

NAVAL ECONOMIC WARFARE: CONSTRUCTING A FRAMEWORK FOR MODERN POLICY

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A research study submitted to Johns Hopkins University in conformity with the requirements  
for the degree of Master of Arts in Global Security Studies

Baltimore, Maryland  
August 2019

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## **Abstract**

What lessons do historical examples of blockades and commerce raiding provide for the creation of a general naval economic warfare framework for modern policymakers? This research study examines the implementation of naval economic warfare strategies over the past 150 years in order to explore this topic. Four case studies of naval economic warfare are analyzed: the Union blockade and Confederate commerce raiding in the American Civil War from 1861-1865, the German submarine campaign of World War 1 from 1914-1918, the United States' submarine and aerial campaign against Japan from 1941-1945, and the Tanker War between Iran and Iraq from 1980-1988. Each case study is broken down into three analytical areas: the naval context, the strategy employed, and the results attained. From these case studies a general framework for modern policymakers is derived based on the connected factors of geopolitical context, strategy employed, naval force structures, and strategic objectives.

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### **Reviewers:**

**Mark Stout, Ph. D**

**Charles Larkin, Ph.D**

## **Acknowledgements**

To my parents, Nan and Scott, whose support made this all possible, and to my second family, the Chirtels, whose warmth and humor was a constant comfort during this degree program.

To Khari, Mike, Liz, and all my other friends in DC and elsewhere.

To all the cats and dogs in my life, especially Jane and Annie.

A special thank you to the wonderful professors and faculty in this program!

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## Introduction

While an integral aspect of the 20<sup>th</sup> century concept of “total war”, economic warfare as a military strategy has existed for millennia. The capture of trade outposts, interdiction of supply lines, and sieges of cities have all served the purpose of degrading an enemy’s ability to wage war through economic means. In modern parlance, economic warfare has grown to encompass more than direct military operations, including the implementation of unilateral or multilateral sanctions or embargoes enforced more through legislation than physical interception. However, modern militaries still use their assets for what I term “kinetic economic warfare”, in which through destruction of economic means (or the threat thereof) states seek to achieve strategic objectives in wartime. A modern example of kinetic economic warfare is the destruction of port facilities, transit hubs, and pipelines in order to reduce or prevent enemy imports and exports.

As long as the majority of commerce relies on maritime routes, economic warfare will be conducted against these assets. This generally takes the form of either commerce raiding or blockades. The former, commerce raiding, is often referred to as “*guerre de course*”, or “war of the chase” in naval theory.<sup>1</sup> Commerce raiding is defined as the interdiction and destruction of merchant shipping by naval or aerial assets in a targeted but often somewhat ad-hoc basis, possibly as part of a broader blockade effort and often far from enemy shores.

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<sup>1</sup> Elleman and Paine, pg. 1

A blockade, according to the United States Navy's *The Commander's Handbook on the Law of Naval Operations*, is "a belligerent operation to prevent vessels and/or aircraft of all states, enemy as well as neutral, from entering or exiting specified ports, airfields, or coastal areas belonging to, occupied by, or under the control of an enemy State."<sup>2</sup> Thus, unlike commerce raiding, a blockade has a specific geographic focus, namely the ingress and egress of an enemy's naval and aerial assets, be they military or civilian in disposition. Blockades typically fall under two categories: close and distant blockades. Close blockades involve the investment of naval assets in the proximity of the state and ports being blockaded, whereas distant blockades have naval assets deployed far from the enemy coast enabling greater flexibility and concentration of resources.<sup>3</sup>

This leads to the focus of this research study, which seeks to analyze naval economic warfare strategies over the past 150 years and extract consistent themes to derive a framework for modern actors on a regional and global level. Specifically, the case studies examined will involve the use of organized military formations to conduct blockades and commerce raiding. For the purposes of this paper, "naval economic warfare" will refer to maritime economic warfare strategies implemented in the interest of degrading an enemy economy to achieve a broader strategic objective.

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<sup>2</sup> *Commander's Handbook*, 7-10

<sup>3</sup> Tucker, pg. 287

## Literature Review

The second half of the 19<sup>th</sup> century and the first decade of the 20<sup>th</sup> century represented a watershed moment in naval theory, with multiple influential individuals leaving their mark on the international maritime community. Theorists from Great Britain and the United States, the former the preeminent global naval power and the latter an emerging contender, espoused strategies which focused on the battle fleet as the fundamental tool of maritime warfare. French theorists on the other hand, seeking to circumvent the Royal Navy's quantitative superiority, concentrated on developing strategies to counter the inherent strengths of large industrial powers and their commensurately strong battle fleets. Opinions regarding naval economic warfare were diverse, with some considering it of minor importance while others arguing it was the fundamental purpose of waging maritime war.

One of the key figures of classical naval theory is Alfred Thayer Mahan, an American naval officer who published multiple works on naval history and strategy in the late 19<sup>th</sup> and early 20<sup>th</sup> century. His ideas regarding fleet engagements and the necessity of naval power had widespread impact on the development of large navies into World War I, with his works influencing as far as Japan. Mahan was a strong proponent of developing a powerful battlefleet to wrest control of the sea away from an adversary; he argued that this control was key to states acquiring and maintaining power. As such, his views are biased towards fleet operations which require the mailed fist of large warships. It is no coincidence that in the 1890s as Mahan's theories were receiving widespread acceptance among world governments, there was a concerted

push towards building larger, more powerful capital ships. Fleets were constructed around the idea of a “decisive battle” in which one navy was utterly destroyed as a fighting force by the other. Indeed, the idea of the “decisive battle” and the importance of the fleet have had considerable endurance well past Mahan’s death in 1914, with even modern thinkers regarding Mahan as influential.<sup>4</sup>

While espousing the importance of decisive engagements and the construction of warships necessary for such battles, Mahan did not emphasize targeted naval economic warfare as a worthwhile function of naval assets. In one of his seminal works, *The Influence of Sea Power Upon History, 1660-1783*, Mahan compares France and Britain to the Union and Confederacy in the American Civil War. In both cases, he argues that the deciding factor in warfare between those actors was significant investment by the enemy battle fleet, not the economic warfare strategies implemented. He claims, referring to the economic consequences of blockades: “[s]uch injuries, unaccompanied by others, are more irritating than weakening. On the other hand, will any refuse to admit that the work of the great Union fleets powerfully modified and hastened an end which was probably inevitable in any case?”<sup>5</sup>

Mahan goes further, arguing that a degradation in the enemy’s economic circumstances is mainly an externality of his favored tactic, complete control of the sea achieved through “decisive battle”. He states: “It is not the taking of individual ships or

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<sup>4</sup> Holmes, James R., PhD, and Kevin J. Delamer. "Mahan Rules." U.S. Naval Institute. May 01, 2017. Accessed July 13, 2019. <https://www.usni.org/magazines/proceedings/2017/may/mahan-rules>.

<sup>5</sup> Mahan, pg. 128-129



convoys, be they few or many, that strikes down the money power of a nation; it is the possession of that overbearing power on the sea which drives the enemy's flag from it..."<sup>6</sup> Mahan thus considers naval economic warfare to be at best a secondary goal for powerful navies to pursue, as the economic externalities of simple control of the sea will more than suffice in this regard. Clearly, Mahan's thinking is at odds with the idea of developing and implementing a specific naval economic warfare strategy.

