 2017, China is estimated to spend about \$6 billion a year on its current space program.⁹³ This has resulted in a combination of manned, commercial, civilian, and military spacecraft and satellite programs. China operates satellites in the LEO, medium Earth orbit (MEO), and GEO orbital regimes. Collectively, the space program is a source of national pride, but individually the space systems provide specific capabilities that aid in the development of China and or help China achieve regional and global national objectives. According to the 2017 U.S. Defense Department's annual report to the U.S. Congress on Chinese military power, China "continues to invest in improving its capabilities in the fields of space-based ISR, satellite communication, satellite navigation, and meteorology, as well as human spaceflight and robotic space exploration" and its "space program continues to mature rapidly."⁹⁴

China currently relies on the Long March series SLVs for space access. In 2016, China revealed two new SLVs: the Long March 7 (LM-7) and the Long March 5 (LM-5). The LM-7 is a medium lift SLV capable of inserting approximately 13,500kg into LEO. The LM-7 draws its structure from China's Long March 2F rocket, which is still currently in use. Once proven reliable, the LM-7 will likely become China's new "workhorse launcher tasked with lifting future space station resupply vehicles into orbit and carrying satellites to geostationary transfer

⁹³ Clark, Stu. 2016. "China: the new space superpower." *The Guardian*.
<https://www.theguardian.com/science/2016/aug/28/china-new-space-superpower-lunar-mars-missions> (October 5, 2017).

⁹⁴ "Annual Report to Congress - Military and Security Developments Involving the People's Republic of China 2017." *Office of the Secretary of Defense*.
https://www.defense.gov/Portals/1/Documents/pubs/2017_China_Military_Power_Report.PDF (December 17, 2017).

orbit (GTO).”⁹⁵ China’s newest SLV, the Long March 5, will provide space launch services for 20-30 years, according to Chinese press.⁹⁶ It was designed to support China’s manned space mission and provide access to lunar and Mars missions. The heavy lift SLV first launched in November 2016, successfully inserting the ShiJian-17 satellite into GEO; however, its second launch failed to insert the ShiJian-18 satellite into orbit in July 2017. As of late 2017, it remains to be seen how China’s space program will recover from the LM-5 failure and if there are lingering effects.⁹⁷

China is currently pursuing remote sensing capabilities in LEO and GEO. GaoFen series satellites are part of the China High-Resolution Earth Observation System (CHEOS) project and provide China with a variety of high-resolution electro-optical and synthetic aperture radar imagery in near real-time. Engineers and scientists at China National Space Administration first proposed the CHEOS concept in 2006, and it was later approved in 2010. Since approval, China has successfully launched six GaoFen satellites into space. Chinese academic writings suggest the CHEOS architecture provides China with a capability to monitor urban changes and survey coastlines. The architecture is aimed at disaster prevention and reduction, precision agriculture, urban planning, and land ownership determination. One of China’s newer GaoFen satellites, Gaofen-4, located at 105.6 degrees East longitude in GEO, provides continuous imagery coverage of the Chinese mainland and surrounding areas. Speculation exists that despite its civilian mission, the People’s Liberation Army (PLA) “could easily make use of such satellites

⁹⁵ Blau, Patrick. 2016. “Debut Launch of Long March 7 to mark Grand Opening of China’s new Spaceport.” *Spaceflight101*. <http://spaceflight101.com/long-march-7-maiden-launch/long-march-7-set-for-debut-launch/> (October 5, 2017).

⁹⁶ CCTV English. 2016. “A walk through China's space launch vehicles.” *YouTube*. https://www.youtube.com/watch?v=iwpk4_p-_OY (October 5, 2017).

⁹⁷ Barbosa, Rui. 2016. “China conducts Long March 5 maiden launch.” *NASASpaceflight*. <https://www.nasaspaceflight.com/2016/11/china-long-march-5-maiden-launch/> (October 5, 2017).

Foust, Jeff. 2017. “Long March 5 launch fails.” 2017. *SpaceNews.com*. <http://spacenews.com/long-march-5-launch-fails/> (October 5, 2017).

during Chinese military operations.” The same article mentions GaoFen-4’s potential ability to track aircraft carriers, presumably US aircraft carriers.⁹⁸ China’s GaoFen satellites likely contribute to China’s foreign policy objectives by providing overhead imagery for One Belt, One Road projects and establishing where foreign combatants are based abroad.

China’s Beidou Navigation Satellite System is China’s positioning and timing service, providing services equivalent to the US Global Positioning Service (GPS). The system is composed of three segments: the space section; the ground section; and the user section. As of late 2017, the space section is composed of 35 satellites in two orbital regimes: a mixture of satellites in MEO, GEO, and some in inclined GEO. China’s Beidou system does not currently provide worldwide positioning services; the services are currently limited to the Asia-Pacific region, according to China’s 2016 space white paper. China plans on providing basic positioning and navigational services to Silk Road countries by 2018 and complete the Beidou constellation for global coverage by 2020.⁹⁹

China operates a number of COMSATs through CASC’s subsidiary China Satellite Communications Company Limited (China Satcom). As of late 2017, China Satcom operates 15 COMSATs in GEO. Collectively, these satellites use a combination of western and Chinese satellites buses and provide communication and broadcasting services to mainland China,

⁹⁸ “Gaofen (High Resolution).” 2016. *China Space Report*. <https://chinaspacereport.com/spacecraft/gaofen/> (October 5, 2017).

Lin, Jeffrey and P.W. Singer. 2016. “Gaofen 4, The World’s Most Powerful GEO Spy Satellite, Continues China’s Great Leap Forward Into Space.” *Popular Science*. <http://www.popsci.com/gaofen-4-worlds-most-powerful-geo-spy-satellite-continues-chinas-great-leap-forward-into-space> (October 5, 2017).

⁹⁹ “Full text of white paper on China’s space activities in 2016.” 2016. *The State Council The People’s Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

Australia, Southeast Asia, the Middle East, Europe, and Africa.¹⁰⁰ See Table 2 for a summary of China Satcom’s on-orbit COMSATs.

Table 2. Current China Satcom Company Assets				
Satellite	Bus	Launch Date	Orbital Position	Areas Served
Chinasat-5A	Lockheed Martin A2100A	May 30, 1998	142 E	Asia-Pacific Region
Chinasat-6A	CAST DFH-4	Sept 5, 2010	125 E	China, Asia-Pacific Region
Chinasat-6B	Thales Alenia Space SB4000	July 5, 2007	115.5 E	Asia, Australia
Chinasat-9	Thales Alenia Space SB4000	June 9, 2008	92.2 E	China
Chinasat-9A	CAST DFH-4	June 2017	101.4 E	China, South China Sea
Chinasat-10	CAST DFH-4	June 21, 2011	110.5 E	China, Asia Pacific Region
Chinasat-11	CAST DFH-4	May 2, 2013	98 E	Asia Pacific Region
Chinasat-12	Thales Alenia Space SB4000 C2	Nov 27, 2012	87.5 E	Asia Pacific Region, ME
Chinasat-15	CAST DFH-4	Jan 26 th , 2016	51.5 E	Africa, Europe, ME, Asia
Chinasat-16	CAST DFH-4S	May 12, 2017	110.5 E	China
Apstar-5*	Space Systems/Loral	June 29, 2004	138 E	Asia Pacific Region
Apstar-6*	Thales Alenia Space SB4000 C2	April 12, 2005	134 E	Asia Pacific Region
Apstar-7*	Thales Alenia Space SB4000 C2	March 31, 2012	76.5 E	Asia, Africa, Europe, ME
Apstar-9*	CAST DFH-4	Oct 17, 2015	142 E	Asia Pacific Region
<p>*China Satcom claims all Apstar satellites as their own resources. CASC is majority owner of Asia Pacific Telecommunication (APT) Source: China Satellite Communications Company Ltd (http://english.csat.spacechina.com/n931903/index.html, 2017)</p>				

China experienced several setbacks with their first two DFH-4 satellites, as both were complete failures. Sinosat-2 and Nigcomsat-1 launched in October 2006 and May 2007,

¹⁰⁰ “Company Profile.” *China Satellite Communications Company Ltd.*
<http://english.csat.spacechina.com/n931656/n931661/index.html> (October 4, 2017).

respectively. Sinosat-2 was a for satellite TV distribution, but shortly after launch one of its solar panels failed to deploy, depriving the satellite of the power required to operate.¹⁰¹ Nigcomsat-1, an exported satellite for Nigeria, had a similar solar panel deployment issue, which also resulted in a complete failure.¹⁰² Following the first two failures, China corrected the failures and the DFH-4 has had at least 13 straight successful launches.¹⁰³

The smaller DFH-4S satellite bus has been used a total of three times for Laosat-1, ShiJian-17, and Chinasat-16. All three satellites have recently launched (2015-2017) and were successful while experiencing no reported failures. Laosat-1 is a telecommunications satellite exported to Laos.¹⁰⁴ ShiJian-17 performs a number of missions in GEO, such as “communications services, a demonstration of satellite-based navigation in the high-orbit regime (using side lobe signals from China’s Beidou navigation satellites), and finally complete a demonstration of an optical-sensing payload to observe space debris at high altitude.”¹⁰⁵ Chinasat-16 is China’s first high-throughput (HTS) COMSAT and is capable of transmitting 20 gigabytes of data per second.¹⁰⁶

¹⁰¹ “China confirms Sinosat-2 failure.” 2006. *Space Today*. <http://www.spacetoday.net/Summary/3574> (February 7, 2018).

¹⁰² Henry, Caleb. 2017. “Back-to-Back commercial satellite wins leave China Great Wall hungry for more.” *SpaceNews.com*. <http://spacenews.com/back-to-back-commercial-satellite-wins-leave-china-great-wall-hungry-for-more/> (October 5, 2017).

¹⁰³ “Dong Fang Hong 4.” 2016. *China Space Report*. <https://chinaspacereport.com/spacecraft/dfh4/> (October 5, 2017).

¹⁰⁴ Clark, Stephen. 2015. “China launches first satellite for Laos.” *Spaceflight Now*. <https://spaceflightnow.com/2015/11/22/china-launches-first-satellite-for-laos/> (October 5, 2017).

Jones, Andrew. 2015 “China launches first satellite for Laos on Long March 3B.” *GBTIMES*. <http://gbtimes.com/china/laosat-1-china-launches-first-satellite-laos-long-march-3b> (October 5, 2017).

¹⁰⁵ Blau, Patrick. 2016. “China’s Shijian-17 Satellite settles in Geostationary Orbit for Experimental Mission.” *Spaceflight101*. <http://spaceflight101.com/cz-5-maiden-flight/shijian-17-settles-in-geostationary-orbit/> (October 5, 2017).

¹⁰⁶ Barbosa, Rui. 2017. “Long March 3B launches experimental ChinaSat-16 satellite.” *NASASpaceflight*. <https://www.nasaspaceflight.com/2017/04/long-march-3b-chinasat-16-launch/> (October 5, 2017).

China is yet to use the DFH-4SP or the DFH-4E. As of early 2018, it is unknown when China plans to use the DFH-4SP. China intends to launch Chinasat-18 in 2019; this will be the first use of the DFH-4E satellite bus.

Chapter 2: Methodology and Variable Selection

The most different system (MDS) design is the most applicable analysis tool to compare the various states that have purchased a satellite from China. MDS design focuses on consistencies between multiple cases in regards to the dependent variable. By comparing similar outcomes, with different independent variables, comparativists can isolate critical variables that are essential to the outcome of the dependent variable. According to Lim, “the MDS design, in sum, is an efficient and effective way of launching a comparative research project.”¹⁰⁷

All states under study (Nigeria, Venezuela, Pakistan, Bolivia, Laos, Belarus, Algeria, and Nicaragua) have signed for the purchase of a communications satellites from China. Since China has only sold turn-key communication satellites to a limited number of states, all purchasing states will be included in the analysis of the variables. The focus of this research is not “why did the state purchase a satellite from China? But rather *why did China sell a satellite to this state?* With the exception of Belarus and Venezuela, all states in this study are not subject to US International Traffic in Arms Regulations (ITAR) restrictions and *could* have purchased satellite technology from the US or other western satellite providers, but instead the states in this study

¹⁰⁷ Dogan, M., and D. Pelassy. 1990. *How to Compare Nations: Strategies in Comparative Politics*. Chatham: Chatham House Publishers.

Lim, Timothy C. 2016. *Doing Comparative Politics: an Introduction to Approaches and Issues*. Boulder, CO: Lynne Rienner Publishers. pg. 43-45

opted for Chinese satellites.¹⁰⁸ The most different system design will allow for specific variables to be isolated and then subsequently analyzed. My variables to measure are government structure of the purchasing state, access to natural resources in purchasing states, the purchasing state's location relative to US allies, worldwide economic rank of the purchasing state, length of formal and informal relations with China, and favorability ratings of each state towards the US and China.

¹⁰⁸ "Country Policies and Embargoes." 2017. *U.S. Department of State*.
https://www.pmdtc.state.gov/embargoed_countries/ (October 23, 2017).

Table 3. Variables for Study

	Nigeria	Venezuela	Pakistan	Bolivia	Laos	Belarus	Algeria	Nicaragua*	Afghanistan**	Sri Lanka**	DR of Congo**
Government Type (see legend below) (CIA World Factbook)	1	1	3	2	4	5	2	2	6	2	7
Natural Resources- crude oil production rank (2015) (CIA World Factbook)	12	11	46	54	155	66	19	178	104	118	71
State's Geographic Location	Africa	South America	Asia	South America	Asia	Europe	Africa	Central America	Asia	Asia	Africa
Length of formal relations w/ PRC (Research)	Feb 1971	Jun 1974	May 1951	Jul 1985	Apr 1961	Jan 1992	Dec 1958	None***	Jan 1955	Feb 1957	Nov 1972
Favorable Public Opinion of US (Pew Center)	63% (2016)	51% (2015)	22% (2015)	55% (2013)	N/A	N/A	N/A	71% (2014)	N/A	N/A	N/A
Favorable Public Opinion of China (Pew Center)	63% (2016)	58% (2015)	82% (2015)	58% (2013)	N/A	N/A	N/A	58% (2014)	N/A	N/A	N/A
Economic Rank (GDP per capita, 2016)	163	109	171	155	165	95	111	169	207	124	228
Satellite Sale Contract Signed (Year)	2004	2005	2008	2010	2010	2012	2013	2012	2017	2013	2012

Government type legend:

- 1: federal presidential republic
- 2: presidential republic
- 3: federal parliamentary republic
- 4: communist state
- 5: presidential republic in name only, although actually a dictatorship
- 6: presidential Islamic republic
- 7: semi-presidential republic

* Nicaragua maintains diplomatic relationships with Taiwan. Between 1985 and 1990 Nicaragua broke formal relations with Taiwan, but has recognized Taiwan since the relationship was restored

**Media announced satellite agreements signed, but no significant progress has been reported, questioning the likelihood of sale

Government Structure:

The government structure of the purchasing states is determined by the CIA World Factbook designation. The states under study vary in government structure from federal presidential republic, to presidential republic, to federal parliamentary republic, to Communist state, to a presidential republic in name only, when the state is actually a dictatorship. This variable was selected to discern whether or not China sought deals with like-governed states or if China was willing to sell satellites to customers regardless of government type. The government

structure variable, if determined relevant to China’s satellite sale selection process, could possibly help identify future Chinese satellite customers. See table 4 for a description of each government type.¹⁰⁹

Table 4. Type of Governments	
Federal Presidential Republic	Combines two types of governments: the federal republic and presidential system. A federal republic is a state in which the powers of the central government are restricted and in which the component parts (states, colonies, or provinces) retain a degree of self-government; ultimate sovereign power rests with the voters who chose their governmental representatives. A presidential system is a system of government where the executive branch exists separately from a legislature (to which it is generally not accountable).
Presidential Republic	Combines two types of governments: the presidential system and republic. A presidential system is a system of government where the executive branch exists separately from a legislature (to which it is generally not accountable). A republic is a representative democracy in which the people's elected deputies (representatives), not the people themselves, vote on legislation.
Federal Parliamentary Republic	Combines two types of governments: the federal republic and parliamentary system. The federal republic is a state in which the powers of the central government are restricted and in which the component parts (states, colonies, or provinces) retain a degree of self-government; ultimate sovereign power rests with the voters who chose their governmental representatives. The parliamentary system is a political system in which the legislature (parliament) selects the government - a prime minister, premier, or chancellor along with the cabinet ministers - according to party strength as expressed in elections; by this system, the government acquires a dual responsibility: to the people as well as to the parliament.
Communist State	A system of government in which the state plans and controls the economy and a single - often authoritarian - party holds power; state controls are imposed with the elimination of private ownership of property or capital while claiming to make progress toward a higher social order in which all goods are equally shared by the people (i.e., a classless society).
Dictatorship	A form of government in which a ruler or small clique wield absolute power (not restricted by a constitution or laws).

¹⁰⁹ “References :: Definitions and Notes.” *Central Intelligence Agency*. [https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html?fieldkey=2128&term=Government type](https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html?fieldkey=2128&term=Government%20type) (October 23, 2017).

Natural Resources:

Natural resources are measured by a state's total crude oil rank production.¹¹⁰ Crude oil is a fossil fuel that is composed of hydrocarbons from plants and animals that lived hundreds of millions of years ago. Many petroleum products are manufactured from crude oil, to include gasoline, heating oil, jet fuel, lubricating oils, asphalt, etc. Crude oil must be pumped from the Earth and then refined in order to use.¹¹¹ This variable was selected because China is currently developing its Strategic Petroleum Reserves (SPR). According to China's Commerce Ministry, it had accrued 33.25 million tonnes of crude oil in its SPR by mid-2016.¹¹² This is a considerable achievement since in 2007 China virtually had no strategic reserves at all.¹¹³ China views its SPR as a necessity since access to oil imports are not assured in a US-Sino conflict. China cannot match US naval supremacy globally and suspects the US would deny China access to imported oil from the sea.¹¹⁴ Furthermore, a growing economy requires petroleum based products as it continues to grow. To help ensure China will not lose access to oil imports in a potential US-Sino conflict or the supply for a growing economy, China is attempting to win the trust of foreign states involved in the oil production process.¹¹⁵ Measuring a state's crude oil production will gauge China's strategic energy interests in said state. If a state has a large supply of crude oil production, then it can reasonably be assumed that China would have increased interest in said state. The increased interest and cooperation between the two could result in a satellite sale to help guarantee continued relations between the two governments and force continued dialogue

¹¹⁰ 2015 was selected because data was available for each state in this timeframe

¹¹¹ "Oil: Crude and Petroleum Products Explained." *US Energy Information Administration*.
https://www.eia.gov/energyexplained/index.cfm?page=oil_home (October 23, 2017).

¹¹² "China strategic oil reserves rise to 33.25 mln t by mid-2016 -Govt." 2017. *Reuters*.
<http://www.reuters.com/article/china-oil-reserves/china-strategic-oil-reserves-rise-to-33-25-mln-t-by-mid-2016-govt-idUSB9N1HS080> (October 23, 2017).

¹¹³ Kurlantzick, J. op. cit., pg. 41.

¹¹⁴ Downs, Erica. 2006. "China." *The Brookings Foreign Policy Studies Energy Security Series*.
<https://www.brookings.edu/wp-content/uploads/2016/06/12china.pdf> (December 2006).

¹¹⁵ Kurlantzick, J. op. cit., pg. 40-41.

between states. This would be akin to China using its satellite technology as a carrot in its suite of statecraft options, as China uses its satellites to woo customers into guaranteed access to natural resources.

Purchasing states location relative to US allies/supporters:

The purchasing state's location relative to US allies will test encirclement. The US has a number of allies globally, specifically within Southeast Asia. Key US allies in Southeast Asia are Japan, South Korea, Philippines, Thailand, New Zealand, and Australia. The global network of alliances is a major power source for the US. The US alliance system is unmatched and creates a US sphere of influence around China and Chinese interests abroad. China, weary of encirclement from the warring states' stratagems, could possibly be attempting to sell satellites to states in an attempt to guarantee relationships with states near US strategic allies or interests. This could possibly grant China a means to counter US influence and alliances abroad. Furthermore, a satellite sale could potentially lead to Chinese military basing rights in the purchasing country. It is speculated that China would build a military base in Pakistan (a purchaser of Chinese satellite technology), though these reports are denied by the Chinese government.¹¹⁶ China has already proven they are ready to expand the PLA's global footprint by basing troops beyond mainland China. In August 2017, China opened its first overseas military base in Djibouti, creating what could be the first of many Chinese bases abroad. By selling satellites, and then leveraging the sales to support future cooperation, China could be attempting to subtly combat US encirclement.

Worldwide economic rank of the purchasing state:

¹¹⁶ Blanchard, Ben. 2017. "China formally opens first overseas military base in Djibouti." *Reuters*. <https://www.reuters.com/article/us-china-djibouti/china-formally-opens-first-overseas-military-base-in-djibouti-idUSKBN1AH3E3> (October 23, 2017).

For decades China has marketed itself as the leader of the developing world. China first positioned itself as the global leader of developing states at the Bandung Conference in 1955.¹¹⁷ The conference, held in Indonesia, was a meeting of leaders from various newly formed and developing states in Asia and Africa.¹¹⁸ Since, China has continued to craft itself as the de-facto leader and that position has been strengthened in recent decades due to China's dramatic economic growth. As the self-proclaimed leader, China might be targeting developing nations specifically as a means to lift other states out of poverty and aid in their development. The purchasing state's worldwide economic ranking will allow us determine if China is targeting developing nations specifically. As of late 2017, All Chinese satellites sale contracts signed, with the exception of Belarus, are to developing economies; however, it remains to be determined if economic development is part of China's calculus when accepting satellite customers.¹¹⁹

Length of formal and informal relations with China:

China initiated formal relations with foreign states following its declaration of victory in the Chinese Civil War in 1949. It is possible that China is leveraging long-standing relationships with other state-actors to facilitate satellite sales. China could treat satellite sales as a reward for formal relations or as a show of good faith between the two actors. Formal relationships have an additional significance in China. Per the one China policy, states maintain formal relations with either the People's Republic of China (PRC) or Republic of China (ROC, aka Taiwan).¹²⁰ In 1994, China publicly announced that it "would use all economic and diplomatic resources to

¹¹⁷ Kurlantzick, J. op. cit., pg. 13.

¹¹⁸ Leng, Chua Chin. 2015. "China Africa relations - 60 years after Bandung." *The Telegraph*. <http://www.telegraph.co.uk/sponsored/china-watch/politics/12033193/bandung-asian-african-conference-60-anniversary.html> (October 23, 2017).

¹¹⁹ "Statistical Annex." *United Nations World Economic Situation and Prospects 2012*. http://www.un.org/en/development/desa/policy/wesp/wesp_current/2012country_class.pdf (October 23, 2017).

¹²⁰ "What is the 'One China' policy?" 2017. *BBC News*. <http://www.bbc.com/news/world-asia-china-38285354> (October 23, 2017).

reward countries that are willing to isolate Taiwan.”¹²¹ It is possible that satellite sales are incentives to woo states from Taiwan’s influence, especially since Taiwan has targeted developing nations through its “Go South” strategy since the 1990s.¹²²

Favorability ratings of each state towards the US and China:

China could be targeting states that favor China over the US for investment and satellite sales specifically. Limited information from public polling indicates that China has a slight edge in favorability over the US in purchasing states. China could be targeting China friendly states and populations to be the benefactor of Chinese investment as a means to cultivate public opinion abroad and help erase global perceptions that China’s rise is something to be feared. Analysis of public opinion before and after each satellite contract signing ceremony and satellite launch could possibly reveal a causal relationship between satellite sales and public opinion.

Hypothesis and Expectations

Beijing leaders almost certainly consider several variables when determining whether it will sell a satellite to a purchasing state. China and China Great Wall Industry Corporation (CGWIC) consider financial earnings on satellite sales secondary to political objectives, so its assumed the primary motivation for satellite sales is not as simple as earning a sale. Each of the identified variables will impact China’s calculus when selling a satellite, but I expect that the most applicable variables that support the sale are probably the purchasing state’s economic rank and the purchasing state’s geographic position relative to the US and its allies. China is likely using satellites to purchase influence in desired states, but it remains to seen how China intends to use its influence and how it can affect US foreign policy.

¹²¹ Kurlantzick, J. op. cit., pg. 42.

¹²² Ibid.

Analysis of each satellite sale will likely reveal China's intentions and motivations. Different variables probably have different priorities depending on the purchasing state. For instance, China may have different motivations when signing a satellite contract with Nicaragua versus when signing with Pakistan. Underlying themes between sales will be highlighted and incorporated into a parsimonious explanation of China's actions.

Chapter 3: Case Studies

China has successfully exported satellites to a number of countries around the world. Analysis of each satellite sale may reveal in patterns in relationships between China and the purchasing state as well as some of the goals the PRC is hoping to achieve. It is likely that China has different objectives and desired end states with each satellite sale, but overall China's preferred outcome likely is associated with increased influence in the purchasing state. Each satellite sale is the likely the product of targeted Chinese engagement.

Nigeria

China Great Wall Industry Corporation (CGWIC) signed a deal with Nigeria's National Space Research and Development Agency (NASRDA) on December 15th, 2004 in Abuja, Nigeria for the in-orbit delivery of the Nigcomsat-1 communications satellite (COMSAT).¹²³ The deal included the satellite, delivery of the satellite into orbit, insurance, technology transfer, satellite operator training, and two satellite ground stations.¹²⁴ The satellite contract totaled \$311

¹²³ "Nigcomsat-1 Program -- In-Orbit Delivery Program." *China Great Wall Industry Corporation*. <http://www.cgwic.com/In-OrbitDelivery/CommunicationsSatellite/Program/NigComSat-1.html> (December 6, 2017).

