

# Great Power Maritime Competition and Ramifications for Small States

by Peter Thomsson

## Resumé

När Alfred Thayer Mahan utvecklade sina tankar argumenterade han med historiska exempel för att sjömakt ger välstånd. Med tilltagande spänningar och konkurrens mellan stormakter återaktualiseras detta tankegod och dess konsekvenser för småstater som Sverige som en följd av att havet redan i fredstid är en arena för maktspel. Artikeln är baserad på författarens masteruppsats vid Högre officersprogrammet 2018-20 vid Försvarshögskolan. Relationen mellan sjömakt och välstånd testades med en tvärvetenskaplig metod. Resultaten kan fogas till forskning om betydelsen av marin närvaro och maritim säkerhet. Utöver anpassning till artikelformat har en utförligare diskussion om småstatens sjömakt infogats.



*... huru nästan hvar och et folkslags styrka i Sjön är den rätta Thermometern, hvarefter man bör dömma om dess magt, välde och anseende i allmänhet, samt huru sant det är, som även i Themistoclis och Pompeji tid var en afgjord sak, at den, som vil ständigt vara Herre til lands, måste nödvändigt begynna med at vara det til sjöss.*

Bengt Ferner<sup>1</sup>

WHEN DRAFTING MY Master's thesis in War Science,<sup>2</sup> I stumbled upon a reference to a Swedish scholar arguing for sea power more than a hundred years before Mahan. Through further research, I gained access to the original manuscript of the acceptance speech into the Royal Swedish Academy of Sciences by the Swedish scientist and politician Bengt Ferner in 1756. In his address to the Academy, from which the quote above is an excerpt, Ferner built an argument for sea power along the same lines as his more renown successor Alfred Thayer Mahan would do 134 years later. Indeed, although the Swedish title *Om Sjö-Magt* would translate

*On Sea Power*, the title of Mahan's opus *The Influence of Sea Power upon History* would have been just as fitting.

Thus, although the thesis took the more established Mahan as a starting point, it reconnected with the Swedish branch of the roots of the seminal thinking on sea power and prosperity. The approach taken in the thesis was cross disciplinary, employing theories and tools for the economic discipline of finance to investigate the causal mechanism by which sea power leads to prosperity. The findings in the thesis are by no means revolutionary, although the mere discovery of a handful of cases that in a test provided

support for the theory was more than what was expected beforehand. This also allowed for looking at the implications of sea power for the highly trade-dependent economy of Sweden, despite its ranking as a minor maritime power.

The thinking of Ferner, Mahan and their likes may seem dated but arguably their legacy carries more relevance today than in the 25 years following the end of the Cold War. This is not only due to the deteriorated global security situation in general but particularly due to the re-emergence of major power competition. With reference to the latter, the ongoing naval competition bears an eerie resemblance to the turn into the 20<sup>th</sup> century.

Military operations abroad are often based on moral and security political grounds while economic reasons are merely alluded to. The main aspiration of this article is to develop a broader understanding of the policy implications and benefits that sea power carries, even for a small state. It can also shed light on dynamics behind employment of sea power in operations, both nationally and internationally. The following article is an abbreviated and edited version of the thesis with an elaboration on what the findings imply for Sweden as a minor sea power.

## Background

Since existential wars are rare in the Western world, more strategy activity presumably takes place in peacetime, to avoid undesired armed conflict and to ensure the best conditions should war break out. This is particularly so for the maritime domain, where power struggles take place already in peace and shape the conditions for possible conflicts.

Securing trade is a core interest in peace and a question of survival in times of war. Although a pecuniary measure, economic strength is often a substitute for power

in international relations. Not only is it a powerful weapon in itself, as implied by terminology such as “trade wars”, but economic strength can also be converted into military might. Prosperity can be considered the utility that economic strength represents for the state.

Prosperity is the product of many factors that interact in complex systems. Consequently, it is difficult to isolate the positive contribution of sea power. Its influence was therefore inferred from its absence, in the form of failure to protect shipment of a key commodity. By the logic of the operationalisation, insufficient sea power results in attacks on shipping. Information of attacks is promptly reflected in asset prices on intensively traded financial markets. A negative change in a stock market index represents a reduction in the value of the traded assets. This in turn provides a negative contribution to national prosperity. Attacks on super tankers were used as empirical data. The ensuing impact was measured in first order effects on oil prices and second order effects on stock market returns. A strong correlation was found between attacks on super tankers and oil price shocks. A sufficiently strong impact on stock market returns was found to allow for arguing that the theory retains validity.