While the transition from the late-19<sup>th</sup> century to the early-20<sup>th</sup> century was the era of Mahan, his views on naval economic warfare were by no means universally accepted. On the other side of the Atlantic, British naval historian Sir Julian Corbett published his *Some Principles of Maritime Strategy* in 1911, shortly before the start of World War 1. Corbett starts from much the same standpoint as Mahan in that the ultimate goal of naval power is to be able to wrest control of the sea from a theoretical adversary. However, Corbett strictly differentiates "control" in naval terminology from its land-based equivalent. A state, outside of territorial waters, simply cannot comprehensively control an area as broad as the open ocean from in the same manner as territory on land. Corbett adds that a state cannot permanently deploy forces to a given patch of open sea for a significant amount of time due to logistical and mechanical restrictions. Instead, the purpose of sea control aside from resources like fishing, Corbett argues, is to maintain a state's own lines of communication and to deny that same ability to the enemy.<sup>7</sup>

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<sup>6</sup> Ibid

<sup>7</sup> Corbett, pg. 93

Extrapolating from his basic definition of sea control as a means to transmit both civilian and military communications (which in Corbett's usage also applies to transportation of goods and materials), he moves on to discussing the practical and moral reasons that naval economic warfare is a worthwhile strategy. Corbett's reasoning is as follows: controlling commerce is already an accepted practice in land warfare during the occupation of territories and population centers, which morally legitimizes the equivalent obstruction of commercial transit by a naval blockade.<sup>8</sup>

Having established naval economic warfare as a morally valid aspect of naval warfare, Corbett next examines its importance to naval strategy. In doing so, he diverges significantly from the Mahanian viewpoint of decisive battle being the main objective of naval forces. Corbett states that, should a state destroy an enemy's battle fleet the enemy "will be but little the worse."<sup>9</sup> Corbett further proposes that if the enemy is a land power, then the naval strategy of decisive battle has done almost nothing to diminish their control over their territory. According to Corbett, then, one cannot expect to win a war by only destroying the naval forces of the enemy. He instead argues that the only way to translate maritime control into strategic victory is to make loss of sea control affect the "commerce and finance" of one's enemy.<sup>10</sup> In his eyes the "primary method... in which we use victory or preponderance at sea and bring

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<sup>8</sup> Ibid, pg. 98

<sup>9</sup> Ibid

<sup>10</sup> Ibid, pg. 99

it to bear on the enemy's population to secure peace, is by the capture or destruction of the enemy's property, whether public or private.”<sup>11</sup>

As classical naval theorists, Mahan and Corbett clearly have nigh-diametrically opposing views on the validity of naval economic warfare as a strategy, apart from their agreement on the necessity of sea control. For Mahan, the purpose of a navy is entirely the destruction of the enemy's navy, which he argues is a goal that is entirely self-evident. With the removal of the enemy naval threat, the Mahanian view dictates that sea control is secured and victory achieved. Corbett, on the other hand, counters that this does little to actually ensure complete victory over the opponent apart from facilitating a subsequent amphibious invasion. Instead, Corbett emphasizes the deprivational aspect of naval economic warfare as the primary means to translate sea control into military victory.

Around the same time that Mahan and Corbett were proposing theories regarding large fleets, a competing school of thought was established in the *Jeune École* in France. One of the foundational figures of the *Jeune École* was Captain Louis-Antoine- Richild Grivel, who published *De la guerre maritime avant et depuis les nouvelles inventions (Maritime war before and after the new inventions)* in 1869 proposing naval strategy in light of new innovations in naval technology during the 19<sup>th</sup> century, like the steam engine and ironclad vessels.<sup>12</sup> Grivel agrees with Corbett on naval economic warfare's utility in translating naval success into strategic victories. Grivel argues that,

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<sup>11</sup> Ibid

<sup>12</sup> Grivel

instead of the “maritime butcheries” between large naval formations, it is instead the financial implications of naval war that force an enemy to sue for peace.<sup>13</sup> Thus, Grivel proposes naval economic warfare as a suitable strategy not only if a state attains naval supremacy but *regardless* of sea control.<sup>14</sup> With this revolutionary idea, Grivel catalyzed the later establishment of the *Jeune École* in the French navy in the late 19<sup>th</sup> century.

From a theoretical standpoint, then, the *Jeune École* represented an alternate path to naval warfare for countries which could not compete with the largest naval powers in terms of naval construction. Juxtaposing themselves against Great Britain as a theoretical adversary, French naval theorists of the *Jeune École* focused on Great Britain’s critical weakness as a colonial power: dependence on overseas supply lines for resources and commerce.<sup>15</sup> Gabriel Charmes, an outsider with a keen interest in the changing naval context of the late 19<sup>th</sup> century, proposed the fundamental *Jeune École* view on commerce raiding as part of a comprehensive naval strategy for a second-tier naval power like France.<sup>16</sup> A critical factor in Charmes’ strategy was the recent development of the torpedo boat which theoretically enabled even small ships to destroy large military and civilian vessels on an individual basis. Self-propelled torpedoes carried massive warheads without requiring a commensurately large gun, thus making small warships a powerful threat. These torpedo boats could be mass produced with significantly fewer resources than battleships or cruisers. The form

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<sup>13</sup> Ibid, pg. 254

<sup>14</sup> Roksund, pg. 5

<sup>15</sup> Roksund, pg. 9

<sup>16</sup> Ropp, pg. 158-164

factor of torpedo boats of the era factored into Charmes' thinking for more than just economic reasons, though. He pointed to the theoretical danger of operating such a small warship in the commerce raiding role as catalyzing a shift in commerce raiding tactics that would become manifest in World War 1.

According to Charmes, in the past commerce raiding was generally performed with an eye towards humanitarian concerns, with the crew being evacuated off the targeted ship before it was sunk. However, "tomorrow", Charmes predicts, "...an autonomous torpedo boat-two officers, a dozen men-meets one of these liners carrying a cargo richer than that of the richest galleons of Spain and a crew and passengers of many hundreds...", a situation which makes the evacuation of crew and passengers practically impossible for the torpedo boat.<sup>17</sup> Interdicting the larger vessel and attempting to redirect it to a friendly port would be fraught with difficulty, too.

Charmes describes the likely situation:

"To this declaration... the captain of the liner would respond with a well-aimed shell that would send to the bottom the torpedo boat, its crew, and its chivalrous captain, and tranquilly he would continue on his momentarily interrupted voyage. Therefore the torpedo boat will follow from afar, invisible, the liner it has met; and, once night has fallen, perfectly silently and tranquilly it will send into the abyss liner, cargo, crew, passengers; and, his soul not only at rest but fully satisfied, the captain of the torpedo boat will continue his cruise."<sup>18</sup>

Charmes' description of commerce raiding is, in hindsight, quite prescient. The size disparity between commerce raider and commercial vessel would be a key consideration in World War 1, especially with the widespread introduction of the

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<sup>17</sup> Ibid, pg. 165

<sup>18</sup> Ibid, pg. 165

submarine. The vulnerability of a submarine on the surface dictated that attacks must be accomplished without warning, ideally while submerged, in order to reduce the risks to the crew.

Ultimately, *Jeune École* theorists like Charmes and his ideological doppelganger Admiral Théophile Aube established a framework that wildly diverged from the battlefleet advocacy of Mahan and Corbett. While Mahan and Corbett saw the battlefleet as accomplishing the majority of naval objectives in wartime, be they set-piece battles or control of shipping and communication lanes, Charmes and Aube considered the development of the self-propelled torpedo and the torpedo boat to be the arbiter of a fundamental shift in the realities of naval combat.<sup>19</sup> The *Jeune École* theorized that, in a war between navies of differential power, the weaker fleet would act as a “fleet-in-being” and avoid direct combat with its superior foe. At the same time, the threat of torpedoes would prevent the superior fleet from capitalizing on its advantage in warships. Thus, for the *Jeune École* the only actual naval warfare in the modern era would be economic warfare.<sup>20</sup>

Clearly, classical naval theorists did not agree on the merits or implementation of naval economic warfare strategies. The early 20<sup>th</sup> century would end up being a proving ground for their theories, though, and the experiences of World War 1 and World War 2 would heavily color later theorists on the utility of naval economic warfare and its position within modern naval strategy.

