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As recently as 2010 China has been reasserting its territorial claims in the Spratly Island chain in the South China Sea. Several other South China Sea nations also have laid claim to the Spratly Island chain including Vietnam, Brunei, Philippines, and Thailand. Through China's territorial claims, tensions between China and the other South China Sea nations have arisen. Due to China's expansion agenda in the SCS there have been several articles, news reports, and journals questioning what the impact would be to the US economy if China were to deny access of shipping through the South China Sea.

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WORLD SHIPPING AND THE US ECONOMY

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OF MASTER OF MILITARY STUDIES

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Executive Summary

Title: China Denies Access to the South China Sea: The Impact to World Shipping and the US Economy

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Thesis: If China were to pursue the option of denying international shipping through the SCS, the economic effects to the US economy could be significant. First, this paper will argue that a territorial dispute and or a major impending conflict with China could result in China selectively denying shipping in the SCS. Second, that shipping freight and insurance rates would increase, but the impact would be marginal. Finally, the cost to the US economy could be 4 to 7 percent of US GDP if multi-lateral trade and investment ceased to exist with China and five other nations in the South China Sea.

Discussion: As recently as 2010 China has been reasserting its territorial claims in the Spratly Island chain in the South China Sea. Several other South China Sea nations also have laid claim to the Spratly Island chain including Vietnam, Brunei, Philippines, and Thailand. Through China's territorial claims, tensions between China and the other South China Sea nations have arisen. Due to China's expansion agenda in the SCS there have been several articles, news reports, and journals questioning what the impact would be to the US economy if China were to deny access of shipping through the South China Sea.

Conclusion: This paper addresses the conditions for why China would restrict access to the SCS, the naval force structure required to conduct a physical blockade, the impact to the merchant shipping and the economic impact to the US Gross Domestic Product (GDP) and US GDP per capita.

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Illustrations

	Page
Figure 1. Nine Dash Line.....	3
Figure 2. China’s South Sea Fleet.....	9
Figure 3. Shipping Density in the South China Sea.....	11

Tables

	Page
Table 1. World Merchant Fleet.....	10
Table 2. Global Container Ship Capacity.....	13
Table 3. GDP per Capita Comparison.....	17
Table 4. US-China Consumption Comparison.....	20

Table of Contents

	Page
Executive Summary.....	i
Disclaimer	ii
List of Figures and Tables.....	iii
Acknowledgements	v
Introduction.....	1
China’s Reason to Deny International Shipping in the South China Sea.....	2
China’s Naval Force Structure.....	8
World Merchant Fleet, Shipping Volume, Freight Rates, and Insurance.....	10
GDP, GDP per Capita, and Purchasing Power Parity.....	14
Conclusion.....	21
Citations and Endnotes	22
Bibliography.....	26

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The South China Sea (SCS) is a critical trading passage for Japan, China, Korea, and other nations of the western Pacific. Annual shipping trade through the SCS is estimated at five trillion dollars.¹ Oil transported through the SCS is three times the volume of the Suez Canal, and accounts for 80 percent of China's oil; 60 percent of Japan and South Korea's energy supplies flow through the SCS.² Territorial expansion disputes and rising tensions in the SCS between China and Southeast Asian countries have created an environment where China could choose an option of defiance and deny access to international shipping through the SCS to defend China's territorial claims for sustained economic growth. Given the right set of conditions that enhance escalation in the region, China's denial of international shipping in the SCS could be pursued to meet its economic goals of the future.

If China were to pursue the option of denying international shipping through the SCS, the economic effects to the US economy could be significant. First, this paper will argue that a territorial dispute with China and the Philippines could result in China selectively denying shipping in the SCS. Second, that shipping freight and insurance rates would increase, but the impact would be marginal. Finally, the cost to the US economy could be four to seven percent of US GDP if multi-lateral trade and investment ceased to exist with China and five other nations in the SCS.

As early as 2010, China made clear to the United States "...that China would not tolerate any interference in the South China Sea, now a part of China's core interest of sovereignty."³ Hu Jintao, China's president from 2003-2013 stated "we should enhance our capacity for exploiting marine resources...resolutely safeguard China's maritime rights and interests, and build China into a maritime power."⁴ China's New Historic Missions detailed that China was "ensuring China's economic development by defending China's sovereignty, territorial integrity and

domestic security... defending China's expanding national interests, especially in the maritime, space, and cyberspace domains.”⁵

China's Reason to Deny International Shipping in the SCS

China's strategy to achieve national power and to ensure domestic stability within China's communist regime is through economic growth. Chinese leaders have made statements in order to build a stronger economic future that pleads for Chinese nationalism and public support due to the increasingly irrelevant ideological beliefs of the communist party.⁶ The SCS is a treasure trove of economic resources. In addition to the global shipping value that transits the SCS, the SCS has vast rich fisheries, trillions of cubic feet of natural gas, and estimated oil reserves surpassing eleven billion barrels.^{7 8} As China continues to rise as an economic power and is determined to defend its claimed territories in the SCS, a high level of pressure has been created with Vietnam, Brunei, Japan, Taiwan, Malaysia, and the Philippines over maritime boundaries, geographic sovereignty, and economic rights.⁹

China's territorial claims in the SCS are nothing new. Its predecessor, The Republic of China claimed an eleven-dash line nine-dash line and China adopted a nine-dash line in 1949. China has had maritime clashes since then with Vietnam in the 1980s and the Philippines in the 1990s. All was relatively quiet until their reassertion of territorial claims over the last eight years. The problem with this reference to claim is that the nine-dash line covers nearly all of the SCS and holds no basis on the United Nations Convention on the Law of the Sea (UNCLOS), which, clearly defines territorial rights, economic and zones, and delineates that no state can make an historic claim to any body of water other than the bays and waterways along the coastline of that state.¹⁰ With China disregarding UNCLOS, the United States perceives China a regional and global threat.

