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SHIPBUILDING INDUSTRY 2016

ABSTRACT: The United States Government (USG) cannot continue to avoid its responsibilities to shape the conditions in the commercial and military shipbuilding and repair industry that promote gross domestic product (GDP) growth, thereby giving the U.S. the ability to meet its national security strategic objectives. The U.S. shipbuilding industry is a significant component of U.S. GDP. This paper presents five policy recommendations, within the context of Michael Porter's determinates of national competitive advantage, to address the decline of the shipbuilding industry's contribution towards the U.S. GDP. The federal government must invest in Human Capital to improve *Factor Conditions* such as increasing industry capacity to innovate and upgrade infrastructure, as well as training industry workers in the latest tools of the trade. The Jones Act must be modified to enable growth in the *Demand Condition*s and *Related Supported Industries*. Washington should increase and shape Foreign Military Sales, in the U.S.'s favor, as described in the *Firm Strategy, Structure, and Rivalry* section, and invest in Anti-Access/Area-Denial capabilities to hedge against the elements of *Chance*. In addition, the USG must develop an Interagency Maritime Strategy, critical to shaping *Government* policies to synchronize acquisition, requirements, and resourcing decisions across all agencies. This *portfolio of shipbuilding industry policy changes*, while improving each Porter determinate of national competitive advantage, will more importantly bolster the industry's contribution to the GDP, strengthen economic and military instruments of national power, and enable the acquisition of a U.S.-flagged shipping fleet to meet national security objectives.

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Domestic:

United States Coast Guard Yard, Curtis Bay, MD
NS Savannah, Baltimore, MD
Maritime Administration, Washington, DC
Philly Shipyard, Philadelphia, PA
S.S. United States, Philadelphia, PA
Naval Surface Warfare Center, Carderock Division, Potomac, MD
Carnival Corporation & PLC, Miami, FL
Newport News Shipbuilding, Huntington Ingalls Industries, Newport News, VA
Portsmouth Naval Shipyard. Kittery, ME
Bath Iron Works, General Dynamics, Bath, ME
Fincantieri Marinette Marine, Marinette, WI
Fincantieri Bay Shipbuilding, Sturgeon Bay, WI
North American Shipbuilding, Larose, LA
Ingalls Shipbuilding, Huntington Ingalls Industries, Pascagoula, MS
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International:

Embassy of the United States, Seoul, Republic of Korea
Samsung Heavy Industries, Geoje, Republic of Korea
Daewoo Shipbuilding and Marine Engineering, Okpo, Republic of Korea

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Introduction

> It must however be admitted, and will be seen, that the wise or unwise action of individual men has at certain periods had a great modifying influence upon the growth of sea power in the broad sense, which includes not only the military strength afloat, that rules the sea or any part of it by force or arms, but also the peaceful commerce and shipping from which alone a military fleet naturally and healthfully springs, and on which it securely rests.[1]
>
> Admiral Alfred Thayer Mahan

When Admiral Mahan first published these words near the turn of the 20th century, United States (U.S.) policymakers had an active interest in protecting and enhancing the nation as a global maritime force. The nation's focus on building sea power and economic strength went *hand-in-hand* to help position the U.S. as the world's leader in economic and military power.

The U.S. possesses multiple economic and military national competitive advantages, defined by the economist Michael E. Porter as an area where a nation leads the world and "rests on endowments of inputs such as labor, natural resources, and financial capital."[2] In the case of the U.S. shipbuilding and repair industry, it is comprised of over 550 businesses, brings in profit of $1.4B,[3] and is one of the U.S. Top 50 Advanced Industries.[4] The Maritime Administration (MARAD) further reported in November 2015 that shipbuilding, with 124 shipyards spread across 26 states, contributed $37.3B towards U.S. gross domestic product.[5] Additionally, the shipbuilding industry as a whole generates more than 400,000 jobs, directly and indirectly, encompassing all 50 states.[6]

However, other nations may have caught up with, and in some cases even surpassed, the U.S. in terms of shipbuilding technology, efficiency and pure commercial tonnage. To maintain the U.S. shipbuilding industry national competitive advantage, the U.S. must rely upon supportive policies to sustain its position in the global commercial shipbuilding industry, while moving away from today's monopsony[7] defense market. This *call for action* is a result of American's deterioration in global commercial shipbuilding capabilities coupled with reductions in military shipbuilding budgets.

In The Competitive Advantage of Nations, Michael Porter's principal assertion is that "Government's real role in [maintaining] national competitive advantage is in influencing [the] four determinants."[8] His determinates are *factor conditions; demand conditions; related and supporting industries*; and *firm strategy, structure, and rivalry*, which are subject to two additional variables, *chance* and *government* (**Appendix 1**). These principles have shaped historical discussion on market-forces, and suggest that losing an advantage in any one determinate will negatively affect a nation's competitive advantage. This paper recommends five U.S. shipbuilding industry *policies* that shape and grow each determinate, and therefore our economic and military national competitive advantage, so that the U.S. retains its global economic and military leadership. If the shipbuilding industry is not sustained, the U.S.' ability to project military and diplomatic power through naval technological superiority upon competitors in Asia and regional powers in Africa and Asia will be diminished.

Following a discussion on the evolution and current status of U.S. shipbuilding, this paper sets forth an overview of each determinate, within the context of the industry, and proposed U.S. Government (USG) actions in their support.

HISTORICAL PERSPECTIVE AND CURRENT STATUS OF U.S. SHIPBUILDING

President Franklin D. Roosevelt often referred to America's industrial base as the "arsenal of democracy."[9] That arsenal was put to the test on December 7, 1941 when Japan's surprise attack on Pearl Harbor damaged or destroyed fifteen U.S warships, severely crippling the Pacific Fleet and propelling the U.S. into World War II.[10] By 1944, America's industrial base had not only repaired and put back into service all but three[11] of the warships bombed in the Pearl Harbor attack, but was launching ships faster than the Navy could place them in commission.[12] By the end of World War II, U.S. industry built more combatant tonnage than Britain, Japan, and Germany combined enabling the U.S. to field the world's largest naval fleet.[13]

However, this shipbuilding capacity did not develop overnight; in fact, World War II proved that naval shipbuilding requires a stable platform of experience in order to grow. This stability can be attributed directly to USG policies responding to the Great Depression, which forced Washington to look at naval shipbuilding as one of the many solutions needed to create jobs. Due to U.S. policy government subsidies and other policies that favored industry, eight private and eight Navy shipyards gained nearly a decade of experience designing, refining those designs, and then building very complex warships before the first shots were fired. In addition, the U.S. had both military and civilian leaders with enough foresight to see the coming war and the resolve to forcefully warn the President and Congress about the need to rejuvenate America's Armed Forces. As a result, months before the first bombs were dropped in Pearl Harbor, not only did the Navy have multiple classes of warship under construction but also America's shipyards were already in the process of overcoming the challenges associated with expanding capability.

Demand driving civilian and military ship construction rapidly diverged on war's end. Shielded by the Jones Act, the U.S. commercial fleet engaged in domestic trade flourished, supporting by 2011 approximately 40,000 hulls while receiving, on average, 178 self-propelled vessels per year into its ranks.[14] The U.S. Merchant Marine engaged in international trade, though, rapidly faded despite government assistance, and, with it, shipbuilding for that market. [15] The Ship Sales Act of 1946, intended to assist war-ravaged allies to re-establish industry and trade through the inexpensive purchase of surplus American merchant vessels, both shrunk the American merchant fleet and helped potential competitors, particularly government-owned fleets and flags of convenience, to regain their footing post-war.[16] By the turn of the 21st century, surviving U.S. firms benefitted from ongoing government efforts to preserve sealift capacity in private hands through cargo preferences, tax incentives, and MARAD's Voluntary Intermodal Sealift Agreements and Maritime Security Program.[17] By contrast, competition with the Soviet Union and conflict in Korea reversed early expectations for demobilization and encouraged continuing, if uneven, investment in the U.S. Navy. Following the 1989 collapse of the Soviet Union, Navy ship procurement slowed. Despite an emphasis on investment in modernization and technological innovation, budget constraints and the shrinking number of hulls in the U.S. Navy[18] prompted commercial and Navy shipyard closures, contributed to the consolidation of military defense contractors, and raised concerns over the viability of the shipbuilding industrial base.