¹²⁴ *Ibid.*

million, of which \$112 million is the cost of the satellite.¹²⁵ This satellite contract was China's first commercial satellite contract. Shortly after launch, Nigcomsat-1 experienced a catastrophic solar array anomaly and the satellite failed. China subsequently built a replacement satellite, Nigcomsat-1R, and launched the satellite into orbit for Nigeria.¹²⁶

Formal diplomatic relations between China and Nigeria began on February 10th, 1971. The relationship between the two was largely in name only until several events in the late 1990s and early 2000s. Nigeria experienced several military coups in the 1980s and 1990s and was not considered a stable state for much of those decades (China had its own domestic issues then, too). It was not until Nigeria's democratic election in 1999, when Olusegan Obasanjo was elected president, that China's and Nigeria's relationship took off. The election also roughly coincided with China's Forum on China-Africa Cooperation in Beijing in 2000. One of the Forum's major results was the creation of China's new approach to Africa; one that would support a stable, long-term and mutually beneficial partnership between China and African states. According to China's Ministry of Foreign Affairs' website, African nations offer strong support of Chinese unity and most African nations support China's "one-China" policy.¹²⁷ Nigeria's President Obasanjo echoed support for China's national unity in 2005 when discussing China's Anti-Secession Law, which was aimed at preventing Taiwanese independence.¹²⁸

It is less clear whether Obasanjo's presidency or China's renewed attention in Africa led to the increase in cooperative actions between Nigeria and China in the early 2000s; however, we

¹²⁵ De Selding, Peter. 2005. "China To Build and Launch Nigerian Telecom Satellite." *SpaceNews.com*. <http://spacenews.com/china-build-and-launch-nigerian-telecom-satellite/> (December 6, 2017).

¹²⁶ "Nigcomsat-1 Program -- In-Orbit Delivery Program." *China Great Wall Industry Corporation*. <http://www.cgwic.com/In-OrbitDelivery/CommunicationsSatellite/Program/NigComSat-1.html> (December 6, 2017).

¹²⁷ "China-Africa Relations." *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/ziliao_665539/3602_665543/3604_665547/t18059.shtml (December 6, 2017).

¹²⁸ "Nigeria supports China's Anti-Secession law." 2005. *People's Daily Online*. http://en.people.cn/200503/21/eng20050321_177591.html (December 6, 2017).

know that President Obasanjo sought to take Nigeria in a different strategic direction and China sought to establish stable relations with African states. The two factors likely worked in conjunction with one another and fostered an increase in official state visits and major agreements between the two states.

President Obasanjo approached Chinese President Hu Jintao for infrastructure projects in exchange for oil deals, leading to a plan dubbed “oil-for-infrastructure.”¹²⁹ For instance, in 2006 China secured four drilling licenses in Nigeria in exchange for the construction of railroad and power stations in Nigeria.¹³⁰ President Obasanjo reportedly recognized Nigeria’s dire infrastructure circumstances and the conditions associated with Western aid were not favorable to Nigeria’s president (read: “aid with conditions”). Obasanjo was persuaded by China’s seemingly hands-off approach to Nigeria’s internal affairs and its impressive infrastructure during state visits. The Nigerian-Chinese deals were regarded as corrupt and inefficient, and when President Obasanjo was replaced by President Yar’Adua in 2007 most of the oil-for-infrastructure deals were cancelled or suspended.¹³¹ President Yar’Adua’s approach to China resulted in cooled relations and little progress in infrastructure was achieved. President Yar’Adua passed in 2010 due to a heart-related condition and his vice president was elevated to

¹²⁹ Tattersall, Nick. 2009. “Mismanagement marred Nigeria-Asia oil deals: report.” *Reuters*. <https://www.reuters.com/article/us-nigeria-asia-oil/mismanagement-marred-nigeria-asia-oil-deals-report-idUSTRE57823I20090809> (December 6, 2017).

¹³⁰ “China and Nigeria agree oil deal.” 2006. *BBC News*. <http://news.bbc.co.uk/2/hi/business/4946708.stm> (December 6, 2017).

¹³¹ Fickling, David. 2017. “China’s Nigerian Misadventures.” *Bloomberg.com*. <https://www.bloomberg.com/gadfly/articles/2017-08-31/believe-china-s-latest-nigerian-adventure-when-you-see-it> (December 6, 2017).

Egbula, Margaret, and Qi Zheng. 2011. “China and Nigeria: A Powerful South-South Alliance.” *Organisation for Economic Co-operation and Development*. <https://www.oecd.org/china/49814032.pdf> (February 7, 2018).

president.¹³² At this point, the newly appointed President Jonathan resumed the Nigeria-China relationship that President Obasanjo initiated.¹³³

China is one of Nigeria's primary trading partners. Since 1999, Chinese-Nigerian trade has grown steadily to the point where China is Nigeria's top importer of goods. The relationship is very lop-sided though, as China does not import many goods from Nigeria. China imports limited amounts of petroleum products from Nigeria. The amount of Nigerian imports into China has grown since 2000, but not nearly as dramatically as China's imports into Nigeria. China has a diversified set of exports into Nigeria consisting of machinery, equipment, and manufactured commodities and consumer goods while China primarily imports petroleum products from Nigeria. According to the UN Commercial Trade database, Nigerian imports from China have grown from 253 million in 2000 to 7,712 million in 2016. Conversely, Nigeria exported 1,689 million dollars' worth of goods to China in 2016, of that 1,072 million were petroleum related products. In 2000, China imported 140 million dollars' worth of goods from Nigeria – all petroleum related products.¹³⁴ To put the amount of oil exported to China in perspective, China imported approximately 14 billion dollars' worth of petroleum related products from Angola in 2016, Africa's largest exporter of petroleum products to China.¹³⁵ The oil-for-infrastructure deals have contributed to some strife within Nigeria, as some have argued that Chinese imports are negatively affecting Nigerian businesses, since the influx of cheap, Chinese goods are stealing

¹³² "Nigeria's president Yar'Adua dies." 2010. *Al Jazeera*.
<http://www.aljazeera.com/news/africa/2010/05/20105523627997165.html> (December 17, 2017).

¹³³ Egbula, M. op. cit.

¹³⁴ "UN Comtrade Analytics - Trade dashboard." *United Nations*. <https://comtrade.un.org/labs/data-explorer/> (December 17, 2017).

¹³⁵ "Products that China imports from Angola (2016)." *The Observatory of Economic Complexity*.
https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/chn/ago/show/2016/ (December 17, 2017).
"Russia Wrests Crown of Top China Oil Supplier From Saudi Arabia." 2017. *Bloomberg.com*.
<https://www.bloomberg.com/news/articles/2017-01-23/russia-wrests-crown-of-top-china-oil-supplier-from-saudi-arabia> (December 17, 2017).

profits from local Nigerian companies.¹³⁶ Figure 2 shows the relatively slow increase in Nigerian goods flowing to China and the explosive growth of imports into Nigeria from China. According to press reports, China is set to purchase records amount of oil in 2017 from African nations, but most of the imports will likely come from Angola, China’s primary African oil exporter.¹³⁷

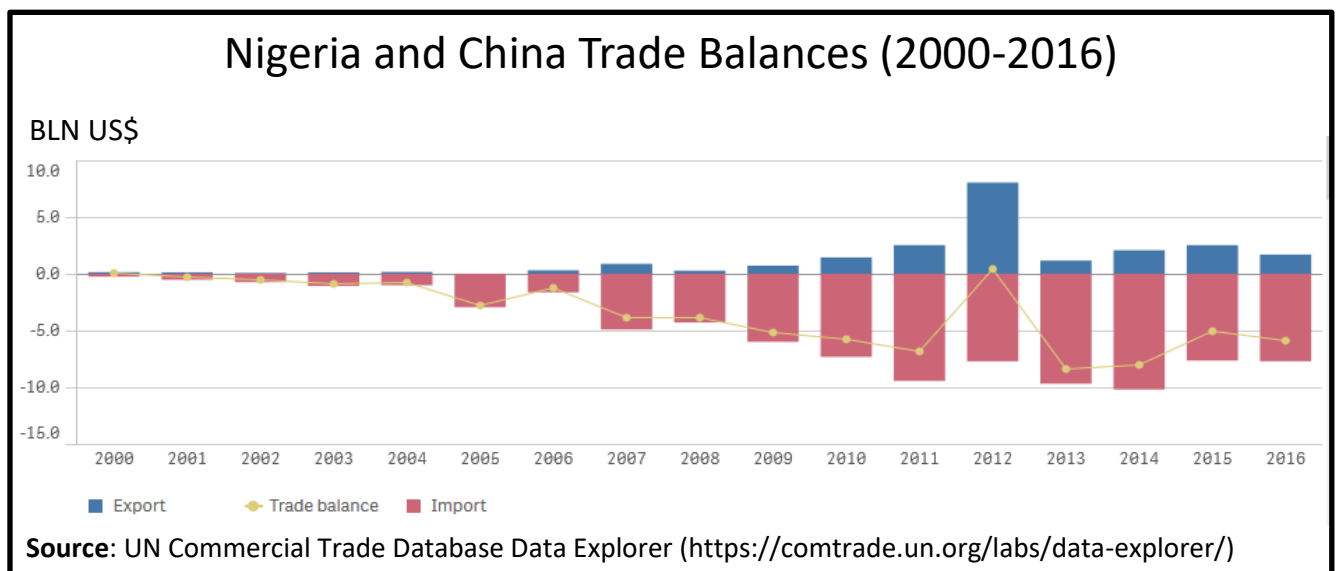


Figure 2. Nigeria and China Trade Balances

Despite the growing relationship with China, Nigerian businesses trade substantial amounts of market goods with the United States. Nigeria was the US’ 50th largest goods export market in 2015 and received \$3.4 billion worth of goods. These goods included mineral fuels and machinery. Furthermore, the US imported \$1.9 billion of goods from Nigeria in 2015. While the US-Nigerian trade relationship has decreased in total value since its peak in 2008, a strong economic relationship remains. Comparison of US and Chinese imports and exports to Nigeria

¹³⁶ Egbula, M. op. cit.

¹³⁷ “China’s oil imports from Africa hit a record.” 2017. *South China Morning Post*.

<http://www.scmp.com/business/commodities/article/2085229/china-importing-record-amounts-oil-africa> (December 6, 2017).

reveals trends that suggest Nigeria is leaning more on China for imports with a decrease in exports to the US (likely associated with an uptick US domestic oil production). This trend suggests that Nigeria is finding alternative markets for their oil exports.¹³⁸

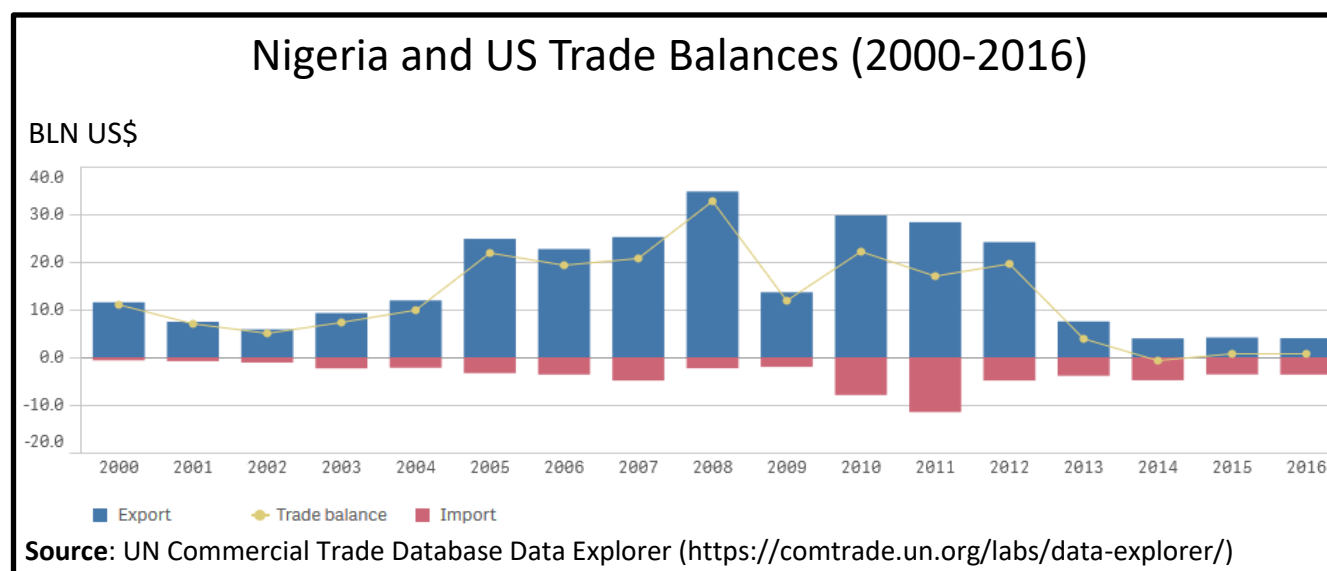


Figure 3. Nigeria and US Trade Balances

The US maintains a military presence in several African states, including a permanent presence in Djibouti. US forces in Africa, aside from Djibouti, are typically assisting and advising local militaries and are acting in a supporting role.¹³⁹ The US is committed to fighting terrorism in Africa and continues to support Africa’s fight against Boko Haram, al-Qaeda, and the Islamic State.¹⁴⁰ The Nigerian military cooperates with the US in annual counter-terrorism

¹³⁸ “Nigeria.” *United States Trade Representative*. <https://ustr.gov/countries-regions/africa/west-africa/nigeria> (December 6, 2017).

¹³⁹ Myre, Greg. 2017. “The U.S. Military In Africa: A Discreet Presence In Many Places.” *NPR*. <http://www.npr.org/sections/thetwo-way/2017/10/20/558757043/the-u-s-military-in-africa-a-discreet-presence-in-many-places> (December 6, 2017).

¹⁴⁰ Meservey, Joshua. “Four U.S. Policy Priorities for Africa in 2016.” *The Heritage Foundation*. <http://www.heritage.org/africa/report/four-us-policy-priorities-africa-2016> (December 6, 2017).

Quist-Arcton, Ofeibea. 2017. “Amid Aid Uncertainty, U.S. Counterterrorism Cooperation Continues In Africa.” *NPR*. <http://www.npr.org/sections/parallels/2017/04/17/521400443/amid-aid-uncertainty-u-s-counter-terrorism-cooperation-continues-in-africa> (December 6, 2017).

exercises, such as FLINTLOCK 2017, and the US has provided economic and military commitments.¹⁴¹ The assistance has come with continued US suggestions that Nigeria needs to review its economic policies.¹⁴² China does not have the same level of military presence in Africa as the US; however, in recent years that commitment appears to be growing. In 2017, China opened its first overseas military base in Djibouti, not far from the US base (Camp Lemonnier, Djibouti), to likely protect Chinese economic interests in Africa. The base comes shortly after China and Nigeria pledged closer military cooperation to fight terrorism in 2013.¹⁴³ It is unknown whether the pledge for increased cooperation will result in meaningful cooperation or if it is solely for media headlines. China likely advocates for closer military cooperation as a means to call for increased stability within Nigeria. China probably wants to assure Nigerian markets are stable for Chinese imports.

In 2004, CGWIC won the contract to build the Nigcomsat-1 satellite over at least 21 other satellite contractors.¹⁴⁴ China was reportedly the only satellite contractor to submit the completed proposal by the requested deadline and had met Nigeria's requirements. Russian and Israeli bidders were unable to meet the requested terms, while US contractors allegedly talked down to General Robert Boroffice, the director of NASRDA. Boroffice also suggested that US satellite contractors were likely weary of US-export control laws and that US and European

¹⁴¹ "FLINTLOCK." *United States Africa Command*. <http://www.africom.mil/what-we-do/exercises/flintlock> (December 6, 2017).

¹⁴² Wroughton; Lesley. 2016. "Kerry commits to more military aid to Nigeria, U.S. official says." *Reuters*. <https://www.reuters.com/article/us-nigeria-usa-kerry-buhari/kerry-commits-to-more-military-aid-to-nigeria-u-s-official-says-idUSKCN10Y24Z> (December 6, 2017).

¹⁴³ "China Pledges Military Cooperation With Nigeria." 2013. *Newsdiaryonline*. <https://newsdiaryonline.com/china-pledges-military-cooperation-nigeria/> (December 6, 2017).

Economy, Elizabeth. 2015. "China's New Military Presence in Africa." *Council on Foreign Relations*. <https://www.cfr.org/blog/chinas-new-military-presence-africa> (December 6, 2017).

¹⁴⁴ Edwards, Cody. 2007. "China Builds And Launches A Satellite For Nigeria." *The Washington Post*. <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/13/AR2007051301264.html> (December 6, 2017).

contractors did not believe Nigeria was serious in its request for proposals.¹⁴⁵ China's winning proposal provided Nigeria with the Nigcomsat-1 satellite, a satellite ground station to command and control the satellite, a comprehensive training program for Nigerian satellite operators, and 15 years of customer service support.¹⁴⁶ The satellite contract was worth \$311 million, set to be paid over an unknown number of years. Despite the large price tag associated with the contract, in 2004, Nigeria claimed the satellite would reduce the outflow of approximately \$100 million worth of capital from Nigeria to outside SATCOM service providers.¹⁴⁷ Nigcomsat-1 failed 18 months after launch, well below the satellite's intended 15-year system design life.¹⁴⁸ By the time its replacement satellite, Nigcomsat-1R, was launched in 2012, Nigeria estimated that Nigerians spent approximately \$1 billion in SATCOM bandwidth leases. SATCOM industry officials do not believe that figure to be accurate. Separately, Nigeria also claimed its SATCOM industry generated \$455 million in sales, which is also believed to be inaccurate.¹⁴⁹

The satellite contract process, as revealed by Boroffice, suggests Nigerian officials were inclined to select China's bid, despite having previously worked with Britain's Surrey Satellite Technology Limited, because China was the only bidder to complete the proposal by the requested due date.¹⁵⁰ At the time of award, China did not have any experience building satellites for foreign nations or external customers. This seems to have avoided affecting Nigeria's

¹⁴⁵ De Selding, Peter. 2005. "China To Build and Launch Nigerian Telecom Satellite." *SpaceNews.com*. <http://spacenews.com/china-build-and-launch-nigerian-telecom-satellite/> (December 6, 2017).

¹⁴⁶ "Nigcomsat-1 Program -- In-Orbit Delivery Program." *China Great Wall Industry Corporation*. <http://www.cgwic.com/In-OrbitDelivery/CommunicationsSatellite/Program/NigComSat-1.html> (December 6, 2017).

¹⁴⁷ De Selding, Peter. 2005. "China To Build and Launch Nigerian Telecom Satellite." *SpaceNews.com*. <http://spacenews.com/china-build-and-launch-nigerian-telecom-satellite/> (December 6, 2017).

¹⁴⁸ Hill, Jeffrey. 2011. "Nigeria Looks to Move On from Nigcomsat-1 Failure with Nigcomsat-1R Launch." *Via Satellite*. <http://www.satellitetoday.com/telecom/2011/06/07/nigeria-looks-to-move-on-from-nigcomsat-1-failure-with-nigcomsat-1r-launch/> (December 6, 2017).

¹⁴⁹ De Selding, Peter. 2011. "Nigcomsat-1R Launched Successfully by Long March." *SpaceNews.com*. <http://spacenews.com/nigcomsat-1r-launched-successfully-long-march/> (December 6, 2017).

¹⁵⁰ De Selding, Peter. 2005. "China To Build and Launch Nigerian Telecom Satellite." *SpaceNews.com*. <http://spacenews.com/china-build-and-launch-nigerian-telecom-satellite/> (December 6, 2017).

decision making. The Nigcomsat-1R satellite program receives heavy criticism and many accuse the program of terrible mismanagement not delivering the promised results. Customers in Nigeria choose more established SATCOM operators, citing Nigcomsat's lack of experience. Nigcomsat employs nearly 400 people while larger SATCOM operators employ less than 50 (of the approximate 400 employees, 49% are assistant managers or higher).¹⁵¹ Nigeria intends on purchasing two more COMSATs from China despite not utilizing its current system citing the need for additional resources to secure customers.¹⁵² It is unlikely that additional COMSATs will solve Nigeria's satellite management issues and deliver the already promised results.

China's satellite sale to Nigeria occurs during a period of public opinion transition for many living in Nigeria. According to the Pew Center Global Attitudes and Trends Question Database, Nigerians have had warming opinions on China in recent years. In 2006 only 59% of Nigerians polled held a favorable opinion of China. By 2017, that figure rose to 72%.¹⁵³ Similarly, Nigerian opinions of the US rose between 2006 and 2017, too. In 2006, 62% of Nigerians held favorable opinions (non-national sample) of the US and by 2017 that number rose to 69%. Historic opinion polling indicates that Nigerian public opinion of the US was at its highest in 2010, when 81% of Nigerian held a favorable view of the US. China's increased activity in Nigeria, through its imports, investment, and cultural exchanges, such as its Confucius

¹⁵¹ "NigComSat-1R becoming white elephant four years after –Investigation." 2016. *Punch Newspapers*. <http://punchng.com/nigcomsat-1r-becoming-white-elephant-four-years-after-investigation/> (December 6, 2017).

¹⁵² Oguh, Chibuike. 2015. "Nigeria's two new satellites to cost \$700 million." *Financial Nigeria*. <http://www.financialnigeria.com/nigeria-s-two-new-satellites-to-cost-700-million-news-265.html> (December 6, 2017).

¹⁵³ Non-National Polling Sample, per Pew Center's Global Attitudes Project.

Institutes, have likely contributed to the increase in public opinion by Nigerians over the last decade.¹⁵⁴

The successful satellite sale between Nigeria and China was China's first attempt at exporting a complete satellite package to a purchasing state. China likely learned valuable lessons from the sale, such as how to approach potential buyers, what services will be required for a successful sale, and how to market a total COMSAT solution. The valuable lessons learned from the Nigcomsat-1 sale were likely then applied to other satellite contracts.

Venezuela

China successfully sold and launched three satellites for Venezuela between 2008 and 2017. Venezuela has purchased a single COMSAT (Venesat-1) and two remote sensing satellites (VRSS-1 and VRSS-2). The Venesat-1 COMSAT deal was signed on November 1st, 2005 and the satellite launched October 2008, the VRSS-1 satellite contract was signed in May 2011 and launched September 2012, while the VRSS-2 satellite contract was signed in October 2014 and launched in October 2017. Venesat-1 is also referred to as Simon Bolivar Satellite and VRSS-1 and VRSS-2 are also referred to as Francis Miranda Satellites. The alternate names for each satellites honor former fighters involved in the struggle for Venezuela's independence. China constructed ground stations in Venezuela, trained Venezuelan satellite engineers, and provided launch and early orbit operations as part of the agreed terms to each contract.¹⁵⁵

¹⁵⁴ Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/database/indicator/1/country/160/> (December 6, 2017).

"Chapter 2: China's Image." 2014. *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/2014/07/14/chapter-2-chinas-image/> (December 6, 2017).

¹⁵⁵ Barbosa, Rui. 2012. "Chinese Long March 2D launches Venezuela's VRSS-1 satellite." *NASASpaceflight*. <https://www.nasaspaceflight.com/2012/09/chinese-long-march-2d-launches-vrss-1/> (December 17, 2017).

Barbosa, Rui. 2008. "China launches VENESAT-1 – debut bird for Venezuela." *NASASpaceflight*. <https://www.nasaspaceflight.com/2008/10/china-launch-venesat/> (December 17, 2017).

China and Venezuela established official diplomatic relations in 1974. Little actual cooperation or engagement between the two existed until 2001. In 2001, China and Venezuela established a strategic partnership of common development and in 2005 Venezuela supported China's anti-secession laws.¹⁵⁶ The partnership was subsequently upgraded in 2013 to a "comprehensive strategic partnership" to deepen political trust and mutually beneficial cooperation between the two actors, the first such agreement between China and a Latin American state. The upgraded partnership sought to emphasize cooperation in new areas such as finance, energy, mining, agriculture and infrastructure.¹⁵⁷ Since the announcement of the partnership, China has had multiple official state visits to Venezuela to demonstrate its commitment to its partner.¹⁵⁸ More recently China has been propping up Venezuela as its economy spins out of control due years of economic mismanagement, inflation, and collapsed global oil prices.¹⁵⁹ China has lent Venezuela \$60 billion since 2001.¹⁶⁰ These funds have enabled Venezuelan President Nicolas Maduro to remain in power. He is wildly unpopular in Venezuela and only is supported by approximately 23% of the Venezuelan population.¹⁶¹ As of

Barbosa, Rui. 2017. "Chinese Long March 2D launches VRSS-2." *NASASpaceflight*.
<https://www.nasaspaceflight.com/2017/10/chinese-long-march-2d-launches-vrss-2/> (December 17, 2017).

¹⁵⁶ "Int'l Community Supports China's Anti-Secession Law." 2005. *China.org*.

<http://www.china.org.cn/english/international/122829.htm> (January 30, 2018).

Shixue, Jiang. 2016. "Don't blame China for the Venezuela story." *China.org.cn*.

http://www.china.org.cn/opinion/2016-06/11/content_38627409.htm (December 17, 2017).

¹⁵⁷ "China and Venezuela." *Ministry of Foreign Affairs of the People's Republic of China*.

http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/lmzs_664952/gjlb_664956/3538_665158/ (February 7, 2018).

¹⁵⁸ "Venezuela - Activities." *Ministry of Foreign Affairs of the People's Republic of China*.

http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/lmzs_664952/gjlb_664956/3538_665158/3540_665162/.

¹⁵⁹ Renwick, Danielle. 2017. "Venezuela Is in the Midst of an Unprecedented Crisis." *Council on Foreign Relations*.
<https://www.cfr.org/backgrounder/venezuela-crisis> (December 17, 2017).

¹⁶⁰ Lansberg-Rodriguez, Daniel. 2017. "Exit the Dragon: Why China Should Stop Supporting Venezuela." *The New York Times*. <https://www.nytimes.com/2017/02/15/opinion/exit-the-dragon-why-china-should-stop-supporting-venezuela.html> (December 17, 2017).

¹⁶¹ Pons, Corina, and Brian Ellsworth; 2017. "Venezuela's Maduro approval rises to 23 percent after Trump sanctions." *Reuters*. <https://www.reuters.com/article/us-venezuela-politics/venezuelas-maduro-approval-rises-to-23-percent-after-trump-sanctions-poll-idUSKCN1C8037> (December 17, 2017).

September 2017, China remained committed to its policy of non-interference and reaffirmed at the UN that its policy towards Venezuela will not change.¹⁶² This could potentially have negative consequences, as Chinese investment in Venezuela may be lost.