But this will require a protecting force on the sea. Otherwise the smallest powers in Europe, every one which possesses a single ship of the line may dictate to us, and enforce their demands by captures on our commerce. Some naval force then is necessary if we mean to be commercial.<sup>3</sup>

The quote above, from a letter by Thomas Jefferson to James Monroe, captures the very essence of why sea power<sup>4</sup> was imperative for the nascent United States, at the time only a minor power. A hundred years before

Mahan, the correspondence above preceded the US-Swedish campaign in 1801–1802 against the Barbary pirates. This illustrates that even minor maritime powers have an interest in sea power and can achieve significant impact when operating concertedly.<sup>5</sup>

The history of sea power is as old as shipping and many scholars have made compelling arguments on the merits of maritime power. In his famous *The Influence of Sea Power upon History 1660–1783*, Alfred Thayer Mahan strove to provide:

[A]n estimate of the effect of sea power upon the course of history and the prosperity of nations. [...] Therefore the history of sea power, while embracing in its broad sweep all that tends to make a people great upon the sea or by the sea, is largely a military history.<sup>6</sup>

Elaborating on the subject in this opus and several other works, in short he claims that sea power brings prosperity. His reasoning seems applicable across time and space as sea power supports the ability to engage in commerce, in turn contributing to national wealth and power. Mahan's deliberate effort to argue for building a strong navy and making the US a maritime state received wide acclaim both domestically and abroad. Still, costly investments in a navy are recurrently questioned and even for affluent nations require proper justification. Today, overseas trade remains of crucial importance to most nations' economies and even sustenance. 90 per cent of external and 40 per cent of internal trade in the EU is seaborne.<sup>7</sup> Provided that the relation between sea power and prosperity can be supported, the economic repercussions of failure to protect shipping would form an argument for sea power, even for lesser powers.

While the necessity of sea power has retained the same fundamental logic over time,

its ways and means have evolved. Maritime trade is more complicated than when Mahan, or Ferner for that matter, developed their thoughts. The subject therefore merited revisiting. Mahan's claim was tested to explore the strategic implications of modern sea power. The study complements previous research and to capture the interdependencies across the civil-military domain and across the conflict continuum, both particular characteristics of sea power.

## Previous research

### Sea Power and prosperity

Rahman and Looney are two research leaders who have performed quantitative analyses to assess the contribution of sea power. The former on the impact of sea power on 18<sup>th</sup> through 20<sup>th</sup> century trade, the latter on its economic impact in the post-Cold War era.

Rahman performed a series of regression analyses as well as dyadic analyses of sea power. He found that the addition of a ship of the line added 0.5–0.8 per cent to a state's trade, reducing the opponent's trade equivalently. Similarly, adding a late 19<sup>th</sup> or early 20<sup>th</sup> century dreadnought contributed a 1.0 per cent increase in trade. Allegedly, in the midst of the naval competition induced by the German Tirpitz plan at the end of the 19<sup>th</sup> century, the Royal Navy was accorded funding equivalent to 10 per cent of the British Gross Domestic Product. This is a massive proportion, and yet economically justified according to Rahman's findings.<sup>8</sup>

These findings are mirrored in another and more refined study on the same period, where the influence is studied with regard to global trade. The finding that sea power promoted one's own trade was corroborated but it was also found that in addition to the established negative effect on the oppo-

ment's trade, it also occurred at the cost of global trade.<sup>9</sup>

The effects of forward naval presence on oil prices and stock markets were investigated in two articles from 2001 and 2003, led by Looney. The choice of using the oil market as a proxy for economic impact is supported by scholars who have found that effects are transferred bidirectionally between the commodity markets and financial markets.<sup>10</sup> By looking at a derivative instrument, oil futures, the first article found a link between naval presence and the development of oil futures price curves. These rose during the onset of the Kuwait War in 1990 and fell following announcements of the crisis response.<sup>11</sup>

In a later article, studying the early effects of the second Iraq War, the effect on oil futures was ambiguous.<sup>12</sup> While the author proposed a number of explanations, one of these may be the most important, the old financial adage that markets prefer bad news over uncertainty. The article does not seem to make a deeper analysis by looking at the prevailing conditions with a long antecedent to the invasion, which may have contaminated the reference period.