The U.S. shipbuilding and repair industry encompassed about 550 companies with a combined annual revenue of about $37.3 billion and an industry profit of $1.4 billion[19]. Major companies include the shipbuilding divisions of General Dynamics and Northrop Grumman, both of which are U.S. military contractors. Other top companies include BAE Systems Ship Repair, Bollinger Shipyards, the inland barge division of Trinity Industries, and VT Halter Marine (a

subsidiary of Singapore Technologies Engineering).[20] The industry is highly concentrated; the largest fifty companies generate about ninety percent of industry revenue.[21] Of these, the six largest shipbuilders, commonly referred to as the Big Six, account for two-thirds of the industry revenue, and perform nearly ninety percent of all military work.[22] Currently, the East and Gulf Coasts are responsible for eighty-five percent of the entire production of the shipbuilding industrial base.[23]

The shipbuilding industry is one of the U.S. Top 50 Advanced Industries.[24] While the sector accounts for a modest .2 percent of U.S. GDP[25], the industry's economic contribution is concentrated in the 26 states hosting the U.S.' 124 shipyards. While stronger in past years, shipbuilding's contributions to the GDP could be revitalized through policy reform. This paper recommends five U.S. shipbuilding industry *policies* to shape and grow Porter's determinants, and therefore the U.S.' economic and military national competitive advantage. The five policy recommendations are to i) employ Human Capital to improve *Factor Conditions*; ii) reform the Jones Act to facilitate the *Demand Conditions* and bolster *Related Supported Industries;* iii) promote Foreign Military Sales (FMS) to positively impact *Firm Strategy, Structure, and Rivalry;* iv) direct government investment to Anti Access/Area Denial (A2/AD) strategies to hedge against *Chance* elements; and v) develop an Interagency Maritime Strategy to shape *Government policies*. The large US GDP, $16.77T, gives the U.S. decision space to resource its national defense strategy.

FACTOR CONDITIONS

The U.S. benefits from an array of favorable factor conditions, the state of those elements necessary to compete in a given industry and foster sustainable economic growth.[26] These elements, or factors of production, include human capital resources; physical or natural resources; knowledge resources in scientific, technical and market knowledge, capital resources, and infrastructure. Natural factors of production such as land, forest, phosphate, copper, iron ore, coal, oil, and natural gas[27] are also available within the U.S. to further support industry. The U.S. leads in management consulting, business process innovation, and areas where intellectual property rights are directly related to technology.[28] The U.S. must institute policy changes that sustain shipbuilding current factor conditions – most importantly human capital and technology - as well as build efficiencies and capacity needed for the U.S. to compete in the global market. This report asserts that investment in infrastructure and work force training will bolster factor conditions.

DEMAND CONDITIONS

The shipbuilding industry is overshadowed by domestic demand conditions, which negatively impact the U.S. shipbuilding industry.[29] Demand conditions are the "nature of home demand for the industry's product or service."[30] These include industry composition, size and pattern of growth, and the mechanism for how domestic preferences are transmitted to foreign markets.[31] U.S. domestic demand conditions, for both commercial Jones Act-regulated shipbuilding and military warfighting / logistic ships, prevent the U.S. shipbuilding industry from competing internationally. One result of government overregulation is lower U.S. shipyard efficiency, resulting in less domestic ability to compete internationally.[32] With the decline of military shipbuilding funding, the U.S. must consider ways to create demand outside of US domestic markets in order to sustain a competitive industry. One approach is to leverage the

Foreign Military Sales processes and expand industry's ability to sell warfighting and logistic ships in international markets. Internationalization could be seen following World War II, with U.S. firms pulled overseas by the "near absence of foreign competitors."[33] However in today's market, more efficient overseas shipbuilders have filled global market demands and U.S. shipbuilders are unable to compete, principally due to efficiency and capacity limits.[34] The U.S. must create policies to internationalize demand towards expanding global markets.

RELATED AND SUPPORTING INDUSTRIES

Given that the U.S. shipbuilding and repair industry is one of the Top 50 U.S. advanced industries (**Appendix 2**),[35] the USG must act to sustain domestic capabilities of industries related to, and supporting, the shipbuilding sector. Related and supporting industries are the "presence or absence in the nation of supplier industries and related industries that are internationally competitive."[36] A combination of Jones Act ramifications, lack of domestic human capital development, and the dwindling number of shipbuilding firms has greatly reduced related and supporting markets. This concern was captured in a 2013 report to Congress that the "DoD [Department of Defense] does not control the supply chain that supports production."[37] Further illustration comes with the fact that four of the six largest shipbuilders (BAE Systems, Austal USA, Keppel, and Fincantieri Marine Group) are foreign owned.[38] Related and supporting industries will atrophy if the U.S. does not regain its ability to compete internationally, if foreign buyers continue outpace the U.S, in advanced production processes, and if the U.S. lags further in refreshing shipbuilding technology and R&D investment.[39] The USG must take lead to set the conditions, through modifying the Jones Act, so that supporting industries can rebound in order to reestablish U.S. shipbuilding industry sustainment and growth.

FIRM STRATEGIES, STRUCTURE, AND RIVALRY

Firm strategies, structure, and rivalry are "conditions in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry."[40] Different firms have different strategies, some limited by federal management of the industrial base/geography, to manage the workforce and profit, given wild swings in raw material prices and shipyard orders. One shipbuilder, for example, has a business model where it builds ships and then sells to an operating division within its own company. Another builds at a pace to sustain its work force, even though it may underutilize its overall capacity. Others rely heavily on federal and state grants to cover human capital costs and training. Whatever the firm's strategy, structure or rivalry, however, the reality for the nation's defense shipbuilders is that there are still only two customers -- the U.S. government and international partner nations. By increasing Foreign Military Sales, the government will help U.S shipbuilders by providing a more stable order book while at the same time reaping a diplomatic benefit.

CHANCE

Chance is an area that this paper considers a significant national security concern. Porter defines chance as the development of events "outside the control of firms" and includes pure innovation, technical discontinuities, input discontinuities such as oils shocks, world financial

markets shifts, world demand surge, foreign government political decisions, and wars.[41] The ability for the U.S. to be ready to respond to chance events is directly related to the nation's access to the seas, to include the littorals. As such, Anti-Access/Area Denial (A2AD) strategies employed by other nations against U.S. naval forces are of particular concern in that they may place limits on *freedom of the seas* for U.S. and partner nations, jeopardizing economic and military interests. The future A2/AD environment is unpredictable and the role of chance will drive the need for future military shipbuilding acquisition and technology strategies. The U.S. must invest in naval assets able to overcome A2/AD threats, thereby positively impacting economic growth and military security as well as bolstering the U.S. national competitive advantage.

GOVERNMENT

The USG must set the conditions to strengthen the shipbuilding industry. Governments, thru policies and regulations, can "improve or detract from the national advantages."[42] Again, Porter states "Government's real role in national competitive advantage is in influencing the four determinants."[43] The USG, including Congress and DoD, currently lacks the ability to reassure domestic shipbuilders with stable requirements and predictability in acquisitions with regard to future platforms. A single, U.S. national maritime strategy, developed, endorsed and implemented by the interagency[44], is critical. Leadership for this task must originate with the National Security Council (NSC). Without a single national maritime strategy for U.S. flagged shipping, Congress and agencies will be forever negotiating changing requirements while missing the opportunity to develop cogent acquisition plans that reduce the risk of wasted resources.

The loss of economic competitive advantage, in the maritime sphere, would become manifest in the U.S. inability to shape economic forces in ways favorable to the U.S. It would negatively affect U.S. capabilities across diplomatic, information, military, and economic instruments of national power and permit adversaries, competitors, and allies alike an undue influence in determining the U.S.' future.[45] While a priority of MARAD is the development of a National Maritime Strategy, this paper asserts that the U.S. must develop an interagency national maritime strategy that addresses in particular U.S. flagged shipping, both commercial and military vessels, in order to instill confidence in the shipbuilding industry.

SUMMARIZED POLICY RECOMMENDATIONS

The U.S. government must address head-on its responsibilities to shape the four determinates towards conditions that promote GDP growth. The five policy recommendations presented in this paper are intended to address the decline of the shipbuilding industry's contribution towards the U.S. GDP. Human Capital investment links to managing factor conditions by increasing industry capacity to innovate, upgrade infrastructure, and train industry workers in the latest tools of the trade. Jones Act modifications shape Demand Conditions and enable further growth for Related Supported Industries. Foreign Military Sales should be applied to positively shape, in the U.S.'s favor, the Firm Strategy, Structure, and Rivalry determinate. A2/AD investments hedge against the elements of Chance. An Interagency Maritime Strategy would direct Government policies on acquisition, requirements, and resourcing decisions across all U.S. government agencies, delivering certainty and building confidence. The portfolio of shipbuilding industry policy changes will grow the shipbuilding industry's contribution to the

GDP and increase economic and military instruments of national power, strengthening national security.