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<sup>19</sup> Ibid, pg. 166

<sup>20</sup> Ibid

Post-World War 2, naval economic warfare appears to have taken something of a backseat in general naval theory. Dr. Bernard Brodie, in the fifth edition of his work *A Guide to Naval Strategy*, barely mentions the offensive aspect of naval economic warfare, simply noting that naval warfare “exerts military-economic pressure on the enemy” by obstructing imports and exports, as well as interfering with coastal shipping and ground transportation.<sup>21</sup> While this is true, Brodie does little to further analyze the methods and situations best suited for naval economic warfare in either blockade or commerce raiding. Brodie provides, however, an entire chapter devoted to the defense of convoys against commerce raiders; this ignores the perspective of a navy that seeks to *conduct* commerce raiding. Published in 1965, Brodie’s fifth edition is clearly oriented towards the threat of nuclear war between NATO and the Warsaw Pact and is written for a Western perspective in which maritime commerce was something to be defended, not attacked.

Even in the late 20<sup>th</sup> century, this Cold War mindset was still reflected in naval economic warfare theory. Hugh F. Lynch’s article “Strategic Imperatives: Economic Warfare at Sea” has an entire section devoted to a theoretical global conventional war between NATO and the Warsaw Pact, although in this case viewed through the lens of economic warfare. Lynch argues that, due to the intrinsic nature of the Warsaw Pact as a large alliance with shared borders, the Warsaw Pact is more likely to conduct commerce raiding than NATO.<sup>22</sup> While his analysis makes sense, this scenario is

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<sup>21</sup> Brodie, pg. 14

<sup>22</sup> Grunawalt, pg. 251

outdated by roughly 30 years and has little relevance for 21<sup>st</sup> century policymakers.

Lynch also includes a section on “limited” wars between non-superpowers but focuses mainly on the legal aspects of defending neutral shipping and less on how regional adversaries might actually conduct naval economic warfare.<sup>23</sup>

In the post-Cold War period, Christopher McMahon published a comprehensive look at the pros and cons of commerce warfare in 2017 in his article “Maritime Trade Warfare: A Strategy for the Twenty-First Century?” McMahon concisely delineates the positive and negative arguments regarding the use of *guerre de course* in a modern context, noting that there is no existing United States naval doctrine regarding the conduct of naval economic warfare in either blockades or commerce raiding, nor much discussion about its utility in a modern conflict.<sup>24</sup> Much like Brodie and Lynch, McMahon’s position is primarily United States-centric, but in doing so he notes some clear vulnerabilities in the American naval structure that could be leveraged by an opponent including a lack of strategic depth in its reserves of merchant and logistical shipping.<sup>25</sup> McMahon concludes by expressing the importance of further application of historical lessons by policymakers from both an offensive and defensive standpoint in order to better prepare for the possibility of naval economic warfare in the future.

Geoffrey Till’s fourth edition of *Seapower: a Guide for the Twenty-First Century*, published in 2018, devotes a section to discussion of offensive action against

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<sup>23</sup> Ibid, pg. 254-259

<sup>24</sup> McMahon, pg. 23

<sup>25</sup> Ibid, pg. 34



commercial shipping. Till echoes McMahon's statements regarding the lack of emphasis on direct naval economic warfare in modern Western doctrine.<sup>26</sup> He proposes that this absence is derived from a general view that broad conflicts are unlikely in the current era as well as the more complex nature of commercial shipping in a globalized economy.<sup>27</sup> However, Till points out that the political and legal obstacles to naval economic warfare can be overcome should there be sufficient need as well as the existence of key vulnerabilities for East Asian countries regarding commercial shipping routes, in particular China's "Malacca dilemma" and its exploitation by theoretical adversaries.<sup>28</sup> Thus, Till presents a relatively ambiguous view towards the future importance of naval economic warfare from a targeted, large-scale offensive standpoint, and instead highlights the importance of naval activities like antipiracy operations in securing the conditions for free maritime trade.<sup>29</sup>

This paper aims to fill this gap in the current literature regarding naval economic warfare. Much of the post-World War II theory either ignores large-scale offensive naval economic warfare operations or is outdated by focusing on the context of the Cold War. More relevant pieces focus primarily on the American point of view, to the detriment of other global and regional actors, or prioritize low-intensity operations. As McMahon notes, it is vital for policymakers to understand if large-scale naval economic warfare should be conducted, and if so, how best to undertake this strategy. In the

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<sup>26</sup> Till, pg. 365

<sup>27</sup> Ibid, pg. 367

<sup>28</sup> Ibid

<sup>29</sup> Ibid, pg. 370

interest of accomplishing this task, this research study seeks to use historical lessons to establish a general framework which can be applied to a variety of conflict scenarios.

#### **Research Question/Methods:**

The fundamental question this study seeks to answer is: what are consistent conditions for success in naval economic warfare, and can they be formed into a guiding framework for modern policymakers when considering the execution of naval economic warfare?

In the interest of answering this, this study will examine four case studies of naval economic warfare which include blockading, commerce raiding, or a combination of the two. These case studies have been selected because of the methods used by the combatants. The first, the Union and Confederacy in the Civil War, is an example of a close blockade over an extremely long coastline with elements of blockade running and commerce raiding throughout. The second, Germany's commerce raiding campaign against Britain in World War 1, represents the use of surface and submarine commerce raiders without augmentation from aircraft. The third, the United States against Japan in World War II, demonstrates the use of submarines and aerial mining to accomplish at first a distant blockade with commerce raiding, which then evolved into a close blockade by the end of the Pacific campaign. Finally, the Tanker War during the Iran-Iraq war is indicative of an extended commerce raiding and close blockade strategy between two regional powers in the modern era using a combination of fixed and rotary-winged aircraft, surface vessels (mainly Iran), anti-shipping missiles, and shore-based artillery

positions. All four represent the use of organized military forces to accomplish strategic maritime economic warfare objectives within a broader conflict.

Each of these case studies will be broken down into their naval context, the economic warfare strategy used, and the results from that strategy's implementation. After analyzing the four case studies, this paper will then apply this analysis to four consistent themes which form a general naval economic warfare framework. These are the broader context of a given conflict, the naval economic warfare strategy applied, the military assets available either at the onset of naval economic warfare or in the near future, and how the naval economic warfare strategy interfaces with the strategic objectives of the combatant. A key priority of this research study is to establish a framework that avoids being constrained by a particular technological or historical context as exemplified by much of the existing literature regarding naval economic warfare.

## **Data**

### **Case Study 1: The United States Civil War: Union Blockade and Confederate**

#### **Commerce Raiding**

##### **Naval Context:**

The Union blockade of the Confederacy in the Civil War started with President Lincoln's statement on April 19, 1861 enacting a blockade of states south of South

Carolina, amended eight days later to include North Carolina and Virginia.<sup>30</sup> At the time, the United States navy was a small force, with a total of 42 warships in commission, 16 being sail-driven and 26 steam-powered.<sup>31</sup> The Confederate navy was even smaller; at the time of secession only 10 warships, with a total of 15 guns, had been seized from the Union.<sup>32</sup> In order for the Union to implement a blockade and for the Confederacy to contest it shipbuilding needed to be prioritized. This is evident in the size of the Union navy's blockade flotilla by January 1865; 471 warships were assigned to blockade duty out of some 700 commissioned throughout the Civil War.<sup>33</sup> Over the same period, the Confederacy commissioned over 210 vessels including floating batteries.<sup>34</sup> Over the course of the Civil War, the technological context shifted from mainly wooden warships with either steam or sails for propulsion to a mixed fleet of unarmored and ironclad screw-driven steam vessels.<sup>35</sup>

#### Strategy:

The Union blockade took well over a year to fully establish, despite officially starting in April 1861.<sup>36</sup> Over 3,500 miles of coastline needed to be patrolled, thus requiring a significant increase in both shipbuilding and basing. The lack of wireless communication necessitated a "close" blockade, in which Union warships remained in the general proximity of the shoreline and ports that they were blockading. By 1862,

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<sup>30</sup> Davis and Engerman, pg. 111

<sup>31</sup> Soley, pg. 243

<sup>32</sup> Ibid, pg. 25

<sup>33</sup> Davis and Engerman, pg. 116

<sup>34</sup> Official Records of the Union and Confederate Navies ser.2:vol.1, pg. 23-25