China is Venezuela's second largest trading partner, behind the US. In 2015 China primarily imported crude petroleum, refined petroleum, and iron ore (this composed approximately 97.7% of all Venezuelan exports to China). Venezuela, on the other hand, imported a wide variety of goods from China in 2015. The variety of goods, consisting of machinery, transportation equipment, metals, textiles, totaled approximately \$2.5 billion. This is down from 2010, when Venezuela imported approximately \$3.8 billion worth of goods, but an increase from 2005, when the total imports were valued at \$913 million. Lastly, China exported only \$221 million to Venezuela in 2000. The growing trade relationship indicates China has become an increasingly more important player in the Venezuelan economy. Decreased exports from Venezuela to China in 2016 are likely attributed to Venezuela's economic situation and unrest at home. Venezuela reportedly owes China roughly \$30 billion in oil exports as of 2016 (per the oil-for-loan deals).¹⁶³

¹⁶² Blanchard, Ben. 2017. "China offers support for strife-Torn Venezuela at United Nations." *Reuters*. <https://www.reuters.com/article/us-china-venezuela/china-offers-support-for-strife-torn-venezuela-at-united-nations-idUSKCN1BV0EW> (December 17, 2017).

¹⁶³ Sonneland, Holly. 2017. "Explainer: Venezuela's Oil and Military Ties with China and Russia." *American Society | Council of the Americas*. <http://www.as-coa.org/articles/explainer-venezuelas-oil-and-military-ties-china-and-russia> (December 17, 2017).

Blanchard, Ben. 2017. "Venezuela falls behind on oil-for-Loan deals with China, Russia." *Reuters*. <http://www.reuters.com/article/us-venezuela-oil-insight/venezuela-falls-behind-on-oil-for-loan-deals-with-china-russia-idUSKBN15O2BC> (December 17, 2017).

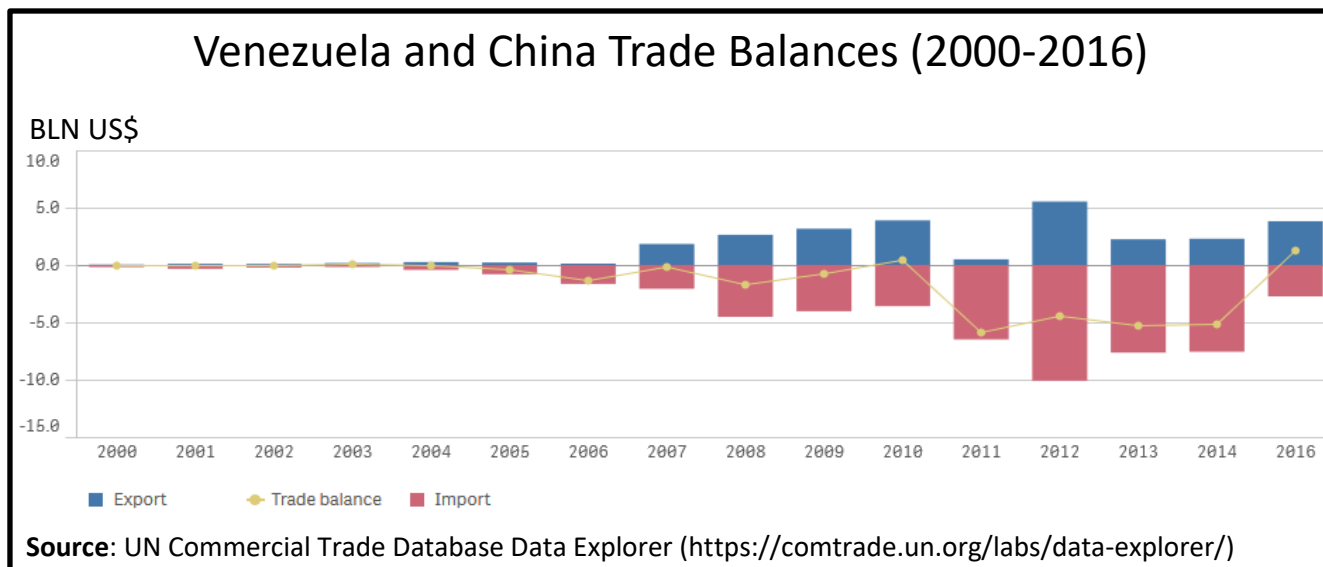


Figure 4. Venezuela and China Trade Balances

The US is Venezuela’s primary trading partner, serving as the destinations for approximately 43% of Venezuelan exports and the originator of 29% of Venezuela’s imports. The primary export to the US is crude petroleum (accounting for 85% of exports).¹⁶⁴ According to the US Department of Commerce, approximately 82 thousand jobs are created in Venezuela as a direct result from the US-Venezuelan trade relationship.¹⁶⁵ This figure is almost certainly down from recent years, likely as a result from a decline in total volume of trade between the two states. Furthermore, the US has continued to place sanction of the Venezuelan government. The US intends to place more pressure on President Maduro to return the country to a democracy.¹⁶⁶ Maduro has suggested the US wants a trade war, and in response has listed oil price exports under the Yuan, China’s currency, as an attempt to free Venezuela from “the tyranny of the

¹⁶⁴ “Products that the United States imports from Venezuela (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/usa/ven/show/2016/ (December 17, 2017).

¹⁶⁵ “U.S.-Venezuela Trade Facts.” *United States Trade Representative*. <https://ustr.gov/countries-regions/americas/venezuela> (December 17, 2017).

¹⁶⁶ Gearan, Anne, and Anthony Faiola. 2017. “Trump tightens Venezuela’s access to U.S. financial system.” *The Washington Post*. https://www.washingtonpost.com/world/national-security/trump-administration-moves-to-restrict-venezuelan-access-to-us-financial-system/2017/08/25/18b22a5e-89ad-11e7-a50f-e0d4e6ec070a_story.html?utm_term=.2d5c8b878798 (December 17, 2017).

dollar.”¹⁶⁷ It is very unlikely that President Maduro actually wants the US-Venezuelan relationship to cease, since it would almost certainly result in the absolute collapse of the Venezuelan economy and he would cease to have what little public support he still holds.

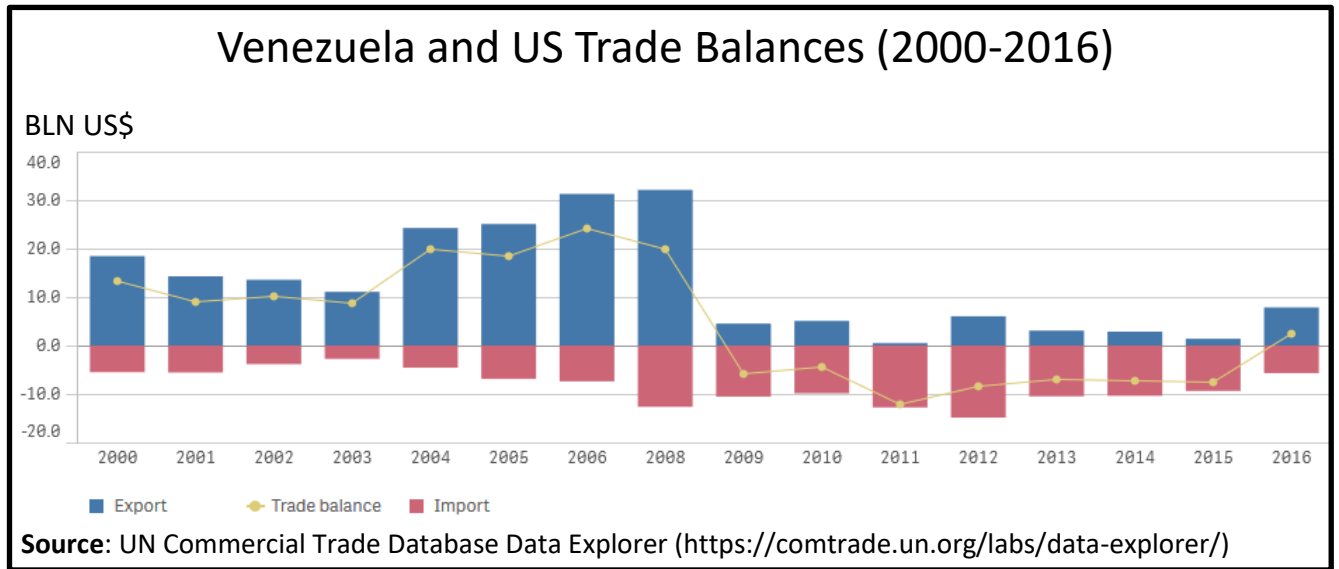


Figure 5. Venezuela and US Trade Balances

The US does not have a permanent military presence in South America; however, US military personnel are stationed in close proximity to Venezuela. The US operates Joint Task Force Bravo at Soto Cano Air Base, Honduras and Joint Task Force Guantanamo at US Naval Station Guantanamo Bay, Cuba.¹⁶⁸ These forces, along with the historical precedence set by the US, position the US to lead and resolve situations or humanitarian crises that arise in South America. Even though China lacks permanent military presence in South America, since at least

¹⁶⁷ China, Eyanir, Brian Ellsworth, and Marianna Parraga. 2017. “Venezuela publishes oil prices in Chinese currency to shun U.S. dollar.” *Reuters*. <https://www.reuters.com/article/us-venezuela-oil/venezuela-publishes-oil-prices-in-chinese-currency-to-shun-u-s-dollar-idUSKCN1BQ2D1> (December 17, 2017).

¹⁶⁸ “SOUTHCOM Component Commands and Units.” *U.S. Southern Command*. <http://www.southcom.mil/About/SOUTHCOM-Components-and-Units/> (December 17, 2017).

2011, Beijing has sent military forces to train in undisclosed South American states.¹⁶⁹ Its speculated the trainings occurred in Venezuela or Argentina and supported counter-terrorism missions.¹⁷⁰ China's troop deployment to South America, and particularly Venezuela, may serve multiple benefits. First, the deployment can strengthen ties between China and other states. It can enhance cooperation and lay the groundwork for future military cooperation and possibly permanent military basing rights. Secondly, it can serve as relevant operational training that could potentially support the evacuations of Chinese citizens from Venezuela if the state were to collapse. Overall, China is in a much less advantageous position than the US in projecting power in South America.

China won the bid to build Venezuela's Venesat-1 satellite, provide launch services, construct the required ground facilities, and train Venezuelan satellite operators. It is unknown how many other satellite contractors bid on the Venesat-1 request, or if the bid was even made public.¹⁷¹ Venezuela was China's first Latin American satellite customer, and since the Venesat-1 deal the two states have collaborated on several other projects, including the VRSS-1 and VRSS-2 satellites. The Venesat-1 deal was reportedly worth \$241 million for the satellite and launch services and \$165 million for the construction of two satellite control stations – bringing the total cost of the project to over \$400 million.¹⁷² Venesat-1 launched on October 30th, 2008 and was successfully handed over the Venezuela on December 1st, 2008.¹⁷³ As of 2014, after the

¹⁶⁹ Jianing, Yao. 2015. "'Leishen Commando' accepts trainings in South America." *Ministry of National Defense the People's Republic of China*. http://eng.mod.gov.cn/Photos/2015-03/03/content_4572706.htm (February 7, 2018).

¹⁷⁰ Lin, Jeffrey and P.W. Singer. 2015. "Which Latin American Country Did China Just Send Commandos To?" *Popular Science*. <https://www.popsci.com/which-latin-american-country-did-china-just-send-commandos> (December 17, 2017).

¹⁷¹ "Complete Satellite Export: VeneSat-1 Program." *China Aerospace Science and Technology Corporation*. <http://english.spacechina.com/n16421/n17215/n161194/c161816/content.html> (December 17, 2017).

¹⁷² Barbosa, Rui. 2008. "China launch VENESAT-1 – debut bird for Venezuela." *NASASpaceflight*. <https://www.nasaspaceflight.com/2008/10/china-launch-venesat/> (December 17, 2017).

¹⁷³ "VeneSat-1 Program -- In-Orbit Delivery Program." *China Great Wall Industry Corporation*. <http://www.cgwic.com/In-OrbitDelivery/CommunicationsSatellite/Program/VeneSat-1.html> (December 17, 2017).

satellites first six years of operation, Venesat-1 was yet to have a significant impact on Venezuela's and South America's SATCOM industry, according to industry officials.¹⁷⁴

Venezuela intended on using the satellite to support telecommunications, distance learning, e-medicine, and cultural exchanges. The satellite project was a step in strengthening the strategic relationship between China and Venezuela, said Venezuelan government officials.¹⁷⁵

Venezuela has also purchased two remote sensing satellites from China, VRSS-1 and VRSS-2. The satellites provide Venezuela with electro-optical images varying in resolution from 1-meter panchromatic to 10-meter multispectral images. Venezuela says the satellites support environmental management, disaster detection, and urban planning. The satellites are able to image Venezuela three times a day and the same location, from the same collection geometry, once approximately every 51 days.¹⁷⁶ It is unknown if Venezuela accepted public bids for its two remote-sensing satellites or if Venezuela only accepted offers from China. Venezuela may have decided to pursue remote-sensing satellite solutions from China because the established relationship between the two (strategic partnership, previous satellite deal). It is also unknown if the ongoing economic crisis in Venezuela will affect or jeopardize the return on China's investment in Venezuela.

Venezuelans hold somewhat favorable opinions of China. According to the Pew Center Global Attitudes and Trends Question Database in 2015, approximately 52% of Venezuelans hold a favorable view of China. This is down significantly from recent years (58% in 2015, 67%

¹⁷⁴ De Selding, Peter. 2014. "China, Venezuela To Collaborate on New Earth Observing Satellite." *SpaceNews.com*. <http://spacenews.com/42109china-venezuela-to-collaborate-on-new-earth-observing-satellite/> (December 17, 2017).

¹⁷⁵ "Venezuela launches first satellite with Chinese technology." 2008. *Space Mart*. http://www.spacemart.com/reports/Venezuela_launches_first_satellite_with_Chinese_technology_999.html (December 17, 2017).

¹⁷⁶ Barbosa, Rui. 2012. "Chinese Long March 2D launches Venezuela's VRSS-1 satellite." *NASASpaceflight*. <https://www.nasaspaceflight.com/2012/09/chinese-long-march-2d-launches-vrss-1/> (December 17, 2017).

Barbosa, Rui. 2017. "Chinese Long March 2D launches VRSS-2." *NASASpaceflight*. <https://www.nasaspaceflight.com/2017/10/chinese-long-march-2d-launches-vrss-2/> (December 17, 2017).

in 2014, and 71% in 2013).¹⁷⁷ This negative trend in public opinion likely stems from poorly structured Chinese backed loans and China's policy of aid without conditions. As Venezuela's economic situation continuing to spiral, and Chinese immigrants and investment leave Venezuela and local Venezuelans see little positives from the Sino-Venezuelan relationship.¹⁷⁸ Conversely, Venezuelan opinions towards the US have remained relatively unchanged in recent years (47% favorability rating in 2017, 53% in 2013).¹⁷⁹ It is likely public perception and favorability for both China and US will continue to drop or remain unchanged in the coming years if Venezuela's economic conditions do not improve.

The Chinese-Venezuelan relationship has blossomed since the partnership in 2001, but little is to show for the relationship today mainly due to Venezuela's economic situation. China must work with Venezuela to fix its political issues but is unlikely to do so per its non-interference policy. The satellite sales are one of few tangible areas where cooperation, if managed correctly, can improve the lives of Venezuelans and become a success story for China.

Pakistan

Pakistan and China signed a deal for the Paksat-1R COMSAT on October 15th, 2008 and the satellite was launched August 11th, 2011.¹⁸⁰ The satellite was built to replace the aging Paksat-1 satellite, which was not a Chinese built satellite. The satellite contract is worth a \$222.3

¹⁷⁷ Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/database/indicator/1/country/238/> (December 17, 2017).

¹⁷⁸ Huifang, He. 2017. "As Venezuela implodes, so do the dreams of Chinese migrants." *South China Morning Post*. <http://www.scmp.com/news/china/economy/article/2102922/venezuela-implodes-so-do-dreams-thousands-fleeing-chinese> (December 17, 2017).

¹⁷⁹ Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/database/indicator/1/country/238/> (December 17, 2017).

¹⁸⁰ Barbosa, Rui. 2011. "China debuts partnership with Pakistan – Long March launches Paksat-1R." *NASA Spaceflight*. <https://www.nasaspaceflight.com/2011/08/china-debuts-partnership-pakistan-long-march-launches-paksat-1r/> (December 17, 2017).

million and is financed through China's Import-Export Bank and the Pakistani government.¹⁸¹ Per the satellite agreement, China would build the satellite, ground control stations, provide satellite launch services, and provide training to Pakistani satellite operators. The Paksat-1R contract was China's third satellite contract for a foreign customer and its first satellite contract for an Asian customer.¹⁸²

Pakistan and China established diplomatic relations in 1951 and maintained a close relationship with one another, fairly steadily, since the early 1950s.¹⁸³ Pakistan and China furthered the relationship in 2003 by publically committing to increase cooperation and to develop deeper bilateral relations between the two and in 2005 Pakistan offered support for China's anti-secession laws.¹⁸⁴ Pakistan and China have since signed several memorandums of understanding and agreements to demonstrate their commitment to one another. One agreement, the China Pakistan Free Trade Agreement, which went into effect in 2007, opened Chinese and Pakistani markets to increased trade and investment.¹⁸⁵ China, in its announcement upon signing the agreement, mentioned how the two states share common interests and goals, since both states are developing countries. China intended to invest in areas such as energy, information technology, and infrastructure in Pakistan and in return hoped Pakistan would support Chinese

¹⁸¹ Fazl-E-Haider, Syed . 2009. "China Agreed To Finance Pakistans Satellite Project." *Pakistan Economist*. <http://www.pakistaneconomist.com/pagesearch/Search-Engine2009/S.E652.php> (December 17, 2017).

¹⁸² Barbosa, Rui. 2011. "China debuts partnership with Pakistan – Long March launches Paksat-1R." *NASASpaceflight*. <https://www.nasaspaceflight.com/2011/08/china-debuts-partnership-pakistan-long-march-launches-paksat-1r/> (December 17, 2017).

¹⁸³ Afridi, Jamal and Jayshree Bajoria. 2010. "China-Pakistan Relations." *Council on Foreign Relations*. <https://www.cfr.org/background/china-pakistan-relations> (December 17, 2017).

¹⁸⁴ "China-Pakistan Joint Declaration." *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/yzs_663350/gjlb_663354/2757_663518/2758_663520/t40148.shtml (December 17, 2017).

"Int'l Community Supports China's Anti-Secession Law." 2005. *China.org*. <http://www.china.org.cn/english/international/122829.htm> (December 17, 2017).

¹⁸⁵ "China FTA Network." *China FTA Network*. <http://fta.mofcom.gov.cn/topic/enpakistan.shtml> (December 17, 2017).

international interests.¹⁸⁶ Perhaps the most high profile initiative between China and Pakistan is the China-Pakistan Economic Corridor (CPEC).¹⁸⁷ CPEC is actually a series of agreements that allows for a number of energy, infrastructure, and transit projects, backed by Chinese investment, to connect Chinese and Pakistani economic centers.¹⁸⁸ CPEC is a major project under China's Belt and Road Initiative.

China is one of Pakistan's top trade partners, as approximately 30% of Pakistan's imports originate from China. This equates to roughly \$17.2 billion worth of trade (in 2016). The total amount of imports has risen in recent years; up from \$5.5 billion in 2010 and \$2.7 billion in 2005. Conversely, only 8% of Pakistan's total exports are sent to China. Pakistan's exports to China are mainly textile and vegetable products. In 2016, Pakistan's total exports to China were reportedly worth \$1.5 billion. This figure is down from 2010, when Pakistan exported \$1.8 billion worth of goods to China, and up from 2005, when the total value of the exports was \$670 million. Interestingly, China does not appear to import significant quantities of crude or refined petroleum from Pakistan. This may change in the coming years, as Pakistan recently discovered one of its largest oil and natural gas reservoirs in October 2017. The new oil field will supply at least 23 million barrels of oil and 292 billion cubic feet of gas.¹⁸⁹

¹⁸⁶ Jintao, Hu. 2006. "Carry On Traditional Friendship And Deepen All-Round Cooperation." *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/yzs_663350/gjlb_663354/2757_663518/2758_663520/t285917.shtml (December 17, 2017).

¹⁸⁷ Varma, K. 2015. "China, Pakistan Sign Deals Worth USD 1.6 Billion to Beef Up CPEC." *Outlook India*. <https://www.outlookindia.com/newswire/story/china-pakistan-sign-deals-worth-usd-16-billion-to-beef-up-cpec/909764> (December 17, 2017).

¹⁸⁸ "Introduction." *China-Pakistan Economic Corridor (CPEC) Official Website*. <http://cpec.gov.pk/introduction/1#> (December 17, 2017).

¹⁸⁹ "Pakistan discovers its largest oil and gas reserve in Jhandial well." 2017. *The Indian Express*. <http://indianexpress.com/article/pakistan/pakistan-discovers-its-largest-oil-and-gas-reserve-in-jhandial-well-4874382/> (December 17, 2017).

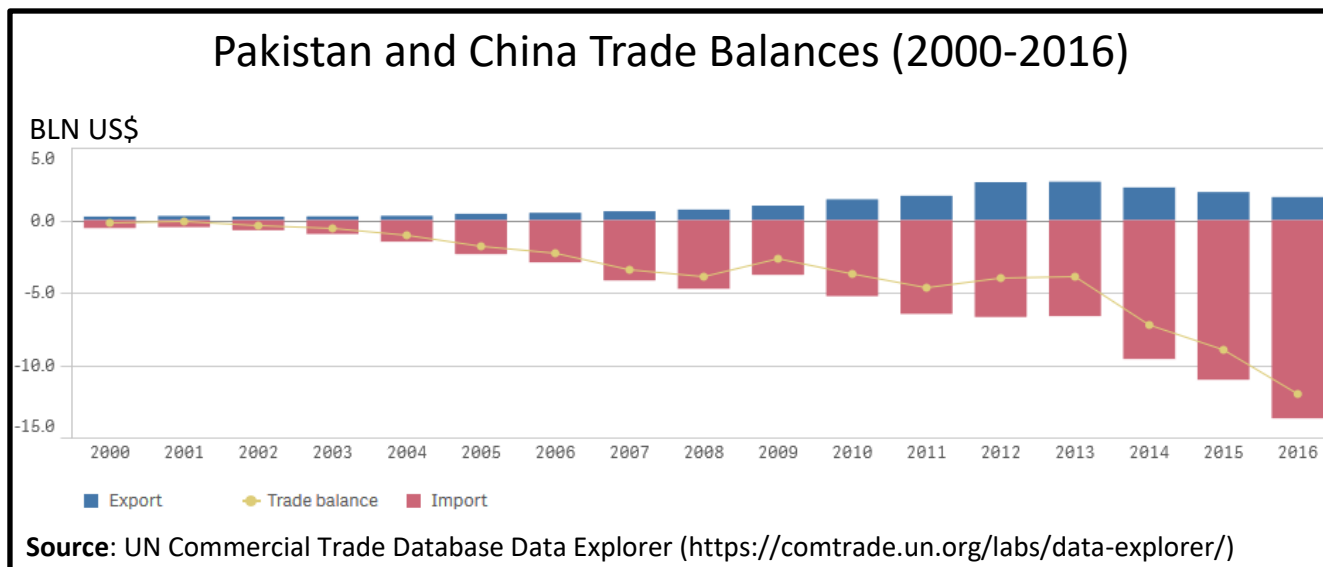


Figure 6. Pakistan and China Trade Balances

In 2016, the US was Pakistan’s primary recipient of trade goods, receiving approximately 17% of all Pakistani exports. The exports, which were valued at \$3.4 billion, sent to the US mainly consisted of textile products. The US-Pakistan trade relationship appears to be very stable and has not fluctuated much in recent years (in 2005 Pakistan exports \$3.3 billion and in 2010 \$3.5 billion to the US).¹⁹⁰ As of 2105, US-Pakistan trade is responsible for 10 thousand jobs in Pakistan, according to the US Department of Commerce.¹⁹¹

¹⁹⁰ “UN Comtrade Analytics - Trade dashboard.” *United Nations*. <https://comtrade.un.org/labs/data-explorer/> (December 17, 2017).

¹⁹¹ “U.S.-Pakistan Trade Facts.” 2017. *United States Trade Representative*. <https://ustr.gov/countries-regions/south-central-asia/pakistan> (December 17, 2017).

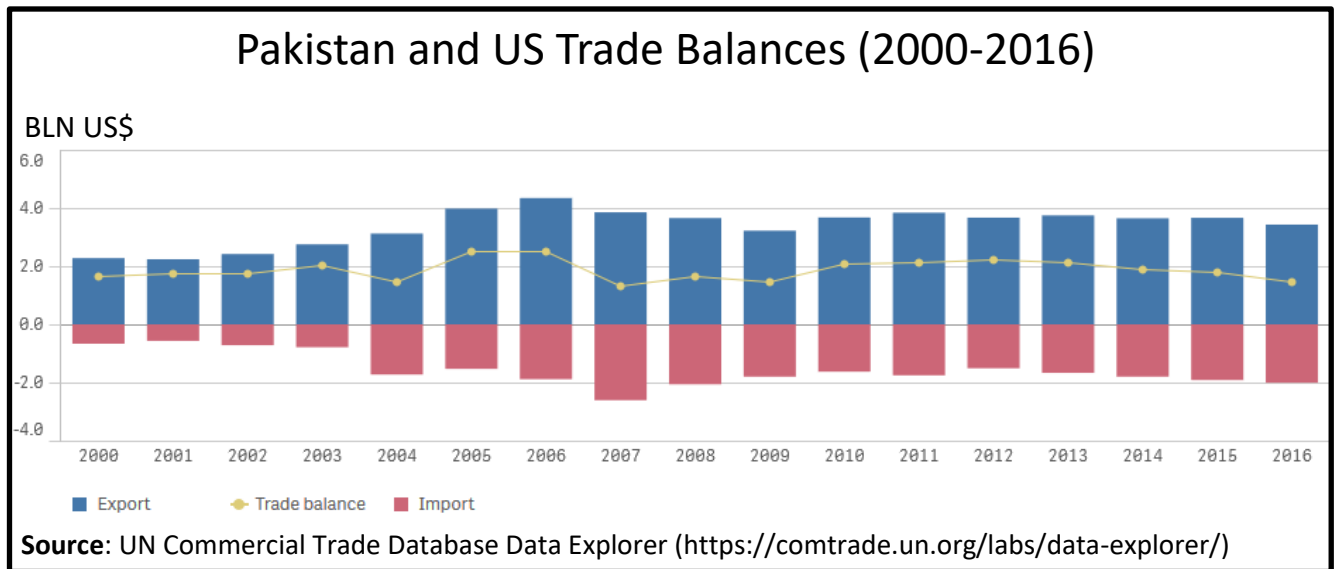


Figure 7. Pakistan and US Trade Balances

The Paksat-1R satellite contract was officially awarded to China on October 15th, 2008. In reality though, the decision to have China build the Pakistani satellite was awarded months earlier. According to Paksat-1R planning documents from Pakistan Space & Upper Atmosphere Research Commission (SUPARCO), Pakistan had intended on awarding the contract to China months before the satellite contract was publically awarded and signed, as the documents reveal that the Paksat-1R satellite manufacturer would preferably be Chinese. The documents further reveal that Pakistan’s preference for a Chinese satellite was the direct result of two memorandums of understanding, one of which was China and Pakistan’s 2007 agreement to strengthen its long-term strategic relationship.¹⁹² With China being the preferred satellite contractor, and then winning the contract, the memorandum of understandings proved useful for China. China has had history of signing Memorandums only for it to amount to nothing, but not the case for Paksat-1R. It enabled China to win its third foreign satellite contract. It is unknown

¹⁹² “Pakistan Communication Satellite System PAKSAT -IR PC-I Page 1-115.” 2008. *Scribd*. <https://www.scribd.com/doc/62132524/Pakistan-Communication-Satellite-System-PAKSAT-IR-PC-I-Page-1-115> (December 17, 2017).

if the contract was advertised for other satellite manufacturers to bid on or if the satellite request for proposals was exclusively sent to CGWIC.