The articles led by Looney and Rahman all studied the effects of naval force generation and employment, examined through a range of sophisticated methods. They represent the closest fit to the research question of the thesis. However, persistent forward naval presence of the kind studied is reserved for a few major powers, limiting the extent of potential generalisation.

## Oil prices and markets

The choice to operationalise via super tankers and stock markets introduces the fields of oil prices and stock indices. Compared to the previous field, the research on oil price

shocks and stock markets is richer. The link between oil prices and stock markets has been found to be dependent on local market characteristics and on the market regime.<sup>13</sup> Markets are more sensitive to an oil price shock in downward moving Bear markets with low mean returns and high volatility. They are less sensitive in upward moving Bull markets with high mean returns and low volatility. This may be attributable to Bull markets having a greater capacity to absorb increased costs. The impact of oil shocks has furthermore been found to be more varied in Bear markets.<sup>14</sup> The timing in a macroeconomic cycle appears to matter, with effects being more pronounced during weak growth or recessions.<sup>15</sup> This can possibly have the same background as the market regime, although it must be borne in mind that financial markets and national accounts do not always move in concert.

The mechanisms for market reactions are complicated. The dominant theory that oil shocks are transferred via microeconomic pricing theory has been questioned, leading to a debate among economists. Critics instead suggest that macroeconomic effects of oil-induced inflation and monetary policy are more influential on market reactions.<sup>16</sup> This is not a trivial technicality as monetary political conditions have metamorphosed from the 1970s to today. Other scholars contend the primacy of microeconomics, qualifying it by adding the influence of structural factors.<sup>17</sup> A comprehensive discussion of mechanisms between oil prices and stock market returns is found in Degiannakis, Filis & Arora.<sup>18</sup>

Another issue is that of US shale oil production, which mitigates the impact of oil price shocks. The oil industry benefits from oil price increases and this carries spill-over effects for other industries. The significance of economic structure, mainly if the country is a net importer or exporter of oil, is corroborated by other studies.<sup>19</sup>

The economic impact of oil price shocks is unfortunately complicated and dependent on multiple factors. The primacy of either micro- or macroeconomic linkages is contested. Market developments such as shale oil extraction or natural gas substitution carry cross pricing effects. Furthermore, there has been a relative decrease in the importance of oil consumption as a proportion of Gross Domestic Product and of total energy consumption. Macroeconomic cycles and market regimes contribute their share, as do country-specific and structural factors. It is also possible that both the first and second order effects, on oil prices and stock markets respectively, have become less pronounced over time. Nonetheless, it appears to remain uncontested that oil supply disturbances lead to oil price hikes which in turn burden stock market returns.

## Trade and economics

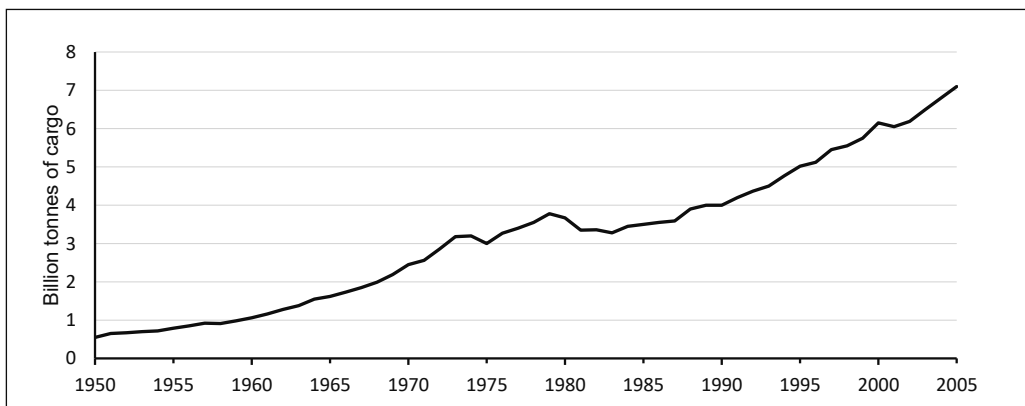
*Seneca thinks this is Nature's greatest service, that by the wind she united the widely scattered peoples, and yet did so to distribute all her products over the earth that commercial intercourse was a necessity to mankind.*