<sup>35</sup> Soley, pg. 244-250

<sup>36</sup> Davis and Engerman, pg. 111-116

Union strategy had become more flexible to better fit the tactical requirements of such a large operation. Instead of withdrawing ships from the blockade line for repairs, the Union created a coordinated policy with army units occupying Southern coasts to create bases of operation; this greatly improved logistics for the Union navy.<sup>37</sup>

At the same time, the Confederacy sought to both break the blockade and interfere with Union merchant shipping in order to draw resources away from the blockade and negatively impact the Union economy.<sup>38</sup> The Confederacy implemented a policy of commerce raiding using both commissioned vessels and privateers, a necessary mix due to the stark industrial situation facing the Confederate navy.<sup>39</sup> Over the course of the war, the privateers were either captured or destroyed by the Union navy or converted into blockade runners to better address the economic impacts of the Union blockade. Confederate naval representatives in Europe were able to commission a total of 18 cruisers, of which seven became commerce raiders and the remaining 11 blockade runners.<sup>40</sup> These warships were fast, wooden, and generally lightly armed. The commerce raiders were then tasked with attacking Union commercial shipping on a broad scale, with attacks taking place as far away as the Bering Sea.<sup>41</sup>

Results:

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<sup>37</sup> Ibid

<sup>38</sup> Elleman and Paine, pg. 73

<sup>39</sup> Ibid, pg. 74

<sup>40</sup> Ibid

<sup>41</sup> Ibid, pg. 86

The Union blockade, though slow to develop, ended up having a significant impact on the Confederacy. While blockade runners were able to penetrate the Union cordon throughout the war, they did so with steadily decreasing success, from one in ten blockade runners being intercepted in 1861 to one in two in 1865.<sup>42</sup> Roughly 1,500 Confederate vessels were captured or destroyed by the blockade, representing at least \$31 million dollars (in 1865) of lost property when combined with their cargoes.<sup>43</sup>

From an economic standpoint, the blockade had an array of effects. One of the most critical was the constraining of cotton exports. The blockade runners, designed more for speed than for cargo capacity, could not export nearly as much cotton as the prewar South was able to, with estimates ranging from a reduction of 80 to 86 percent of the Confederacy's prewar exports.<sup>44</sup> At the same time, this reduced capacity and the inherent incentive to maximize profit versus risk led to what Mark Thornton and Robert B. Ekelund call the "Rhett Butler effect", in which blockade runners imported luxury goods despite the Confederacy's need for essentials like iron and machinery which had a lower ratio of profit per pound.<sup>45</sup> By the end of the war, the Confederate public had severe difficulties buying necessities while still being able to acquire luxury items.<sup>46</sup> The Union blockade contributed to a rise in inflation as well.<sup>47</sup> Although even at the height of the Civil War blockade runners were able to bring thousands of weapons and millions

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<sup>42</sup> Davis and Engerman, pg. 113

<sup>43</sup> Ibid, pg. 113

<sup>44</sup> Ibid, pg. 154

<sup>45</sup> Thornton and Ekelund, pg. 40

<sup>46</sup> Ibid, pg. 55

<sup>47</sup> Davis and Engerman, pg. 113

of pounds of goods like meat and lead, the broader effects of the blockade in conjunction with poor Confederate economic policy contributed to the ultimate defeat of the Confederacy in 1865.<sup>48</sup> Critically, the Union was far better able to weather the financial burden of maintaining the naval blockade than the Confederacy was able to withstand the stress of being blockaded.

The Confederate commerce raiders, while nowhere near as comprehensive as the Union blockade, had startling tactical successes. The *CSS Alabama* captured or sank 64 Union ships on its own, sailing 75,000 miles in the process.<sup>49</sup> The commerce raiders caused millions of dollars of damage to Union shipping and tied up dozens of Union warships in attempts to hunt them down, an effort which cost the Union several million more dollars by itself.<sup>50</sup> Ultimately, the Confederate commerce raiding effort sank over 100,000 tons of Union shipping and increased insurance rates. A greater impact, though, was the flight of Union shipping to foreign registries; this deprived the Union of nearly 800,000 tons of shipping or more than half of the commercial shipping available to the Union during the Civil War. While clearly successful in imparting a disproportionate impact on the Union economy, the Confederate commerce raiders were unable to achieve their ultimate strategic objective of forcing the Union to sue for peace.

## **Case Study 2: German Submarine Commerce Raiding in World War 1**

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<sup>48</sup> Ibid, pg. 113, 158

<sup>49</sup> Elleman and Paine, pg. 86

<sup>50</sup> Ibid

## Naval Context:

After the start of World War 1, the German navy was in a disadvantaged position compared to the Allies. The British surface fleet had quantitative superiority on its own; even more so when combined with the French and Russian navies. Seeking the Mahanian decisive battle was not a realistic strategy for achieving sea control, especially when the British navy enacted a policy of distant blockade which significantly lessened the ability of German surface torpedo craft to augment German surface strength.<sup>51</sup> Initial surface battles like Heligoland Bight in 1914 revealed inadequate response time for the High Seas Fleet and exacerbated the German fears of losing expensive surface assets for little gain. Germany had implemented the *Etappe* system of surface commerce raiders, but apart from the *Emden* these were generally unsuccessful despite the revolution in wireless communications that had taken place in the preceding decade.<sup>52</sup> Germany was forced to look to submarine assets for its *guerre de course* campaign against the Allies. The German navy had 28 U-boats of all types at the beginning of the conflict and quickly implemented a large research and construction effort to expand the U-boat fleet's capabilities.

## Strategy:

The first German U-boat efforts were piecemeal individual strikes against both military and merchant shipping, resulting from technological limitations, numerical limitations, and the lack of existing precedent for submarine warfare. The success

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<sup>51</sup> Ibid, pg. 136

<sup>52</sup> Ibid, pg. 136-137



witnessed by these raids, which were able to avoid British surface combatants, compelled the German navy to take submarine operations more seriously.<sup>53</sup> The practical issues of warning merchant ships before striking (as predicted by Charmes in the 1880s) catalyzed the implementation of “unrestricted” submarine warfare in early 1915 around the British Isles, with the exception of part of the Dutch coast and the eastern North Sea.<sup>54</sup> While Germany procured dozens of U-boats during this period, fears of international retaliation against the unrestricted campaign compelled German leadership to limit U-boat operations to the North Sea by the end of 1915, operating under restrictive “cruiser rules” in which merchant ships were notified of impending attack before being sunk primarily with gunfire, not torpedoes.<sup>55</sup> This ended the first German submarine *guerre de course* campaign, although U-boats operating under “cruiser rules” continued to attack merchants through the end of 1916.

In January 1917, proponents for a return to unrestricted submarine warfare convinced German command that reimplementing that strategy would end British participation in the war within five months, well before any American reprisals could realistically impact Germany.<sup>56</sup> Now numbering over 100 U-boats, the German U-boat fleet began its second unrestricted *guerre de course*, which would carry through to the end of the war.

Results:

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<sup>53</sup> Davis and Engerman, pg. 165

<sup>54</sup> Elleman and Paine, pg. 139

<sup>55</sup> Ibid, pg. 143

<sup>56</sup> Ibid, pg. 147

Both the 1915 and 1917-1918 unrestricted submarine campaigns had a significant impact on Allied merchant shipping. The first campaign resulted in the sinking of 1.29 million tons of shipping, although this was counteracted by British construction of 1.23 million tons and capture of 682 thousand tons during the same period.<sup>57</sup> It is important to note, however, that had the unrestricted campaign been maintained into 1916, the lack of additional merchant ship captures and the declining economic and material situation in Britain might have led to strategic success before American intervention and the development of antisubmarine warfare tactics could swing the balance back in the Allies' favor.