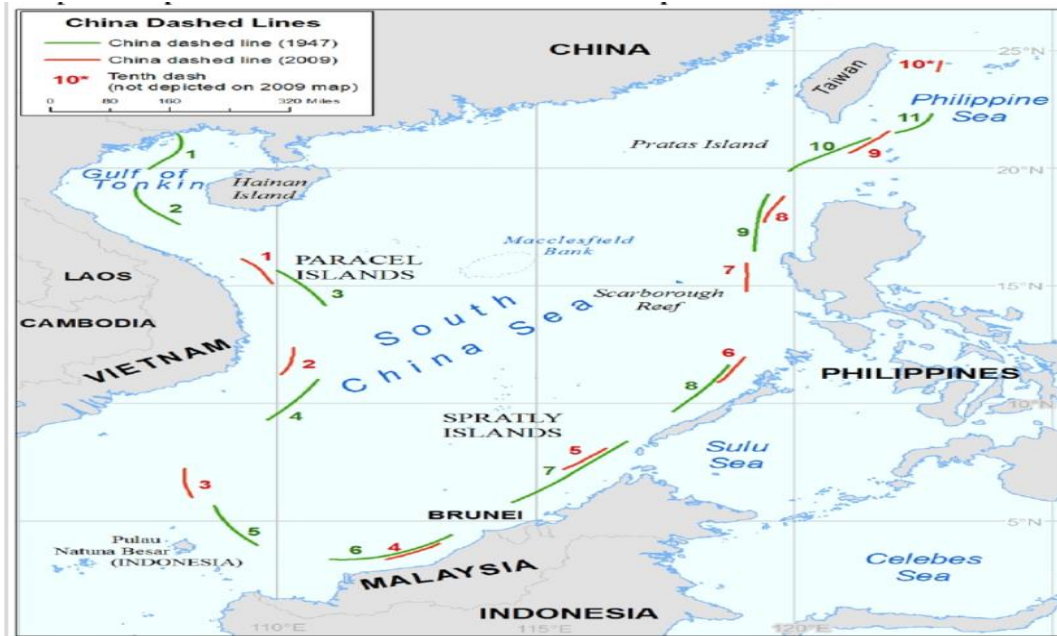


Figure 1. Source: Office of Naval Intelligence.

Given China's assertiveness for economic growth and defense of non-internationally recognized territories and the militarization of claimed land in the Spratly Island chain, the conditions for China to control the SCS are being set and could drive China to introduce actions to deny passage of international shipping through the SCS. Of note, denying passage of the SCS does not have to be a physical blockade. A blockade could be considered a credible threat high enough that global trade companies would re-route shipping to avoid risk indicating a closure or restricted access.¹¹

Exploration in the defense of territorial rights through the threat of escalation to armed conflict is considered in this paper. In addition, China's historical territorial conflicts under the theories of power transition theory and offensive realism are taken into account for the purpose of this paper. From the historical perspective, Dr. Chris Yung, of US Marine Corps University cites several instances from 214 B.C.E. through 1864 C.E. where China has fought to retain or to regain claimed territory.¹² From the U.S. Korean War in 1950 to China's clash with Vietnam

over the Spratly Island chain, China has engaged in conflict to ensure the security of its borders through claimed maritime disputes.¹³ According to M. Taylor Fravel, Professor of Political Science at MIT, “Scholars who examine the consequences of China’s rise through the lens of either power transition theory or offensive realism predict a future of conflict.”¹⁴ Power transition theory states that conflict will occur when a rising power is not content with the current status or norms and determines itself as an equal to the dominant state in the region, and will use force to form differently current rules or institutions.¹⁵ Additionally, the theory of offensive realism “asserts that states will pursue expansion as they grow stronger, when statesmen perceive a relative increase in power.”¹⁶ A recent example of how these theories can apply directly links to the recent international tribunal ruling against China’s claims for territory in the SCS. The ruling at The Hague determined that China had no legal basis for its historical territorial claims and went even further to reject China’s occupation in some of the Spratly Island chain. Regardless of the ruling from the international tribunal, China has fully rejected the authority of the tribunal and claims that the ruling “ ‘is invalid and has no binding force’ ” and that “ ‘China does not accept or recognize it.’ ”¹⁷

A territory dispute in the Spratly Island chain could drive China to choose the option of denying access to the SCS. China, Malaysia, the Philippines, Vietnam, and Taiwan all have claims for reef or island territory in the Spratly Island chain. Vietnam claims the most at twenty-nine, the Philippines claim nine, Malaysia claims three, and China claims five. Taiwan claims one, the largest island in the chain.¹⁸

With China’s strategy of designed to continuously promote economic growth, the Spratly Islands are a significant resource to meet China’s goal. China is militarizing its claims and the capability for China to harass and torment in the Spratly Island chain has never been greater.

According to Gagliano's article from the United States Naval Institute magazine *Proceedings*, "Fiery Cross, Mischief, and Subi Reefs each will have a nearly 10,000-foot runway, long enough to land any aircraft in China's air force, and deep-water ports are under construction that will accommodate any combatant in its navy."¹⁹ Either by physical blockade or by threatening or restricting access in the SCS, China could either deter Malaysia, the Philippines, Vietnam, and Taiwan from pursuing their claims or coerce them to release their claims to China based on the economic impact that restriction or closure would have on those other countries.