Hugo Grotius<sup>20</sup>

Better known for his thinking on law and *Mare Liberum*, the 17<sup>th</sup> century Dutchman Hugo Grotius succinctly captures the essence of trade. Through five millennia, trade has been a precursor to prosperity, spreading from Mesopotamia in 3000 BC. Contrary to what Philip Colomb stated<sup>21</sup> seaborne trade appears to have preceded naval war. The relation is close however "...commerce thus on the one hand deters from war, on the other hand it engenders conflict, fostering ambitions and strifes which tend towards armed collision. Thus it has continuously been from the beginning of sea power."<sup>22</sup> With a tint of his political view, Engels even attributes the emergence of modern navies to colonial trade.<sup>23</sup>

Improvements in transportation technology contributed to the vibrant growth in trade and wealth from the age of industrialisation. This growth has continued into the modern day. Shipping represents almost the entire volume of interregional transportation of goods and a substantial part of short distance transports. Over the last half of the 20<sup>th</sup> century, shipped cargo increased fifteen-fold, see *Figure 1*.

To a great extent this is an effect of transport economies that have rendered the cost



*Figure 1. : Maritime trade 1950–2005. (Author, based on Stopford 2008)*

so small that freight has become subordinate to manufacturing cost.<sup>24</sup> In turn this has resulted in South East Asia becoming the ‘factory of the world’.

The relevance of economic factors for naval and military affairs is not always recognised, although it is quite straightforward to view them through an ends-ways-means perspective. They can be part of the *ends* of a war, in the sense that winning, or at least not losing, economically valuable assets are normally part of the objectives of a war. They can be part of the *ways*, inasmuch as embargoes, sanctions and other economic instruments are part of the grand strategic toolbox. Finally, in a more abstract sense, they can be *means*, as being part of the resource base from which to build a war effort.

## Sea power

*Naval strategy has for its end to found, support, and increase, as well in peace as in war, the sea power of a country.*

Alfred Thayer Mahan<sup>25</sup>

It is clear that Mahan across his numerous works developed a deep understanding of sea power and trade in a wide strategic context by careful analysis and study of history. This may have been cultivated by his father, who was a professor at the U.S. Military Academy and a writer on military theory. The younger Mahan seems to have adopted elements from his father’s thinking before developing volumes on a wide range of subjects pertaining to sea power. Mahan’s work is often designated as a search for Jominian principles. While Mahan may have adopted Jomini’s analytical methods, the modern scholar Sumida in his thorough reading of Mahan finds stronger association with Clausewitz’ thoughts, most importantly

the necessity of the commander’s genius to manage the unpredictability of war.<sup>26</sup>

Upon appointment to the U.S. Naval War College, Mahan set out to compile and analyse the history of naval warfare. At this time, living standards were improving and international trade grew vibrantly. To this backdrop, Mahan argued for substantial investment in the U.S. Navy, building his argument on Britain as the example in *The Influence of Sea Power upon History*. In addition to this, Mahan wrote a body of work on naval topics as tactics, strategy and force composition; but also on trade and grand strategy. His ideas are often portrayed one-dimensionally and he later refuted some of his earlier statements. However, his thoughts on international naval cooperation, on indirect strategy and on the necessity of trade for a modern state’s survival, all remain current and valid. This shows that his thinking was at the very least on par with his contemporaries. While elements of his thinking have become dated by technological and political developments, the lion’s share appears to have aged with dignity. His thinking is possibly even more current now than only a decade ago.