The second campaign, from 1917-1918, was ultimately no more successful from a strategic standpoint despite sinking significantly more merchant vessels. U-boats were able to sink hundreds of thousands of tons of shipping a month through October 1918, with Britain alone losing over 5 million tons of merchant shipping over this period.<sup>58</sup> British imports fell by 20 percent from 1916 to 1917, but the American declaration of war against Germany in April 1917 (which was catalyzed by the unrestricted commerce raiding), rationing, increased domestic British food production, and the development of new antisubmarine tactics like convoys prevented the campaign from achieving its ultimate goals.<sup>59</sup>

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<sup>57</sup> Ibid, pg. 143

<sup>58</sup> Salter, pg. 358-359

<sup>59</sup> Davis and Engerman, pg. 187

Thus, the German *guerre de course* of World War 1, while achieving remarkable tactical success, was ultimately unable to force Britain out of the war and arguably further hurt Germany by convincing the United States to join the Allies.

### **Case Study 3: United States submarine warfare against Japan in the Pacific, World War 2**

#### Naval Context:

The crippling or destruction of key American naval assets at Pearl Harbor in December 1941, along with the capture of southeast Asian and island bases through early 1942 gave Japan a quantitative and qualitative advantage in the Pacific theater. American naval forces were further hampered by the necessity of splitting their focus between the Atlantic and the Pacific oceans. From an economic standpoint, the Japanese home islands were entirely reliant on outside resources imported via merchant shipping. The deficiencies in surface combatants and basing as well as the strategic and logistical considerations of fighting a two-front war meant that unrestricted submarine warfare was one of the only suitable tactics for American forces at the start of World War II to degrade Japan's ability to wage war and would remain so for several years. Development of large, long-endurance submarines like the Gato-class in the interwar period helped the United States overcome the difficulties of operating in the Pacific.

#### Strategy:

American pre-war strategic planning against Japan was encompassed by War Plan Orange, which dictated that the American fleet proceed “westward through the Marshalls and the Carolines, consolidating as it goes, and then on to the recapture of the Philippines.”<sup>60</sup> The plan called for the “eventual economic starvation” of Japan, indicating that even before the issues imposed by Pearl Harbor the US navy was planning economic warfare against Japan.<sup>61</sup> CNO Admiral Stark additionally expressed concerns that proceeding directly to the Philippines would be inadvisable, citing extensive German training as a key factor in their success against Norway and advocating that the US take a similar approach.<sup>62</sup> Should the United States find itself in a two front war, as was eventually the case, Stark proposed imposing an economic blockade on Japan while concentrating on supporting Britain in the Atlantic against Germany.<sup>63</sup> Immediately after Pearl Harbor, Stark issued the command to commence “against Japan unrestricted air and submarine warfare.”<sup>64</sup>

When the United States became militarily involved in World War 2, these policies were generally complied with. President Roosevelt espoused the belief in July 1942 that Germany’s defeat would lead to the downfall of Japan; on the other hand, Japan’s defeat would do little towards victory against Germany.<sup>65</sup> Under these conditions, the American submarine force was ideally suited to fulfilling the “Plan DOG”

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<sup>60</sup> CNO Stark, Plan Dog memo, pg. 9

<sup>61</sup> Ibid

<sup>62</sup> Ibid, pg. 13

<sup>63</sup> Ibid, pg. 14

<sup>64</sup> Elleman and Paine, pg. 230

<sup>65</sup> FDR memo to Gen. Marshall, Adm. King, Harry Hopkins; July 15 1942, pg. 3

espoused by CNO Stark where other American assets were either quantitatively or qualitatively insufficient or deployed to the Atlantic. As Germany did not have a large surface or merchant fleet by this point in the war, American submarines were of little utility in the Atlantic theater.

While American submarine bases were relatively few in number, interwar technological development created submarine classes which had the necessary endurance to adopt a distant blockade in the form of a sustained *guerre de course* against Japan.<sup>66</sup> Tactics and weaponry, however, were initially unsuitable for combat in this manner. Many submarine commanders proved unable to handle combat stress, and American torpedoes had inherent design flaws which mitigated numerous otherwise successful attacks during the first few years in the Pacific.<sup>67</sup> Additionally, strategic indecisiveness regarding the role of submarines saw their efforts divided amongst myriad insubstantial roles like supporting guerillas and transporting military staff.<sup>68</sup> Despite these early problems, the American *guerre de course* continued to accelerate into 1944. By this point, the glaring faults were generally mitigated and a combination of new tactics, closer basing, more submarines, and improved torpedoes revolutionized American submarine warfare.<sup>69</sup> By the end of 1944, aircraft could finally be based close enough to Japanese merchant lanes to augment, and then supplant, submarine efforts primarily with aerial mining operations.<sup>70</sup>

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<sup>66</sup> Davis and Engerman, pg. 338

<sup>67</sup> Elleman and Paige, pg. 230-232

<sup>68</sup> Davis and Engerman, pg. 370-371

<sup>69</sup> Ibid, pg. 374

<sup>70</sup> Davis and Engerman, pg. 365

## Results:

Initially, American submarine economic warfare in the Pacific had only a marginal impact on Japanese shipping. At the start of 1943, despite sinking over 650 thousand tons of Japanese merchant shipping, total Japanese merchant capacity had only diminished by 185 thousand tons, augmented by shipbuilding and capture of foreign ships.<sup>71</sup> However, over the next two years the situation quickly changed. In 1943, over 1.34 million tons of shipping were sunk by submarines, and over 2.45 million tons were sunk the following year.<sup>72</sup> While it is important to note that the submarine effort was part of a combined arms strategy involving aircraft, mines, and surface vessels, the submarines still accounted for the majority of Japanese merchant shipping sunk during the Pacific campaign. Out of the total 7.91 million tons of commercial shipping destroyed by the United States, 4.78 million tons (about 60 percent) was claimed by submarines.<sup>73</sup>

The effects of this campaign are clear to see when looking at Japanese economic metrics. Forced to devote whatever remaining capacity to only the most essential goods, coal and iron imports had virtually ceased by March 1945.<sup>74</sup> At the same time, Japanese steel production was forced to concentrate on only the highest-priority items like shipping, which left little for military equipment like tanks and almost nothing for

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<sup>71</sup> Ibid, pg. 369-371

<sup>72</sup> Ibid, pg. 372-373

<sup>73</sup> Joint Army-Navy Assessment Committee NAVEXOS P-468 (I have conflicting data about this from US government sources)

<sup>74</sup> USBSS pg. 15

civilian goods.<sup>75</sup> Oil importation was eliminated by April 1945, placing massive constraints on Japanese training and mobility.<sup>76</sup> The Japanese economy was virtually crippled by this point.

The American submarine campaign against Japan, while taking months to manifest, ended up being arguably the most successful implementation of naval economic warfare in modern history. Especially when supplemented by aircraft and mines later in the war, Japanese industry was severely impacted; this was one of the most important factors contributing to the Japanese defeat in 1945.

#### **Case Study 4: The Tanker War during the Iran-Iraq War**

Naval Context:

During the Iran-Iraq war from 1980-1988, neither side was able to deliver a decisive blow against the other on land. This inevitably led to the expansion of the war into the maritime theater, as both Iran and Iraq relied on shipping for economic and military support. At the start of the war, Iran had a small navy that had been built up under the Shah to include eleven larger surface combatants (like upgraded Allen M. Sumner class destroyers and Thornycroft Mark 5 Frigates) as well as nineteen smaller warships.<sup>77</sup> These were augmented by hundreds of land-based fixed and rotary-winged aircraft, though the majority had no anti-shipping training and few spare parts after the

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<sup>75</sup> Ibid

<sup>76</sup> Ibid

<sup>77</sup> Navias and Hooton, pg. 22-23

1979 Revolution.<sup>78</sup> Iraq, on the other hand, had only a handful of small patrol craft, but boasted 16 Aerospatiale Super Frelon helicopters capable of launching Exocet missiles which would prove critically important in the Tanker War.<sup>79</sup> Much like Iran, however, the rest of Iraq's aircraft were neither equipped nor trained for anti-shipping duties. Both sides would be forced to rely on shore-based artillery and missile installations to supplement their maritime attack capabilities.