The Chinese built Paksat-1R satellite included several Pakistani designed and built payloads to test and validate Pakistani technology in a space environment. Pakistan included on-board data handling, power distribution systems, and telemetry payloads on Paksat-1R.¹⁹³ The Pakistani payloads meet several objectives, which were revealed in Paksat-1R planning documents. First, it encourages participation of Pakistani industries in the project. Second, it allows Pakistan to acquire relevant technology know-how. The included payloads, along with China training Pakistan's satellite operators as part of the contract, very likely further develop Pakistan's aerospace industry.¹⁹⁴

As of September 2017, the US does not maintain a standing military presence in Pakistan.¹⁹⁵ Nevertheless, there is a strong US presence in the surrounding region. Over a decade of military ventures in the Middle East has left the US with significant presence in states directly adjacent or not far from Pakistan (Afghanistan, Qatar, Syria, Kuwait). The US once considered Pakistan to be one of its best allies in Asia, but US leaders have since accused Pakistan of harboring "agents of chaos."¹⁹⁶ The relationship was further complicated after the US raided Osama Bin Laden's residence in 2011. Pakistan accused the US of violating its sovereignty by

¹⁹³ "Chinese-Built Paksat-1R To Include Pakistani Payloads." 2009. *SpaceNews.com*. <http://spacenews.com/chinese-built-paksat-1r-include-pakistani-payloads/> (December 17, 2017).

¹⁹⁴ "PakSat-1R - Training." *China Great Wall Industry Corporation*. <http://cn.cgwic.com/PakSat-1R/english/px.html> (December 17, 2017).

¹⁹⁵ Ahmed, Adeel. 2017. "6 tough questions fielded by PM Abbasi in his maiden US visit." *Dawn.com* <https://www.dawn.com/news/1359112> (December 17, 2017).

¹⁹⁶ Khan, Mohammed Ayub. 2009. "The Pakistan-American Alliance." *Foreign Affairs*. <https://www.foreignaffairs.com/articles/asia/1964-01-01/pakistan-american-alliance> (December 17, 2017).
McElroy, Damien. 2017. "Pakistan-US alliance thrown into doubt ahead of UN General Assembly." *The National*. <https://www.thenational.ae/world/the-americas/pakistan-us-alliance-thrown-into-doubt-ahead-of-un-general-assembly-1.629679> (December 17, 2017).

launching the military operation without prior notification.¹⁹⁷ Officially, the US and Pakistan maintain a strong security partnership that works to dismantle terror networks in the Middle East but it appears the relationship is not as strong as it once was.¹⁹⁸

As of late 2017, China does not have any military bases in Pakistan, although this may soon be changing. In May 2017 the Pentagon reported that China “likely will seek to establish additional military bases in countries with which it has a longstanding friendly relationship and similar strategic interests, such as Pakistan.”¹⁹⁹ Despite not having a permanent military presence, China routinely conducts military exercises with Pakistani military forces to improve its tactics, techniques, and procedures. The most recent exercise in September 2017, the Shaheen-VI, involved Pakistani and Chinese air forces and lasted nearly 3 weeks.²⁰⁰ Furthermore, Pakistan hosts Chinese Navy ships regularly to increase cooperation and communications between the two militaries.²⁰¹

China has enjoyed strong popular support from Pakistan over the last decade with nearly 80% of Pakistani citizens having a favorable view of China. The data shows a slight increase in

¹⁹⁷ Strange, Hannah. 2013. “US raid that killed bin Laden was 'an act of war', says Pakistani report.” *The Telegraph*. <http://www.telegraph.co.uk/news/worldnews/asia/pakistan/10169655/US-raid-that-killed-bin-Laden-was-an-act-of-war-says-Pakistani-report.html> (December 17, 2017).

¹⁹⁸ “Pakistan.” 2017. *U.S. Department of State*. <https://www.state.gov/r/pa/ei/bgn/3453.htm> (December 17, 2017).

¹⁹⁹ “Annual Report to Congress - Military and Security Developments Involving the People’s Republic of China 2017.” *Office of the Secretary of Defense*. https://www.defense.gov/Portals/1/Documents/pubs/2017_China_Military_Power_Report.PDF (December 17, 2017).

²⁰⁰ Panda, Ankit. 2017. “Air Forces of Pakistan, China Begin 'Shaheen VI' Exercises.” *The Diplomat*. <https://thediplomat.com/2017/09/air-forces-of-pakistan-china-begin-shaheen-vi-exercises/> (December 17, 2017).

Sanyal, Anindita. 2017. “China And Pakistan Pilots Fly Jets In Joint Combat Exercise Shaheen-VI.” *NDTV.com*. <https://www.ndtv.com/india-news/china-and-pakistan-pilots-fly-jets-in-joint-combat-exercise-shaheen-vi-1756421> (December 17, 2017).

²⁰¹ Panda, Ankit. 2017. “Chinese Navy Task Group Visits Pakistan With a Focus on Increasing Interoperability.” *The Diplomat*. <https://thediplomat.com/2017/06/chinese-navy-task-group-visits-pakistan-with-a-focus-on-increasing-interoperability/> (December 17, 2017).

public support in Pakistan from 2005 to 2015, the last year for which data is available.²⁰² This is in stark contrast to public opinion toward the US. Generally, Pakistani citizens do not have favorable opinions of the US and in 2015 only 22% held favorable or somewhat favorable opinions on the US.²⁰³ Favorability ratings for the US dipped in 2011 to roughly 11% support, likely following the US strike on Osama Bin Laden's compound, but have since recovered to pre-strike levels. Overall, China is much more popular than the US among everyday citizens. As China continues to invest in Pakistani infrastructure projects its popularity will likely continue to rise.

China and Pakistan have a long, storied history together full of agreements and deals. The agreements directly supported Pakistan's acquisition of the Paksat-1R satellite from China. The sale was mutually beneficial. Pakistan was able to continue providing SATCOM services to its customers and China was able to gain more international customers.

Bolivia

Bolivia signed a contract for the in-orbit delivery of the Chinese-made Tupac Katari (TKSAT-1) COMSAT on December 13th, 2010. According to the contract, China would provide Bolivia with a package solution, including the satellite, launch services, ground control stations, and satellite operator training. The satellite, also known as Tupac Katari to honor two Bolivian independence fighters, was successfully launched into orbit on December 21st, 2013.²⁰⁴ The

²⁰² Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/database/indicator/24/survey/all/> (December 17, 2017).

²⁰³ Heimlich, Russell. 2012. "Question Search." *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/question-search/?qid=844&cntIDs=%4036-%4036.5-&stdIDs> (December 17, 2017). =

²⁰⁴ "China Successfully Launched TKSAT-1 Communications Satellite." *China Great Wall Industry Corporation*. http://www.cgwic.com/news/2013/1227_Launched_TKSAT-1_Communications_Satellite.html (December 17, 2017).

Barbosa, Rui. 2013. "Long March 3B/E lofts TKSat-1 for Bolivia." *NASASpaceflight*. <https://www.nasaspaceflight.com/2013/12/long-march-3b-tksat-1-boliva/> (December 17, 2017).

entire project cost an estimated \$295 million, of which \$250 million was financed from China Development Bank (with the remaining costs being funded by the Bolivian government).

Bolivia intended to use the satellite to connect rural Bolivians that were off the telecommunications grid.²⁰⁵

China and Bolivia have maintained diplomatic relations since 1985. On the 25th anniversary of the relationship, in July 2010, Beijing hosted a celebration reaffirming their mutual cooperation.²⁰⁶ A month later, in August 2010, China and Bolivia pledged to expand their military ties by strengthening exchanges in military and officer training. The pledges were announced in Beijing by each state's Defense Minister. The Bolivian Defense Minister emphasized Bolivia's commitment to the 'One-China' policy.²⁰⁷ The relationship runs deeper than just pledges of military cooperation. China is currently Bolivia's primary bilateral creditor, steadily increasing its role in Bolivia over the last 15 years. As of late 2017 Bolivia owes more \$600 million to Chinese banks, constituting approximately 10% of Bolivia's total foreign debt.²⁰⁸ The loans have been used to support a variety on infrastructure and telecommunications projects. There were more than 100 Chinese companies operating in Bolivia in mid-2016 (up from 35 in 2015) and the Chinese presence in Bolivia continues to grow.²⁰⁹ In 2013, the two states signed multiple agreements involving economic and technical cooperation, agricultural cooperation, and cooperation on public safety technology. China's Ministry of Foreign Affairs boasts about its

²⁰⁵ De Selding, Peter. 2013. "China Launches Bolivia's First Telecom Satellite." 2013. *SpaceNews.com*. <http://spacenews.com/38800china-launches-bolivia-first-telecom-satellite/> (December 17, 2017).

²⁰⁶ "China, Bolivia celebrate 25th anniversary of diplomatic ties." 2010. *Sina.com*. <http://english.sina.com/china/2010/0709/328544.html> (December 17, 2017).

²⁰⁷ "Defense chiefs of China, Bolivia pledge stronger military ties." 2010. *Xinhua*. http://www.gov.cn/misc/2010-08/17/content_1681962.htm (December 17, 2017).

²⁰⁸ Achtenberg, Emily. 2017. "Financial Sovereignty or A New Dependency? How China is Remaking Bolivia." *NACLA*. <https://nacla.org/blog/2017/08/11/financial-sovereignty-or-new-dependency-how-china-remaking-bolivia> (December 17, 2017).

²⁰⁹ *Ibid.*

relationship with Bolivia, saying the two states “maintained communication and cooperation on major international issues including UN affairs and the climate change.”²¹⁰

Bolivia created the Bolivian Space Agency (ABE) on February 10th, 2010 with the intention of purchasing a satellite from China.²¹¹ The satellite contract between China and Bolivia was signed in December 2010, but the wheels were officially set in motion in October 2009 when Bolivian President Morales met with Hu Jintao in Beijing. At the meeting China and Bolivia signed a memorandum of understanding for the construction of the TKSAT-1 COMSAT.²¹² President Morales explained that the satellite would be named after the two independence fighters who had given their lives in the fight for the independence of the Bolivian people. The final satellite contract, for the in-orbit delivery of TKSAT-1, construction of satellite ground stations, satellite operator training, and launch, concluded over two years of negotiations between Bolivia and CGWIC, which unofficially started in 2008, prior to the memorandum of understanding.²¹³ It is unclear what initially drove Bolivia to approach the China for a satellite in 2008 or if Bolivia considered other satellite contractors before ultimately deciding to pursue a Chinese satellite solution.

The Chinese-Bolivian trade relationship has grown in recent years. In 2015, China was the top importer of goods into Bolivia, narrowly beating out Brazil (\$1.65 billion vs \$1.53

²¹⁰ “China and Bolivia.” *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/lmzms_664952/gjlb_664956/3468_664998/ (December 17, 2017).

²¹¹ De Selding, Peter. 2010. “Bolivia Orders Chinese Telecom Satellite.” *SpaceNews.com*. <http://spacenews.com/bolivia-orders-chinese-telecom-satellite/> (December 17, 2017).

“Historia” *Agencia Boliviana Espacial*. <https://www.abe.bo/nosotros/historia/> (December 17, 2017)

²¹² “China to help Bolivia launch satellite by 2013.” 2009. *Space Daily*. http://www.spacedaily.com/reports/China_to_help_Bolivia_launch_satellite_by_2013_999.html (December 17, 2017).

²¹³ De Selding, Peter. 2013. “China Launches Bolivia's First Telecom Satellite.” 2013. *SpaceNews.com*. <http://spacenews.com/38800china-launches-bolivia-first-telecom-satellite/> (December 17, 2017).

De Selding, Peter. 2010. “Bolivia Orders Chinese Telecom Satellite.” *SpaceNews.com*. <http://spacenews.com/bolivia-orders-chinese-telecom-satellite/> (December 17, 2017).

billion). In 2015, China was the 5th largest recipient of Bolivian trade, trailing Brazil, Argentina, the US, Colombia, respectively. Bolivia’s exports are worth a total of \$9.1 billion and its primary exports are petroleum gas, zinc ore, gold and precious metals. Bolivia is rich in precious metals, petroleum, and natural gas. Most of its natural resource remains untapped, though.²¹⁴ China’s growing demand for raw materials, coupled with Bolivia’s untapped resources, positions Bolivia to increase its exports to China in the coming years. Despite the relative low volume of trade, China’s imports from Bolivia have grown significantly since 2007. Bolivia’s main exports to China are precious metals, raw tin, and copper and zinc ore.

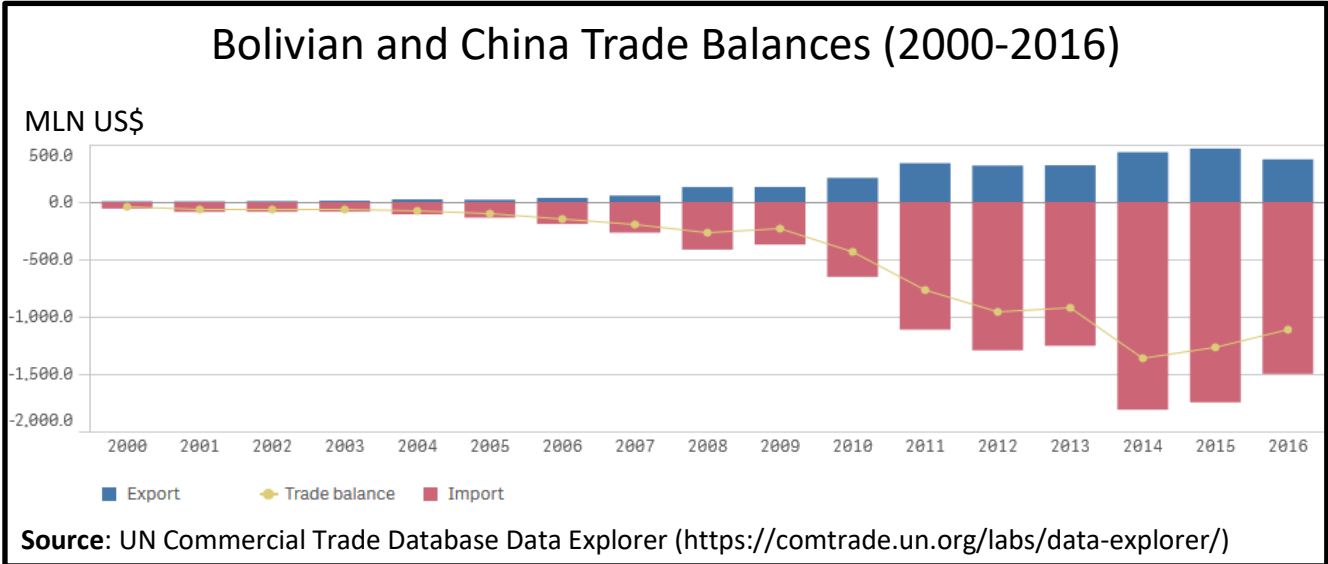


Figure 8. Bolivia and China Trade Balances

The US is Bolivia’s third largest export destination. The US predominantly imports gold, silver, raw tin, and jewelry from Bolivia. The total volume of trade between the US and Bolivia does not match the total volume of trade between China Bolivia, but has remained somewhat steady in recent years (around \$1 billion in total volume). Overall, US trade with Bolivia is up

²¹⁴ Soutter, Will. 2013. “Bolivia: Mining, Minerals and Fuel Resources.” *AZoMining.com*. <https://www.azomining.com/Article.aspx?ArticleID=69> (December 17, 2017).

from the mid-2000s, but down from its peak in 2014. An estimated 4,000 jobs in Bolivia are supported from US-Bolivian trade.²¹⁵ It remains to be seen if US-Bolivian trade will continue to drop from 2014 trade levels or if the total volume of trade will level out.

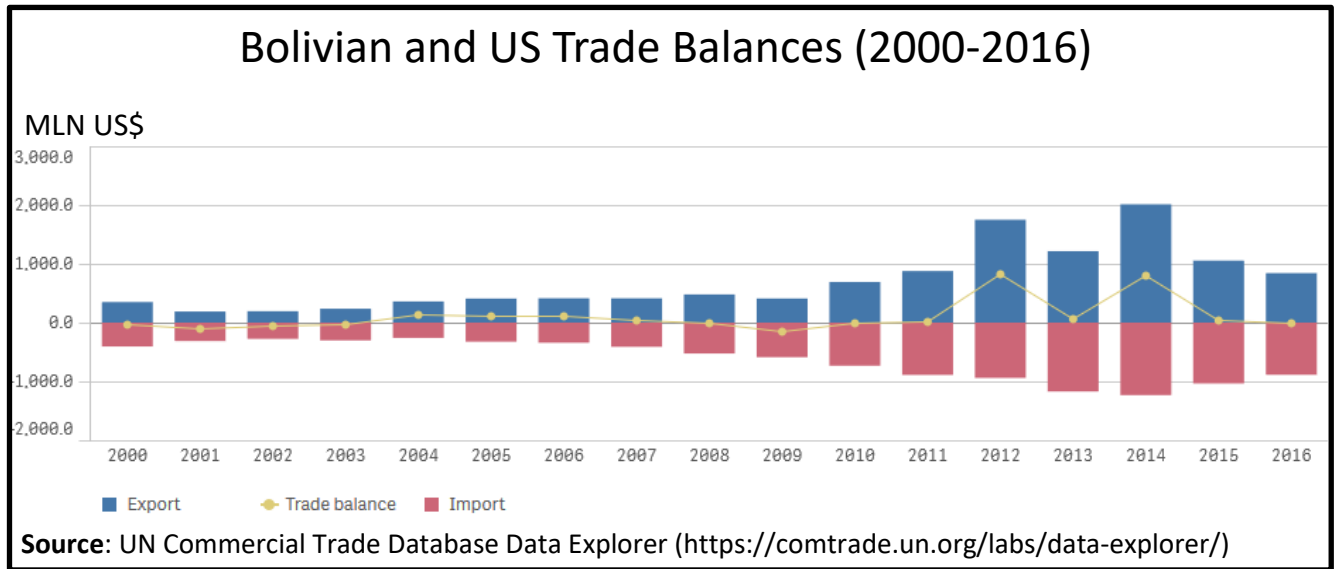


Figure 9. Bolivia and US Trade Balances

The US does not maintain a military presence in Bolivia. In 2008, Bolivia expelled the US ambassador and US DEA personnel operating in Bolivia and has turned down the opportunity to participate in US led military exercises in South America.²¹⁶ Bolivia’s current president, Evo Morales, has accused the US of promoting global terrorism through military ventures abroad, using the rise of the Islamic State terror group as evidence. In 2016, Bolivia opened an ‘anti-imperialist’ school to counter US influence in South America and the developing world. And in 2017, President Morales criticized US leadership for politicizing international

²¹⁵ “U.S.-Bolivia Trade Facts.” *United States Trade Representative*. <https://ustr.gov/countries-regions/americas/bolivia> (December 17, 2017).

²¹⁶ “Bolivia opens 'anti-Imperialist' school to counter US.” 2016. *BBC News*. <http://www.bbc.com/news/world-latin-america-37114191> (December 17, 2017).

“Bolivia says NO to joint military drills with U.S. in Amazonia.” 2017. *The Santiago Times*. <http://santiagotimes.cl/2017/06/09/bolivia-says-no-to-joint-military-drills-with-u-s-in-amazonia/> (December 17, 2017).

organizations and suggested the US holds double standards against socialist states.²¹⁷ The US-Paraguay relationship is also a concern to Bolivian leadership. Paraguay, located southeast of Bolivia, has trained and hosted US forces in the past.²¹⁸ Suspicions exist that suggest Washington intends on opening a permanent military presence in Paraguay – which President Morales would likely view as a threat. President Morales does not hold favorable views of the US and it is unlikely that he will allow Bolivia to participate in US led military exercises in the future and the existence of US troops in neighboring Paraguay likely does not sit well with him.

China also lacks a military presence in Bolivia, even though Beijing trains Bolivian soldiers and participates in joint military exercises. The relationship will likely deepen in the coming years, as both states publically reaffirmed their commitments to strengthen cooperation and boost relation in December 2016.²¹⁹ President Morales directed the Bolivian military to acquire Chinese military aircraft and weapons early in his presidency, and more recently in October 2017 Bolivia showcased its new Chinese unmanned aerial vehicles (UAVs) at the Paucarpata II military exercise.²²⁰ The purchased military equipment will likely be incorporated

²¹⁷ Raymundo, Sarah. 2017. “Bolivia's Evo Morales Says Trump Seeks to Destroy Anti-Imperialist Leaders.” *teleSUR English*. <https://www.telesurtv.net/english/news/Bolivias-Evo-Morales-Says-Trump-Seeks-to-Destroy-Anti-Imperialist-Leaders-20170919-0009.html> (December 17, 2017).

²¹⁸ Kozloff, Nikolas. 2012. “What is Washington up to in the Chaco region?” *Al Jazeera*.

<http://www.aljazeera.com/indepth/opinion/2012/07/2012718115122519807.html> (December 17, 2017).

Raymundo, Sarah. 2015. “US Army to Train Paraguay Soldiers Amid Militarization Concerns.” *teleSUR English*. <https://www.telesurtv.net/english/news/US-Army-to-Train-Paraguay-Soldiers-Amid-Militarization-Concerns-20150512-0026.html> (December 17, 2017).

Ruiz, Jose. 2014. “SOUTHCOM helps Paraguay open its first regional disaster-Relief hub.” *DVIDS*.

<https://www.dvidshub.net/news/121114/southcom-helps-paraguay-open-its-first-regional-disaster-relief-hub> (December 17, 2017).

“US Southern Command and General Staff of Paraguay, develop special operations skills competition.” 2017. *U.S. Embassy in Paraguay*. <https://py.usembassy.gov/us-southern-command-general-staff-paraguay-develop-special-operations-skills-competition/> (December 17, 2017).

²¹⁹ “China to promote military relations with Bolivia.” 2016. *Xinhua*. http://news.xinhuanet.com/english/2016-12/27/c_135936816.htm (December 17, 2017).

²²⁰ Achtenberg, Emily. 2017. “Financial Sovereignty or A New Dependency? How China is Remaking Bolivia.” *NACLA*. <https://nacla.org/blog/2017/08/11/financial-sovereignty-or-new-dependency-how-china-remaking-bolivia> (December 17, 2017).

into annual Chinese-Bolivian military drills. The annual drills attempt to verify the “effectiveness of the marine, land and air operations of Bolivian military forces.”²²¹

Few data points exist for Bolivian favorability ratings on the US or China. The most recent favorability data from 2013 suggests both China and the US enjoy similar support from Bolivia. 55% of Bolivians had favorable views of the US while 58% of Bolivians had favorable views of China. Non-national polling samples from 2007 reveal slightly lower favorability ratings for the US and China amongst Bolivians.²²² In 2007, China had 46% favorability rating and the US had 42% favorability rating amongst Bolivians. The increase in favorability for China probably stems from increased Chinese investment in Bolivia. The TKSAT-1 satellite probably helps China’s favorability rating, too. TKSAT-1 is reportedly generating upwards of \$2 million in monthly revenue and is expected to generate \$500 million over its mission life.²²³ The satellite is extending television and broadband coverage to rural, unconnected regions of Bolivia. TKSAT-1, among other Chinese investments in Bolivia, is likely increasing its image. Despite President Morales’ public dislike for the US, the US favorability amongst Bolivians is relatively high. It is unknown if Chinese or US favorability rating have risen or dropped since 2013.

Sanchez, Alejandro. 2017. “Bolivian Army showcases new UAVs, apparently from China's Yuneec.” *Jane's 360*. <http://www.janes.com/article/75368/bolivian-army-showcases-new-uavs-apparently-from-china-s-yuneec> (December 17, 2017).

²²¹ “Military exercise held in Bolivia.” 2016. *Xinhua*. http://news.xinhuanet.com/english/photo/2016-08/04/c_135563546_2.htm (December 17, 2017).

²²² Heimlich, Russell. 2010. “Global Indicators Database.” *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/database/indicator/1/country/27/> (December 17, 2017).

Heimlich, Russell. 2012. “Question Search.” *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/question-search/?qid=844&cntIDs=%405-%405.5-&stdIDs=> (December 17, 2017).

Heimlich, Russell. 2012. “Question Search.” *Pew Research Center's Global Attitudes Project*. <http://www.pewglobal.org/question-search/?qid=827&cntIDs=%405-%405.5-&stdIDs=> (December 17, 2017).

²²³ De Selding, Peter. 2015. “Bolivia's TKSAT-1 Expected To Generate \$500 Million.” *SpaceNews.com*. <http://spacenews.com/bolivias-tksat-1-expected-to-generate-500-million/> (December 17, 2017).