## Sea power

*But thus much is certain, that he that commands the sea, is at great liberty, and may take as much and as little of the war as he will. Whereas those that be strongest by land are many times nevertheless in great straits.*

Sir Francis Bacon<sup>27</sup>

Many benefits of the ability to exercise sea power are intuitive and seem widely accepted. Still, the idea of sea power and its definitions have long been debated. One of the narrowest definitions states that it is “...a

military concept, that form of military power, that is deployed at or from the sea”.<sup>28</sup> This is similar to Friedman’s “...power centered on and projected from the sea...”.<sup>29</sup> A more modern definition states “...a navy is the portion of military forces that operates in the fluid mediums that humans use for information, transportation, and exchange but cannot normally inhabit”.<sup>30</sup> Finally, a wider definition of sea power is suggested “...the political and military use of naval forces, in war and peace”.<sup>31</sup>

Not only do the latter two offer more generous definitions that better suit the purposes of this article, they also have the merits of encompassing the full conflict spectrum, including the use of sea power in peacetime. The integration of naval into military strategy has obvious advantages for synergy and coordination. However, as an unfortunate side-effect, such a narrow understanding of sea power reduces it to an exclusively military role, wherein it fails to be exploited to its full capacity in a wider context. Maritime strategy, to which naval strategy also caters, encompasses both peace and war, consequently, so should naval strategy. Supporting both military strategy and maritime strategy, naval forces are required for operations of

great variety across the conflict continuum from policing to high-intensity operations.<sup>32</sup>

Due to its close connection to the economic domain as well as to national sustenance, sea power has wide strategic implications and interdependencies.<sup>33</sup> Grand strategy, in Liddell Hart’s definition, includes the full range of state instruments. Even if it extends beyond, war is at its heart.<sup>34</sup> Castex offers a wider concept of *stratégie générale*, encompassing all the state’s coordinated efforts: “... the art of managing all the powers of a nation starting from peacetime: it transcends, dominates, coordinates and disciplines all [domain] specific strategies” (author’s translation).<sup>35</sup> This furthermore includes domain interdependence, where maritime strategy interacts with industrial, economic and diplomatic strategy. Landquist builds a similar framework on maritime and naval strategies’ multiple relations, across peace and war.<sup>36</sup> This is more pertinent in the modern conflict environment that includes threats to trade and to critical resource provision. For an antagonist, attacks on shipping have the attraction of achieving strong impact, by grey zone activities as well as acts of war.<sup>37</sup> Figure 2 illustrates linkages from naval strategy.

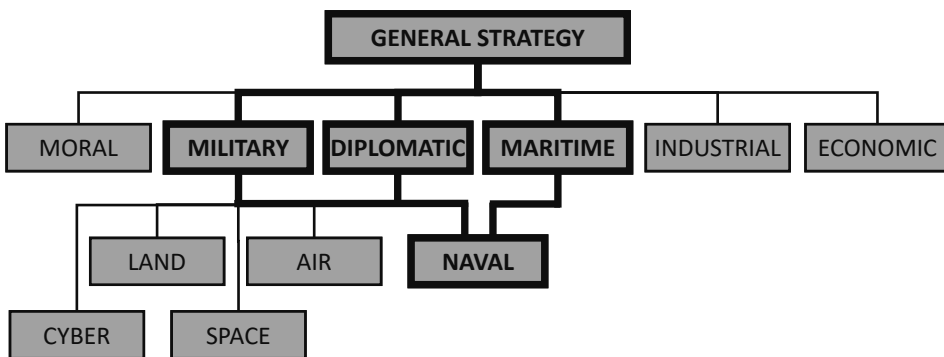


Figure 2: Strategic interdependence. (Author)

## The functions of a navy

*It follows then as certain as that night  
succeeds the day, that without a  
decisive naval force we can do nothing  
definitive, and with it every thing  
honorable and glorious.*

George Washington<sup>38</sup>

This quote originates from a letter to the Marquis de Lafayette by George Washington. It is possible that the wording of the utility of a navy is coloured by a flattering acknowledgement of the French Navy's contribution to the victory against Earl Cornwallis. The French expedition nonetheless exhibited all three functions – military, policing and diplomatic – later defined by Booth.<sup>39</sup>

The defining role for a navy is the military one. Naval missions strive to exercise sea control and, when necessary, to perform operations from the sea. Added to this should be sea denial, normally striven for by the inferior power to reduce the opponent's value of the sea.<sup>40</sup> It is inherent to the nature of naval warfare that the sea as such cannot be subjected to permanent possession. The primary objective is consequently to secure one's own communications and deny those of the enemy. Local and temporary control is the norm.<sup>41</sup> This is often contrasted to a description of land strategy wherein conquest and possession of territory hold primacy, although both descriptions are schematic and need nuancing.