ESSAYS ON MAJOR ISSUES AND CORRESPONDING POLICY RECOMMENDATIONS

HUMAN CAPITAL, TECHNOLOGY AND THE INDUSTRIAL BASE

Throughout history, the ability to acquire ships for military or commercial purposes has been deemed important to a nation's well-being.[46] Within each maritime nation, the commercial shipbuilding sector strives for the ability to retool and meet the need of ever-changing transportation markets. The defense shipbuilding sector works to be able to adapt and meet evolving mission requirements, such as refining platforms and integrating new war-fighting technologies.[47] The outcome of a robust, competitive shipbuilding industry remains a positive influence on military power, economic well-being, and national security. If the U.S. does not invest in advanced human capital and technology for the US shipbuilding base, it will lose its ability to sustain this industry for the future.

The U.S. shipbuilding industry is a highly complex industrial market and one of the nation's oldest industries, but, for over a century, the industry has faced a decline in growth,[48] a trajectory only interrupted on the occasion of war. Since the 1980s, the industry has faced several internal and external threats. Many industry leaders continue to voice concern regarding the general economic stability of the shipbuilding industrial base and its ability to meet mobilization requirements.

The cyclical nature of the shipbuilding industry, coupled with the length of time for the construction process, creates significant fluctuations in the labor mix that is required to support the industry.[49] To address these fluctuations, shipyards within the United States use layoffs and slowdowns to ensure that the organizations can handle the low workload. However, by handling issues in this manner, the balance struck hurts the overall investment in human capital needed to ensure that qualified workers are employed by the shipyards to complete the work. Constructing sound ships requires highly specialized skills that cannot be learned overnight. It takes years for ship-fitters, electricians, etc. to learn their maritime tradecraft satisfactorily, even if they have had previous training outside of the maritime realm. For perspective, it takes an average of four years to train a welder in shipbuilding techniques before they are fully productive in a shipyard. Another area affected is the advancement in technology. U.S. shipbuilding is an average of twenty years behind international shipyards regarding advanced technology.[50] The decline in human capital investment and technology means that U.S. shipbuilders are always trying to catch up to the international community.

Policy Recommendations

A nation's competitive advantage depends on the capacity of its industry to innovate and upgrade infrastructure, while investing in human capital to stay viable in the international community. Companies gain advantage against the world's best competitors because of pressure and challenges they face in the industry. They benefit from having strong domestic and international rivals, aggressive home-based suppliers, demanding local customers – and an understanding when to innovate. Therefore, some form of government support for shipyards has become accepted as "normal" throughout most of the world.[51] Most international shipyards are more advanced and depend on government support to function, placing U.S. shipbuilding industry

is at a distinct disadvantage. To help the U.S. shipbuilding base be more competitive, support through direct investment in technology and human capital is needed from the U.S. government and private sector.

Human Capital: Investing more in human capital is essential to sustaining the U.S. shipbuilding industry base. The USG and the shipbuilding industry need to be more proactive in developing a joint plan to sustain and train the workforce. The status quo is not sustainable in the long term; training and investment must occur by both the U.S. government and the shipbuilding industry. Today the U.S. government has several different grant programs for training of local workforces; shipyards can apply for these funds through different federal agencies, but these vehicles could be more direct. Instead of creating many different areas to apply for these funds, direct subsides could be set aside each year for the purpose of training and disbursed to the industrial base directly. Furthermore, a portion of the workforce could be federalized to prevent instability or high turnover in the industry. Training centers already exist, and a similar approach to federalizing shipyards is used to support U.S. public shipyards.

Technology: Advanced and mature technologies can bring about significant efficiencies and cost savings, especially when they become widely available. Such advancements are very limited in shipbuilding.[52] Industry and government must look for ways to collaborate to improve technology transfer opportunities and seek ways to incentivize efficiency and cost reductions. The government pays for decreased capacity, either through the inefficiencies that increase costs and schedule delays or, as over the last century, through significant sums to private corporations to build manufacturing capacity and improve manufacturing efficiencies.[53] Industry would be more willing to share the burden of the cost if the government continued to seek future partnership opportunities. The improved collaboration would also enable technology transfers between government and industry partners, maximizing investment dollars by pooling resources to solve joint problems.

Another proactive measure for the shipbuilding industry to undertake is to sponsor IT and technology developments in an academic environment. Nearly every U.S. shipyard reaches out to middle and high schools student to recruit laborers. These outreach programs address the requirements for today's shipbuilding industry. However, the industry needs to recognize the demand to move the industry forward into the Information Age and invest in the future. Shipyards can make great strides in meeting future requirements by leveraging the expertise and work being done in technical colleges and universities. They can tap into this know-how by sponsoring research and development initiatives to design and deliver revolutionary changes to the shipbuilding industry, rather than making incremental changes as they present themselves.

To its credit, the U.S. shipbuilding industry is looking for ways to improve processes and increase efficiency. However, it often embraces innovation as presented, mostly by leveraging what is developed overseas. By the U.S Government investing in local innovation the U.S. shipbuilding industrial base will regain some of its competiveness in the industry and prove the U.S. is still a maritime nation. Without this support, the U.S. shipbuilding industry will relegate itself to being an international follower, as opposed to capitalizing on what the U.S. is known for – an innovative and technologically advanced nation.

Building ships for military or commercial purposes is important to a nation's well-being and the overall strength of the shipbuilding industrial base. The outcome of a robust, competitive shipbuilding industry remains a positive influence on military power, economic sustainment, and national security. If the U.S. does not invest in advanced human capital and technology for the

U.S. shipbuilding base, the ability to sustain the industry for the future will be lost. Understanding that the U.S. is losing ground to international overseas shipbuilders is key to pushing the needed advancements forward. In the end, the U.S. has to decide if it is a maritime nation; if so, the shipbuilding sector deserves the investment needed to keep the base alive.

JONES ACT MODIFICATIONS TO SHAPE DEMAND

The overregulation of the U.S. shipbuilding industry and lack of direct government subsidies has resulted in less technologically advanced and less efficient domestic shipbuilding practices, ultimately causing the price of a ship built in the U.S. to be roughly three times higher than that of a similar ship built in South Korea. Since ships built in the U.S. cost more than those built in other countries, the majority of domestic shipbuilders are solely dependent on the demand for Jones Act compliant ships to remain in business. The below essay further evaluates the impact of the Jones Act on the domestic shipbuilding industry.

Although the Jones Act has long been considered the foundational law for U.S maritime policy,[54] the Jones Act is viewed by many as a 1920s holdover that serves no contemporary purpose. Although the Jones Act continues to safeguard a portion of the U.S. commercial maritime industry that serves as a military auxiliary in wartime, critics argue that it serves only to increase shipping costs, smother competition, and inhibit innovation in the U.S. shipbuilding industry.[55] However, the reality is that the Jones Act currently serves a vital role in support of the U.S. economy and national security by preserving the capacity to build, repair, crew, and deploy U.S. ships when they are needed in support of peacetime operations, in response to contingencies, or during times of war. The USG must continue to support the Jones Act as the commercial shipbuilding industry and merchant marine fleet are essential features of the country's economy and national security.

The Jones Act refers to a portion of the Merchant Marine Act of 1920 introduced by Senator Wesley Jones. It is a federal statute intended to bolster the American Merchant Marine fleet by regulating maritime commerce in U.S. territorial waters and between U.S. ports. Within this Act is the heart of U.S. maritime policy still today:

> It is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States; and it is declared to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of such a merchant marine…[56]

More specifically, the Jones Act mandates that all maritime shipping between two U.S. ports must occur on ships that meet four criteria: 1) owned by U.S. citizens; 2) crewed by U.S. citizens or permanent residents; 3) built by U.S. shipyards; and 4) operated under U.S. laws and regulations.[57]

Opponents of the Jones Act

Opponents of the Jones Act contend that the law prevents fair competition in the shipbuilding industry by foreign nations, which results in U.S.-built ships being much more expensive than ships built in other countries. However, almost every other maritime country has enacted legislation or practices with effects similar to the Jones Act, such as extensive government

subsidies or direct cash payments to their shipbuilding industry in order to keep firms afloat (or increase market share) and maintain seemingly competitive shipbuilding costs. It is clear that these protectionist measures have been in place for hundreds of years and continue today. Most maritime nations impose some type of restrictions on commercial vessel ownership, crewing, or actual ship construction for vessels operating domestically within their territorial waters.[58] South Korea, for example, is home to the largest shipbuilding companies in the world. The South Korean government is known to provide substantial subsidies and even government bailouts to their shipbuilding companies. This practice enables South Korean shipbuilding companies to sell their vessels at or even below the cost of construction. For example, in January of this year, the South Korean government announced it was establishing a $1.2B fund to support the domestic shipping industry following months of losses and will require shipbuilders to downsize.[59] This follows nearly $5B in cash and loan guarantees provided by the Korean Development Bank to just one of the shipyards hardest hit by the recent downturn in production.[60] This practice of pricing new ship construction artificially low has allowed South Korea to drastically increase their share of the world shipbuilding market and regularly invest in the latest and greatest shipbuilding technological advances. Traditional anti-dumping and countervailing legislation does not apply to shipbuilding.[61]

The second argument is that this lack of foreign competition results in increased shipping costs that are ultimately paid by consumers. However, repealing the domestically constructed, owned and crewed provisions of the Jones Act would not level the playing field and create "fair" competition as opponents suggest; it would instead put U.S. shipbuilders and ship-owners at an even greater disadvantage.[62] Most commercial shipbuilding yards within the U.S. would simply cease to exist without the Jones Act and the steady business it provides to them and their supply chains. The negative economic and social effects to the U.S. commercial shipbuilding industry would be immediate and catastrophic as most of our coastal states depend on the shipbuilding industry and their associated supply chain for their livelihoods. Especially at a time when the U.S. economy is still trying to recover from a recession, the enormous negative economic impact and loss of GDP resulting from the bankruptcy of commercial shipyards and domestic shipping firms around the U.S. cannot be overemphasized.