Strategy:

Owing to the material limitations on both sides, the Tanker War generally consisted of missile and rocket attacks delivered by Iraqi and Iranian aircraft, shore installations, and Iranian naval assets. Both sides declared Gulf maritime exclusion zones (GMEZ) early in the war in order to protect friendly shipping, although these zones were often used for targeting, especially by Iraq.<sup>80</sup> During the first few years of the conflict, attacks on merchant shipping were a relatively small aspect of the broader war, with Iraq executing the majority of the attacks.<sup>81</sup> Around forty merchant ships were struck, mainly by Iraqi helicopters, and 23 were either sunk or written off as constructive total losses (CTL).<sup>82</sup> Iran resorted to convoying merchant ships to its own ports, while Iraq relied on third parties like Saudi Arabia and Kuwait as proxies.

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<sup>78</sup> Ibid, pg. 24

<sup>79</sup> Ibid, pg. 25

<sup>80</sup> Elleman and Paine, pg. 240

<sup>81</sup> Navias and Hooton, pg. 65

<sup>82</sup> Ibid, pg. 66



By 1984, the Tanker War expanded in both geographical and strategic scope for both sides as Iraq received French fixed-wing aircraft with the capability of firing Exocets and Iran began to use land-based attack aircraft with repurposed air-to-surface missiles and unguided rockets.<sup>83</sup> Iran was at a technological disadvantage in the air as their weapons were limited to daytime operations only, whereas the Exocets could be guided by solely internal inertial and radar guidance.<sup>84</sup> Out of 68 ships attacked (49 by Iraq and 19 by Iran), 35 were either sunk or declared CTLs.<sup>85</sup> Attacks continued by both sides through 1985 and 1986, with the main method of attack shifting decisively towards fixed-wing aircraft-launched Exocets for Iraq, and Iran still using a mix of fixed and rotary-winged aircraft as well as naval forces. Attacks reached their apex in 1987 and continued through the end of the conflict in 1988.

Both sides expanded their GMEZs throughout the war in order to better degrade the other's economic capabilities and justify their attacks on neutral shipping.<sup>86</sup> Mines also saw significant use, primarily by the Iranians as they had access to the Strait of Hormuz and could deny responsibility if a neutral ship hit a mine, thus in theory avoiding international backlash.<sup>87</sup>

Results:

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<sup>83</sup> Ibid, pg. 73-83

<sup>84</sup> Ibid, pg. 86

<sup>85</sup> Ibid, pg. 99

<sup>86</sup> Elleman and Paine, pg. 242

<sup>87</sup> Navias and Hooton, pg. 143

Ultimately, both sides in the Tanker War, either through sinking or writing off more than 100 vessels, destroyed roughly half the tonnage of merchant shipping sunk by both sides in World War II.<sup>88</sup> 40 million tons of shipping were damaged and more than 400 ships were attacked, with total economic costs estimated at roughly 1.2 trillion dollars.<sup>89</sup> Iraqi Exocets were by far the most important weapon in the conflict, representing nearly 75 percent of all ships sunk by both sides.<sup>90</sup> Shipping firms responded by reflagging vessels and relying on third-party convoying, while insurance companies raised rates for commercial vessels in the Persian Gulf. Ironically, this incentivized some Gulf shipping routes as companies perceived a financial gain from the increased fees and cheapened Iranian oil.

Neither side was able to achieve their strategic goals in the conflict, as Iraq did not retain control over any Iranian territory and Iran could not collapse Saddam Hussein's regime. However, had the conflict persisted, it is possible that Iraq's effort might have forced Iranian concessions. Iran's economy seems to have been harder hit than Iraq's, as Iranian oil revenues declined 25 percent from 1987 to 1988, down to 3.7 billion dollars, while Iraq's oil revenue rose by 25 percent over the same period thanks to its relatively secure oil pipeline infrastructure.<sup>91</sup>

While convoys were implemented by third parties, and there was an eventual American intervention in the war, major involvement did not occur until 1987. The

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<sup>88</sup> Elleman and Paine, pg. 249

<sup>89</sup> Ibid

<sup>90</sup> Navias and Hooton, pg. 183

<sup>91</sup> Ibid, pg. 177

main catalysts for this were attacks on American naval assets by both Iraq and Iran, notably the USS *Stark* by Iraqi Exocets in March 1987 and the USS *Samuel B. Roberts* by an Iranian mine in April 1988.<sup>92</sup>

### **Discussion: A framework for naval economic warfare**

Based on these four case studies, what consistent factors could be used establish a framework for the implementation of naval economic warfare strategies? Four key considerations can be derived: the context of the broader conflict (who a nation is fighting and relevant geopolitics), the naval economic warfare strategy used (*guerre de course*, close blockade, distant blockade, or some combination thereof), the military assets available, and the how naval economic warfare integrates into the overall strategy of the combatant.

Contextual factor:

Starting with the contextual aspect, understanding the adversary that the nation is fighting against is a critical component to successful implementation of naval economic warfare. The strategy implemented, be it commerce raiding, blockading, or some combination of the two, must have some hope of actually impacting the economy of the opponent. Taken to the extreme, it would be absurd to try to implement a naval blockade or commerce raiding strategies against a landlocked nation, as it is unlikely that they rely on their own shipping for trade and likely have no ports that could be blockaded. Even some coastal areas may not be suitable for naval economic warfare.

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<sup>92</sup> Elleman and Paine, pg. 246-248

The fundamental reason why the United States' blockades against the Confederacy and Japan were so effective is that both adversaries were reliant on either maritime imports or exports for their wartime economies to function. Thus, shutting off key supply lines and economic corridors had a real chance of degrading their ability to fight. On the other hand, Iraq has coastal access but Iranian anti-shipping efforts had little effect on Iraq's economy thanks to overland oil pipelines that enabled Iraq to circumvent Iran's control of the Strait of Hormuz. At its most fundamental level, then, naval economic warfare strategies can only be successful against adversaries that are primarily economically reliant on shipping.

The next consideration in the contextual aspect of naval economic warfare success is the industrial power of the adversary, as evidenced by Germany's failure to starve Britain into submission in World War 1. Simply sinking shipping is only sufficient to severely degrade an economy if the state does not have the ability to procure or produce replacements in a given timeframe; otherwise, the likely result is an increase in insurance rates and rationing but not economic collapse. Despite sinking millions of tons of shipping throughout World War 1, the German submarine force was unable to accomplish its key strategic objective of forcing Britain to sue for peace. The Confederate commerce raiders, while disproportionately successful against the Union, were unable to degrade the Union's economy sufficiently for their efforts to be anything beyond a morale booster for the South; the Union was far too wealthy and had access to vast natural resources to supply its industry for the duration of the Civil War.

Even American efforts against the Japanese took years to really impact the Japanese economy because their shipbuilding capacity took months to diminish after the official start of unrestricted submarine warfare in the Pacific. The better the adversary's shipbuilding infrastructure and reserves of key resources like steel and oil, the longer it will take for naval economic warfare strategies to have a critical impact on the conflict. Extrapolated from this, based on the case studies one cannot expect naval economic warfare strategies to be successful in short-term conflicts, as the likelihood is that the logistics of implementing these strategies and their impact's temporal delay is going to far surpass the duration of a short conflict. In all four case studies, the programs were implemented over the course of years and took many months for any strategic effects to be realized.

The final contextual consideration is the broader geopolitical environment in which the combatants find themselves. Naval economic warfare strategies, especially those involving the detention or destruction of neutral shipping, may catalyze significant international reactions that could prove inimical to the goals of the country implementing them. In two of the case studies (Germany in World War 1 and the Tanker War) their naval economic warfare programs, mainly the targeting of neutral commercial or military shipping, resulted in critical backlash that at the very least counteracted perceived gains from conducting naval economic warfare. While it is possible that Germany's first unrestricted program might have been sufficient to achieve strategic success had it been maintained into 1916, by 1917 the main result of their renewed campaign was to bring the United States into the war on Britain's side;

arguably, then, Germany's second campaign decisively *lost* the war for them, despite notable tactical successes and sinking millions of tons of merchant shipping. In the case of the Tanker War, American involvement took place after naval vessels deployed to protect international interests were struck by the combatants. This emphasizes the importance of accurate targeting, which may not always be possible if operating in an ISTAR-deprived environment.