In the policing role, the navy normally addresses non-state actors with the purpose of enforcing state sovereignty and maintaining good order at sea.<sup>42</sup> Often referred to as *maritime security*, this has grown significantly in importance and definitional content following the 9/11 terrorist attacks.<sup>43</sup> Maritime security is a topic, as well as a

product, of sea power and is often used to denote a wide range of activities from securing national interests in food and mineral extraction to safeguarding the sea from pirates and terrorists.

The diplomatic role is unique for the navy and sometimes overlooked. In the words of Oliver Cromwell "a man-o-war is the best ambassador".<sup>44</sup> This can be exemplified by the US naval visits to Turkey and Greece to stem expansion of the Soviet sphere of influence in the aftermath of World War 2.<sup>45</sup> More recent examples are the resumed US-UK naval operations in Barents Sea in May 2020. *Gunboat diplomacy*, using naval presence as a signal, is well-known but naval diplomacy is more than that. Sea power can be exercised far from home and close to allies or potential antagonists. This can be signalling but it is also a way to award political and strategic decision-makers time and allow them to keep options open.<sup>46</sup>

## Sea power and prosperity

*... for whosoever commands the sea  
commands the trade; whosoever  
commands the trade of the world  
commands the riches of the world, and  
consequently the world itself.*

Sir Walter Raleigh<sup>47</sup>

As can be surmised from the quote, one of the key aspects of sea power is obtaining power by securing trade. Even if the core of human activity takes place on land, the sea represents many values, the foremost of which remains that of offering civilian and military lines of communication.<sup>48</sup> In addition, over the past decades resource extraction has grown in importance, either marine life from the body of water or minerals from the seabed.<sup>49</sup>



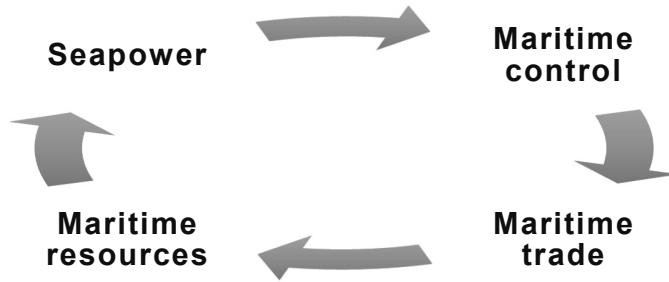


Figure 3: *The virtuous spiral of sea power.* (Author)

A state's ability to reap the rewards of the sea is dependent on several factors. Scholars generally include at least geography, demography, history and tradition.<sup>50</sup> The state's character and self-perception as a continental or maritime power also influences or even dictates its prioritisation of sea power and its prerogative to exploit its maritime position for strategic choices.<sup>51</sup>

The merits of sea power transcend the ideological divide. Gorshkov established that by historic example, naval forces have been instrumental for states to maintain their standing and status.<sup>52</sup> Engels claimed that sea power is a product of a state's industrial power, rather than a precursor to it. A powerful navy thus epitomises the economic power of a nation.<sup>53</sup> This fits with the idea of the virtuous spiral by which sea power in extension is self-reinforcing.<sup>54</sup> Engels is not necessarily in conflict with Mahan, it merely seems the starting point differs.

### Securing sea lines of communications

*...the success of all operations depends upon the disposition of the forces in such a manner as will best secure the base of operations and ensure safety and freedom of communication.*

John Charles Ready Colomb<sup>55</sup>

In addition to his theory on sea power, the enduring legacy of Mahan are his thoughts on the primacy of concentration into a battle fleet to destroy that of the enemy, to obtain command of the sea through a decisive battle.<sup>56</sup> This is in concordance with the thoughts advanced by his British contemporary Philip Colomb.<sup>57</sup> It also echoes the Clausewitzian central tenet of annihilating the enemy's main army in a *Hauptschlacht*.<sup>58</sup>

The French admiral Castex at least initially emphasised the offence and annihilating the enemy's battle fleet as much as Mahan, making *Guerre de course*, which he considered a peculiar approach, a lower priority.<sup>59</sup> Albeit reluctant to admit his theoretical affinity with his British counterpart, Castex later agreed with Corbett on the primacy of securing communications,<sup>60</sup> possibly as a consequence of his continental power perspective that did not offer hopes for dominance of the oceans.