Furthermore, the Government Accountability Office (GAO) study conducted in 2013 surmised that, although repealing the Jones Act would introduce foreign competition, which would presumably decrease shipping rates, these foreign-flagged ships would still be subject to U.S. labor, environmental and safety regulations[63] and other laws, likely minimizing cost differences. The report went on to note that repealing the Jones Act would almost certainly cause a surge of consolidation among existing carriers and cause the higher-cost carriers to exit the market, so any benefits gained from initially lower freight rates may not be sustained for very long.[13]

A separate GAO study conducted in 2013 focused on the potential impacts of repealing or permanently waiving the Jones Act for Puerto Rico. The study concluded that modifying the Jones Act for Puerto Rico "would have uncertain effects and may result in difficult tradeoffs", an observation, which does not exactly support change.[64] The GAO study also concludes that repealing the Jones Act would cause immediate harm to domestic shipbuilders and military readiness. If American policy makers desire to reduce shipping costs, a better solution would be to support revitalizing our commercial shipbuilding industry, port infrastructure, and maritime industry as well as develop more affordable shipping fuel.[65]

Advocates of the Jones Act

Supporters of the Jones Act proffer two major justifications in its favor. The first and most important justification is the direct linkage between the Jones Act and U.S. national security, as well as the impacts to national security if the Jones Act were repealed. The second rationale outlines the impact the Jones Act has on the U.S. economy, and the negative repercussions that would follow if the Jones Act were to be repealed.

National Security Impact: The U.S. domestic Jones Act fleet is an essential link in our national transportation infrastructure and a vital element of our military readiness and force projection. The Jones Act is directly responsible for the creation and maintenance of the merchant marine, commercial U.S. ships that play a crucial role supporting our troops during contingencies, and is regularly used to support our friends and allies during other emergencies or natural disasters.[66] The merchant marine is responsible for transporting supplies and military equipment to and from the U.S. in times of peace and war. As a recent example, there were as many as 167 merchant marine ships supporting Operation Iraqi Freedom on a single day in 2003 under the direction of the Military Sealift Command (MSC).[67] It is widely accepted that having a strong Navy is essential to securing the oceans and thereby enabling sea trade. Having a strong Navy is dependent on the U.S. industrial base to build new ships and repair/maintain existing ships.[22] A strong Navy is also dependent on the merchant marine and MSC for logistical support in peacetime as well as contingencies and wartime.

The U.S. Merchant Marine is the feeder source for both ships and professional mariners for MSC. MSC is the leading provider of ocean transportation for the Navy and the rest of the DoD, providing an average of 110 ships around the world supporting the DoD on a daily basis. MSC operates the ships that provide logistical support to the Navy and other sea services during peacetime as well as wartime, serving as a critical enabler of U.S. power projection and directly supporting our national security objectives.[68]

If the Jones Act were repealed, the U.S. shipbuilding industry would rapidly decline as companies choose to have new ships built overseas for a significant cost savings. Similarly, most commercial ship owners would choose to re-flag their vessels under foreign nations where there is much less regulation and cheaper labor, again realizing a significant cost savings. The U.S. would then see a drastic decline in its shipbuilding industry and merchant marine fleet, leaving MSC without a domestic fleet to draw from in order to accomplish their mission of supporting the Navy and DoD. The U.S. citizen-mariner pool needed by MSC and DoD in times of peace and war would disappear. The USG would then be forced to pay even more exorbitant prices for the construction of new naval vessels and rely on foreign-owned or flagged vessels to transport military cargo during peacetime as well as during contingencies when ocean travel may be contested by adversaries. Maintaining an industrial base of commercial ship construction and repair/overhaul in the U.S. is absolutely vital in maintaining shipyard capacity, and that of their supplier chain, in order to support the DoD and U.S. national security objectives in war time.[69]

Economic impact: The positive economic impacts of the Jones Act are enormous as domestic carriers upgrade their fleets with ocean-going vessels, barges, ferries, and offshore supply vessels while U.S. shipyards and ports modernize their infrastructure.[70] The U.S. domestic shipbuilding industry has a serious impact on our national economy, adding $49.3B in 2013 in income, goods and services to U.S. economic output.[71] New ship construction and refurbishment has an even greater impact on the U.S. national economy once the multiplying effect of the supply chain and services sector - everything from steel manufacturing to welding supplies to trucking-

is taken into account.[72] American shipyard workers and their supply chains are crucial to the well-being of our nation from both an economic and national security perspective.

Policy Recommendations

The U.S. should maintain the Jones Act as it is a crucial component of the U.S. maritime industrial base. However, the Jones Act in its current version is not enough. Based on the performance of the U.S. shipbuilding over the past 96 years, and leaving aside the total destruction of the competition in World War II, the Jones Act has not created an environment that promotes shipbuilding nor has it provided for a viable merchant marine force for national security. The Jones Act should be updated and modified to account for where the U.S. shipbuilding industry is today, as well as to create incentives that will allow the industry to regain a competitive advantage on the global market. The role of the U.S. government is not to interfere with the marketplace, but rather to assist in creating a fair and even playing field in which all parties may compete; shipbuilding is the right place to apply wise government policy levers.

The first policy recommendation for an updated Jones Act is to consolidate and streamline the regulatory requirements for the marine industry. According to the 2014 McLaughlin-Sherouse List, the "Deep Sea, Coastal and Great Lakes Water Transportation" industry had 11,279 restrictions placed on the industry; this places the marine industry in the top ten most regulated industries in the U.S.[73] Such heavily regulated industries reduce entrepreneurship and impact employment opportunities, which also potentially divert investment dollars and affect labor productivity.[74] Reducing the regulatory burden will not only help simplify the compliance process, but will greatly assist in reducing the cost of business for shipbuilders. A more competitive U.S. shipbuilding industry will improve national security through better priced navy ships and increased sea power worldwide through the availability of more U.S. vessels.

A second recommendation for an updated Jones Act is to create incentives to build the ships needed for the merchant marine force. Unfortunately, the ships needed to transport military personnel and cargo do not always line up with the vessels demanded by the market for moving commercial merchandise across the waterways. Tax breaks, grants, loans and investment incentives should be used to modernize U.S. shipyards and create new ship designs that can meet multiple U.S. shipping demands. These incentives would only be in place for 10 years, not in perpetuity, in order to have an opportunity to evaluate the success of various programs. These programs will be paid for through a higher tax rate for the shipbuilding industry following an improved performance period. This initiative directly impacts national security by ensuring the U.S. has a current and viable merchant marine force, which the current Jones Act has not done well over the last 96 years.

The time to act is now. The Jones Act, in the current form, falls short of the policy goals and national security objectives as proposed. American sea power is worth saving, and can continue to provide the U.S. with both economic power through commerce and protection through national security.

USING FOREIGN MILITARY SALES TO EXPAND THE MARKET FOR U.S.-BUILT VESSELS

As a leading economic and military world power, the U.S. historically uses arms transfers as a tool of foreign policy, distributing weapons for a variety of strategic purposes. International

arms transfer is a form of security assistance to other countries authorized by the Arms Export Control Act (AECA) and is a fundamental tool of U.S. foreign policy aimed at protecting national security interests and supporting defense strategies.

Foreign military sales help achieve enduring national interests, including "the security of the United States, its citizens, and U.S. allies and partners" and "a rules-based international order advanced by U.S. leadership that promotes peace, security, and opportunity through stronger cooperation to meet global challenges."[75] Thus, weapons transfers help to keep international order in balance by:

- Strengthening the U.S. global network of Allies and Partners;
- Increasing their interoperability with U.S. forces; and
- Providing assets for their own defense.