Laos

China launched Laosat-1 for Laos on November 21st, 2015.²²⁴ The satellite was China's fifth launch for an international customer and the first to an Association of Southeast Asian Nations (ASEAN) state. The contract between Laos and China was signed on February 25th, 2010 and called for the first use of China's indigenously produced Dongfanghong-4S (DFH-4S) satellite bus.²²⁵ According to the Laosat website, the successful launching of Laosat-1 "is of great important significance on the ... further implementation of the strategy of the Belt and Road Initiative."²²⁶ The satellite was financed by China's Export-Import Bank for a sum of \$259 million and provides telecommunication services to Southeast Asia.²²⁷

China and Laos established formal relations in April 1961. The relationship has at times been strained, as both countries have delicately balanced relationships with third parties during military conflicts in Indochina. Initially, China's relations consisted of economic support and assistance to Laos. China publically backed Laos in its "struggle of the Lao ethnic people against foreign imperialists."²²⁸ Relations took a significant step forward in 2000, when China's President Jiang Zemin traveled to Laos and signed a joint statement on bilateral cooperation with Laos, ensuring comprehensive long-term cooperation between the two states.²²⁹ The joint statement included support for the 'One China' policy and paved the way for a number of high-

²²⁴ Barbosa, Rui. 2015. "Long March 3B lofts LaoSat-1." *NASASpaceflight*.

<https://www.nasaspaceflight.com/2015/11/long-march-3b-lofts-laosat-1/> (December 17, 2017).

²²⁵ "LaoSat-1 Program -- In-Orbit Delivery Program." *China Great Wall Industry Corporation*.

<http://www.cgwic.com/In-OrbitDelivery/CommunicationsSatellite/Program/Laos.html> (December 17, 2017).

²²⁶ "Launching of LAOSAT-1." *LAOSAT*. <http://www.laosat.la/en/news-Launching-of-LAOSAT-1.php> (December 17, 2017).

²²⁷ De Selding, Peter. 2015. "Laos, with China's Aid, Enters Crowded Satellite Telecom Field." *SpaceNews.com*. <http://spacenews.com/laos-with-chinese-aid-is-latest-arrival-to-crowded-satellite-telecom-field/> (December 17, 2017).

²²⁸ "Laos-China cooperation continues to grow (Part 1)." *Embassy of the People's Republic of China in the Lao People's Democratic Republic*. <http://la.china-embassy.org/eng/news/t1034300.htm> (December 17, 2017).

²²⁹ "China-Laos bilateral ties." 2006. *China Daily*. http://www.chinadaily.com.cn/china/2006-11/14/content_732556.htm (December 17, 2017).

profile state visits, which have continued on after transitions of power. Laotian leaders also supported China's anti-secession laws again in 2005.²³⁰ Since the 2000 joint statement, Laos and China signed a comprehensive strategic partnership in 2009 to deepen their mutual trust in political and economic affairs.²³¹ This has resulted in an increase in Chinese investment and infrastructure projects in Laos. Laos is the recipient of a number of Chinese Belt and Road projects – the most high profile project being a 414 kilometer (km) railway connecting China to Laos. The project costs approximately \$6 billion and hopes to connect China to Southeast Asia.²³²

It is unclear whether Laos received multiple bids or offers for Laosat-1 or if the satellite contract was even advertised to receive bids. There are a number of stakeholders in the Laosat-1 satellite program. Laos owns 45% of the satellite, the Asia-Pacific Mobile Telecommunications Satellite Company (APMT) owns 35%, Space Star Technology Company Ltd. owns 15%, and Asia-Pacific Satellite Technology owns 5%.²³³ APMT and Space Star Technology Co. Ltd. are both owned and operated by China Aerospace Science and Technology Corporation (CASC).²³⁴ It is interesting that China considers Laosat-1 an exported satellite, when half the rights of the satellite are owned by the Chinese government. Furthermore, throughout the process Asia-Pacific Telecommunication Company Ltd (APT) provided satellite program advising and

²³⁰ “Laos voices support for China's Anti-Secession Law.” 2005. *People's Daily Online*. http://en.people.cn/200503/17/eng20050317_177205.html (December 17, 2017).

²³¹ “Laos, China agree to cement strategic partnership.” 2013. *Asean Affairs*. http://www.aseanaffairs.com/laos_news/ties/laos_china_agree_to_cement_strategic_partnership (December 17, 2017).

²³² Hutt, David. 2017. “Laos is a key link for China's Obor ambitions.” *Asia Times*. <http://www.atimes.com/article/laos-key-link-chinas-obor-ambitions/> (December 17, 2017).

²³³ De Selding, Peter. 2015. “Laos, with China's Aid, Enters Crowded Satellite Telecom Field.” *SpaceNews.com*. <http://spacenews.com/laos-with-chinese-aid-is-latest-arrival-to-crowded-satellite-telecom-field/> (December 17, 2017).

²³⁴ “Company Profile.” *China Rocket Company Ltd*. <http://www.apmt.cn/en/about.aspx> (December 17, 2017). “Company Overview.” *Space Star Technology Company Ltd*. <http://spacestar.com.cn/en/about.html> (December 17, 2017).

consultation to Laos and China APMT.²³⁵ APT is majority owned by China and also advertises Laosat-1 as Apstar-L to customers.²³⁶ A China Academy of Space Technology (CAST) deputy general manager suggested the Laosat-1 satellite was a “significant manifestation of the China-Laos comprehensive strategic co-operative partnership and also a demonstration project to support China’s “One Belt, One Road” Initiative.”²³⁷

While the satellite is operated from Laos and primarily delivers satellite telecommunication services to Laos and the Indochina Peninsula, China clearly has a vested interest in the success of Laosat-1.²³⁸ The interests, however large they may be, were not without hurdles that were overcome. Laos originally filed with the International Telecommunications Union (ITU) in 2008 and, per ITU regulations, was required to occupy the 128.5 degrees East longitude orbital position with a satellite no later than May 13th, 2015.²³⁹ Due to radio-frequency de-confliction with neighboring COMSATS (to avoid unintended RF interference), lending conditions imposed by China’s Export-Import bank resulting in litigation, and late payments from Laos to China, Laos was not able to meet the 13 May 2015 deadline was forced to obtain an extension from the ITU, extending the deadline to 31 December 2015. Laos was granted the extension since Laos is a least-developed state. The ITU deadlines reveals Laos was considering a satellite as early as 2008 – which predates China’s strategic cooperative partnership with Laos.

²³⁵ “APT Provides Consultant Service for LAOSAT-1 Satellite.” 2014. *APSTAR*.

<http://www.apstar.com/en/news/apt-provides-consultant-service-for-laosat-1-satellite/> (December 17, 2017).

²³⁶ “APT Satellite and CICC expand partnership to promote Great Wall TV Platform in Indochina & South East Asia.” 2016. *Casbaa*. <http://www.casbaa.com/news/member-press-release/apt-satellite-and-cicc-expand-partnership-to-promote-great-wall-tv-platform-in-indochina-south-east-asia/> (December 17, 2017).

“Company Brochure.” *APSTAR*. [http://www.apstar.com/en/brochure/company-brochure/#prettyPhoto\[broc2017\]/13/](http://www.apstar.com/en/brochure/company-brochure/#prettyPhoto[broc2017]/13/) (December 17, 2017).

²³⁷ “Laosat-1 Telecommunications Satellite Delivered In-Orbit.” 2015. *ChinaGoAbroad*.

<http://www.chinagoabroad.com/en/article/laosat-1-telecommunications-satellite-delivered-in-orbit> (December 17, 2017).

²³⁸ “Satellite Info.” *LAOSAT*. <http://www.laosat.la/en/satellite-info.php> (December 17, 2017).

²³⁹ De Selding, Peter. 2015. “Laos, with China's Aid, Enters Crowded Satellite Telecom Field.” *SpaceNews.com*. <http://spacenews.com/laos-with-chinese-aid-is-latest-arrival-to-crowded-satellite-telecom-field/> (December 17, 2017).

It is possible that China pushed Laos to set up the joint ventures with APMT and SSTC and offered a lucrative deal for the satellite, under the guise of the strategic cooperative partnership, as a means to gain access to an orbital position and telecommunication services over Southeast Asia for another Chinese made satellite.

China is Laos' second largest trading partner next to Thailand.²⁴⁰ In 2016 China imported approximately \$1.2 billion worth of goods from Laos. The imports primarily consisted of copper ore and bananas (those two imports accounted for 75% and 10% of total imports, respectively). Laos imported a variety of products from China in 2016 totaling about \$1 billion in imports. The bulk of Laotian imports from China were machines, transportation equipment, and metal products.²⁴¹ Chinese demand for Lao products has created tension between Lao and Chinese government officials. Chinese investors have aggressively created Banana plantations in Laos' Northern provinces to meet an increased demand for fruit in China. The demand led to an increase in Chinese investment in some of the poorest Lao provinces, but in 2017 the Lao government created a law banning the opening of new Chinese plantations due to the unchecked uses of pesticides by Chinese plantation owners.²⁴² The pesticides are reportedly making many Lao workers sick and are damaging the environment and sources of water that many Lao citizens depend on. Nearly all of Laotian banana exports end up in China and it is unknown how the government laws will affect the state's relationship with China. The total volume of trade between Laos and China continues to rise.

²⁴⁰ "China-Laos trade, economic cooperation continuously develop in past 20 years." 2017. *Xinhua*. http://news.xinhuanet.com/english/2017-07/06/c_136423290.htm (December 17, 2017).

"Laos." *OECD - Laos (LAO) Exports, Imports, and Trade Partners*. <https://atlas.media.mit.edu/en/profile/country/lao/> (December 17, 2017).

²⁴¹ *Ibid*.

²⁴² Martina, Michael, and Amy Sawitta Lefevre. 2017. "Cash and chemicals: for Laos, Chinese banana boom a blessing and curse." *Reuters*. <https://www.reuters.com/article/us-china-silkroad-laos/cash-and-chemicals-for-laos-chinese-banana-boom-a-blessing-and-curse-idUSKBN187334> (December 17, 2017).

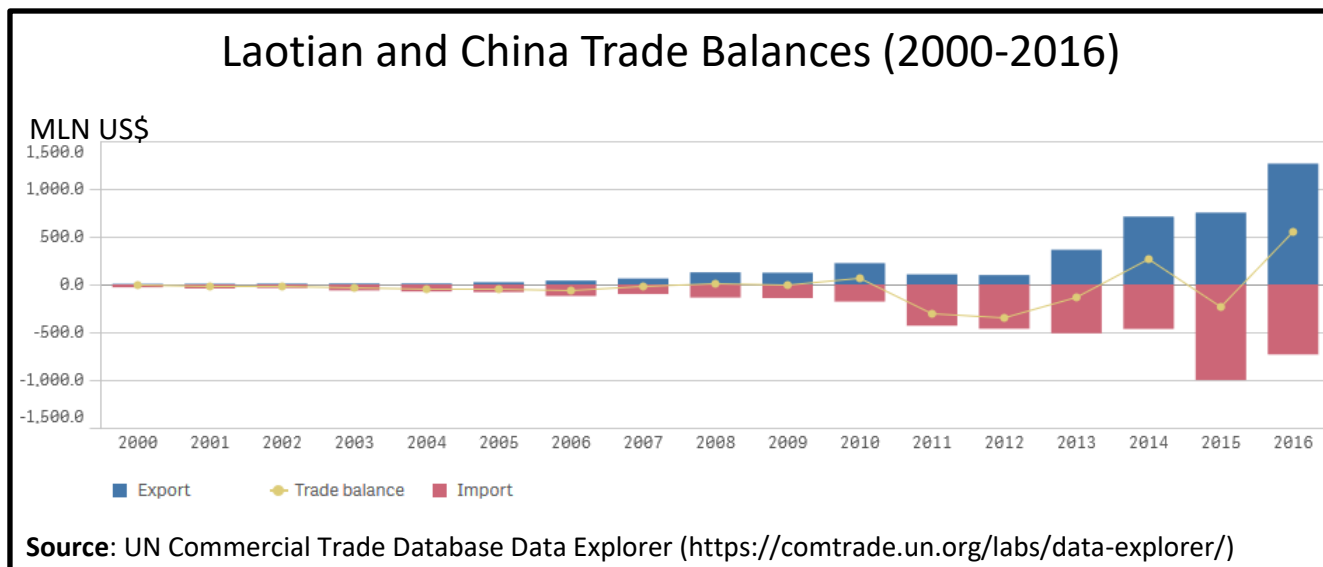


Figure 10. Laos and China Trade Balances

The Lao-US trade relationship is not as robust as Lao-China relationship. In 2016, Laos’ exports to the US totaled approximately \$19 million. Its main exports to the US were jewelry, hydrogen, men clothing products, and coffee. In 2016, the US exported approximately \$30.9 million worth of goods to Laos. Its two main exports to Laos were synthetic fabrics and diamonds (those two items accounted for 52% of exported goods). Laos is the 171st largest trading partner of the United States, and the United States is Laos’ eighth largest source of imports.²⁴³

²⁴³ “Laos.” *United States Trade Representative*. <https://ustr.gov/countries-regions/southeast-asia-pacific/laos> (December 17, 2017).

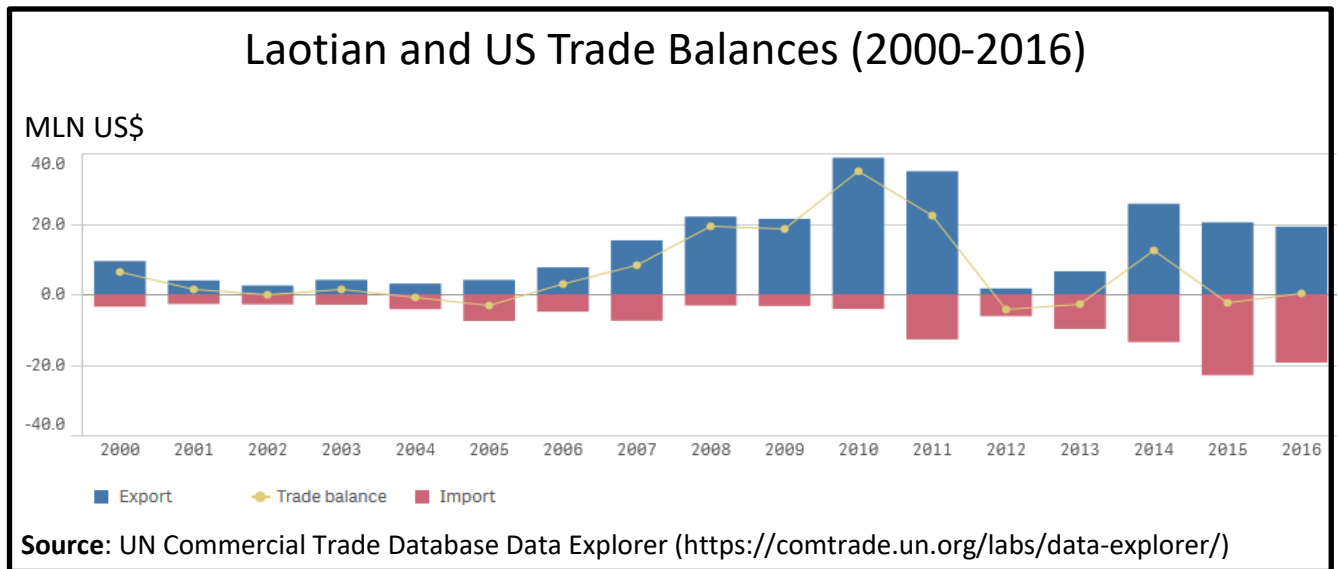


Figure 11. Laos and US Trade Balances

The US does not maintain a military presence in Laos. During the Vietnam War, the CIA trained, armed, and assisted Lao guerilla fighters in its fight against communism, but the CIA or US military does not operate a base there currently. Over the course of the Vietnam War, the US performed approximately 580,000 bombing missions in Laos dropping 2.5 million tons of bombs. Of the 2.5 million tons of bombs, an estimated 30% never exploded.²⁴⁴ This drove President Obama to pledge increased efforts to remove remaining unexploded ordinances in Laos. The pledge, along with joint Lao-US bilateral defense dialogues, has strengthened the relations between the two states. The joint defense dialogues are “a forum for bilateral consultations between the Lao Ministry of National Defense and U.S. Pacific Command to strengthen bilateral and multilateral cooperation, as well as to develop defense cooperation

²⁴⁴ Blakemore, Erin. 2016. “Why the US is Pledging Millions to Clean Up Bombs in Laos.” *Smithsonian.com*. <https://www.smithsonianmag.com/smart-news/why-us-pledging-millions-clean-bombs-laos-180960351/> (December 17, 2017).

programs that enhance relations between our security forces, encourage greater regional military cooperation, and promote the common interests of both countries.”²⁴⁵

China does not maintain a military presence in Laos. In 2016, the two states have vowed to increase military cooperation and increase the number of high-level military exchanges.²⁴⁶ And in 2017, Laos received office equipment and medical assistance from China. The Chinese embassy in Laos presented office equipment to the Lao Ministry of Defense in April 2017. The Lao Deputy Minister of Defense received the equipment and suggested that it would be used to maintain close communications with Chinese embassy officials.²⁴⁷ Later, in August 2017, China deployed a 90-person medical team to Laos on a goodwill mission. The mission, called ‘Train of Peace 2017’, brought medicine and doctors to a makeshift 14-tent field hospital. Chinese forces distributed 20,000 boxes of medicine to over 6,500 patients over the 10 day mission.²⁴⁸ China likely uses the medical support and military cooperation to gain valuable deployment experience for its military forces while also improving cooperation and coordination between the two militaries.

The increased cooperation between China and Laos has many questioning China’s motives. China may be financing large Lao projects, such as the Laosat-1 communication satellite or the railway, despite analysis that indicates poor economic returns on the projects.²⁴⁹ This suggests China’s primary motivation for Lao project is not economic. Perhaps China has

²⁴⁵ “United States – Lao People's Army Conduct Eleventh Annual Bilateral Defense Dialogue.” 2016. *U.S. Embassy in Laos*. <https://la.usembassy.gov/unitedstateslaopeoplesarmyconducteleventhannualbilateraldefensedialogue/> (December 17, 2017).

²⁴⁶ “China, Laos agree to boost military exchanges, cooperation.” 2017. *Xinhua*. http://news.xinhuanet.com/english/2017-09/16/c_136614211.htm (December 17, 2017).

²⁴⁷ “Chinese embassy presents office equipment to Lao defense ministry.” 2017. *Xinhua*. http://news.xinhuanet.com/english/2017-04/12/c_136202934.htm (December 17, 2017).

²⁴⁸ Yang, Zi. 2017. “What is China’s PLA doing in Laos?” *Asia Times*. <http://www.atimes.com/article/chinas-pla-laos/> (December 17, 2017).

²⁴⁹ “China’s railway diplomacy hits the buffers.” 2017. *Financial Times*. <https://www.ft.com/content/9a4aab54-624d-11e7-8814-0ac7eb84e5f1> (December 17, 2017).

political motivations, since a strong partnership would limit Vietnam's future options or future decisions ASEAN in the South China Sea.

Belarus

Belarus and China signed the contract for the in-orbit delivery of the Belintersat-1 COMSAT on September 18th, 2011. Per the contract, China would design, construct, integrate, test, launch, and deliver the satellite to Belarus. Additionally, China would construct the related ground control facilities. The contract was worth \$280.9 million and also included satellite insurance and nine months of Belarussian satellite operator training in China. The satellite was China's first satellite sale to a European country. The satellite launched January 15th, 2016 from China's Xichang Satellite Launch Center in Southwest China's Xichuan Province.

China and Belarus established formal relations in 1992 and since then the two states have regularly exchanged high-profile state visits.²⁵⁰ In October 2010 Belarussian President Alexander Lukashenko said China was Belarus's best friend and in September 2016 he awarded Chinese President Xi the 'Peace and Friendship' medal of Belarus as a sign of appreciation of China's continued commitments to Belarus.²⁵¹ One of China's most high profile commitments in Belarus is the Great Stone Industrial Park, located approximately 25 km from Minsk, Belarus (the Belarussian capital). China touts the project as a 'bright moment' in the relationship between the two and regards the project as a key point of the Belt and Road initiative.²⁵² The industrial park

²⁵⁰ Koch-Weser, Iacob. 2011. "What Drives China-Belarus Relations." *BelarusDigest*. <https://belarusdigest.com/story/what-drives-china-belarus-relations/> (December 17, 2017).

²⁵¹ Nedzhvetskaya, Nataliya. 2011. "China and Belarus: A Special Relationship." *Harvard Political Review*. <http://harvardpolitics.com/world/china-and-belarus-a-special-relationship/> (December 17, 2017).
"Xi says Belarus is a good partner." 2016. *Chinadaily.com.cn*. http://www.chinadaily.com.cn/china/2016-09/30/content_26944007.htm (December 17, 2017).

²⁵² "Chinese MFA: Great Stone is a big project of cooperation with Belarus." 2017. *Belarusian Telegraph Agency*. <http://eng.belta.by/economics/view/chinese-mfa-great-stone-is-a-big-project-of-cooperation-with-belarus-105893-2017/> (December 17, 2017).

is a result of just one of the numerous agreements signed between the two states.²⁵³ The agreements enhance cooperation in multiple areas, including investment, trade, education, and science. Since at least 2000, Belarus has supported the ‘One China’ policy and recognized Taiwan as a part of China while China has supported President Lukashenko in his contested 4th presidential election.²⁵⁴ Belarus and China’s relationship has deepened since 1992. It is likely that the completion of Great Stone Industrial Park and China’s Belt and Road initiative will make the relationship grow, as Belarus will be a European hub for Chinese goods and political influence.

The details of the Belintersat-1 bidding process are unknown. According to the Belintersat website, “the history of the project began with a closed tender won by CGWIC.”²⁵⁵ The participants in the Belintersat-1 bidding process were not identified in Belarussian or Chinese media. It is less clear who Belarus advertised the closed tender to or if China was the only bidder. Regardless, the satellite contract mirrored previous Chinese satellite contracts with other Chinese satellite customers and similar services were offered. Several clues provide insight into China’s involvement in the closed tender bidding process. First, the satellite deal inked in September 2011 occurred less than a year after China and Belarus agreed to the creation of the Great Stone Industrial Park. The timing of the satellite contract and the Great Stone Agreement

“Spotlight: China-Belarus industrial park to play important role in Silk Road initiative.” 2015. *Xinhua*. http://news.xinhuanet.com/english/2015-05/11/c_134229503.htm (December 17, 2017).

²⁵³ “Xi says Belarus is a good partner.” 2016. *Chinadaily.com.cn*. http://www.chinadaily.com.cn/china/2016-09/30/content_26944007.htm (December 17, 2017).

“October, 2010 – Signing of the Agreement.” *Great Stone Industrial Park- Archive*. <http://www.industrialpark.by/archive/2010> (December 17, 2017).

²⁵⁴ Nedzhvetskaya, Nataliya. 2011. “China and Belarus: A Special Relationship.” *Harvard Political Review*. <http://harvardpolitics.com/world/china-and-belarus-a-special-relationship/> (December 17, 2017).

“The People's Republic of China and Belarus Republic Issued Joint Press Communiqué in Minsk.” 2001. *Ministry of Foreign Affairs of the People's Republic of China*. http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/dozys_664276/gjlb_664280/3140_664302/3141_664304/t16620.shtml (December 17, 2017).

²⁵⁵ “History.” *Belintersat*. <http://en.belintersat.by/project/history> (December 17, 2017).

suggest the Chinese-Belarusian negotiations for each project were happening concurrently. The success of one was likely not tied to the other, but collectively the two very public and highly visible projects show significant Chinese interest in Belarus around 2010. Secondly, China Satellite Communications Company Ltd (China Satcom) purchased eight of Belintersat-1's transponders and markets its transponders as Chinasat-15.²⁵⁶ An older, now mission-ended Chinese COMSAT, Chinasat-5D, previously occupied Belintersat-1's orbital location at 51.5 degrees East longitude.²⁵⁷ China Satcom used Chinasat-5D to provide C-band television services. China Satcom's purchase of eight transponders from Belarus is a cheaper alternative than launching a replacement satellite for Chinasat-5D. It is unknown if China intended to purchase the transponders from Belarus from the onset of the satellite deal, but it is a convenient option for China to replace satellite telecommunication services from 51.5 degrees East. Third, Nigeria won the rights to provide carrier spectrum monitoring services for Belintersat-1's African beams.²⁵⁸ Nigeria, which also purchased a COMSAT from China, almost certainly uses similar, if not identical, ground equipment as the Belarussians (this is assumed since China was contracted to build the ground stations for each customer). While it is unknown who else bid on the closed tender, the timing of the satellite deal, China's purchase of multiple transponders on the satellite, and a Chinese-built Nigerian ground station won the CSM contract suggest that China was part of an exclusive bidding process, possibly a bidding process that was just limited to China. Belarus used China's Export-Import bank for project financing.

²⁵⁶ Henry, Caleb. 2015. "Belarus' Belintersat Project Prepares for Inaugural Telecom Satellite." *Via Satellite*. <http://www.satellitoday.com/telecom/2015/05/13/belarus-belintersat-project-prepares-for-inaugural-telecom-satellite/> (December 17, 2017).

²⁵⁷ "Chinasat-5D." *Satbeams Web and Mobile*. <https://www.satbeams.com/satellites?norad=23943> (December 17, 2017).

²⁵⁸ Magan, Veronica. 2015. "Nigeria to Manage Belarus Satellite for 15 Years." *Via Satellite*. <http://www.satellitoday.com/technology/2015/12/31/nigeria-to-manage-belarus-satellite-for-15-years/> (December 17, 2017).

China is Belarus's 9th largest trading partner and accounts for 1.8% of all Belarussian exports. The majority of Belarussian exports are sent to Russia (48% of all exports), Ukraine (12% of all exports), the UK (4.7% of all exports), and other neighboring European states.²⁵⁹ In 2016, Belarus exported a total of \$22.8 billion worth of goods, of which a meager \$435 million worth of went to China. Belarus mostly exports fertilizers, polyamides, and flax fibers to China, which China could almost certainly find elsewhere from other established trade relationships. On the other hand, Belarus imports approximately \$1 billion worth of goods from China annually.²⁶⁰ The majority of imports are transportation and machinery equipment. The trade imbalance generates debt on the Belarussian side and, according to the Jamestown foundation, "Minsk finds it difficult to compete with other Central and Eastern European countries for the status of the gateway to the EU. Most of those countries are already EU members or, at least, have advanced trading regimes with the bloc."²⁶¹ Belarus could have turned to China as a trading partner following the drop in global oil prices or as a means to limit its economic dependency on Russia. Refined petroleum is Belarus's primary export, and interestingly enough, China does not import any refined petroleum from Belarus.