Despite a continental strategic situation similar to that of France, Tirpitz rejected the ideas of the *Jeune école* as well as *Guerre de course* or its German relative, *Kleinkrieg*. Instead he argued for building the *Hochseeflotte*, capable of challenging the Royal Navy, and a strategy to invite battle on German conditions.<sup>61</sup> This is generally held as a warning example of a strategic misconception.<sup>62</sup> The verdict of history may

need nuancing as alternatives were scarce for Germany, locked in behind the North Sea.<sup>63</sup>

Corbett agreed with his predecessor Mahan about the ends: securing one's own communications across the sea and denying those of the enemy. He disagreed about the ways and means, arguing that seeking a decisive battle fleet engagement entails a risk of expending excessive effort in vain and in the process failing to secure communications.<sup>64</sup> He furthermore saw the need for a differentiation of ship types by task, with not only a battle fleet capable of securing sea control but also vessels suitable for exercising or disputing sea control.<sup>65</sup> In fairness it should be mentioned that this need for differentiation was recognised before him, by Philip Colomb.

Particularly pertinent for the subject of this article is the thinking of John Colomb, brother of Philip Colomb, since he formulated as a principle the necessity of protecting commerce also in peacetime.<sup>66</sup> The conceptual distinction between naval and land forces, the focus on controlling communications rather than territory, may also stem from John Colomb but is often attributed to Corbett, the more influential of the two.<sup>67</sup> Moreover, both of these thinkers appear sceptical to the prospects of decisive battles. The concept of prioritising the flag state's naval vessels for securing its seaborne commerce was embraced even in countries lacking sufficient resources to fully enact this, in Sweden as late as 1935.<sup>68</sup>

## Guerre de course

*...tomber sans pitié sur le faible et fuir sans fausse honte de toute sa vitesse devant le fort, telle en est la formule.*

Gabriel Charmes<sup>69</sup>

Considering the decisive battle an unaffordable risk for an inferior navy, the proponents of the *Jeune école*, centred on small but agile ships and a defensive strategy, instead suggested to engage in *Guerre de course*. Its essence is captured in the quote above. Unable to exercise sea control, the weaker part may take recourse to sea denial, with the objective of denying the opponent the advantages which itself cannot enjoy. Falling upon the enemy's merchant vessels in this regard does not only imply attacking an easy prey but also a strategic indirect approach. It aims at strategic effect by cutting necessary trade and imports.<sup>70</sup>

In World War I, blockades and *Guerre de course* caused severe difficulties for the belligerents as well as for neutral Sweden.<sup>71</sup> Today, shipping is a target for terrorists, as seen in the attack on the *Limburg* off Aden in 2002,<sup>72</sup> where Al Qaida sought to achieve the same strategic effect as by *Guerre de course*. Increased trade dependence, just-in-time delivery optimisation and lower self-sustaining capacity has made the modern state more vulnerable to disruptions to shipping. A recent corollary is the situation of Sweden, which during the COVID-19 Crisis, lacked necessary reserves of medical supplies and saw shipments intercepted in transit by a fellow EU member. As a contrast, Finland relied on strategic reserves of critical resources. Still, in the long run both states are vulnerable to trade disruptions as full self-sustainment is near impossible.

## Four generations of protection of shipping

Carl von Clausewitz scholars stated that history should be studied neither in isolation, nor prescriptively, but as a fundament for addressing future situations. Mahan likewise considered it a medium for communicating

and cultivating strategic skills.<sup>73</sup> The evolution of protection of shipping is categorised into four generations, as a theoretic background.

### Generation zero: shipping capable of self-protection

Prior to organised forms of protection of shipping, merchant vessels were often armed and quite capable of fending for themselves. The perhaps best known examples are those of the legendary British East India Company, carrying substantial armament to deter and to defeat pirates, privateers and navies along their perilous trade routes from the Indian Ocean.<sup>74</sup>

Arming merchant vessels outside war was long been considered a thing of the past and replaced by subsequent generations of protection of shipping. Nonetheless, despite concerns by the International Maritime Organization, the resurgence of piracy in the Indian Ocean led to merchant ships again being armed, albeit with temporary *Privately Contracted Armed Security Personnel*.<sup>75</sup> While this has contributed to a substantial reduction in Somali piracy there are concerns for misunderstandings and use of firearms on third parties.