In order to develop and maintain global cooperation with partners and allies the USG maintains numerous Security Cooperation Programs, enabling a variety of arms sales. Arms transfers are mostly conducted under Security Assistance through a wide range of options. The U.S. Navy, in particular, participates in three main programs that facilitate weapons sales to foreign governments: Foreign Military Sales, Direct Commercial Sales and Excess Defense Articles.

"*Foreign Military Sales* (FMS) Program is that part of Security Assistance authorized by the Arms Control Export Act (AECA) and conducted using formal contracts or agreements between the [USG] and an authorized foreign purchaser. These contracts … provide for the sale of defense articles and/or defense services (to include training) usually from Department of Defense stocks or through purchase under DoD-managed contracts."[76] The Departments of State and Defense administer this program. Under the FMS program a buyer not only receives hard assets, but also related software, spares, repairmen, engineering and logistics support, publications and personnel training – all of the support for a weapons across its lifecycle. Foreign Governments can pay for the U.S. assets/services from their national budgets, however, funds can also be provided through USG assistance programs or grants.

The *Direct Commercial Sales* (DCS) program is administrated by the Department of State. Its Directorate of Defense Trade Controls is responsible for DCS implementation by regulating and licensing private companies to sell weapons, other military equipment, defense services and military training to foreign countries.

The Foreign Assistance Act (FAA) of 1961 defines *Excess Defense Articles* (EDA) as: "…the quantity of defense articles …owned by the United States Government…which is in excess of the Approved Force Acquisition Objective and Approved Force Retention Stock of all Department of Defense Components at the time such articles are dropped from inventory by the supplying agency for delivery to countries or international organizations under this Act."[77] In other words, defense articles declared as excess by DoD can be offered to foreign governments or international organizations in order to support U. S. national security and foreign policy objectives. Partner nations can receive EDA at a reduced price based on the condition of assets, but are responsible for the expenses related to packing, handling, transportation and refurbishment, if necessary. In the most cases, nations use EDA transfers to support modernization of their forces.

Policy Recommendations

Given that most foreign navies are comprised primarily of frigates, corvettes, cutters, and other types of smaller craft, the Navy's small surface combatants (littoral combat ships and the

impending frigates) and the Coast Guard's national security, offshore patrol, and fast response cutters present the best opportunity for foreign military sales. The benefits are many: increased interoperability among naval forces, decreased unit costs, diplomatic and military prestige on the world stage, and sustainability of American shipyards and skilled labor thanks to increased orders. Once the uncertainty regarding the ships' capabilities and survivability have been addressed, the U.S. government and industry leaders should do their utmost to become the leader in this significant, large market segment.

The same benefits exist with larger capital ships and surface combatants, albeit to a lesser degree considering the very small number of countries that can purchase and operate these ships. Most aircraft carriers operated by foreign navies are the equivalent of the Navy's amphibious assault ships, capable of launching rotary, tiltrotor, and fixed wing (short takeoff/vertical landing [STOVL]) aircraft. There is certainly a market for these ships. China's aggressive behavior in the western Pacific has renewed interest in amphibious capabilities. Along with Marines providing training and exercising with their counterparts, the U.S. should at the same time encourage the sale of its amphibious assault ships. On that note, the Defense Security Cooperation Agency (DSCA) should have representatives attending bilateral and multilateral training exercises to provide partners with an opportunity to discuss and influence arms sales after they have seen the "goods" in person and witnessed them in action.

Along with hulls, the U.S. should strongly consider making its advanced combat systems available to its closest, most trustworthy allies and partners. Because of the heightened interest in ballistic missile defense around the world, the AEGIS combat system would likely be in very high demand. Discretion is the key; taking the Corruption Perceptions Index, diplomatic relations, and weighing the risk of advanced technologies being used inappropriately or transferred to undesirable parties and nations must be taken into account when vetting potential customers.

The U.S. should also shift away from selling decommissioned vessels in order to encourage the sale of new ships. Favorable loans with low interest rates, perhaps facilitated by the Export-Import Bank, can lead to greater sales. If the expansion and modernization of domestic shipyards are required to support an increase in foreign orders, the Bank may be able to assist with that as well. Otherwise, the USG can provide tax incentives or direct subsidies. The USG can also help offset industry's costs associated with producing other incentives that companies can offer to attract foreign customers.

The U.S. is not alone in selling its naval wares. There are many European and Asian countries that sell completed ships, licenses for ship designs, and vessel construction services. The U.S. should be more aggressive in expanding its market share to reap the considerable benefits outlined earlier.

POTENTIAL IMPACT OF A2/AD THREATS ON THE SHIPBUILDING INDUSTRY

"The Enemy gets a vote" is a popular military phrase, and succinctly captures the concept that an enemy, adversary, or competitor has a say in what the future looks like. Shipbuilding in support of the U.S. Navy is based on military planning assumptions regarding enemy capabilities. Since this involves looking into the future, there is an element of chance involved, and is a great example of one of the underlying forces that Porter uses to describe the "competitive advantage of nations". In order to further explore this topic, the following essay examines the impact of anti-access/area-denial strategies on the Navy's shipbuilding base.

The emergence the Anti-Access/Area-Denial (A2/AD) threat, coupled with a shrinking U.S. defense budget, creates a perfect storm of risk and opportunity for the U.S. Navy and her shipbuilding industrial base. To overcome this risk, the Navy must take two actions with regards to its fleet: first, embrace a wide range of small surface combatants and, second, pursue a mix of traditional big deck aircraft carriers and smaller, more inexpensive aircraft carriers. Taken together, these actions will allow the shipbuilding industry to better support Navy missions and future shipbuilding plans in the face of emerging A2/AD threats in the Pacific.

In the mid-1990s, senior defense leaders began discussing the ramifications of emerging long range threats to the U.S.'s ability to deploy forces into a theater. These observations were born out of the U.S.'s experience in Operation DESERT SHIELD/DESERT STORM, when the U.S. was fortunate to have six months and uncontested sea and air lanes to build up air, sea, and land forces in the Persian Gulf before commencing combat operations in January 1991. Following U.S. success in the first Gulf War, competitor nations - in particular, China - sought to develop asymmetric capabilities to hold U.S. forces at risk in the event of a major theater conflict.[78]

At its core, an A2/AD strategy is in effect a deterrent strategy. The Chinese seek to create enough risk in deploying U.S. forces into theater that the U.S. would question the wisdom of even introducing those forces into theater in the first place. In order to create that risk, the Chinese invested in a diverse portfolio of capabilities to enable an A2/AD strategy.

The Chinese A2/AD portfolio consists of a mix of ground-based, air, and naval assets and associated weapons systems enabling the Chinese to dissuade, deter, and attempt to defeat U.S. naval and air forces operating in the Western Pacific.[79] Across all warfighting domains, the Chinese have invested in long-range precision strike This entire system of systems is backed up by a robust intelligence and surveillance system that includes satellite surveillance, over the horizon sky wave and surface wave radars, and an enormous amount of digitally obtained intelligence gained on U.S. operations.[80] This impressive intelligence effort is used to cue the A2/AD system of systems allowing the Chinese to attempt to target U.S. forces should the need arise.

The Navy's Long Range Vessel Construction Plan

A review of U.S. 30-year shipbuilding plans from year to year generally shows small perturbations in numbers of each ship built (within class) based on fiscal realities faced by the Navy during each fiscal year (FY) and over each future year defense plan (FYDP). The Navy is tasking the shipbuilding industry to produce nuclear aircraft carriers (CVNs), guided missile destroyers (DDGs), small surface combatants (Littoral Combat Ships (LCS) or Frigates (FF)), nuclear attack submarines (SSN), ballistic missile submarines (SSBN), and a mix of amphibious assault ships (LHA, LHD, LPD, etc), logistics vessels and support vessels to enable and support the battle line.[81] A historic review to FY06 fails to reveal any significant shifts in the types of ships the Navy is asking the shipbuilding industry to produce, despite a drastic shift in the A2/AD capabilities of China.[82] This begs the question- is the Navy considering the rise of A2/AD capabilities and strategies sufficiently in its shipbuilding plan, and is the shipbuilding industry postured to handle future shifts in shipbuilding requirements driven by the evolving threat? In order to understand this question, a closer examination of the major ship types and ship builders will be instructive.