Although the Spratly Island region is not considered a SLOC or chokepoint, if China were to gain full control of the Spratly Island chain, China could choose an option to threaten any vessels that intended to pass through the Spratly Islands. This could drive those vessels to choose another navigation option spiking the cost of freight rates and the cost to the global economy. China could then continue to claim the significant resources beneath the SCS to reach its ultimate goal of increased economic growth.

Defense of claimed or sovereign territory would not be the singular reason for China to execute a blockade and deny shipping in the SCS. Although defense of territory is an ingredient, an event more drastic would have to occur. There would have to be either a threat to the government regime or with the threat of armed conflict, in particular with the US. With China's territorial claims comes the two hundred mile Economic Exclusion Zones (EEZ) and within that two hundred mile EEZ lay Taiwan. Since China claims Taiwan as a part of its sovereign territory, if Taiwan declares independence or pushes for stronger autonomy in international relations, then the escalation of conflict would result in potential conflict between the US and China. Through China's Active Defense strategy, if an impending conflict with the US is perceived, China may justify striking first if China deems its strategic interests are threatened.²⁰

Dr. Yung's recent testimony to the U.S.-China Economic and Security Commission supports this analysis as a potential road to conflict. Dr. Yung and other scholars agree that China's strategy with Taiwan is the "slow absorption of Taiwan back into Beijing's sphere of influence."²¹ With this strategy in mind and if Taiwan resists, Dr. Yung's testimony provides several overt options that China could pursue to strongarm Taiwan to submit to China's strategy. Some of the options are mining waters, full blockades around the island, and harassment of international shipping to Taiwan. The testimony further states that the US would most likely respond to defend Taiwan against China's assertiveness creating a hostile environment ripe for armed conflict.²²

Another scenario that could be explored for why China would deny access or restrict access through the SCS is a territorial dispute between China and the Philippines. In this scenario, which could take several months or even years, China wants the Philippines to secede from its claims of the Spratly Island chain. The government of the Philippines refuses to such a demand. China's plan to influence the Philippines to secede is by targeting its economy by re-routing commercial shipping to the east side of the Philippine archipelago. To execute this plan, China devises a piracy scheme in the Strait of Malacca to pirate commercial shipping destined to or from the Philippines' west coast ports. Piracy is nothing new in the SCS. According to the Norwegian Ministry of Foreign Affairs report on piracy in 2016 "nearly 60% of all incidents reported anywhere in the world have occurred in Asia, and a full two thirds of Asian piracy occurs within SE Asia."²³ China deploys its Coast Guard under the guise that the Coast Guard is in the Strait of Malacca for Counter-Piracy operations. From China's perspective, this plan could be a win-win. A pirated vessel could yield gains in the range of 1.2 to 2.4 million dollars.²⁴ A realistic response is counter piracy operations by the Philippine Navy and Marines.

The Philippine government's response would be to deploy its own counter-piracy capabilities via Philippine navy and by embarking Marine security teams on commercial vessels in the defense against piracy. An interaction ensues as Chinese pirates attempt to board a vessel with an embarked Philippine security team, where the security team would kill several Chinese pirates. This international incident would create even more tension between the two countries. China twists the narrative against the Philippines and threatens to contain any and all vessels going to the Philippines through the SCS and by force if necessary. The Philippine government would request US assistance and the US agrees to the request. The US assists the Philippines through the Enhanced Defense Cooperation Agreement (EDCA) and by arming the Philippines with advanced weapon systems made available as a result of Russia's recent violation of the Intermediate-Range Nuclear Forces Treaty (INF).

The INF is an agreement between Russia and the US that "requires destruction of the Parties' nuclear ground-launched ballistic and cruise missiles with ranges of between 500 and 5,500 kilometers, their launchers and associated support structures and support equipment within three years after the Treaty enters into force."²⁵ This treaty was ratified by the US in 1988. With Russia's posturing and recent violation of the INF,²⁶ the US would use this pretext to fully withdraw from the treaty and begins to place non-nuclear road mobile cruise missiles to locations inside the Philippines under the premise of the EDCA.

The EDCA is an agreement between the US and the Philippines that "is aimed at deepening bilateral defense cooperation in order to maintain and develop the individual and collective capacities of the Philippines and the United States to resist armed attack as set out in their Mutual Defense Treaty."²⁷ Article IV of the EDCA notes "that prepositioned material could be used to benefit humanitarian assistance and disaster relief as well as the enhancement of

individual and collective defense capabilities.”²⁸ This counter move by the US and Philippines is used as a deterrent against further Chinese aggression.

China’s response is not conflict, but to threaten all shipping in the SCS and to cut full economic ties to the United States and the Philippines while indirectly impacting the economies of Thailand, Brunei, Vietnam, and Cambodia. Some scholars may argue that China would not take such action, but to get further to the heart of this paper, this countermove of not responding with armed conflict by China drives home the point. For China to take this course of action, it would require a naval force structure that could meet its current power projection demands and additional forces to either threaten a closure or actually conduct a physical blockade in the SCS.

Naval Force Structure

According to the Congressional Research Service report on China’s naval modernization efforts, China’s goals are “asserting or defending China’s territorial claims in the South China Sea and East China Sea.”²⁹ Additionally, China’s intentions are to regulate military activities within its own Exclusive Economic Zone (EEZ) and ensure the security of its strategic sea lines of communications.³⁰ And according to the Department of Defense Annual Report to Congress “modernization and development trends over the last decade reflect an expansion in the PLA’s capabilities to address regional and global security objectives”³¹ with the “focus on conducting offensive missions, such as blockades, sovereignty enforcement...”³² These statements indicate that China is fully invested to meet its maritime objectives by financing more naval assets.