²⁵⁹ "Belarus." *OECD - Belarus (BLR) Exports, Imports, and Trade Partners*. <https://atlas.media.mit.edu/en/profile/country/blr/> (December 17, 2017).

²⁶⁰ *Ibid.*

²⁶¹ Preiherman, Yauheni. 2017. "Strategic Advances and Economic Hopes of Belarus-China Relations" *The Jamestown Foundation*. <https://jamestown.org/program/strategic-advances-and-economic-hopes-of-belarus-china-relations/> (December 17, 2017).

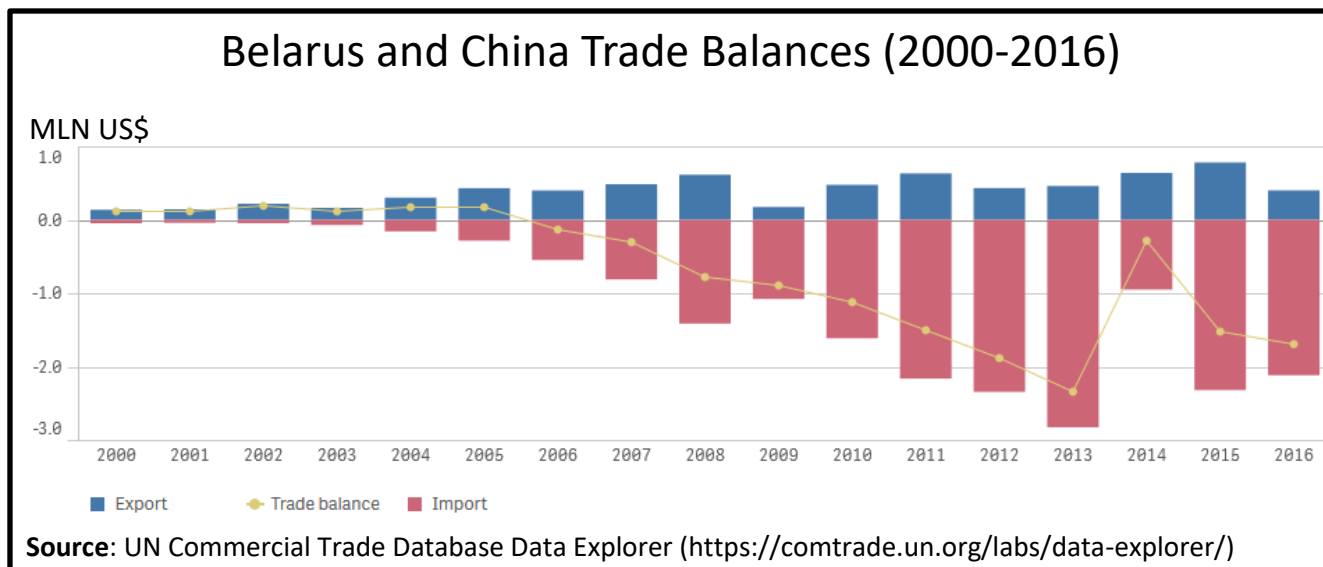


Figure 12. Belarus and China Trade Balances

The US and Belarus do not engage in significant amounts of trade. As of 2016, the US imports approximately \$144 million worth of goods from Belarus annually. The imports mainly consist of fertilizers, mineral products, and X-ray equipment.²⁶² Conversely, the US only exports approximately \$200 million worth of goods to Belarus, most of which is unspecified goods.²⁶³ The US and Belarus established formal relations in 1992, following the collapse of the Soviet Union. More recently in 2015 the US and Belarus have cooperated on the release of political prisoners in Belarus and the US subsequently lifted sanctions on several Belarussian entities. Despite the lifting of those sanctions, other sanctions remain that are focused on the human rights situation within Belarus.²⁶⁴ The US hopes to move Belarus toward a more democratic and free

²⁶² “Products that the United States imports from Belarus (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/usa/blr/show/2016/ (December 17, 2017).

²⁶³ *Ibid.*

²⁶⁴ “U.S. Relations With Belarus.” 2016. *U.S. Department of State*. <https://www.state.gov/r/pa/ei/bgn/5371.htm> (December 17, 2017).

market society and provides monetary assistance towards Belarussian group that advocate for human rights and private business rights.²⁶⁵

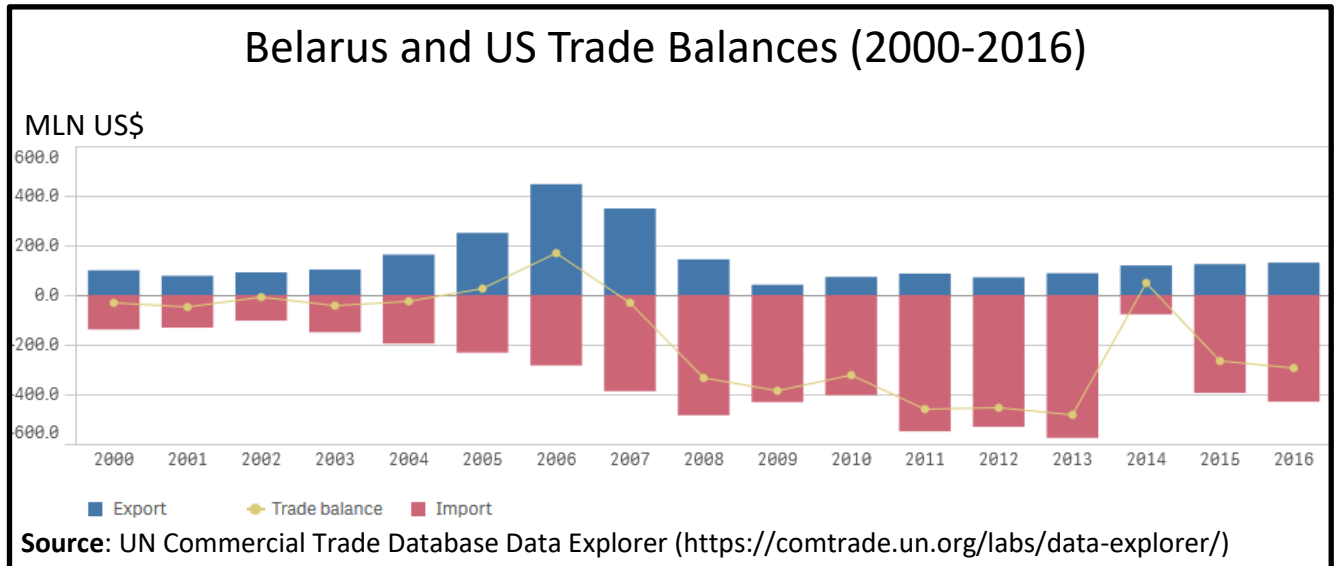


Figure 13. Belarus and US Trade Balances

In October 2017, the US and Belarus signed a joint agreement for bilateral military cooperation for the following year.²⁶⁶ It is unknown what level of cooperation the two states will engage in, but this marks an increase in cooperation from recent years. Analysis of historical cooperation between the two suggests the two states did not engage in meaningful cooperation, since the US had viewed military cooperation as an extension of political dialogue. Since Belarus was under sanction for human rights violations, the US did not make meaningful efforts to

²⁶⁵ “Foreign Operations Assistance: Belarus.” 2016. *U.S. Department of State*. <https://2009-2017.state.gov/p/eur/rls/fs/2016/261450.htm> (December 17, 2017).

²⁶⁶ “Minsk, Washington Sign Military Cooperation Plan for 2017.” 2016. *Sputnik International*. <https://sputniknews.com/military/201610211046573228-us-belarus-military-cooperation/> (December 17, 2017).

engage in military cooperation.²⁶⁷ The US does not have troops stationed in Belarus but still maintains a robust military presence in other European states and organizations.

In June and October 2017, China and Belarus engaged in military cooperation dialogues.²⁶⁸ The June talks culminated with Belarus announcing that China would be providing new armored vehicles to Belarus. The two states have an existing security relationship, and in the past China provided technical military training and military equipment to Belarus.²⁶⁹ Aside from military aid, it does not appear that China has held drills with Belarussian military forces or has announced plans to do so. China does not have any military troops stationed in Belarus to protect Chinese interests.

Algeria

China launched the Alcomsat-1 COMSAT for Algeria on 10 December 2017.²⁷⁰ Algeria entered into a contract with CGWIC to design, construct, manufacture, and launch a COMSAT on 17 September 2013.²⁷¹ Limited media reporting exists on the satellite, but it is known that the satellite is based on China's DFH-4 satellite bus and China launched the satellite from its Xinchang Space Launch Center. Alcomsat-1 will provide civil and military telecommunication services, such as broadcasting, telephony, and internet service, to Algerian and African users.

²⁶⁷ "Military cooperation between Belarus and US will be very modest." 2016. *Belarus in Focus*. <https://belarusinfocus.info/international-relations/military-cooperation-between-belarus-and-us-will-be-very-modest> (December 17, 2017).

²⁶⁸ "Belarus, China discuss military cooperation." 2017. *Belarusian Telegraph Agency*. <http://eng.belta.by/society/view/belarus-china-discuss-military-cooperation-106362-2017/> (December 17, 2017). "Belarus-China military cooperation discussed." 2017. *Belarusian Telegraph Agency*.

<http://eng.belta.by/society/view/belarus-china-military-cooperation-discussed-102085-2017/> (December 17, 2017).

²⁶⁹ Parameswaran, Prashanth. 2017. "China Gives Belarus New Armored Vehicles." *The Diplomat*. <https://thediplomat.com/2017/06/china-gives-belarus-new-armored-vehicles/> (December 17, 2017).

²⁷⁰ Henry, Caleb. 2017. "Chinese Long March 3B launches Algeria's first telecom satellite." 2017. *SpaceNews.com*. <http://spacenews.com/chinese-long-march-3b-launches-algerias-first-telecom-satellite/> (January 24, 2018).

²⁷¹ "Alcomsat-1 Network Resolutiuon 609 Annex Commitment Letter." *NASASpaceflight | Forums*. <https://forum.nasaspaceflight.com/index.php?PHPSESSID=51vn52ep70malqpttpj7j8kna1&action=dlattach%3Btopic> (December 17, 2017).

The satellite is supported by two satellite control stations and China is also training Algerian space operators.²⁷²

China and Algeria established formal relations in December 1958. China was one of the first states to recognize Algeria, after they declared independence from France in September 1958, and Algerian diplomats actively lobbied for the PRC to be restored to the United Nations in the 1970s (important distinction in this case since “China” had been in the UN since 1945, but that “China” was what we now call Taiwan).²⁷³ The two states have signed multiple joint declarations and strategic partnerships over the years to increase cooperation between the two, with the most recent agreement in 2014.²⁷⁴ The Comprehensive Strategic Partnership, signed in 2014, will reportedly usher in “a new historical stage of bilateral ties,” “deepen friendly exchanges between the parliaments of the two countries,” and “closely coordinate and cooperate with China on international and regional affairs.”²⁷⁵ The increased cooperation between the two is demonstrated by China’s investment in a variety of Algerian markets. As of 2016, China had financed infrastructure projects, including a \$3.2 billion seaport in Cherchell, Algeria, housing developments, and vehicle and truck assembly plants. The various projects are supported by an estimated 35,000–40,000 Chinese workers.²⁷⁶ China’s Belt and Road Initiative is a driving force

²⁷² Hawkes, Rebecca. 2016. “Algeria to launch communications satellite in 2017.” *Rapid TV News*. <https://www.rapidtvnews.com/2016100344528/algeria-to-launch-communications-satellite-in-2017.html#axzz50EUNRNQt> (December 17, 2017).

²⁷³ “Algeria, China strengthen strategic partnership.” 2008. *China Daily*. http://www.chinadaily.com.cn/cndy/2008-12/19/content_7320543.htm (December 17, 2017).

²⁷⁴ “Algeria hails new strategic relations with China.” 2016. *Forum on China Africa Cooperation*. <http://www.focac.org/eng/zxxx/t1385652.htm> (December 17, 2017).

²⁷⁵ “Spotlight: China, Algeria vow to boost comprehensive strategic partnership.” 2014. *Forum on China Africa Cooperation*. <http://www.focac.org/eng/zxxx/t1207173.htm> (December 17, 2017).

²⁷⁶ Markey, Patrick. 2016. “Hit by oil price drop, Algeria turns to China for funds.” *Reuters*. <https://www.reuters.com/article/algeria-economy-china/hit-by-oil-price-drop-algeria-turns-to-china-for-funds-idUSL8N15223J> (December 17, 2017).

behind the Chinese projects in Algeria, and it appears that China is committed to significant amounts of investment in Algeria going forward.²⁷⁷

The details of the Alcomsat-1 bidding process are unknown and little information is provided on the Algerian Space Agency's (ASAL) website. The lack of publically available information makes it difficult to determine the logics and processes Algeria used when selecting China as the satellite's contractor. The ASAL website revealed Algeria's bilateral space cooperation efforts. As of late 2017, ASAL has signed three government cooperation agreements (Argentina, France, and Ukraine) and seven memorandums of understandings for space cooperation (Russia, China, United Kingdom, Germany, India, Syria, and Argentina). ASAL's website also says that official government agreements are also being finalized with Russia, South Africa, and China.²⁷⁸ The agreements would elevate the existing memorandums to formal, bilateral relationships. It is unknown when China and Algeria signed the memorandum of understanding on space cooperation, but it was at least after 2011, since China's 2016 Space White Paper mentioned the Algerian memorandum as an accomplishment since its previous Space White Paper in 2011.²⁷⁹

It is possible the memorandum of understanding led to China being the preferred satellite contractor, as was the case with the Paksat-1R satellite program, but it is unknown if this factored into the selection process. International Telecommunication Union documents show that Algeria entered into a contract with CGWIC for a COMSAT on 17 September 2013. The original launch date, according to the documents, was 31 January 2016. It is possible China won the

²⁷⁷ "Feature: Chinese workers help bring prosperity to countries along Belt and Road." 2017. *Xinhua*. http://news.xinhuanet.com/english/2017-05/12/c_136276420.htm (December 17, 2017).

²⁷⁸ "ASAL: Agence Spatiale Algerienne." *Agence Spatiale Algerienne*. <http://www.asal.dz/> (December 17, 2017).

²⁷⁹ "Full text of white paper on China's space activities in 2016." 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

contract since it promised that the satellite would be launched quickly, but it seems unlikely that China would have been able to produce the satellite in just 2 years 4 months (based off other Chinese COMSAT sales timelines).²⁸⁰ The lack of media reporting regarding an Algerian satellite bid in 2013 suggests the process was closed to select bidders, which would be much like the Belintersat-1 satellite sale. If Algeria had an open bid, we would almost certainly have seen media reports of proposals being won or lost by various companies. Algeria awarded the contract to China as the two states were deepening bilateral cooperation, so it is likely the satellite contract factored into those conversations.

Algerian exports a total of \$29.9 billion worth of goods annually, of which only 1.1% of the goods is exported to China.²⁸¹ Algeria's largest export destinations are Italy (17%), Spain (13%), and the US (13%). Algeria relies heavily on petroleum products for revenue and petroleum, gas, and crude petroleum account for approximately 75% of Algerian exports.²⁸² Of China's \$332 million worth of imports from Algeria, approximately 97% of the imports are refined petroleum and petroleum gas. It is no surprise China's imports are predominantly petroleum products, but the total volume and net worth of Chinese imports from Algeria is relatively low. Algeria imports approximately \$7.5 billion worth of goods from China. The imports consist of machines, textiles, metals, and plastics and rubbers. China and Algeria agreed to increase trade cooperation in 2006 at the Forum on China-Africa Cooperation. Trade between

²⁸⁰ "Alcomsat-1 Network Resoluituon 609 Annex Commitment Letter." *NASASpaceflight.com / Forums*. <https://forum.nasaspaceflight.com/index.php?PHPSESSID=51vn52ep70malqpttpj7j8kna1&action=dlattach%3Btopic> (December 17, 2017).

²⁸¹ "Algeria." *Observatory of Economic Complexity - Algerias*. <https://atlas.media.mit.edu/en/profile/country/dza/> (December 17, 2017).

²⁸² *Ibid.*

the two has increased substantially from 2005, when bilateral trade was approximately \$1.8 billion.²⁸³

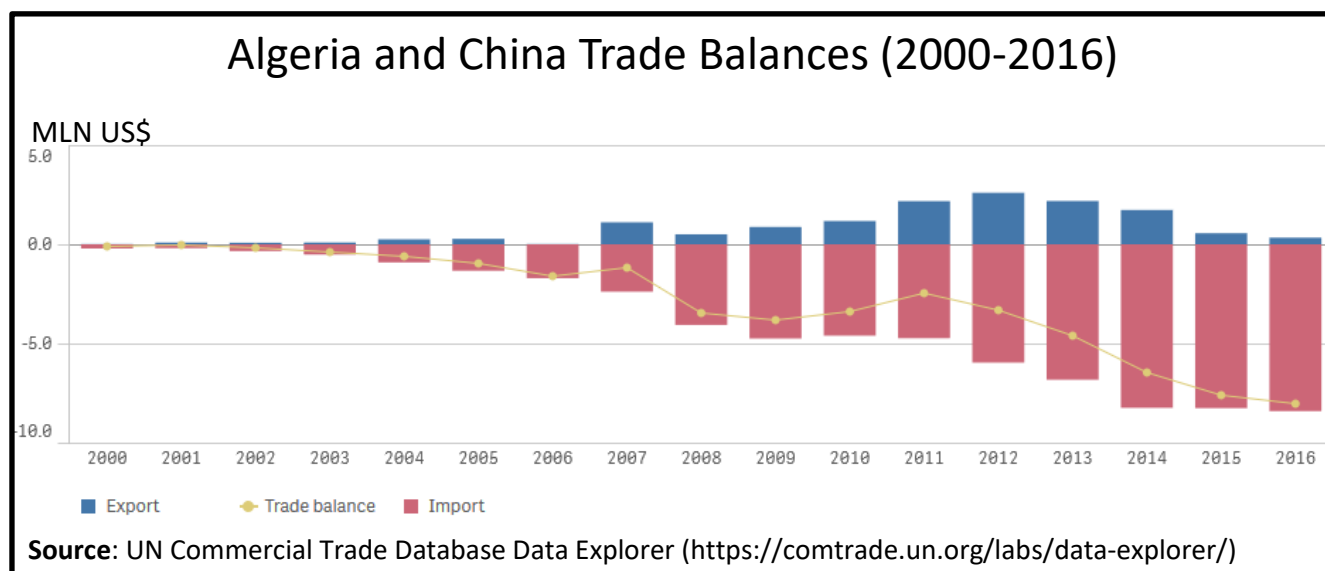


Figure 14. Algeria and China Trade Balances

The US is tied for the second largest destination for Algerian exports. In 2016, Algeria exported approximately \$3.4 billion to the US. The exports are predominantly refined and crude petroleum products. Refined and crude petroleum accounts for approximately 94% of all Algerian exports to the US.²⁸⁴ In 2016, Algeria imported approximately \$2.2 billion worth of goods from the US. The imports consisted of machines, vegetable products, and refined

²⁸³ “China, Algeria vow to expand trade cooperation.” 2006. *Forum on China Africa Cooperation*. <http://www.fmprc.gov.cn/zflt/eng/jmhzt403896.htm> (December 17, 2017).

²⁸⁴ “Products that the United States imports from Algeria (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/usa/dza/show/2016/ (December 17, 2017).

petroleum.²⁸⁵ The two states have signed trade agreements and the US endorses Algerian reforms that would support economic diversification and economic transparency.²⁸⁶

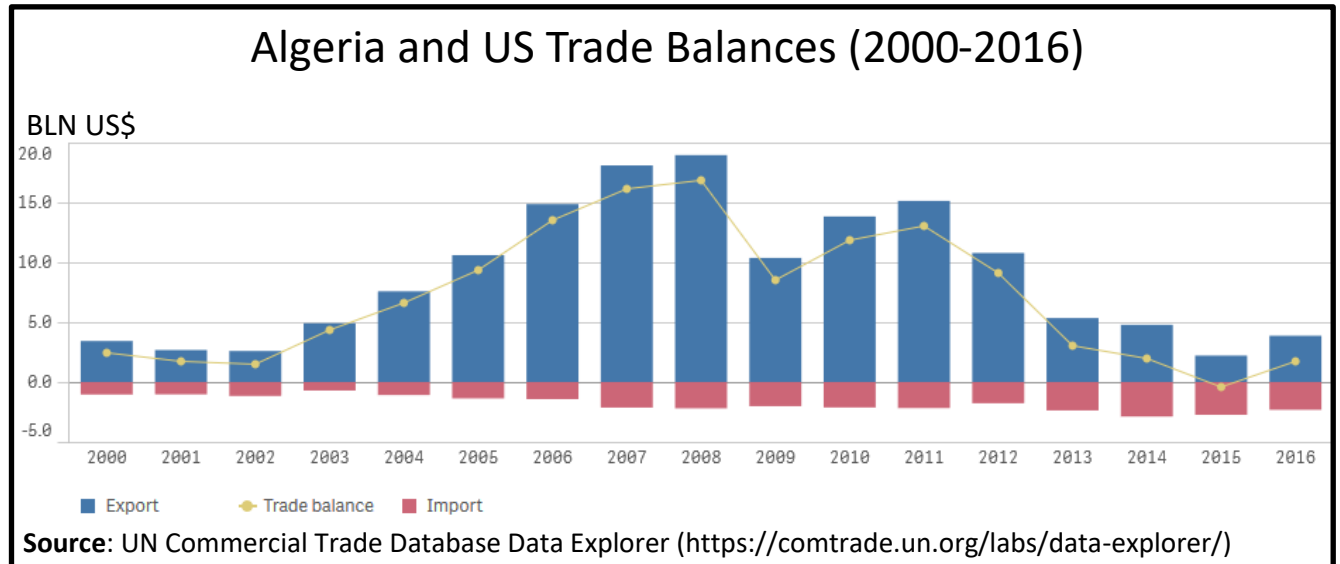


Figure 15. Algeria and US Trade Balances

The US does not have military troops stationed in Algeria, but the two states maintain cooperative military relations. Since 2008, the U.S. has spent about \$1 million a year to bring Algerian military officers to the United States for advanced military education.²⁸⁷ The US and Algeria established a regional intelligence-sharing center in 2010, but the organization has largely been described as a disappointment. A former US Africa Command general noted in 2013 that Algerian intelligence supports US efforts against terror groups in North Africa. He suggested that Algeria has access to intelligence sources that the US does not, which proves

²⁸⁵ “Products that the United States exports to Algeria (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/export/usa/dza/show/2016/ (December 17, 2017).

²⁸⁶ “U.S. Relations with Algeria.” 2017. *U.S. Department of State*. <https://www.state.gov/r/pa/ei/bgn/8005.htm> (December 17, 2017).

²⁸⁷ Lake, Eli. 2013. “Why Algeria Didn't Warn the U.S. About Its Hostage Raid.” *The Daily Beast*. <https://www.thedailybeast.com/why-algeria-didnt-warn-the-us-about-its-hostage-raid> (December 17, 2017).

critical to the success of counter-terrorism operations.²⁸⁸ In April 2017, US and Algerian representatives met in Washington, DC for the fourth annual bilateral dialogue on security and combatting terrorism.²⁸⁹ The US-Algerian military relationship is mostly built upon security and counter-terrorism.

China does not have a military presence in Algeria. China and Algeria have engaged in high-level exchanges between military officials and Algerian military officers have trained and studied in China.²⁹⁰ China has sold military equipment to Algeria and in May 2017 Algeria confirmed it was using Chinese 155 mm self-propelled howitzers. Algeria reportedly purchased the equipment in 2014 after signing the contract in 2013.²⁹¹ It appears China and Algeria have not engaged in bilateral military exercises. It is unknown when, and if, China and Algeria will perform bilateral military exercises.

Nicaragua

In November 2013, Nicaragua and China signed a contract for the in-orbit delivery of the Nicasat-1 COMSAT. China originally planned to launch the satellite in late 2016, but it has since been delayed to early 2019, likely due to regulatory and financial hurdles. The satellite contract is worth \$254 million; however media outlets have also reported the contract being worth

²⁸⁸ Whitlock, Craig. 2013. "Algerian stance spoils U.S. strategy for region." *The Washington Post*. https://www.washingtonpost.com/world/national-security/2013/01/18/7af23fbe-617c-11e2-89a2-2eabfad24542_story.html?utm_term=.5dcf07bde302 (December 17, 2017).

²⁸⁹ "Bilateral Dialogue Between the United States and Algeria on Security and the Fight Against Terrorism." 2017. *U.S. Department of State*. <https://www.state.gov/r/pa/prs/ps/2017/04/269525.htm> (December 17, 2017).

²⁹⁰ Zambelis, Chris. 2010. "China's Inroads into North Africa: An Assessment of Sino-Algerian Relations." *Jamestown*. <https://jamestown.org/program/chinas-inroads-into-north-africa-an-assessment-of-sino-algerian-relations/> (December 17, 2017).

²⁹¹ "Algeria displays new Chinese artillery." 2017. *DefenceWeb*. http://www.defenceweb.co.za/index.php?option=com_content&view=article&id=47996&catid=74&Itemid=30 (December 17, 2017).

approximately \$300 million or \$346 million.²⁹² It is unclear if Nicaragua still intends to purchase a COMSAT from China. Nicaragua has not released any details regarding the status of the satellite or given a status update on the program. Nicaragua, at the very least, had officially registered the satellite with the International Telecommunications Union in June 2016, and the license was granted in July 2016.²⁹³ Separately, there are reports that the Beijing based Xinwei Group obtained access to Nicasat-1's orbital slot and purchased the rights to the project. Nicasat-1 would be China's first satellite export to a Central American state; however, the sale seems unlikely given the recent transactions.