Littoral Combat Ship / Frigate: The LCS program is unique as it is the only surface combatant in the Navy's inventory that was designed with the A2/AD environment in mind. LCS, conceived in the wake of 9/11, was built to counter the nascent A2/AD threats emerging in the

Persian Gulf and elsewhere, including submerged mines, swarming fast attack boats, and quiet diesel-electric attack submarines. The platform embraced many levels of immature technology, including modular mission packages and a smaller rotational crew construct that would allow the ship to spend more time at sea.[83] The LCS employs one of three primary mission packages (MPs): surface warfare (SUW), anti-submarine warfare (ASW), and mine-countermeasure (MCM) packages allowing a theater commander to tailor the LCS platform to the threat.[84] The LCS program encountered numerous problems in cost, schedule, and performance, and, in December 2015, the Secretary of Defense directed a truncation of the program and transition to the Frigate program.[85] The Frigate program will also be a small surface combatant, but will be more survivable, and will adopt an enduring mission focus, vice a modular mission focus like LCS.

The LCS seaframes are effectively two completely different vessel classes, and are produced at two different shipyards. The Independence Class LCS are produced at Austal USA in Mobile, Alabama on behalf of General Dynamics, and the Freedom Class LCS are produced by Fincantieri Marinette Marine in Wisconsin on behalf of Lockheed Martin.[86] These shipyards were either non-existent or markedly less capable before their parent companies invested massive amounts of capital into them prior to the awarding of the LCS contracts in the mid-2000s. The creation of two world class shipyards from scratch to support the US Navy is, indirectly, the greatest impact of the A2/AD threat on the U.S. shipbuilding industry to date.[87] The Navy is well-placed to maximize the industrial capacity created at these two shipyards to produce larger numbers of small surface combatants, enabling a more cost-effective, dispersed operating force.

Submarine Force: The submarine force is another beneficiary of the increasing A2/AD capability of the Chinese. Given the threat to surface and air forces, and acknowledging the current weakness of Chinese anti-submarine warfare capabilities, the submarine force will continue to be an area of investment that will allow the U.S. to operate freely in the Western Pacific.[88] The ballistic missile submarine force serves as critical leg of the nuclear triad, and the Ohio Class replacement program promises to consume one third to one half of the Navy's shipbuilding budget, unless DoD appropriates separate funding for the Triad's recapitalization.[89]

The guided missile submarines (SSGNs), converted from SSBNs after 9/11, will be phased out during the 30-year shipbuilding plan, but their striking power will be backfilled by the Virginia Class Payload Module (VPM). The VPM is an additional hull segment built into Virginia class submarines starting in FY19. VPM allows an additional complement of either Tomahawk Land Attack Cruise Missiles (TLAM) or unmanned-underwater vehicles, giving them additional land attack striking power or capability.[90] This significant capability will enable precision targeting in the A2/AD threat environment. Additionally, the Virginia Class SSNs will ramp up production to two hulls per year, via a split production mechanism between General Dynamics/Electric Boat and Huntingdon Ingalls Industries/Newport News Shipbuilding. This will keep the industrial base engaged delivering multiple attack submarines per year until FY25.[91]

Large Surface Combatants: Large surface combatants include DDGs and Cruisers (CGs). The Navy does not forecast the acquisition of any more CGs in the 30-year shipbuilding plan, likely indicating that future DDGs will assume the critical role of area air warfare (AAW) commander.[92] DDGs are multi-mission workhorses, capable of anti-surface, anti-submarine, anti-air, and ballistic-missile defense. Given the DDG's robust capability against a slew of A2/AD threat profiles, and given the acquisition priority shown in the shipbuilding plan, there is little to no volatility presented by the A2/AD environment for the DDG force. DDGs are produced at two shipyards- Bath Iron Works and Ingalls Shipyards via a work-sharing arrangement that helps

preserve the industrial base and increases output of major surface combatants. These shipyards have been the sole producers of major surface combatants for the U.S. Navy since 1985.[93]

Carriers & Amphibious Assault Ships: Perhaps the most contentious platform discussed from an A2/AD threat perspective is that of the CVN. Since the Second World War, the CV (and later the CVN) has been the centerpiece of the Navy's fleet. This has led to a period of approximately 70 years where the aircraft carrier has been the primary vessel around which the rest of the fleet has been built, both operationally and fiscally.[94] Aircraft carriers are employed as part of carrier strike groups (CSGs), which are task organized forces that include a CG, DDGs, SSNs, and support ships to allow the carrier to operate. Similarly, expeditionary strike groups (ESGs) are built around amphibious assault ships (LHA/LSD/LHD/LPDs), which allow Marine forces to conduct amphibious operations ashore. ESGs are similarly constructed with supporting escorts to allow it to operate and defend itself in harm's way.

CVNs have steadily increased in cost over the years, with the current Ford class CVNs costing approximately $11-12B per ship, compared to $5B per ship for the Nimitz class ships they are replacing.[95] Given the extreme cost of these ships, emerging A2/AD capabilities like the DF-21 anti-ship ballistic missile (ASBM), and the limited inventory of CVNs (11), deployment of CVNs into harm's way in a future conflict clearly puts an extraordinary amount of blood and treasure on the line.

A contrary school of thought, championed by multiple think tanks, advocates for less capable, cheaper CVs or CVNs.[96] The rationale behind this argument is that, by building cheaper vessels, the Navy can afford to put more CV/CVNs afloat, which preserves flexibility and resilience should a shooting war start. Similarly, by finding savings in the funding for CV/CVNs, the Navy can afford to build a greater number of other surface combatants, which will allow the Navy to create a more networked, resilient battle force. This will create a force which is more survivable in an A2/AD contested environment.

From an industry perspective, should the Navy choose to make a break with their traditional super-carrier CVN design, the shipbuilding base is capable of absorbing the change in strategy. Since the 1950s, every American carrier has been built by Newport News Shipbuilding.[97] As such, Newport News has the intellectual and industrial expertise to create modified designs to meet the Navy's needs for smaller carriers. Similarly, their parent company, Huntington-Ingalls Industries, runs the Ingalls Shipyard in Pascagoula, Mississippi which has built large-deck amphibious assault ships for the Navy, including LHDs and LHAs.[98] These ships, displacing 40-45K tons, are comparable to aircraft carriers commissioned by other fleets, and are the centerpiece of an ESG. In summary, HII Shipbuilding is well-positioned to respond to shifting Naval ship requirements driven by changes in the A2/AD threat environment, and the Navy should use the evolving threat and the impending fiscal cliff as a stimulus for meaningful change to the battle force.

Policy Recommendations

The emergence of the Chinese A2/AD strategy, compounded by domestic political gridlock and fiscal uncertainty in the U.S., creates a significant challenge for U.S. naval power projection in the Pacific. This challenge can be met and converted into opportunity if the Navy chooses to embrace changes to its battle force construct at the low and high end of the battle force. By maximizing output of the new shipyards at Fincantieri and Austal, USA, the Navy can task the shipbuilding base to expand its small surface combatant fleet. This growth of the small surface combatant fleet can be financed by a shift away from sole reliance on nuclear powered super-carriers towards a mix of CVNs and smaller, less expensive CV/CVNs. This shift will allow a

more diverse, potentially more survivable capability that the U.S. may be more willing to commit to an A2/AD combat environment. Additionally, the Navy should continue the current uptick in submarine production in order to grow the fast attack submarine force as it fills a central role in permitting access to an A2/AD environment.

NATIONAL MARITIME STRATEGY

Strategy articulates priorities and provides guidance on the path forward. As Liddell Hart explained, strategy is "the art of distributing and applying military means to fulfill the ends of policy."[99] However, the U.S. does not have an overarching national maritime strategy supported by interagency buy-in. The responsibility of government, as defined by Porter, to "… influenc(e) the four determinants,"[100] remains unfulfilled.

To that end, the President must task the NSC to develop a single, national-level strategy for U.S. flag shipping with direct support from all USG departments and agencies. This policy recommendation is focused towards both national defense shipbuilding and the maritime industry as a whole. An interagency national maritime strategy can be leveraged to determine shipbuilding force structure across the USG and convey requirements to industry more succinctly.

The NSC approach should follow a few simple steps. Initially, global maritime security requirements should be addressed as seaborne movements or *flows* across the global commons.[101] *Flows* include economic commerce, military forces, refugees, foreign fighters, etc. The key objective is to define where U.S. maritime security will shape the conditions to ensure the rule of law, U.S. economic prosperity, and freedom of navigation. By closely reviewing where the exercise of maritime state authority is at its weakest, and where refugee, foreign fighter, drugs, and other *flows* indicate there should be U.S. maritime military presence, the USG can identify commercial and military maritime missions supported by U.S. flagged vessels.

Once maritime missions are identified, roles and responsibilities could then be assigned to specific USG agencies. DoD will maintain the lead maritime role where forward presence is needed to engage terrorism or piracy. However, the Department of State or U.S. Coast Guard (USCG) could be assigned as lead in areas where there is a minimal chance of military conflict and resolution can be achieved through diplomatic means or host nation cooperation. Commodore Ellsworth Bertholf, the first commandant of the US Coast Guard, best stated the contributions of the USCG during a time of peace - "The Coast Guard exists for the particular and main purpose of performing duties which have no connection with a state of war, but which on the contrary, are constantly necessary as peace functions."[102] By identifying maritime missions and lead USG agencies, the NSC can then direct policy guidance towards an interagency national-level shipbuilding acquisition and resourcing strategy.