China’s South Sea Fleet would have to have a sizable force in order to conduct a physical blockade given the geography in the SCS. Figure 2 shows China’s current South Sea Fleet inventory as of 2016.



Figure 2. Source: Office of Naval Intelligence.

Based on geography the only feasible location for China to execute a denial of international shipping through the SCS with the intention of rerouting to the east coast of the Philippines would be the 308 nautical miles (NM) area between Singapore and Singkawang, Indonesia. With the assumption that China would have to maintain the South Sea Fleet for current operations, an additional combined force of aircraft carriers, destroyers, frigates, and missile patrol craft will be needed to execute the power projection required for such a blockade. Although China has only one aircraft carrier in its inventory, China could build two to three aircraft carriers over the next fifteen years.³³ Consideration must be given though to the difference between construction of aircraft carriers and the training and proficiency of the crew operating the carrier. Given the short distance across the sea-lane between Singapore and Indonesia, a US three carrier strike group equivalent could be sufficient to sustain a blockade for a short term duration of approximately six to nine months. If such a blockade were to occur, there would be a short-term impact to commercial freight rates and insurance.

World Merchant Fleet, Shipping Volume, Freight Rates, and Insurance

The world shipping fleet has approximately 87,233 vessels and can be broken down in the most simplistic forms to two categories by size (gross tonnage) and type of vessel (tanker, oiler etc.). Gross tonnage (GT) is defined as “a measurement of volume of all enclosed spaces on a ship with 100 cubic feet = to one ton.”³⁴ World merchant fleet ships are further categorized by size, type, and dimensions relating to the various canals or locks that they may travel through. In addition, merchant ships are categorized by type of cargo they may carry such as dry, wet, or containers. In this category dead weight tonnage (DWT) is used.³⁵ DWT is defined as “the weight (in tons) of all the cargo, fuel, dry provisions, supplies, etc. carried on board the ship.”³⁶ In this category, there are ten sizes of vessels, however, four of the ten will be used to illustrate the relationship to the shipping market, which will be discussed later. Table 1 illustrates the world merchant fleet in 2015.

Table 1. Total number of ships in the World Merchant Fleet by type and size.

Ship Type	Small ⁽¹⁾		Medium ⁽²⁾		Large ⁽³⁾		Very Large ⁽⁴⁾		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
General Cargo Ships	4,367	13.6%	11,729	30.6%	222	2.0%			16,318	18.7%
Specialized Cargo Ships	8	0.0%	211	0.6%	65	0.6%	3	0.1%	287	0.3%
Container Ships	16	0.0%	2,269	5.9%	1,605	14.2%	1,284	23.6%	5,174	5.9%
Ro-Ro Cargo Ships	30	0.1%	645	1.7%	613	5.4%	201	3.7%	1,489	1.7%
Bulk Carriers	310	1.0%	3,770	9.8%	5,596	49.5%	1,613	29.7%	11,289	12.9%
Oil and Chemical Tankers	1,854	5.8%	6,749	17.6%	2,517	22.3%	1,601	29.4%	12,721	14.6%
Gas Tankers	39	0.1%	1,096	2.9%	275	2.4%	397	7.3%	1,807	2.1%
Other Tankers	318	1.0%	538	1.4%	7	0.1%			863	1.0%
Passenger Ships	3,729	11.6%	2,577	6.7%	272	2.4%	163	3.0%	6,741	7.7%
Offshore Vessels	2,612	8.1%	5,339	13.9%	112	1.0%	169	3.1%	8,232	9.4%
Service Ships	2,466	7.7%	2,441	6.4%	25	0.2%	6	0.1%	4,938	5.7%
Tugs	16,387	51.0%	987	2.6%					17,374	19.9%
Total	32,136	100%	38,351	100%	11,309	100%	5,437	100%	87,233	100%

Source: Equasis (1) GT<500 - (2) 500≤GT<25,000 - (3) 25,000≤GT<60,000 - (4) GT≥60,000

Source: Equasis Data Base

Of the 87, 233 ships in the world fleet, approximately thirty percent of the world's merchant fleet has passed through the SCS in 2015.³⁷ Figure 3 shows the shipping density in South East Asia in 2015.