The absence of outside intervention can be critical, too. A key aim of the Confederacy throughout the Civil War was attaining recognition from European powers, specifically Britain and France, in the interest of having them intervene against the Union. While the Confederacy was able to maintain imports and exports from Europe with varying degrees of success throughout the war, they failed to catalyze a European intervention. Theoretically, had such an intervention taken place at the beginning of the war when the Union navy was at its weakest quantitatively and qualitatively, this might have been enough to secure independence for the South. Instead, European countries simply sought other suppliers for goods like cotton and avoided becoming embroiled in the Civil War. The geographic isolation of Japan from its European allies in World War 2 also applies, as there was virtually no chance of Japan getting anything beyond nominal technical support from the other Axis powers. Germany could only commit submarines to make supply runs to Japan, while Italy remained bottled up in the Mediterranean by the Allied naval forces. Thus, Japan had to rely on insufficient domestic assets and production to try to break the blockade.

From a general standpoint, based on these case studies, the ideal context for naval economic warfare to take place within is against an adversary that relies heavily on shipping for resources and commerce, has either or both limited industrial and natural resource capacity, and has few or geographically isolated international allies that cannot be expected to intervene on their behalf. Regional powers must be especially mindful of instigating reactions from more powerful global actors.

#### Naval Economic Warfare Strategy Employed:

After satisfying the contextual considerations for implementing naval economic warfare, the next critical aspect is the nature of the strategy employed. There are three general strategies that can be either employed separately or fused in order to suit the specific goals of the nation in question. These are commerce raiding, close blockades, and distant blockades.

Commerce raiding is the easiest to implement, as commercial shipping can be targeted by a number of naval and land-based assets in the modern era. If there is a significant likelihood of international intervention over sinking neutral shipping, then “cruiser rules” should be followed whenever possible. While this makes naval assets more vulnerable, it will also help mitigate the negative geopolitical externalities of commerce raiding against neutral shipping, as evidenced in the German World War 1 case study. “Cruiser rules” also facilitate the proper targeting of merchant vessels, as challenging the ship openly and evacuating the crew gives more opportunity to accurately determine the disposition and cargo of the merchant ship. This remains true

in a 21<sup>st</sup> century context. While the Automatic Identification System (AIS) attached to all modern commercial vessels beyond 300 tons would theoretically help with identification in this regard, this system can be spoofed, placing commerce raiders in a difficult position depending on the rules of engagement.<sup>93</sup> Successful *guerre de course*, though highly effective when used in proper circumstances, is contingent on satisfying these requirements.

There are key strategic considerations when implementing a blockade, too. First, the adversary must have ports that can be realistically sealed off from the outside world by one's own forces. Although Iraq was able to target shipping and port infrastructure along the Iranian coast, it did not have the surface assets necessary to establish a blockade against Iran. Assuming that the adversary can be blockaded, next one must determine the type of blockade best suited for the relevant coastline. If the opponent has only a few ports that are geographically close together, then a close blockade would enable superior concentration of naval assets in the relevant area. However, when implementing this form of blockade it is vital to carefully analyze the littoral and coastline military assets the adversary might have access to. The widespread use of antishipping missiles and drones, in addition to attack aircraft and small warships, makes the littoral zone a high-risk environment for even a well-supplied navy in the 21<sup>st</sup> century.

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<sup>93</sup> Balduzzi, Wilhoit, and Pasta, pg.1



The Union was able to implement a close blockade against the Confederacy for two key reasons: the geographic proximity of friendly basing for servicing and repairing naval assets and the relatively low threat environment in which only the few Confederate ironclads and shore installations posed a substantial risk to Union vessels. Establishing or capturing territory near the blockade line is fundamental to supporting this form of blockade.

There is, however, another way to effectively establish a close blockade without stationing expensive naval assets within range of the adversary. Mines, either deployed by air or submarine, can effectively close off a harbor due to their inherent deterrence factor. Modern mines, like the Mark 60 CAPTOR employed by the United States until recently, have vastly improved capabilities over systems used during the World Wars.<sup>94</sup> These torpedo-launching mines have a standoff capacity which enhances their utility far beyond that of legacy contact or magnetic varieties. Clearing minefields is a time intensive process, made all the more difficult by this standoff capacity as safe lanes must be far wider than was previously necessary with proximity naval mines. Even with far more basic proximity mines, the aerial mining campaign of the Pacific campaign was second only to submarines in merchant tonnage sunk, while Iranian mines had some success in the Tanker War against large commercial vessels. Mines, however, have the same intrinsic disadvantage as indiscriminate commerce raiding in that the destruction of neutral shipping may result in an international reaction detrimental to strategic

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<sup>94</sup> Truver, Scott C., PhD. "Naval Mines and Mining: Innovating in the Face of Benign Neglect." Center for International Maritime Security. December 20, 2016. Accessed June 27, 2019. <http://cimsec.org/naval-mines-mining-innovating-face-benign-neglect/30165>.

objectives; the American reaction to the *Samuel B. Roberts* striking an Iranian mine is clear evidence of this.

The final option is a distant blockade, like that employed by Britain against Germany in World War 1 or the fusion *guerre de course*/blockade employed by the United States against Japan. This involves stationing naval assets far from the enemy coastline and tasking those assets to deal with targets and threats in a more decentralized manner. While this is a useful strategy for preventing an adversary from sortieing naval surface vessels, it is inherently less effective at interdicting merchant shipping unless there are numerous naval assets available that can operate independently from larger task forces. For the United States in World War II submarines were able to serve in this capacity. Depending on the rules of engagement, drones could perform this same role; however, as unmanned craft, drones would likely be unable to evacuate crew from merchant shipping and may thus provoke a negative geopolitical reaction if non-combatants or neutral sailors are killed or left adrift.

Depending on the situation, these strategies can be fused to varying degrees, as shown by both the German World War 1 and American World War 2 case studies. In both scenarios, submarines were used as commerce raiders and minelayers to enact distant blockades through destruction of shipping within a specific geographical zone. Over the course of the campaign, the American effort against Japan eventually would incorporate all three naval economic warfare strategies as the virtual elimination of the Imperial Japanese Navy and the shrinking Japanese-held territory transitioned the

American effort into a close blockade in 1945. Thus, some synthesis of blockade and commerce raiding strategies is likely the best course of action if possible.

#### Military Forces and Structure:

Another important factor in successful naval economic warfare is employing strategies that best suit the military force structure that is realistically available. The case studies show that at least tactical, if not strategic, successes were achieved only by following this criterion. For example, the Confederacy was able to employ commerce raiders with surprising effectiveness; they were forced into this strategy, though, by the inherent constraints of their lack of shipbuilding infrastructure and limited funds for acquisition of foreign vessels. These few cruisers would have been entirely wasted had the Confederacy sought to enact a rigid blockade of Union ports as they would have stood little chance against the overwhelming quantitative superiority of the Union navy. Likewise, the German submarine commerce raiding campaigns in World War 1 were vastly more successful than their surface vessel equivalents as the Royal Navy had a significantly easier time countering a surface threat with the ships and technology available at the time. Focusing additional resources on the surface component would have had little, if any, return on investment for the German navy; the prioritization of submarine production towards the end of the war indicates that the Germans realized this. Iraq's lack of naval assets and geographic reality dictated the employment of land-based antishipping missiles, artillery, and aircraft against commerce in the Persian Gulf.

There is another consideration when looking at military forces and structure as they relate to economic warfare, which I term “potential” assets. If, as predicted by the United States leadership at the start of World War II, the conflict is likely to be long enough that production capacity and systems development will become a deciding factor, then the assets a nation can deploy a year or two down the road may have a critical impact on the shape and success of their naval economic warfare strategy. As seen in the case studies, there is typically a noticeable lag before a naval economic warfare strategy can coalesce into an effective operation. This can result from initial lack of assets or training as well as inadequate systems and weaponry. Implementing sufficient development and production of these “potential” assets along with establishing the necessary combat and logistical tactics to support them, can transform an initially ineffective strategy into one of significant strategic impact. The Union navy in the span of roughly four years went from a few dozen vessels available for all duties to hundreds of assets dedicated solely to blockading the Confederacy. The realization of this potential morphed the inconsequential Union blockade of 1861 into a key factor in the defeat of the Confederacy. Likewise, the reform of training and strategy in conjunction with improved weaponry and increased submarine production meant that, by 1944, American submarines were sinking vastly more Japanese merchant shipping than they had in 1942 and 1943. Iraq was able to acquire fixed-wing aircraft with significantly greater capabilities than their initial rotary-wing force, enhancing their maritime strike capabilities throughout the Persian Gulf.