Policy Recommendations

The mandate to deliver a single, interagency national maritime strategy goes well beyond the *military-centric* "A Cooperative Strategy for 21st Century Seapower"[103] or the soon to be released MARAD National Maritime Strategy. It includes all USG agencies in the initial strategy development phase and has four outcomes. Benefits of a holistic strategy include (a) a signal to industry where investment in capital expenditures, research and development are most needed (**Appendix 3**); (b) multi-year contracts with decreased unit costs, in lieu single-year acquisitions; (c) an intelligent transformation of industry capacity from today's shipbuilding industry to a future industry that supports a single national maritime strategy,[104] and (d) possibly reduce the need to

salami-slice shipbuilding budget cuts since future shipbuilding requirements, acquisition, and resourcing is coordinated across all USG agencies. The single, interagency national level maritime strategy for U.S.-flagged shipping will help ensure shipbuilding industry demands at levels that sustain corporate economic rates and maintain current firms, induce new US firms to enter the shipbuilding market, and ensure work force technical skills remain current.[105] In addressing the USG's interest in controlling the narrative and managing national-level strategy, the proposal strengthens the economic and military competitive advantage and meets national security strategy needs.

CONCLUSION

The USG cannot continue to avoid its responsibilities to shape the four determinates towards conditions that promote GDP growth and, therefore, give the U.S. the decision space to meet its national security strategic objectives. The five policy recommendations presented in this paper are intended to address the decline of the shipbuilding industry's contribution towards the U.S. GDP. First, Human Capital investment strengthens Factor Conditions by increasing industry capacity to innovate, upgrade infrastructure, and train industry workers in the latest tools of the trade. Second, while the existing Jones Act supports Demand Conditions and Related Supported Industries, modification to the Act will increase economic growth by (1) consolidating and streamlining the regulatory requirements for the marine industry, and (2) creating incentives to build the ships needed for the merchant marine force. Third, Foreign Military Sales options can be used to positively shape the Firm Strategy, Structure, Rivalry determinates of U.S. firms by (1) making its advanced combat systems available to the U.S.' closest, most trustworthy allies and partners, and (2) shifting away from selling decommissioned vessels in order to encourage the sale of new ships. Fourth, an A2/AD investment hedges against the elements of Chance, encouraging stability in the shipbuilding sector. Shipbuilders are well-placed to accommodate DoD's potential acquisition of a mix of CVNs and smaller, less expensive CV/CVNs that will deliver a more diverse, potentially more survivable capability that the U.S. could willing to commit into an A2/AD combat environment. Fifth, an Interagency Maritime Strategy is critical to shaping Government policies in order to (1) signal to industry where investment in capital expenditures, research and development are the most needed; (2) deliver multi-year contracts with decreased unit costs, in lieu single-year acquisitions; and (3) encourage an intelligent transformation of industry capacity from today's shipbuilding industry to a future industry that supports a single national maritime strategy, and (4) reduce salami-slicing of shipbuilding budget reductions since future shipbuilding requirements, acquisition, and resourcing is coordinated across all USG agencies. This portfolio of shipbuilding industry policy changes, while growing each Porter determinate of national competitive advantage, will bolster the industry's contribution to the GDP, increase economic and military instruments of national power, and enable the acquisition of a U.S. flag shipping force to meet national security objectives.

APPENDIX 1: FOUR DETERMINATES OF NATIONAL ADVANTAGE

Michael Porter presented the four determinants of national advantage in his book titled The Competitive Advantages of Nations. Though originally released in 1990, its theory has not been disproven in the 25-years of application and serves as a broad economic theory applied today. Its application is relevant to formulating the discussion that economics is the lead instrument of power.

1. **Factor Conditions.** The nationals position in factor of production, such as skilled labor or infrastructure, necessary to compete in a given industry.
2. **Demand Conditions.** The nature of home demand for the industry's product or service
3. **Related and supporting industries.** The presence or absence in the nation of supplier industries and related industries that is internationally competitive.
4. **Firm strategy, structure, and rivalry.** The condition in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry.

APPENDIX 2: ADVANCE US INDUSTRY SECTORS

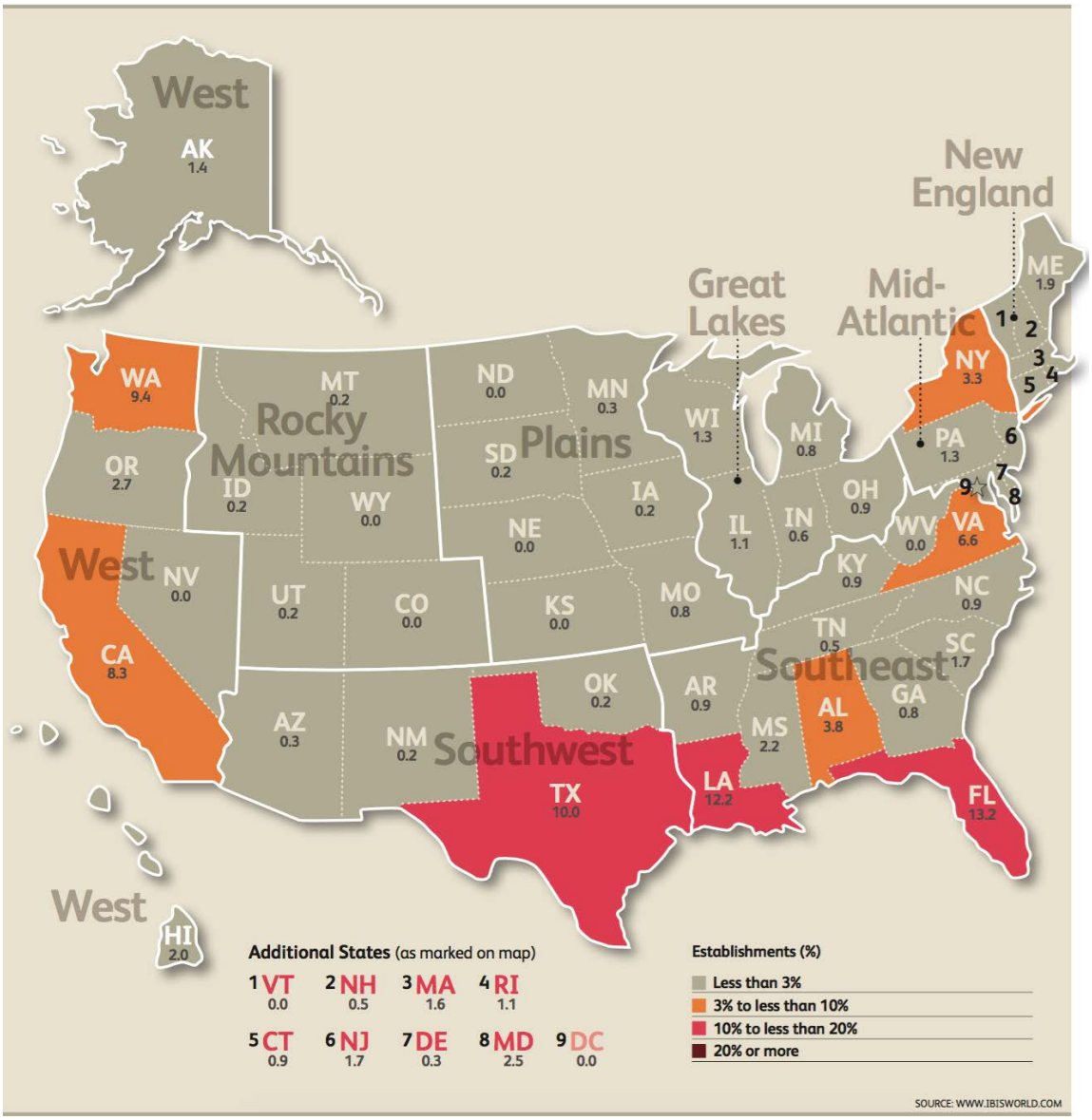
Brookings Institute list of Top 50 US Advanced Industries.[106]