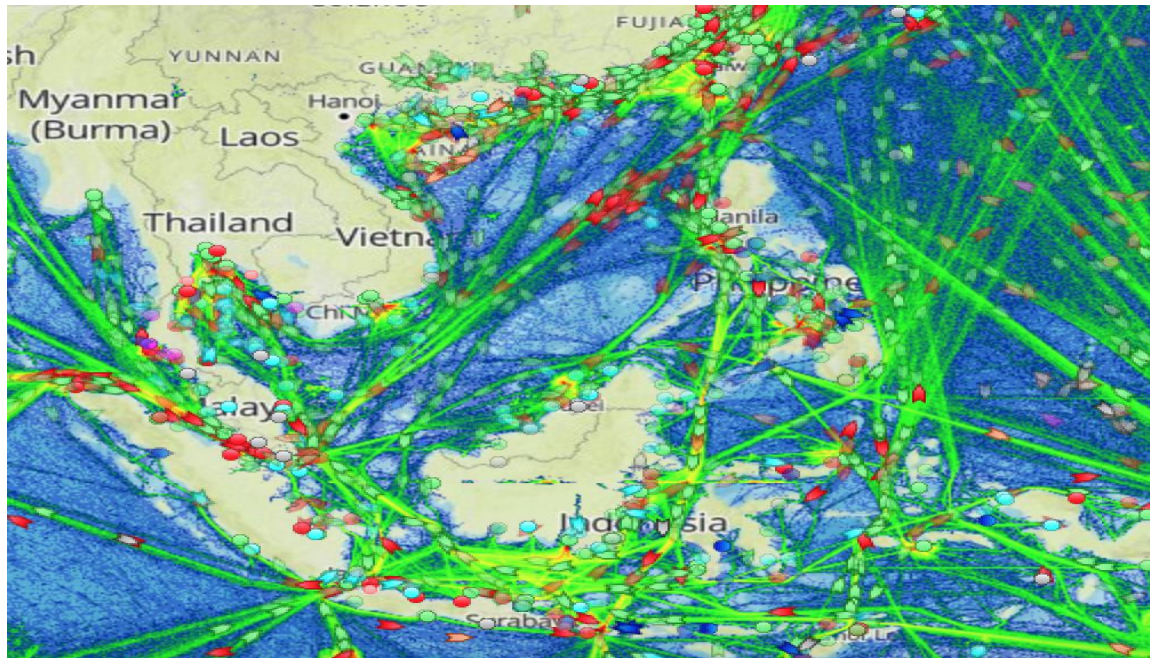


Figure 3. Shipping Density in the SCS.

Source: Maritime Traffic.com

Freight rates are calculated by a number of factors such as destination, service charges, currency, bunker capacity, terminal fees, crew costs, and the season. For example, freight rates increase during the winter months for fuel capacity shipped to the northern hemisphere.³⁸ Freight rates are also determined by either twenty equivalent units (TEU) or by a full container load (FCL) or less container load LCL with LCL defined as a container that is not filled to capacity and typically shared with another customer.³⁹ Both refer to the size of the standard shipping container for cargo vessels being twenty feet long by eight feet high and eight feet six inches

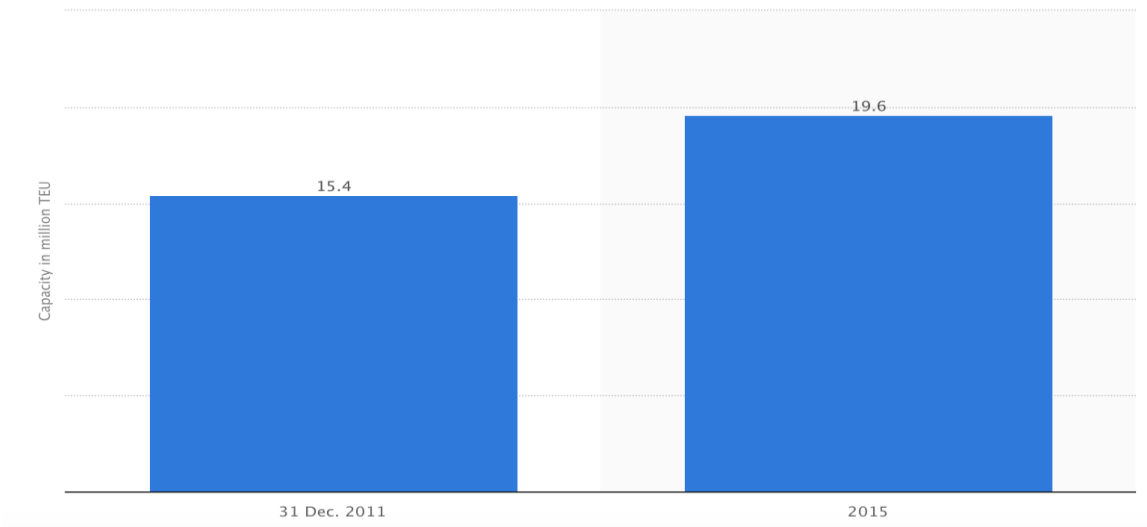
wide. To illustrate, if a company were to ship a commodity such as fruits and vegetables with the capacity requirement of fifty FCL valued at 500,000 United States Dollars (USD) from Singapore to Kaohsiung Taiwan, the cost per day based on traveling a standard steaming speed of 13 knots for a distance of 1609NM would cost between 69,900 USD and 77,00 USD. This value depends on the shipping market and lock in rates at the time of securing the rate.⁴⁰ If this same cargo were to be rerouted through the Makassar Strait and around the east side of the Philippine archipelago, adding an additional 1182 NM plus four extra days of transit time, the minimum cost increase (increased insurance rates not calculated) would be between 55,900 USD and 61,800 USD.

If China were to fully deny access through SCS past the Spratly Islands, John Noer and David Gregory, scholars from National Defense University, suggest freight rates would increase because the number of steaming days would increase to get the cargo to its intended destination. There also would be a significant increase for vessel capacity and denying shipping in the SCS “would disrupt shipping markets even more severely generating shortages”⁴¹ by directly impacting the costs of imports and exports.⁴² This argument would have been partially true three years ago based on the size of the merchant shipping inventory. There is no denying that freight costs would be higher because of the longer distance required for goods to reach the intended destination. With today’s current shipping market and oversupply of vessels, the shipping market could absorb the capacity demand if China would deny access to international shipping today.