Broader Strategic Objectives:

The final consideration regarding the employment of naval economic warfare is the theoretical place it would take in the broader strategic goals of the conflict. Aside from the aforementioned risk of international intervention from destruction of neutral shipping, implementing naval economic warfare itself may prove antithetical to strategic goals. If limited objectives are sought, then threatening to starve a country of goods and resources would likely galvanize resistance and transform a limited war into something far broader and bloodier. While Iran and Iraq were fighting over relatively small tracts of land, the Tanker War eventually provoked an international intervention which likely led to the failure of both sides to achieve their strategic objectives. The threat of humanitarian crisis through resource deprivation may by itself catalyze international intervention on behalf of the adversary. Leadership must examine the expected duration of the conflict, the desired objectives, and the theoretical negative externalities of implementing naval economic warfare. Even if properly implemented, naval economic warfare's effectiveness could prove to be a double-edged sword.

### **Conclusion: Naval economic warfare in the 21<sup>st</sup> century**

After looking at the case studies and the framework derived from them, can naval economic warfare still be employed by modern regional and global combatants? While clearly not a blanket solution, naval economic warfare will remain an important strategy for the foreseeable future. The global reliance on maritime commerce will incentivize blockades and commerce raiding whenever feasible within the framework established by this paper. However, future naval economic warfare may not be as destructive as indicated by the four case studies. Distant blockading can be augmented

by unmanned and space-based surveillance systems, facilitating the safe redirection of neutral shipping away from the combat zone whenever possible and thus allowing kinetic force to remain a deterrent, reducing the likelihood of international intervention. Unmanned surface vessels, as evidenced by the United States Navy's Sea Hunter program, could enable close blockades in the littoral without significant risk of human casualties.<sup>95</sup> Electronic warfare could disable commercial vessels without the need to fire a shot, while cyber-attacks could cripple port infrastructure without bombardment. The naval economic warfare framework could be altered to accommodate the maturation of these technologies, especially risk calculations regarding international reactions to the targeting of neutral shipping.

While emerging technologies may enable less destructive future naval economic warfare, kinetic *guerre de course* is likely to become a viable solution for an increasing number of state and non-state actors exemplified by the emerging antishipping capabilities of Houthi rebels in Yemen. The Tanker War established the Exocet missile as the most effective weapon on either side for the destruction of commercial vessels; it is important to note that the Exocet was designed in the 1970s with relatively simple targeting and fuzing. Its 165kg warhead was often insufficient to inflict crippling damage on larger merchant vessels like crude tankers displacing over 200,000 tons.<sup>96</sup> More modern antishipping missiles with larger warheads and more sophisticated

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<sup>95</sup> Eckstein, Megan. "Sea Hunter Unmanned Ship Continues Autonomy Testing as NAVSEA Moves Forward with Draft RFP." USNI News. April 29, 2019. Accessed July 13, 2019. <https://news.usni.org/2019/04/29/sea-hunter-unmanned-ship-continues-autonomy-testing-as-navsea-moves-forward-with-draft-rfp>.

<sup>96</sup> Navias and Hooton, pg. 86

guidance would likely perform far better, significantly increasing the viability of missile-based commerce raiding. Additionally, current submarines with guided torpedoes are likely to be far more effective in performing *guerre de course* operations than their early-20<sup>th</sup> century counterparts. There is a direct need for analysis regarding the construction of modern commercial vessels and the effectiveness of these kinetic systems in order to better assess the validity of commerce raiding for state and non-state actors.

Thus, while the framework established by this research study should remain valid well into the 21<sup>st</sup> century, future research should be conducted on how current and emerging technologies and weapons systems affect the conduct of future naval economic warfare and the implementation of these principles.

## Appendix 1: Case Study Overview

Case Study	Context	Strategy	Outcome
US Civil War	Generally steam-powered wooden and iron-hulled vessels, muzzle-loading black powder weapons; both sides have initially small navies and require rapid shipbuilding programs to augment their strength	Union: "Anaconda" strategy of blockading Confederate coastline Confederacy: Commerce raiding to tie up Union resources and impact Union economy	Strategic Union victory: Confederate economy heavily affected by blockade and externalities, while Confederate commerce raiding has insufficient effect to turn the tide
German Commerce Raiding WW1	Submarines and torpedoes relatively mature but untested technology, Britain reliant on vulnerable merchant routes, German surface fleet insufficient to achieve sea control	Two campaigns of unrestricted submarine warfare targeting merchant shipping, fusing commerce raiding with blockade strategies	Strategic German defeat: despite notable tactical success and millions of tons of merchant shipping sunk, German campaigns are unable to force Britain to sue for peace and represent key factor in America's entry into WW1
American Pacific Theater WW2	American surface fleet unable to project power after Pearl Harbor attacks, interwar developments in fleet submarines enable operations far from existing bases	Implementation of Plan DOG, submarine campaign against Japanese merchant shipping later augmented by an aerial mining campaign	Strategic American victory: By the beginning of 1945, Japanese economy is crippled and is unable to supply critical war materials
Tanker War, Iran-Iraq War	Both sides have relatively small surface fleets, Iraq has rotary-winged aircraft capable of firing Exocet ASHM but neither side has sufficient formations trained in anti-shipping operations in the Persian Gulf	Both Iraq and Iran target merchant shipping using whatever means at their disposal, with Iraq emphasizing Exocets and Iran using a variety of repurposed ordinance and mines	Ambiguous: While the Tanker War had a broad effect on the region, neither side was able to realize major strategic gains from their implementation of naval economic warfare



## Appendix 2: Naval Economic Warfare Framework

Key Principle	Contingent Factors
Broader Context of Conflict	<p><b>What geographic features promote/impede the implementation of naval economic warfare?</b> (Coastal features, straits, etc.)</p> <p><b>What is the likelihood of international intervention if naval economic warfare is implemented?</b> (Particularly important if regional power)</p> <p><b>What are the enemy's economic vulnerabilities or lack thereof?</b> (Enemy reliance on merchant shipping, infrastructural redundancies like pipelines)</p> <p><b>What is the predicted duration of the conflict?</b> (Kinetic naval economic warfare typically takes months to years for effects to be realized)</p>
Naval Economic Warfare Strategy Employed	<p><b>Close blockade:</b> improved control over port ingress and egress, but asset intensive and exposed to littoral dangers</p> <p><b>Distant blockade:</b> less risk and less asset intensive, but less direct control over coastal shipping routes</p> <p><b>Commerce raiding:</b> physical destruction of merchant ships and possible deterrent effect, but asset intensive and increased risk of civilian and neutral casualties</p> <p><b>Seek to fuse these strategies to maximize utility</b></p>
Military Force Structure	<p><b>What assets are available right now? What assets can be acquired in the near future?</b></p> <p><b>Do military forces have relevant antishipping training or experience?</b></p> <p><b>How reliant are military forces on outside support to maintain effectiveness?</b></p> <p><b>How well can military forces withstand attrition or sustained operations?</b></p>
Broader Strategic Goals	<p><b>Does victory require broad or limited objectives?</b></p> <p><b>If limited objectives are sought, will the implementation of naval economic warfare hamper achieving these objectives?</b> (Risk of galvanizing enemy resistance or international intervention before objectives can be achieved)</p> <p><b>How well can the domestic economy withstand the externalities of naval economic warfare?</b> (Cost of deploying and acquiring assets, economic backlash by enemy/allies of enemy)</p>

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## **Curriculum Vita**

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