The 50 Industries That Constitute the Advanced Industries Sector

MANUFACTURING		ENERGY
Aerospace Products and Parts	Motor Vehicles	Electric Power Generation, Trans., and Distribution
Agr., Construction, and Mining Machinery	Navigation, Measurement, and Control Instruments	Metal Ore Mining
Aluminum Production and Processing	Other Chemical Products	Oil and Gas Extraction
Audio and Video Equipment	Other Electrical Equipment and Components	**SERVICES**
Basic Chemicals	Other General Purpose Machinery	Architecture and Engineering
Clay Products	Other Miscellaneous Manufacturing	Cable and Other Subscription Programming
Commercial and Service Industry Machinery	Other Nonmetallic Mineral Products	Computer Systems Design
Communications Equipment	Other Transportation Equipment	Data Processing and Hosting
Computers and Peripheral Equipment	Pesticides, Fertilizers, and Other Agr. Chemicals	Medical and Diagnostic Laboratories
Electric Lighting Equipment	Petroleum and Coal Products	Mgmt., Scientific, and Technical Consulting
Electrical Equipment	Pharmaceuticals and Medicine	Other Information Services
Engines, Turbines, and Power Trans. Equipment	Railroad Rolling Stock	Other Telecommunications
Foundries	Resins and Synthetic Rubbers, Fibers, and Filaments	Satellite Telecommunications
Household Appliances	Semiconductors and Other Electronic Components	Scientific Research and Development
Industrial Machinery	Ship and Boat Building	Software Publishers
Iron, Steel, and Ferroalloys	Medical Equipment and Supplies	Wireless Telecommunications Carriers
Motor Vehicle Bodies and Trailers	Reproducing Magnetic and Optical Media	
Motor Vehicle Parts		

APPENDIX 3: SHIPBUILDING INDUSTRY LOCATIONS 2015

From IBISWorld, the chart below shows the business locations in 2015.[107] The Southeast accounts for 43.8% of facilities. The West and Southwest accounts for 23.9%. All other regions account for 21.7% of industry establishments.



ENDNOTES

[1] Alfred Thayer Mahan, *The Influence of Sea Power Upon History, 1660-1783: Volume 1*, (Boston, MA: Little Brown and Company, 1890), 28.

[2] Competitive advantage in this paper is applied as described in Michael Porter's Five Forces model. He defines a competitive advantage as "rests on endowments of inputs such as labor, natural resources, and financial capital." Michael E. Porter, The Competitive Advantage of Nations (New York, New York: Free Press, 1990), xi.

[3] "Ship Building in the United States," IBIS World Industry Report (March 2015), accessed March 26, 2015, http://clients1.ibisworld.com.nduezproxy.idm.oclc.org/reports/us/industry/default.aspx?entid=852

[4] Mark Muro, Jonathan Rothwell, Scott Andes, Kenan Fikri, and Siddharth Kulkarni, "Advance Industries and Why They Matter," *Brookings Institute Report* (2015), 3.

[5] Source: MARAD at http://www.marad.dot.gov/ships-and-shipping/.

[6] Of this 400,000, U.S. shipbuilders employ more than 110,000 in direct employment. MarEx, "U.S. Shipbuilding Industry Tops 110,000 Jobs," The Maritime Executive, accessed on May 8, 2016, http://www.maritime-executive.com/article/us-shipbuilding-industry-tops-110000-jobs

[7]U.S. Government (USG) funded shipbuilding, coupled with minimal domestic commercial shipbuilding, has resulted in the USG becoming the single buyer with multiple industry sellers. "Monopsony is a market similar to a monopoly except that a large buyer not seller controls a large proportion of the market and drives the prices down. Sometimes referred to as the buyer's monopoly."

[8]Competitive advantage in this paper is applied as described in Michael Porter's Five Forces model. He defines a competitive advantage as "rests on endowments of inputs such as labor, natural resources, and financial capital." Michael E. Porter, *The Competitive Advantage of Nations* (New York, New York: Free Press, 1990), 126-127.

[9] Robert F. Dorr and Fred L. Borch, "U.S. 'industrial miracle' helped win World War II," *Navy Times*: 38, accessed April 2, 2016, http://search.proquest.com.nduezproxy.idm.oclc.org/docview/203991762?accountid=12686.

[10] Peter Grier, "Pearl Harbor Resurrection: The Warships that Rose to Fight Again," Christian Science Monitor, December 7 2012, accessed April 2, 2016, http://www.csmonitor.com/USA/Politics/Decoder/2012/1207/Pearl-Harbor-resurrection-the-warships-that-rose-to-fight-again-video.

[11] Three battleships were to heavily damage to be repaired. The USS Arizona and USS Utah were both sunk and remain on the Pearl Harbor floor to this day. The USS Oklahoma was raised after considerable effort but was deemed unrepairable.

[12] Grier and "U.S. 'industrial miracle' helped win World War II."

[13] Thomas Heinrich, "Fighting Ships that Require Knowledge and Experience: Industrial Mobilization in American Naval Shipbuilding, 1940-1945, "*Business History Review* 88, no. 2 (Summer 2014): 273.

[14] The 40,000-hull 2011 estimate included approximately 30,000 barges; 6,300 tugs; 1,000 offshore support vessels; and 200 ships engaged in blue-water trade with Hawaii, Guam, Alaska and Puerto Rico. The self-propelled vessel delivery annual average is for the period 1987-2011. (Samuel A. Giberga and John Henry Tab Thompson, "We and Mrs. Jones: How the Misunderstood Jones Act Enhances Our Security and Economy", Journal of Maritime Law and Commerce 46, 4, 493-513 (October, 2015), 497)., citing the 2011 U.S. Water Transport Statistical Snapshot (http://marad.dot.gov/wp-content/uploads/pdf/US_Water_Transportation_Statisitical _Snapshot.pdf).

[15] Factors buffeting the blue-water non-Jones Act U.S. Merchant Marine included containerization and other efficiencies (David A. O'Neil, "America's Orphan: The U.S.-Flag Merchant Marine" Sea History 77, 44-47 (Spring 1996), p. 44); the end of the passenger trade (Frank O. Baynard, The Big Ship: The Story of the S.S. United States (Museum Publication No. 40), The Mariners' Museum (Newport News, 1981), p. 266 and 268); the high costs and inflexible practices of American labor (Baynard, p. 264-265); the Reagan Administration's termination of ship construction and operating subsidies (Christopher J. McMahon, "The U.S. Merchant Marine.: Back to the Future?" Naval War College Review 69, no. 1 (Winter 2016): 86-108, p. 96-97 Academic Search Premier, EBSCOhost (accessed May 14, 2016).and competition from low-cost, subsidized, regulation-light and/or investment-friendly foreign flagged fleets (Giberga and Thompson, 507).

[16] McMahon, 95.

[17] United States Maritime Administration, "Ships & Shipping," accessed April 09, 2016, http://www.marad.dot.gov/ships-and-shipping/.

[18] In 1989, the United States had 792 active ships in its Navy. Mackenzie Eaglen, *The State of the U.S. Military*, The Heritage Foundation, (January, 2010), 17. On May 10, 2016, the United States had 272 battle force ships. http://www.navy.mil/navydata/nav_legacy.asp?id=146.

[19] IBISWorld.

[20] Ibid

[21] Lee Wilkerson and M.D. Sarder. "Sustainable Manufacturing in the US Shipbuilding Industry through job growth." International Journal of Engineering and Industries (IJEI) 2, no. 4 (2011): 86-96.

[22] "Shipbuilding and Repair in U.S. Shipyards," May 2012, Accessed April 11, 2016. http://americanshipbuilders.com/ship-repair/shipbuilding-and-repair-shipyards-1208

[23] Ibid., 5.

[24] Muro, Rothwell, Andes, Fikri, and Kulkarni, 3.

[25] IBISWorld.

[26] Porter, 71.

[27] Ibid, 294.

[28] Ibid, 45.

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[30] Porter, 71.

[31] Ibid, 86.

[32] IBISWorld.

[33] Porter, 301.

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[37] Under Secretary of Defense for Acquisition, Technology and Logistics, Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, "Executive Summary" and "Strategic Guidance," Annual Industrial Capabilities Report to Congress, October, 2013, 1.

[38] IBISWorld.

[39] Porter, 166 and 169.

[40] Ibid, 71.

[41] Ibid, 124.

[42] Ibid, 73.

[43] Ibid, 126-127.

[44] Interagency refers to the Departments, Agencies, Commissions and Offices that fall under the authority of the Executive Branch.

[45] This statement is this author's opinion, which was developed and informed through the Fall and Spring lectures.

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[52] United States Government Accountability Office, "Report to Congressional Committees, Navy Shipbuilding–Opportunities Exist to Improve Practices Affecting Quality" (November 2013).

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[55] Brian Slattery, Bryan Riley, and Nicolas D. Loris, "Sink the Jones Act: Restoring America's Competitive Advantage in Maritime-Related Industries," *The Heritage Foundation Backgrounder*, no. 2886 (May 22, 2014): 1.

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