The international shipping freight rates are significantly low and vessel capacity exceeds demand for shipping. Three years ago ocean freight companies heavily invested in the next generation of freightliners, which are “larger and so much more efficient than previous ships.”⁴³

Lower costs matter in commoditized industries like freight shipping, and it's no surprise that global container lines have aggressively upgraded their fleets.”⁴⁴ Table 2 illustrates capacity in TEU from 2011 to 2015. Three years ago freight rates were high and the ocean freight companies expected the same rates as they did three years ago; however, that did not turn out to be the case and the “expected profits from more efficient ships has never materialized.”⁴⁵ With this increase in vessel capacity and lower demand, freight service rates have dropped. So as Noer et al. suggest, the demand for capacity would increase, which is true however, the current oversupply could handle the demand.

Table 2. Forecasted capacity of global container ship fleet, a comparison between 2011 and 2015 (in million TEU)



Source: Statista.com

If it were considered that vessel capacity could meet the demand, would freight market rates rise? Conventional wisdom assumes yes. As discussed earlier there are several considerations for determining a freight rates. The freight rates themselves have numerous

factors that affect the fluctuation of rates. Freight market rates fluctuate for a number of reasons and one of those reasons is oil. The biggest cost for ships is oil, which also varies. So if a longer route was required around the SCS more oil is consumed which means demand goes up and so may prices, depending on supply.⁴⁶ Briefly described earlier and shown in Table 2 is the shipping cycle. If there is too much supply then rates will go down eventually. As rates go down, less investment in new shipping liners are realized which drive capacity down. In turn, as demand surpasses supply rates go up and investment occurs creating more capacity.⁴⁷ Shipping companies desire to make a profit, so the speculations in the market drive rates while as one company either increases or decreases rates others are sure to follow in order to remain competitive in the market. Political policies can affect rates as well “wars, revolutions, national crises, strikes, etc are all political factors that affect rates.”⁴⁸ Finally and perhaps the most obvious is the world economy. For example, “after 9/11, world output decreased and led to a reduction in both global import and export, which resulted in freight fluctuations.”⁴⁹

Insurance rates could rise in the event that China denies shipping through the SCS. A rate increase would depend on the risk to cargo and the perceived threat to the cargo. If China’s objective is to merely re-route shipping and not threaten the merchant fleet or its cargo, and that the cargo will meet its intended destination, insurance rates could remain stable.

GDP, GDP per Capita, and Purchasing Power Parity

The US Gross Domestic Product (GDP) is calculated by four factors: personal consumption, business investments, government spending, and net exports.⁵⁰ The formula for calculating GDP is GDP equals personal consumption plus business investment plus government spending plus net exports where net exports are calculated by subtracting imports from exports.⁵¹

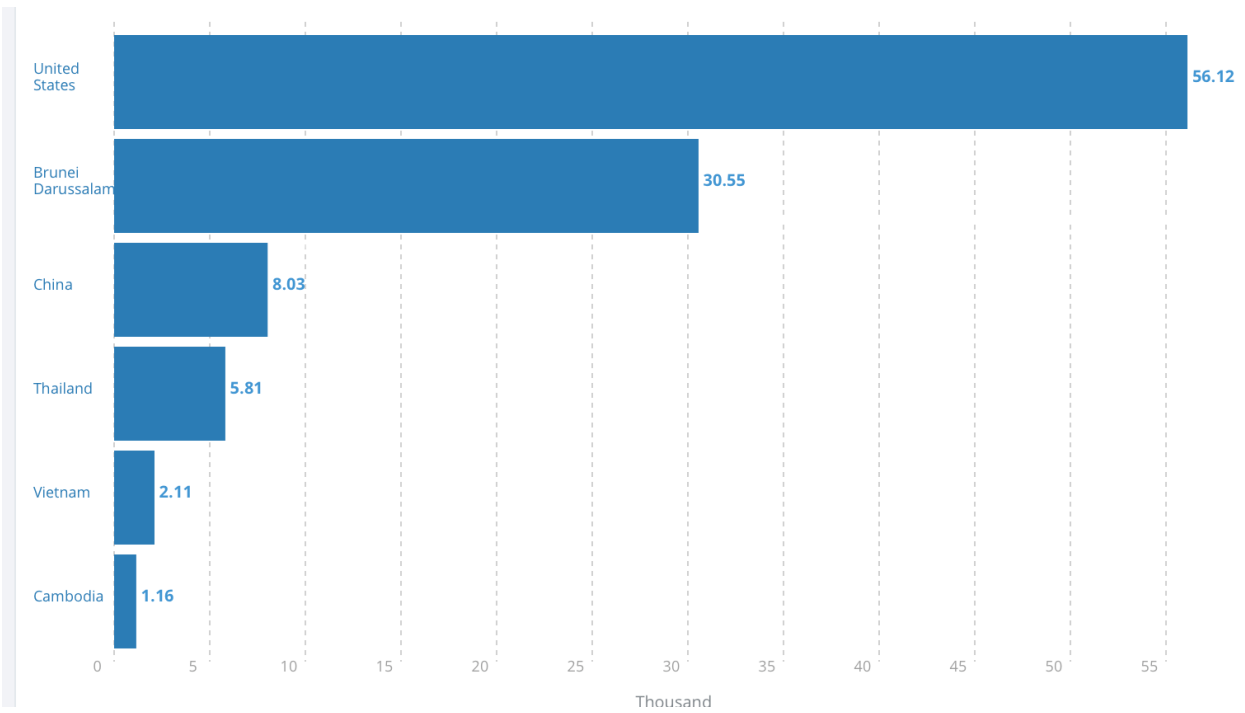
GDP is further divided into nominal and real GDP. Nominal GDP does not account for inflation or price levels where real GDP does. For the purposes of this paper real GDP will be used.⁵²