Nicaragua does not maintain formal relations with China, maintaining diplomatic relations instead with Taiwan. This has not deterred Chinese leaders, who have proposed several infrastructure and telecommunications projects in Nicaragua. The most high-profile projects are the proposed Nicaraguan Canal, Nicasat-1 project, and terrestrial telecommunications projects. The canal and telecommunications projects are reportedly the result of private investment from non-Chinese government affiliated organizations; however, analysts speculate that Wang Jing, CEO of in Beijing Xinwei, has approval from the Chinese government for the Nicaraguan projects.²⁹⁴ China has pledged at least \$250 billion to Latin American states, many of whom do

²⁹² "Nicaragua : HE XING: NICASAT-1 satellite slated for launch in 2016." 2012. *The Free Library*. [https://www.thefreelibrary.com/Nicaragua %3A HE XING%3A NICASAT-1 satellite slated for launch in 2016-a0302678731](https://www.thefreelibrary.com/Nicaragua+%3A+HE+XING%3A+NICASAT-1+satellite+slated+for+launch+in+2016-a0302678731) (December 17, 2017).

Calero, Mabel. 2017. "Satélite de Nicaragua Nicasat-1 ya tiene licencia internacional." *La Prensa*. <https://www.laprensa.com.ni/2017/11/02/nacionales/2324460-satelite-nicasat-1-ya-licencia-internacional> (December 17, 2017).

"Nicaragua to launch Nicasat-1 satellite in 2016." 2013. *Telecompaper*. <https://www.telecompaper.com/news/nicaragua-to-launch-nicasat-1-satellite-in-2016--948263> (December 17, 2017).

²⁹³ Op Cited., Calero.

²⁹⁴ Watts, Jonathan. 2015. "Land of opportunity – and fear – along route of Nicaragua's giant new canal." *The Guardian*. <https://www.theguardian.com/world/2015/jan/20/sp-nicaragua-canal-land-opportunity-fear-route> (December 17, 2017).

not recognize China and instead maintain formal relations with Taiwan.²⁹⁵ This is likely an attempt to create environments in Latin American states that are receptive to future Chinese investment and trade goods, with the ultimate goal of swaying political recognition to China.

Nicaragua does not appear to be moving closer to China's orbit and instead has recommitted itself to Taiwan. In January 2017, Nicaraguan President Daniel Ortega re-affirmed his country's public support for Taiwan saying "We're still engaged in this battle, which is a just battle, one of principles, so that the people of Taiwan continue to be incorporated in international organizations attached to the United Nations."²⁹⁶ Later, in September 2017, Nicaragua and Taiwan signed a defense cooperation agreement, which strengthened the bilateral relationship between the two.²⁹⁷ The relationship between Nicaragua and Taiwan has previously been rocky. Ortega broke relations with Taiwan in 1985 during Ortega's first term as Nicaraguan president. Relations were restored in 1990 after Ortega left office, and when Ortega was elected to president again, in 2006, he retained established relations. Ortega threatened to cease formal relations in 2007 as a means to gain financial support from Taiwan.²⁹⁸ As one of only 20 states that maintain formal relations with Taiwan (following Panama's surprise switch from formal

²⁹⁵ "UPDATE 2-China's Xi woos Latin America with \$250 bln investments." 2015. *Reuters*. <https://www.reuters.com/article/china-latam/update-2-chinas-xi-woos-latin-america-with-250-bln-investments-idUSL3N0UN1CP20150108> (December 17, 2017).

²⁹⁶ Graham, Dave. 2017. "Nicaragua pledges to fight for Taiwan recognition on global stage." *Reuters*. <https://www.reuters.com/article/us-taiwan-usa-nicaragua/nicaragua-pledges-to-fight-for-taiwan-recognition-on-global-stage-idUSKBN14V03Z?il=0> (December 17, 2017).

²⁹⁷ "Nicaragua, Taiwan sign defence agreement." 2017. *SBS News*. <https://www.sbs.com.au/news/nicaragua-taiwan-sign-defence-agreement> (December 17, 2017).

²⁹⁸ Chung, Lawrence. 2017. "Will Nicaragua be next to break ties with Taiwan?" *South China Morning Post*. <http://www.scmp.com/news/china/policies-politics/article/2060218/will-nicaragua-be-next-break-ties-taiwan> (December 17, 2017).

recognition of Taiwan to China in January 2017), Nicaraguan leaders contend that one of its most important financial partners is Taiwan.²⁹⁹

The original satellite sale between Nicaragua and China was signed in 2013 and was reportedly worth \$254 million.³⁰⁰ Few details exist about the contract bidding process. It is unknown what drove Nicaragua to select China as its satellite contractor, but Nicaragua likely sold the rights to the satellite project to Luxembourg Space-Flight Communications Corporation (LST). It is unknown when the satellite project rights were officially sold to LST but, according to CGWIC's website, CGWIC and LST signed a contract for the in-orbit delivery of the LSTSAT-1 COMSAT in November 2016.³⁰¹ LST is wholly-owned subsidiary of Beijing Xinwei Technology Group.³⁰² Beijing Xinwei attempted to acquire Spacecom's assets in 2016, but a subsequent launch failure of the Amos-6 COMSAT stalled the sale.³⁰³ Beijing Xinwei had intended to integrate its newly acquired Spacecom assets into LST. Since the Spacecom sale fell through, Beijing Xinwei may have targeted Nicaragua's Nicasat-1 satellite project since Beijing Xinwei already had significant investment in Nicaragua's canal project and had received rights to various telecommunication projects in Nicaragua. In May 2016, Chinese media reported that

²⁹⁹ Moreno, Elida. 2017. "Panama Forges Diplomatic Ties With China, Ditches Taiwan." *Time*. <http://time.com/4815921/panama-china-taiwan-beijing-diplomacy/> (December 17, 2017).

"Nicaragua, Taiwan sign defence agreement." 2017. *SBS News*. <https://www.sbs.com.au/news/nicaragua-taiwan-sign-defence-agreement> (December 17, 2017).

³⁰⁰ "Nicaragua : HE XING: NICASAT-1 satellite slated for launch in 2016." 2012. *The Free Library*. <https://www.thefreelibrary.com/Nicaragua+%3A+HE+XING%3A+NICASAT-1+satellite+slated+for+launch+in+2016-a0302678731> (December 17, 2017).

³⁰¹ "International Cooperation in Commercial Space Recital New Songs Boost Construction of Aerospace Power." 2016. *China Great Wall Industry Corporation*. <http://cn.cgwic.com/news/2016/1101.html> (December 17, 2017).

³⁰² De Selding, Peter. 2016. "Chinese group to buy Israel's Spacecom satellite operator for \$285 million." *SpaceNews.com*. <http://spacenews.com/chinese-group-to-buy-israels-spacecom-satellite-operator-for-285-million/> (December 17, 2017).

³⁰³ "Beijing Xinwei, Spacecom acquisition talks remain frozen." 2017. *Reuters*. <https://www.reuters.com/article/space-com-xinwei-group/beijing-xinwei-spacecom-acquisition-talks-remain-frozen-idUSL8N1HZ2LT> (December 17, 2017).

LST obtained the rights to Nicasat-1's orbital position.³⁰⁴ Separately, according to International Telecommunication Union documents, Nicaragua registered for its orbital slot in June 2016.³⁰⁵ Beijing Xinwei, through LST, likely obtained the rights to the Nicasat-1 COMSAT project and intends to position the satellite, now known as LSTSAT-1, in Nicasat-1's orbital position.³⁰⁶ This would position LST, and Beijing Xinwei, to provide SATCOM services to Nicaragua and the Americas. Beijing Xinwei could then use its satellite to support its wide variety of telecom services projects in Nicaragua, since Beijing Xinwei recently won six telecom licenses in Nicaragua. This puts Wang Jing in a unique situation. His companies own the rights to the Nicaraguan canal, the rights to the LSTSAT-1 COMSAT, and Xinwei's telecom licenses in Nicaragua.³⁰⁷ While he suggests he is a private citizen, the amount of investment in Nicaragua seems to indicate that he is not acting solely on his own.³⁰⁸ Lastly, according to ChinaSpaceFlight, LSTSAT-1 may have adopted the DFH-5 satellite bus, which would allow for a larger payload and possible secondary payloads to be positioned over the Americas.³⁰⁹

Nicaragua is the poorest state in Central America and has widespread underemployment and poverty.³¹⁰ Its primary exports are textiles, insulated wire, and coffee. In 2016, Nicaragua's total exports were worth \$5.12 billion and only 0.66% of Nicaraguan goods went exported to

³⁰⁴ "Xinwei Group will increase by 2.2 billion "made satellite"." 2016. *CN Stock*. http://company.cnstock.com/company/scp_dsy/tcsy_rdgs/201605/3793009.htm (December 17, 2017).

³⁰⁵ Op Cited., Calero

³⁰⁶ "Nicaragua Satellite Communications 1 (LSTSAT-1): launched in April 2019." 2016. *China Space Flight*. <https://www.chinaspaceflight.com/satellite/tongxin/Nicasat-1/Nicasat-1.html> (December 17, 2017).

³⁰⁷ Ammachchi, Narayan. 2015. "Xinwei's Entry Likely to Shake Up Nicaragua's Telecoms Market." *Nearshore Americas*. <http://www.nearshoreamericas.com/xinweis-entry-shake-nicaraguas-telecom-market/> (December 17, 2017).

³⁰⁸ Qing, Koh Gui. 2013. "Chinese businessman behind \$40 billion Nicaragua canal denies special." *Reuters*. <https://www.reuters.com/article/us-china-nicaragua-canal/chinese-businessman-behind-40-billion-nicaragua-canal-denies-special-ties-idUSBRE95O0PA20130625> (December 17, 2017).

³⁰⁹ ChinaSpaceflight. 2016. "[Nicaragua No.1] The LSTSAT-1 communications satellite purchased by Xinwei adopts the Dongfanghong-5 platform and was launched in 2019." *Twitter*. <https://twitter.com/cnspacelflight/status/794043407731552258> (December 17, 2017).

³¹⁰ "The World Factbook: NICARAGUA." 2017. *Central Intelligence Agency*. <https://www.cia.gov/library/publications/the-world-factbook/geos/nu.html> (December 17, 2017).

China. China’s Nicaraguan imports totaled just \$17.9 million.³¹¹ China primarily imported wood products, ground nut oil and scrap copper. In 2016, China exported \$624 million worth of goods to Nicaragua. China’s exports to Nicaragua were primarily textile products, machines, and metals.³¹²

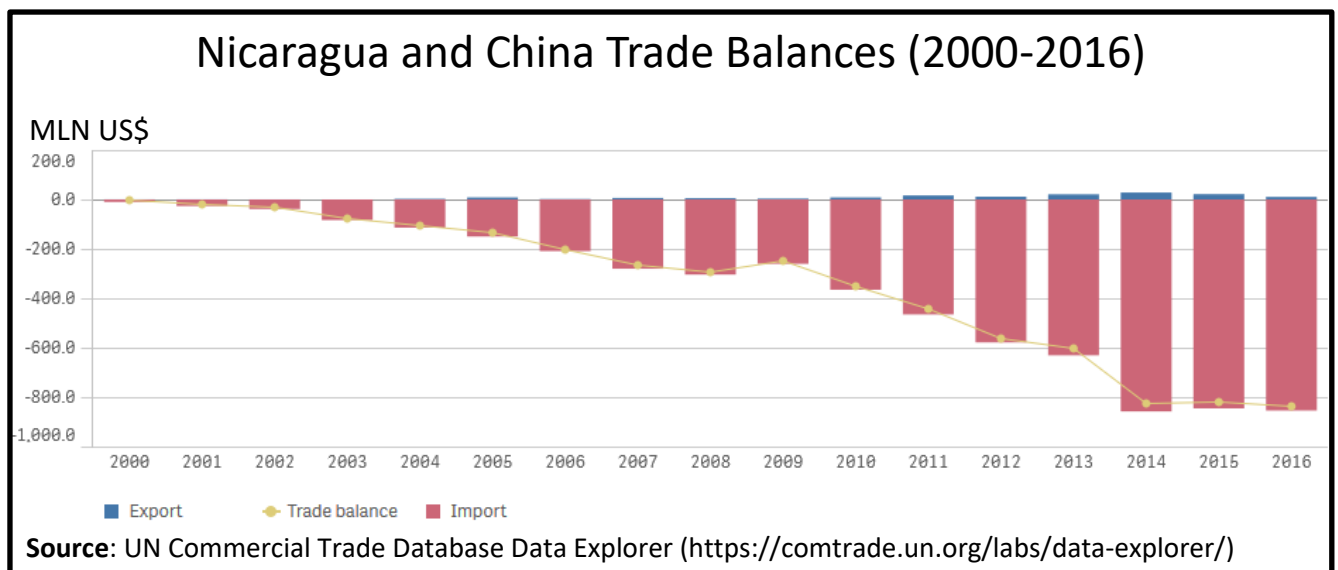


Figure 16. Nicaragua and China Trade Balances

The US is one of Nicaragua’s most important trading partners. In 2016, the US accounted for 55% of all Nicaraguan exports and 17% of Nicaraguan imports. The US exported \$1.5 billion worth of goods to Nicaragua. The exports consisted of machines, textiles, and mineral products, and imported approximately \$3.4 billion.³¹³ Similar to Nicaragua’s exports to China, its exports to the US were primarily textiles, insulated wire, gold, and coffee.³¹⁴ US trade with Nicaragua

³¹¹ “Products that China imports from Nicaragua (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/chn/nic/show/2016/ (December 17, 2017).

³¹² “Products that China exports to Nicaragua (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/export/chn/nic/show/2016/ (December 17, 2017).

³¹³ “Products that the United States exports to Nicaragua (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/export/usa/nic/show/2016/ (December 17, 2017).

³¹⁴ “Products that the United States imports from Nicaragua (2016).” *The Observatory of Economic Complexity*. https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/usa/nic/show/2016/ (December 17, 2017).

supports an estimated 9,000 jobs (as of 2015). Nicaragua and the US are both party to the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR).³¹⁵ The agreement strengthens cooperation between the nations and promotes regional economic integration.³¹⁶

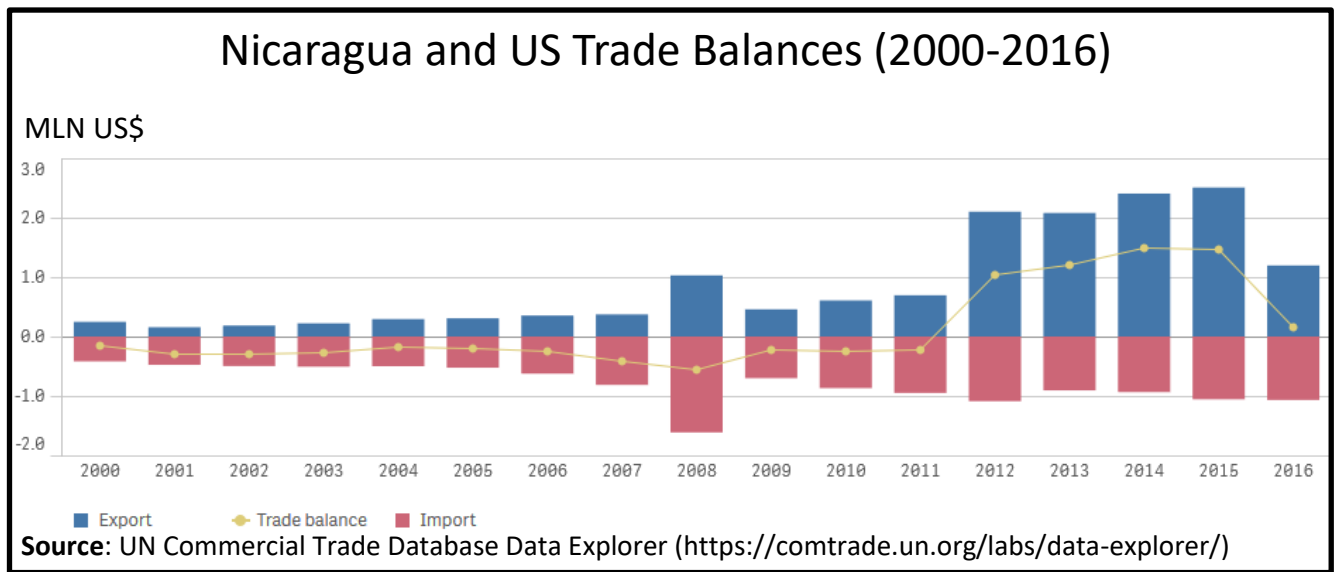


Figure 17. Nicaragua and US Trade Balances

Neither China nor the US maintains robust military relationships with Nicaragua. In fact, Ortega recently signed a defense agreement with Taiwan in September 2017.³¹⁷ Nicaragua’s President harbors vocal anti-US sentiment. Resentment of US foreign policies has led to public rebukes of US actions.³¹⁸ As a result of the Anti-US feelings atop the Nicaraguan government

³¹⁵ “Nicaragua.” *United States Trade Representative*. <https://ustr.gov/countries-regions/americas/nicaragua> (December 17, 2017).

³¹⁶ “CAFTA-DR (Dominican Republic-Central America FTA).” *Office of the U.S. Trade Representative*. <https://ustr.gov/trade-agreements/free-trade-agreements/cafta-dr-dominican-republic-central-america-fta> (December 17, 2017).

³¹⁷ “Nicaragua, Taiwan sign defence agreement.” 2017. *SBS News*. <https://www.sbs.com.au/news/nicaragua-taiwan-sign-defence-agreement> (December 17, 2017).

³¹⁸ Rogers, Tim. 2008. “Ortega leads anti-U.S. critique at Latin American food summit.” *The Christian Science Monitor*. <https://www.csmonitor.com/World/Americas/2008/0509/p04s02-woam.html> (December 17, 2017).

and the complicated history between the US and Nicaragua (read CIA operations in Nicaragua in the 1980s), Nicaragua and the US do not engage in military exercises. Nicaragua previously sent military troops to train in the US, but in 2012 President Ortega withdrew Nicaraguan participation from the school.³¹⁹

Few data points exist for Nicaraguan favorability ratings on the US or China. The most recent favorability data from 2014 suggests both China and the US enjoy relatively high support from Nicaraguans. 71% of Nicaraguans had favorable views of the US while 58% of Nicaraguans had favorable views of China.³²⁰ It is unknown if Chinese ventures in Nicaragua have changed the public's perception of China for the positive or negative. There have been many critics of China's canal plans in Nicaragua. Critics suggest the canal is an environmental risk and will supplant thousands of Nicaraguans. Supporters of the Canal, and other Chinese investment, welcome the foreign contribution and look forward to the long-term economic boost a canal would provide.³²¹ It is unknown if Nicaraguan opinions towards the US have changed for the positive or negative. Nicaraguan political leaders harbor anti-US sentiment, so that may have trickled down to the general population, but that is very unlikely since Ortega has preached anti-US sentiments for years now and Nicaraguan opinions of the US still remain high.

Ríos, Julia. 2015. "Nicaragua's avowed anti-US leader Ortega eyes new mandate." *The Tico Times*. <http://www.ticotimes.net/2015/12/05/nicaraguas-avowed-anti-us-leader-ortega-eyes-new-mandate> (December 17, 2017).

³¹⁹ "Nicaragua Ends U.S. Military Training." 2012. *America | the Jesuit Review*.

<https://www.americamagazine.org/issue/5152/signs/nicaragua-ends-us-military-training> (December 17, 2017).

³²⁰ Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*.

<http://www.pewglobal.org/database/indicator/24/country/158/> (December 17, 2017).

Heimlich, Russell. 2010. "Global Indicators Database." *Pew Research Center's Global Attitudes Project*.

<http://www.pewglobal.org/database/indicator/1/country/158/> (December 17, 2017).

³²¹ Ghitis, Frida. 2014. "Would huge Nicaragua canal be win for China?" *CNN*.

<http://www.cnn.com/2014/11/24/opinion/ghitis-nicaragua-canal-project/index.html> (December 17, 2017).

Chapter 4: Analysis

Analysis of the relationships between China and the purchasing states reveal telling insights. It appears China is motivated by a number of factors that determines which states they aggressively pursue as COMSAT customers. The satellite sales also likely serve immediate and future political goals, including supporting China's Belt and Road initiative, gaining international support for the One-China policy, and proliferating Chinese satellite technology throughout the globe.

China's meteoric economic rise in the 1990s and 2000s likely created a demand signal within the Chinese government for external political control and access to foreign markets. In each case examined, China's imports to the purchasing state have increased and cooperation between the seller and recipient state actors has grown. In almost all cases, the purchasing state supported China's anti-secession policies or its One-China policy. The major exception was Nicaragua, who recently reaffirmed its support to Taiwan in 2017. Coincidentally, analysis of the Nicaragua satellite sale in 2018 suggests the rights to the satellite may have been sold to a Chinese business and Nicaraguan ownership of the project is now in question. In each case China Great Wall Industry Corporation (CGWIC) brokers the deals between China and the purchasing state. CGWIC's objectives are political and profits are secondary, which supports the notion that purchasing states are targeted for political purposes and the satellite sales are likely politically motivated and not driven by China's demands for natural resources – or at least crude oil.

Some posit that Chinese foreign sales, including satellites, can be explained mostly by the economic imperative or the drive for resources. My data challenge this. For instance, analysis of the Laosat-1 COMSAT sale suggests China will not have meaningful returns on its investment.

Also, China exports far more than it imports from almost all of its satellite sale customers. For instance, Belarus exports \$401 million worth of goods to China while importing \$1.09 billion worth of Chinese goods.³²² Nigeria, often considered a leading African exporter of oil to China, is dwarfed by Angola's total oil output to China.³²³ Furthermore, China established its Strategic Petroleum Reserve in 2007, well after China signed its first satellite contract with Nigeria.³²⁴ If China were primarily driven by its motivation to acquire sustainable access to natural resources to fuel its growing economy, then it is reasonable to expect China to have initiated its Strategic Petroleum Reserve project about the same time it signed its Nigcomsat-1 satellite contract, not four years after. In other cases, China demonstrated that satellite deals are ideally announced in conjunction with other flagship projects (e.g. Nicaragua Canal and Great Stone Industrial Park). Yet, this was not the case with Nigeria. Nigeria has been the recipient of numerous Chinese investments, but Nigeria lacks a flagship project that was announced in conjunction with Nigcomsat-1 contract. Additionally, Angola is China's largest African supplier of petroleum products. Angola is a developing state, rich with natural resources, and a low GDP per capita. These attributes suggest the state is ripe to select China to provide a satellite solution; however, Angola selected a Russian satellite manufacturer to design, assemble, and launch its satellite. It is unknown if China lost the Angola satellite bid or if it bid at all. If China were purely motivated to sell satellites to guarantee access to natural resources, then it can reasonably be assumed that China would have aggressively pursued and won the contract to provide Angola with a Chinese

³²² "Belarus." *OEC - Belarus (BLR) Exports, Imports, and Trade Partners*.
<https://atlas.media.mit.edu/en/profile/country/blr/> (January 10, 2018).

³²³ Radford, Joseph. 2017. "China crude oil import data show winners and losers from rebalancing." *Reuters*.
<https://www.reuters.com/article/us-column-russell-crude-china/china-crude-oil-import-data-show-winners-and-losers-from-rebalancing-russell-idUSKCN1C70LW> (January 10, 2018).

³²⁴ Upadhyay, Rakesh. 2017. "Here are the countries hoarding the most oil in case of an emergency." *Business Insider*. <http://markets.businessinsider.com/commodities/news/biggest-strategic-petroleum-reserves-countries-2017-3-1001887852> (January 10, 2018).

satellite solution that could not have been beaten by a foreign competitor, given China's reliance on Angola for oil and petroleum products.

China has the ability to produce at least 10 communication satellites (COMSATs) a year for domestic and foreign customers.³²⁵ The demands for satellites have primarily been domestic Chinese customers, and by 2020 Chinese scientists predict that China will have supplied at least 10% of the world's satellites.³²⁶ If China wants to reach its goal, then foreign customers are required. China's internal demand for satellite based telecommunication services will likely level out and the demand will be satisfied (as China deploys larger satellite platforms, SATCOM needs can be met with a fewer number of satellites), which will force China to pursue additional foreign customers in the coming years if China intends on reaching its 10% market share projection. This is consistent with lateral pressure theory. As China satisfies its own domestic demands for satellites and COMSATs, China will likely look for additional external customers. In the future, China will almost certainly market its satellite solutions and contracts to established commercial operators, like it recently has with Thailand's Thaicom or Indonesia's Pasifik Satelit Nusantara (PSN) in 2016 and 2017.³²⁷ China likely wants to compete with Western satellite manufacturers now, but it lacks the sustained track record of success across decades, thus China largely considers developing states as potential customers. An expanded client pool would provide China with additional political options, as China could pressure commercial satellite communication (SATCOM) operators to take official positions that favor

³²⁵ Henry, Caleb. 2017. "Back-to-Back commercial satellite wins leave China Great Wall hungry for more." *SpaceNews.com*. <http://spacenews.com/back-to-back-commercial-satellite-wins-leave-china-great-wall-hungry-for-more/> (January 10, 2018).

³²⁶ Jones, Andrew. 2016. "China to handle 10 percent of global satellite market." *GBTIMES*. <https://gbtimes.com/china-expects-10-percent-global-satellite-market-share-2020> (January 10, 2018).

³²⁷ Henry, Caleb. 2017. "Back-to-Back commercial satellite wins leave China Great Wall hungry for more." *SpaceNews.com*. <http://spacenews.com/back-to-back-commercial-satellite-wins-leave-china-great-wall-hungry-for-more/> (January 10, 2018).

China's official stances or deny SATCOM services to particular customers, namely those who oppose specific Chinese actions or influence.

Chinese satellite sales blend elements of hard and soft power. Soft power, the power of attraction, is fueled by elements of China's hard power. Not surprisingly, China's satellite industry is bankrolled and directed by the Chinese government. The tangible economic elements and military utility provided by COMSATs demonstrate China's hard power. The satellites supplied to the foreign customers, as discussed in this thesis, demonstrate how hard power can be used to achieve soft power gains. Foreign engineers are trained by Chinese engineers. China constructs satellite ground stations in foreign states to operate the purchased satellite. China transfers full control of satellites to its customers, per the contracts. The foreign state then uses its satellite to supposedly lift its citizens out of poverty or improve their lives. It is easy to see the positive effects a COMSAT can have on a state, when tele-medicine and tele-learning can connect rural villages to urban population centers. The hard power stimulates an increase in support from China's partners, as they see its new satellite benefiting all. Satellite sales represent China using its hard power tools to purchase influence with each foreign partner. China also achieves soft power gains, as China appears more attractive following the launch of the purchased satellite. The purchased satellites become a source of pride and prestige and they can thank China. Beijing leaders, through soft power with Chinese characteristics, use hard power tools to achieve soft power gains in the purchasing states, as demonstrated by official support for China's policies and positive public favorability ratings.