Each of the four factors that determine GDP hold different weighted value. Personal consumption accounts for approximately 70 percent of GDP and is comprised of two subcomponents, which are goods and services. Goods are further divided into durable and non-durable goods. Durable goods are items such as furniture and automobiles that are projected to have use beyond three years.⁵³ Non-durable goods are items such as food, clothing and gasoline. Business investments account for nearly seventeen percent of GDP and are “purchases that companies make to produce consumer goods.”⁵⁴ Business investments include software, equipment, and manufacturing. An additional component is commercial and residential real estate, but only new construction is calculated and not the resale of existing property. Government spending accounts for approximately eighteen percent of GDP with state and local government contributions estimated at 11 percent and the remainder of the contributions at the federal level with the majority of spending concentrated towards the military.⁵⁵ Finally, net exports of goods and services are calculated. Net exports consist of capital goods, industrial supplies, consumer goods, automobiles, and foods, feeds, and beverages.⁵⁶ Capital goods are comprised of commercial aircraft, industrial machines, electronics, medical equipment, and telecommunications. Industrial supply examples include oil products, chemicals, and plastics. Consumer goods consist of cellular products, jewelry (mainly diamonds), and pharmaceuticals. Examples of food, feeds, and beverages are soybeans, meat and poultry and corn.⁵⁷

Real GDP per capita is an economic indicator used to measure the “total economic output of a country divided by the number of people and adjusted for inflation.”⁵⁸ GDP per

capita is used to compare the standard of living between countries. Economists use Purchase Power Parity (PPP) in conjunction with real GDP to further expand comparisons. PPP is an economic theory that states “ residents of one country should be able to buy the goods and services at the same price as inhabitants of any other nation over time.”⁵⁹ Although PPP cannot realistically be used on a day-to-day basis because there is variance in items that cannot be shipped or traded. These items include such items as land, a haircut, or transportation costs. Economists apply the PPP theory stating that international trade enables consumers to shop for the best price and over time purchasing power will reach parity.⁶⁰ PPP is calculated to establish costs of goods and services in any given country given that parity exists. Kimberly Amadeo, author and economic analyst states, “Purchasing power parity solves the problem of comparing countries with different standards of living.”⁶¹ PPP recalculates pricing of goods and services based on being sold in the US. For example, the cost of a pair of shoes in the US may cost fifty dollars and the exact same pair of shoes in China would cost twenty dollars because the cost of living is lower in China. Amadeo reasons that China “artificially sets the value of its currency to be lower than the U.S. dollar”⁶² resulting in a cost of living that is lower enabling China to pay it’s workforce less and a lower cost to export goods and services allowing for competition in the global trade market.⁶³ As a comparison, China is ranked 104th globally with GDP per capita at \$8,000 compared to the US ranked globally at 12th with a GDP per capita of \$56,000. Table 1 shows the GDP per capita comparison between the US and the nations that are located in the SCS. ⁶⁴

Table 3. GDP per Capita PPP Comparison.



Source: World Bank.

Trade with the US, China, and the South China Sea Nations

Estimating economic effects can prove difficult if the Chinese were to deny trade in the SCS given the conditions of escalation presented earlier. There are several factors that are not considered based solely on not knowing the actions and reactions from the US and China in the scenario provided. For example; government policy responses, the reactions from consumers and the workforce, financial institution responses, and other trading partnership reactions.⁶⁵ For the purposes of this paper, only direct GDP losses are taken into account and then further calculated to GDP per capita. Additionally, no attempt has been made to estimate the impact on regional and global economies.

Current world GDP is estimated at just over 70 trillion dollars. The US contribution to world GDP is 18 trillion dollars or 25 percent of the world GDP and China's contribution is 11 trillion dollars or 16 percent. Cambodia, Thailand, Vietnam, Philippines and Brunei add just fewer than 1 trillion dollars combined or 1.2 percent of the world GDP.⁶⁶

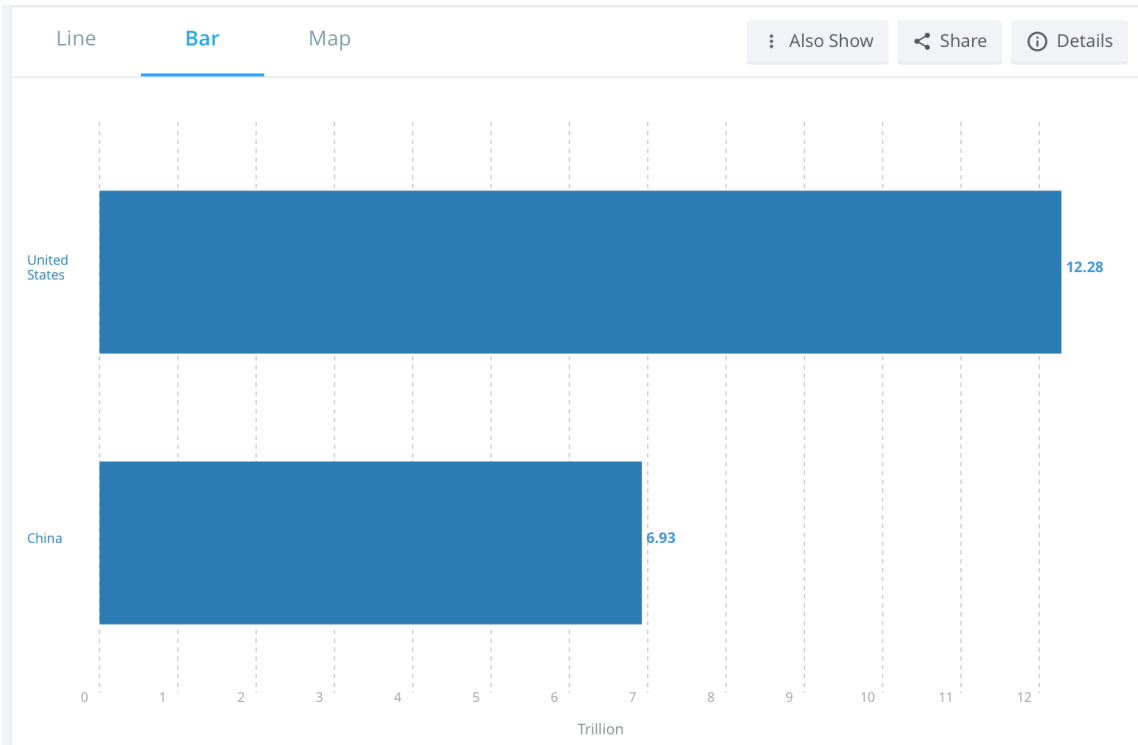
US trade contributes 28 percent to the total US GDP and of that 28 percent, nearly 8 percent is trade exports to China and 1.8 percent with Cambodia, Thailand, Vietnam, Philippines and Brunei combined.⁶⁷ Exports to China from the US totaled 115 billion dollars. Imports from China accounted for 17.7 percent of US trade totaling nearly 463 billion dollars.⁶⁸ Export trade of US GDP with China is .63 percent and import trade of US GDP with China is 2.56 percent. US import values with Cambodia, Thailand, Vietnam, the Philippines and Brunei combined total 79 billion dollars and exports are a combined 27 billion dollars.⁶⁹ The export percentage of US GDP from all five countries is .42 percent and the import percentage of US GDP from the five countries is .14 percent. In total with China and the five mentioned countries in the SCS, the total percentage of exports is 2.98 of US GDP and imports is .77 percent of US GDP. Given the data above and the conditions met of a full trade stop with China and the SCS countries at a minimum, a 4 percent decrease in US GDP could occur resulting in a decrease in US GDP per capita from \$56,000 to \$53,700.

Other scholars suggest that the effect to US GDP could be between 5 to 10 percent of US GDP. Considering Foreign Direct Investment and Consumption, US GDP could meet that threshold. Foreign Direct Investment (FDI) is "an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling

interest in a foreign company.”⁷⁰ In 2015, the US had just over 379 billion dollars⁷¹ in FDI and 74.5 billion of that was invested in China with the majority of the investments made in manufacturing at 42 billion dollars.⁷²

Consumption in economics is “the value of goods and services bought by people. Individual buying acts are aggregated over time and space.”⁷³ Consumption can be further divided into durable goods and non-durable goods where durable goods are items such as automobiles and electronics. Non-durable goods are items such as food and services from a restaurant for example.⁷⁴ Consumption is also categorized by needs such as food, housing, entertainment, and clothing. Consumption must also be considered as buying acts of time in particular to durable goods due to an item’s longevity. Consumption is also calculated by taking into account only newly produced goods. For example, a house purchased new in 2003 is not considered as a variable for consumption if purchased again in 2017 because the house was already accounted for in GDP in the year 2003.⁷⁵ In 2015, US consumption accounted for just over 12 trillion dollars or 66 percent of US GDP.⁷⁶ Table 4 shows the comparison of US consumption of GDP with China.

Table 4. US-China Consumption Comparison.



Source: The World Bank 2017.

Strictly using US FDI and consumption from China, and the five the other countries in the SCS, the damage to US GDP will increase. Given the 79 billion dollars in FDI, and the combined 542 billion dollars of imports from China and the SCS nations, an estimated 621 billion dollars will reflect negatively on US GDP resulting in an additional 3.45 percent decrease to US GDP.

As Gompert et al. suggests' the overall impact to US GDP could in fact range from 5 to 10 percent. Taking into account total trade, FDI, and consumption as factors of impact to US GDP, the minimum impact could be estimated at 7.45 percent of US GDP. US GDP per capita would then decrease from \$56,000 to \$52,000. The second order effect to this is a decrease in consumer spending.

Another consideration beyond trade, FDI, and consumption is the impact on employment. For the purposes of this paper an example of the potential impact to employment will be from the supported jobs of goods and services in relation to China. In 2015, jobs supported by goods exports was estimated at 601, 000 and jobs supported by services with China was estimated at 309, 000 jobs.⁷⁷ As of February 2017 the US Department of Labor estimated the unemployment rate at 4.7 percent or 7.5 million people.⁷⁸ Adding 900, 000 more jobs to the unemployment rate would increase the number of unemployed to 8.4 million people with a rate hike to 5.5 percent. As one could see, the loss of jobs directly impacts consumption and therefore could further decrease GDP per capita beyond the already estimated 7.45 decrease.

Conclusion

China's aggressive militarization in the Spratly Island chain, disregard for The Hague ruling, and UNCLOS indicates that China is ready to defend its territorial claims in the SCS. Given a scenario of conflict with either Taiwan and the US or the Philippines, China could implement a persuasive tactic of denying access to the SCS through either a threat or physical blockade. In order to execute such an event, China would require a naval force structure equivalent of three US carrier strike groups. If such blockades were to occur and shipping was re-routed around the east side of the Philippine archipelago, the impact to the international shipping would be minimal. The larger impact of a blockade would be felt in the economies of the SCS nations and the US. In the event full conflict erupted between the US and China, and all trade ceased between the two countries, the impact to US GDP could be nearly 7.5 percent.

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