Another likely motivation for China is the strategic imperative: they sell satellites strategically as a means to gain access to specific orbital positions they would not otherwise have access to. For instance, Laosat-1 is located directly over Southeast Asia, which is a congested

area in geosynchronous Earth orbit (GEO). There are a finite amount of orbital slots, with each state having the ability to claim certain slots for a COMSAT. China, in the instance of Laosat-1, owns the rights to 50% of the satellite and the satellite occupies a Lao orbital slot.³²⁸ For Laos, they receive a COMSAT on its 40th anniversary of the Lao People’s Democratic Republic.³²⁹ For China, they receive access to an orbital slot over Southeast Asia and rights to a satellite that covers a significant portion of China’s Belt and Road designated states (Chinese media acknowledged Laosat-1’s role in China’s Belt and Road initiative).³³⁰ It should be noted that the Laosat-1 sale is the only use to date of China owning a portion of the satellite that operates in another state’s orbital slot.³³¹ Belintersat-1 is co-branded as Chinasat-15, but the satellite occupies a Chinese orbital slot.³³² Eventually, Nicaragua is likely to have a Chinese owned satellite in its orbital slot, but it remains to be seen.

China’s foreign COMSAT sales serve an additional purpose: the proliferation of Chinese SATCOM technology can be leveraged for use by the People’s Liberation Army (PLA). If China’s goal is to become a global actor and expand beyond its current regional role, then China will need to utilize COMSATs positioned around the globe for its communication needs, much like the US has done for several decades. It is reasonable to expect China to prefer its own technology, a satellite it built, as its telecommunication provider when its military troops are

³²⁸ “Space Services Department (SSD) - SNL Part B - Query result.” *International Telecommunications Union*. https://www.itu.int/net/ITU-R/space/snl/bresult/radavance.asp?sat_type=C&sat_name=LAOSAT-128.5E&sel_satname=LAOSAT-128.5E&plan_id= (January 10, 2018).

³²⁹ Jones, Andrew. 2015 “China launches first satellite for Laos on Long March 3B.” *GBTIMES*. <http://gbtimes.com/china/laosat-1-china-launches-first-satellite-laos-long-march-3b> (October 5, 2017).

³³⁰ “LaoSat-1 telecommunications satellite delivered in orbit.” 2012. *China Go Abroad*. <http://www.chinagoabroad.com/en/article/laosat-1-telecommunications-satellite-delivered-in-orbit> (January 10, 2018).

³³¹ “Space Services Department (SSD) - SNL Part B - Query by publication references.” *International Telecommunications Union*. <https://www.itu.int/net/ITU-R/space/snl/bsearchb/spublication.asp> (January 10, 2018).

³³² “Space Services Department (SSD) - SNL Part B - Query result.” *International Telecommunications Union*. https://www.itu.int/net/ITU-R/space/snl/bresult/radavance.asp?sat_type=N&sat_name=CHINASAT-ROUTE1&sel_satname=CHINASAT-ROUTE1&plan_id= (January 10, 2018).

deployed. In 2012, the US Africa Command signed a deal to lease satellite bandwidth from a Chinese satellite.³³³ This was met with criticism from US lawmakers, as they deemed it a security threat and worked to prevent future US use of Chinese COMSATs.³³⁴ It is expected that China would respond similarly if required to use a US company-owned COMSAT and would likely defer to a Chinese built satellite system. As China continues to sell COMSATs to foreign customers, those satellites will likely be prime candidates to lease bandwidth to the PLA if the PLA is operating beyond the coverage area of China's state-owned military or commercial COMSATs.

Overall, China's COMSAT sales are occurring in a time of broader space involvement with foreign actors. China's 2016 space white paper suggested China would continue to leverage its space program abroad and would entertain deeper space-involvement with foreign states. The document states that "a global satellite communications and broadcasting system integrated with the ground communications network will be established step by step."³³⁵ As China continues to sell satellite to foreign states, it is possible they continue to share ownership of the satellites with its customers. This would likely be an easier path for China to reach its stated objective of a global SATCOM network. Satellite navigation (SATNAV), SATCOM, and remote-sensing satellites would be a cornerstone in China's space-based Belt and Road, providing users with Chinese satellite technology and supporting China's larger Belt and Road initiative. China's current space involvement extends beyond Belt and Road specific states though, as China cooperates with African, European, and American states on a variety of space related issues. For

³³³ Ferster, Warren. 2013. "Pentagon Renews Controversial Satellite Lease Arrangement." 2013. *SpaceNews.com*. <http://spacenews.com/35363pentagon-renews-controversial-satellite-lease-arrangement/> (January 10, 2018).

³³⁴ Shachtman, Noah. 2017. "House Panel Shoves Pentagon-China Satellite Deal Out of the Airlock." *Wired*. <https://www.wired.com/2013/05/pentagon-china-satellite/> (January 10, 2018).

³³⁵ "White paper on China's space activities published." 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (January 10, 2018).

instance, in December 2017 China's Foreign Minister met with his Venezuelan counterpart in Beijing and suggested the two state's space cooperation is within the framework of China's Belt and Road initiative.³³⁶ While COMSAT sales are unique and important, other Chinese space ventures are occurring elsewhere, so proper context is required to adequately portray the COMSAT sales. China is rapidly becoming a global space power, and COMSAT sales are just a piece of the larger puzzle.

Lastly, China may be extending its hand to key states and offering telecommunication and infrastructure projects as a means to deliberately force reliance and debt repayment in the future, which China can then turn into favorable leases of land or basing rights. In December 2017, Sri Lanka handed over its Hambantota Port to China on a 99-year lease in exchange for \$1.1 billion of debt relief.³³⁷ The port is reportedly to be used only for commercial purposes only and China will not use the port for military activities, but it is hard to believe that will be the case for the duration of 99 year lease.³³⁸ China completed several robust infrastructure projects in Sri Lanka and the projects have not yielded economic returns for Sri Lanka or China, but as Sri Lanka continues to fall behind in payments, China may ask for additional provisions, such as military basing rights.³³⁹ China opened its first overseas military base in Djibouti in August 2017 and is probably going to look for other basing option along its Maritime Silk Road and Polar Silk

³³⁶ "China hopes to expand cooperation with Venezuela: FM." 2017. *Xinhua*.

http://www.xinhuanet.com/english/2017-12/22/c_136846016.htm (January 10, 2018).

³³⁷ Schultz, Kai. 2017. "Sri Lanka, Struggling With Debt, Hands a Major Port to China." *The New York Times*.

<https://www.nytimes.com/2017/12/12/world/asia/sri-lanka-china-port.html> (January 10, 2018).

³³⁸ "Sri Lanka formally hands over Hambantota port on 99-Year lease to China." 2017. *The Hindu*.

<http://www.thehindu.com/news/international/sri-lanka-formally-hands-over-hambantota-port-on-99-year-lease-to-china/article21380382.ece> (January 10, 2018).

³³⁹ Larmer, Brook. 2017. "What the World's Emptiest International Airport Says About China's Influence." *The New York Times*. <https://www.nytimes.com/2017/09/13/magazine/what-the-worlds-emptiest-international-airport-says-about-chinas-influence.html> (January 10, 2018).

Road.³⁴⁰ Pakistan, who also received significant Chinese funding for infrastructure projects, is also reportedly considering allowing China to construct multiple ports, one of which will reportedly have a military mission (these reports have been denied by the Chinese government).³⁴¹ China's satellite sales may play a role in China's scheme to acquire basing rights abroad, as the COMSAT deals are worth upwards of \$300 to \$400 million a contract. Should a purchasing state default on its payments (as they are all are developing states with poor economies), China may leverage the satellite sale debt for access or control of key ports, or even partial or complete control of the satellite.

³⁴⁰ Blanchard, Ben. 2017. "China formally opens first overseas military base in Djibouti." *Reuters*. <https://www.reuters.com/article/us-china-djibouti/china-formally-opens-first-overseas-military-base-in-djibouti-idUSKBN1AH3E3> (January 10, 2018).

³⁴¹ Gertz, Bill. 2018. "China building military base in Pakistan." *The Washington Times*. <https://www.washingtontimes.com/news/2018/jan/3/china-plans-pakistan-military-base-at-jiwani/> (January 10, 2018).

Khan, Wahajat S. 2017. "China May Soon Establish Naval Base in U.S. Ally Pakistan." *NBCNews.com*. <https://www.nbcnews.com/news/china/china-may-soon-establish-naval-base-u-s-ally-pakistan-n770991> (January 10, 2018).

Aamir, Adnan. 2017. "How a Sri Lankan port is sparking Chinese takeover fears in Pakistan." *South China Morning Post*. <http://www.scmp.com/comment/insight-opinion/article/2125783/will-gwadar-go-way-hambantota-why-chinese-loans-pakistan-are> (January 10, 2018).

Chapter 5: Conclusions

The focus of this thesis was to determine why China sold communications satellite (COMSATs) to particular states. My original hypothesis suggested that China likely considers several variables when determining whether it will sell a satellite to a purchasing state. I proposed a number of variables, such as government type, natural resources, a state's geographic location, length of formal relations with the PRC, public favorability ratings of the US and China, and economic rank, to establish the nature of the relationship between the purchasing state and China. I conducted miniature case studies for the states that had successfully purchased a COMSAT to determine trends or similarities between the purchasing states.

China's foreign policy is, in large part, driven by its pursuit of becoming a global power with sustained economic growth and domestic stability.³⁴² As China's power relative to others in the international system grows, China is afforded additional foreign policy options it previously did not have. A significant part of its increased power is an aerospace industry capable of exporting COMSATs to international customers. China's aerospace industry and its space program date back to the 1950s and one of its most significant milestones was its first ever satellite in 1970. Early on, China recognized the importance of its space program and how it could be used as a political tool. Mao used China's space program as a social stimulant and a tool for inspiration following China's Great Leap Forward and the resulting famines from 1959 to 1961.³⁴³ China's first satellite, the DongFangHong-1, was derived from a Maoist saying that suggested the strengths of socialism were greater than the strengths of Western imperialism. The space program offered a source of pride for China and helped legitimize China's ruling elite.

³⁴² Sutter, R. op. cit., pg. 27

³⁴³ Handberg, R. op. cit., pg 66.

To this day, China still uses its space program for political purposes. Space programs are useful for all states, but authoritarian regimes are more likely to use the space program for domestic gains.³⁴⁴ Unsurprisingly, China's space program drives international cooperation, garners attention from the world's leading scientists, and is a source for national pride.³⁴⁵ As of January 2018, China is increasingly seen as space science leader within the international community and China's 2016 Space White Paper specifically mentions using its space program for international exchanges and cooperation, which will likely grant China more influence in international affairs.

It is mankind's unremitting pursuit to peacefully explore and utilize outer space. Standing at a new historical starting line, China is determined to quicken the pace of developing its space industry, and actively carry out international space exchanges and cooperation, so that achievements in space activities will serve and improve the well-being of mankind in a wider scope, at a deeper level and with higher standards. China will promote the lofty cause of peace and development together with other countries.³⁴⁶

Publically, China intends on developing its space program and using it to help lift and elevate other states, similar to how China advertises its unprecedented economic growth. As China grows, the world grows; however, this model is likely self-serving, as China gains influence in multiple space-related forums and is granted increased options.

Variables

Initially, I had not identified a single variable that I anticipated to be a more contributing factor to satellite sales than others and I only posited that China was likely using satellite sales to

³⁴⁴ Handberg, R. op. cit., pg. 66.

³⁴⁵ Qiu, Jane. 2017. "China Ramping Up Quest to Become a Space Science Superpower" *Scientific American*. <https://www.scientificamerican.com/article/china-ramping-up-quest-to-become-a-space-science-superpower/> (February 7, 2018)

³⁴⁶ "Full text of white paper on China's space activities in 2016." 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

purchase influence in foreign states. After analyzing cases in which China successfully exported COMSATs (specifically Nigcomsat-1/-1R, Venesat-1, Paksat-1R, TKSAT-1, Laosat-1, Belintersat-1), the strongest evidence suggests China is most concerned about political support and recognition for anti-secession and one-China policies and securing markets for Chinese goods. At varying points in each case, the purchasing state offered public support for one-China or anti-secession laws that favored China. For example, the Venesat-1 satellite deal was signed between China and Venezuela in 2004 and then in 2005 Venezuela offered support for China's anti-secession laws. And when Nicaragua wouldn't bend to Beijing's demands of recognition and reaffirmed support for Taiwan, the contract was likely then sold/awarded to a Chinese company.

While China likely leverages the satellite sales for increased influence in the region, this objective is secondary to political support. China's influence, through its satellite sales, manifests itself as both hard and soft power, granting Beijing's leaders multiple tools and levers of power to help them reach their objectives of global power. It is considered hard power, since China's aerospace technology is being proliferated, much like any other weapon system that is bought or sold. COMSATs are a tangible asset with a monetary worth that can be measured. But the sales can also be considered a tool within Beijing's soft power arsenal, since COMSATs can be used to provide areas of scientific cooperation and they offer public services that elevate and improve the lives of citizens.

China's satellites are likely not sold with the intention of having great economic returns. China is almost certainly not selling satellites with the intention of generating significant sources of income; otherwise, China would not primarily be selling satellites to developing states. Developing states have pressing needs in multiple sectors and often have scarce resources. In

some instances, China's foreign COMSATs were not delivered on time due to financing problems, as was the case with LAOSAT-1. If China were primarily motivated by financial gains, then we would almost certainly see China primarily signing satellite contracts with economically stable states that have the capacity to provide payments on time. Laos failed to provide payments on time to China and it is assumed other states, who maintain access to similar financial resources, would likely not be able to reliably generate the funds needed for continued payments.

China uses its excess aerospace industry capacity to manufacture COMSATs for its customers. The sales support the Chinese space industry and give China influence in the purchasing state. As described in Chapter 4, China Academy of Space Technology (CAST) is able to produce up to 10 COMSATs per year with its current facilities.³⁴⁷ China, likely not having a need for 10 new COMSATs each year, but still desiring high levels of production, exports its satellites to international customers and gains access to foreign markets elsewhere.

My analysis suggests China's leaders likely factor a state's economic development status, its geographic location, and its proximity to US forces (to some degree) into its calculus when exporting a COMSAT. The purchasing states have developing economies and China has positioned itself as the champion of the developing world since the Bandung Conference in 1955.³⁴⁸ China continues to lead developing states by providing friendly loans and all-in-one COMSAT solutions. In Chapter 1, I outlined China's future ambitions and its desire to be a global power, and in Chapter 2, I posited that China, weary of encirclement, would attempt to counter US military power abroad by using satellite sales to gain footholds or military basing

³⁴⁷ Henry, Caleb. 2017. "Back-to-Back commercial satellite wins leave China Great Wall hungry for more." *SpaceNews.com*. <http://spacenews.com/back-to-back-commercial-satellite-wins-leave-china-great-wall-hungry-for-more/> (January 10, 2018).

³⁴⁸ Kurlantzick, J. op. cit., pg. 13.

rights in foreign states. More detailed analysis suggests that this is incorrect. While the opportunity exists for China to use the satellite sales as a gateway to basing rights, China has not demonstrated its desire to station military troops in each of its purchasing states. The only example of this is China possibly trying to gain basing rights in Pakistan, as some media reporting suggests China is considering a military base along its maritime Silk Road route, but that determination cannot be applied to every case examined in this study. Basing rights in neighboring states and abroad is probably a medium to long-term goal of China. As China bides its time, while building a robust economy capable of long-term sustainability, China is likely planning for overseas bases that align with its strategic interests.

Contrary to my expectations, the length of formal diplomatic relations between the PRC and purchasing states did not appear to have any significant impact on whether a state would be more or less willing to purchase a Chinese COMSAT. A state's natural resources, measured in crude oil production did not appear to have a significant impact on whether a state would be more or less willing to purchase a COMSAT from China. China, in some instances, could get natural resources from other states that are closer, thus reducing shipping costs. Lastly, government type of the purchasing state did not appear to play a major role.

In conclusion, China positioned itself to be the leader of the developing world decades ago at Bandung and satellite sales are an extension of this manifestation. China is not concerned about financial gains, but rather influence, recognition, and external markets. Satellite sales are a convenient way to export influence and gain international recognition as an international space leader, all while presenting the illusion that it is done in support of the developing world. As mentioned, authoritarian regimes are more likely to use the space program for domestic gains, and China's customers, such as Bolivia, Venezuela, Laos, also happen to be authoritarian

regimes. This is no coincidence and, for reasons outlined in this thesis, China will likely to continue to use its satellite contracts to gain recognition and influence in developing states in the future.

Future Studies

This study can be improved in a number of ways in the future. First, other variables should be factored into the analysis. For instance, including the number of Confucius Institutes in each purchasing country or a more in-depth consideration of how freedom of the press (or lack thereof) affects the sale and how it contributes to a state's decision to purchase a COMSAT. Perhaps there is a correlation between the number of military agreements between China and the purchasing state and the likelihood of a COMSAT deal? Future studies should look at natural resources beyond petroleum, such as precious metals. Lastly, future studies should compare the states under study to developed states, which have not purchased COMSATs from China. The additional variables and the side by side comparison would likely reveal interesting trends that would contribute to a more analytically sound thesis.

Future studies could identify specific states likely to purchase Chinese satellite technology, based off the analyzed variables. Secondly, analyzing China's foreign military sales and understanding where COMSAT sales fit into the larger picture. How has China previously sold its military hardware? Is China conducting its COMSAT exports the same way it has conducted its historical foreign military sales? Or is the COMSAT export process substantially different? Lastly and perhaps most importantly, examining all of China's foreign space activity and understanding the extent of China's involvement with other nations. China is very active in the space industry and has not just sold communication satellites, but engages in joint space-

related projects and research with numerous foreign states. How is China using its other ventures in space for political gain? And do other states use space programs the same way, as in does Russia, the European Space Agency, or the US engage in similar behavior? Is China acting the same as any other emerging space power has or would? Where is China involved in other non-COMSAT space related missions area with foreign partners? A holistic approach to China's current space program, where its bilateral and multilateral relations in other mission areas (ISR, navigation, human space flight, lunar missions, deep space, space situational awareness) are analyzed, would give better perspective on China's space intentions and its level of involvement elsewhere. Future studies should incorporate these suggestions into their analysis.

Conditions for China's Future Success

In order for China to continue to market its satellites to foreign states and commercial SATCOM operators and expand its influence in the space domain, several conditions must be met. First, the CCP will continue to govern despite slowing economic growth. The CCP draws its legitimacy largely from China's unprecedented economic growth. As the economy slows, the CCP may perceive domestic pressures for changes in regulations or leadership. This forecast assumes the CCP will continue to govern despite China's slowing economic growth. Secondly, this assumes China will continue to support its space program and will provide adequate funding for research and development of new space technologies. All indications lend support to this assumption, as described by China's most recent Space White Paper in 2016. As China's space technology continues to mature and become more reliable, consumer confidence in Chinese satellites will increase, likely leading to an accelerated proliferation of Chinese satellites worldwide. China's 2016 Space White Paper demonstrated China's future commitment to its space program.

To build China into a space power in all respects, with the capabilities to make innovations independently, to make scientific discovery and research at the cutting edge, to promote strong and sustained economic and social development, to effectively and reliably guarantee national security, to exercise sound and efficient governance, and to carry out mutually beneficial international exchanges and cooperation; to have an advanced and open space science and technology industry, stable and reliable space infrastructure, pioneering and innovative professionals, and a rich and profound space spirit; to provide strong support for the realization of the Chinese Dream of the renewal of the Chinese nation, and make positive contributions to human civilization and progress.³⁴⁹

Third, analysis in this thesis assumes that the international system remains stable. A stable international system, absent of great power war, will enable China to remain committed to economic growth and its space program. Lastly, this analysis assumes there are not drastic changes to US ITAR restrictions and China's nascent commercial space industry accepts state regulatory regimes (as in CGWIC continues to satellite broker satellite deals with foreign states, regardless of China's commercial space enterprise's ambitions).

Future Sales

With the requisite conditions met, China will almost certainly continue to proliferate its COMSATs to developing states and commercial SATCOM operators, possibly to include western SATCOM operators, in the next twenty years. China's original intent with its COMSAT sales was to probably assist developing states in achieving a space capability and gain political support for sensitive issues, but as China's space technology matures and additional satellite platforms are developed, such as the DFH-4S, -4E, -5, as described in Chapter 1, China will almost certainly attempt to expand its customer base. In just 15 years, China has exported seven COMSATs and signed multiple satellite contracts with regional commercial SATCOM

³⁴⁹ "Full text of white paper on China's space activities in 2016." 2016. *The State Council The People's Republic of China*. http://english.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (February 7, 2018).

operators. China will likely build on those successes and use consumer confidence to boost its satellite products.

China's future customers will likely continue to be from all corners of the globe, but there will likely be an initial emphasis on Belt and Road states. This will continue to spread Chinese-made satellites to each Africa, Europe, and throughout Asia, granting China's military an indigenous SATCOM capability while deployed to use if needed. China's military will likely open more overseas bases as its military power increases relative to others in the international system. China can use its exported satellites to augment its military dedicated COMSATs for communications back to Beijing, allowing it to maintain effective command and control (C2) of its troops. China could purchase transponder space or maintain partial ownership of the satellite, as part of the satellite export contract. This would ensure China's access to the satellite's services.

Based on past COMSAT sales, I expect China will likely have exported at least 20 COMSATs to various international and commercial customers in the next 20 years. This assumes several things. First, China's current COMSAT customers choose a Chinese satellite solution to replace current satellite it has purchased from China, after its satellite reaches the end of its operational life. Secondly, this assumes the demand for SATCOM remains steady or increases. Third, this assumes China continues to market its satellites aggressively to foreign customers. And lastly, this assumes China's DFH-4 satellite platform, and other variants, have continued operational success. If China's satellites experience a rash of space-based anomalies or if China's SLVs cannot guarantee access to the required orbits, then China could fall short of exporting 20 satellites in the next 20 years. The anomalies, if dramatic or sustained, would likely lead to

hesitancy among international and commercial customers, since the risks for a potential satellite based anomaly would lead customers to selecting non-Chinese satellite manufacturers.

It is unknown which international customers would be targeted next by China. China would likely pursue additional customers in South Asia, Africa, and South America. States that rank low in economic development, GDP, freedom of the press, and are geographically relevant to China's strategic intentions would be the most susceptible to Chinese targeting. The two most obvious customers are Afghanistan and Sri Lanka, since media reporting suggests the two states have already communicated with China about a potential COMSAT sale and both have valuable strategic positions relative to China. Other states in the Middle East or in Eastern and North Africa, such as Iran, would likely be highly sought after customers. A Chinese satellite sale to Iran would be a great strategic gain at the expense of the US, as China would be afforded more influence in a state that has an extremely contentious relationship with the US. States in these regions would allow China to position Chinese built satellites in orbital slots that could support the Maritime Silk Road and also combat US influence in the Middle East.

The 20 exported COMSATs, in addition to China's expected growth of its civil and military dedicated COMSATs, would demonstrate China's growth in the SATCOM industry. The growth itself would attract additional new customers and China would likely be looked at as a leader in the SATCOM industry, potentially rivaling the US and other Western states and aerospace companies. The US will likely have few options to counter China's rise as an aerospace leader. The US could engage with states that China is specifically targeting. By sponsoring an increased number of educational scholarships or specialized satellite training at US academic institutions, hosting and participating in space-related forums designed to include states not typically seen as space powers, and incentivizing US satellite manufacturers to engage

with developing states for the delivery of space systems or hosted communications payloads, the US can possibly negate some of China's increased space influence. The US must play the long game, much like China is, and exploit the current technological advantages it maintains over China, while that advantage remains. Bilateral and multilateral space engagement will not deliver immediate results, but over time it could help negate China's strategic deployment of exported satellites, and the Chinese influence that comes with each sale.

Importance of Space Studies

Space is becoming increasingly important in the 21st century. The proliferation of space technology has enabled states not previously thought to be space actors to have satellites and other space related capabilities. The US has long maintained a technological edge in space and as the space domain becomes more and more crowded with actors that have diverging interests and objectives, understanding how it works and how it is used will be of paramount importance for governments and industries worldwide. What are decision points that the US can influence? How can the US help shape the future of space technologies? This topic should be examined for other state actors, not just China, to inform US decision makers, enabling them to preserve US supremacy in space.

Appendix A

Acronym List

Algerian Space Agency	ASAL
Asia-Pacific Mobile Telecommunications Satellite Company	APMT
Asia-Pacific Telecommunications Company Ltd	APT
Association of Southeast Asian Nations	ASEAN
Belt and Road Initiative	OBOR
Bolivian Space Agency	ABE
Central Intelligence Agency	CIA
China Academy of Space Technology	CAST
China Aerospace Science and Technology Corporation	CASC
Chinese Communist Part	CCP
China Great Wall Industry Corporation	CGWIC
China High-Resolution Earth Observation System	CHEOS
China-Pakistan Economic Corridor	CPEC
China Satellite Communications Company Limited	China Satcom
Command and control	C2
Communication Satellite	COMSAT
Community of Latin American and Caribbean States	CELAC
Dominican Republic-Central America-United States Free Trade Agreement	CAFTA-DR
DongFangHong	DFH
Geosynchronous Earth orbit	GEO
Geostationary transfer orbit	GTO
Global Positioning Service	GPS
Great Wall Industry Corporation	GWIC
High-throughput satellite	HTS
Intelligence, Surveillance, Reconnaissance	ISR
International Telecommunications Union	ITU
International Traffic in Arms Regulation	ITAR
Kilometer	Km
Leading Small Group	LSG
Long March	LM
Low Earth orbit	LEO
Luxembourg Space-Flight Communications Corporation	LST
Medium Earth orbit	MEO
Most different system	MDS
Ministry of Foreign Affairs	MOFA
National Space Research and Development Agency	NASDRA
Pasifik Satelit Nusantara	PSN
Pakistan Space & Upper Atmosphere Research Commission	SUPARCO
People's Liberation Army	PLA

People's Republic of China	PRC
Politburo Standing Committee	PSC
Radio Frequency	RF
Republic of China	ROC
Research and development	R&D
Satellite communication	SATCOM
Space launch vehicle	SLV
Satellite navigation	SATNAV
Strategic Petroleum Reserves	SPR
Tupac Katari	TKSAT-1
Unmanned aerial vehicle	UAV
Very Small Aperture Terminal	VSAT

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