### First generation: seminal thinking of protection of shipping

*Denn was ist Deutschland ohne Flotte?  
Ein armer, alter, schwacher Mann,  
den Dänemark mit zwanzig Schiffen  
verderben, hungern lassen kann.*<sup>76</sup>

The verse is from a German newspaper in 1848, describing the dire helplessness under Danish blockade. Although born the year after, this seems to have been as formative for Alfred von Tirpitz as the Napoleonic Wars

were for Carl von Clausewitz, possibly a cause for the Tirpitz plan described above. In the era of industrialisation, securing and denying trade was a topic elaborated upon by thinkers in maritime as well as continental states. A crude sketch of the ideal aspired for in the classical version of protection of shipping required a grey vessel escorting a white vessel, both flying the same flag with owner, crew and cargo all from the same state and in the nation's interest.<sup>77</sup> This had strong implications for nations incapable of securing their overseas trade.<sup>78</sup>

### Second generation: hegemonic protection of shipping

When Great Britain was the hegemon on the seas, it was argued that as this supremacy emanated from a trade-oriented state, this benefited other states.<sup>79</sup> The allied victory in World War II settled the naval competition that had preceded the war. The US emerged as the major naval power, establishing its Pax Americana while the Soviet Union prioritised nuclear arms and the air force.<sup>80</sup> The period can be denoted as under US dominance.<sup>81</sup> Without discounting major navies as the British and French, this lasted through the Cold War, and the Soviet Navy could never fully measure up to the U.S. Navy.<sup>82</sup> Gorshkov drew up ambitious plans,<sup>83</sup> but the Soviet empire was already waning. Even without naval power parity, the Eastern Bloc saw some benefits. The US hegemonic maritime security was useful in peacetime but a concern for a contender in wartime, consistent with empirical findings by Levy & Thompson.<sup>84</sup> Maritime powers have more potential but also more need for seeking hegemony. Conversely, continental states are likely less dependent on the sea. However, already Mahan considered hegemonic control untenable.<sup>85</sup>

### Third generation: cooperative protection of shipping

With 90 percent of global trade by volume transported by sea, shipping lanes and the freedom to navigate them have become the critical elements of the world's economic infrastructure. As a result, the security of these commons is now a core issue for all nations, regardless of size or capability.<sup>86</sup>

With the demise of superpower confrontation, the U.S. Navy's dominance was reinforced but yet insufficient to meet growing challenges to maritime security. Not only had trade and globalisation grown but so had piracy and terrorism, while the number of naval ships to uphold security had shrunk since the end of the Cold War.<sup>87</sup> A new strategy was developed in the generally benign and cooperative global security situation.<sup>88</sup> The most influential document was the so-called 1,000 Ship Navy.<sup>89</sup> In this, the US Chief of Naval Operations proposed broad international cooperation, mainly for the lower range of the conflict spectrum.

Protection of shipping is now a common good provided by states operating together as a loosely coordinated system. A ship, its operator and its crew may be of several different nationalities. The cargo can belong to a broad palette of owners and repeatedly change ownership underway. Maintaining trade is a shared fundamental interest among a world community of post-modern navies. Both US and Chinese scholars and professionals have advocated increased cooperation for maritime security.<sup>90</sup> The successful international operations off Somalia<sup>91</sup> testify of consensus on the mutual benefit. However, this may already be fracturing with the advent of renewed major power competition.

### Theory test

*The history of Sea Power is largely, though by no means solely, a narrative of contests between nations, of mutual rivalries, of violence frequently culminating in war. The profound influence of sea commerce upon the wealth and strength of countries was clearly seen long before the true principles which governed its growth and prosperity were detected.*

Alfred Thayer Mahan<sup>92</sup>

Even with some criticism for being overly case dependent and deterministic, the basic relationship between sea power and prosperity in Mahan's theory appears uncontroversial among scholars. Nonetheless, sea power is but one of many factors contributing to national wealth.<sup>93</sup> This makes it difficult to isolate its effect for a causal relationship. However, it may conversely be possible to infer the importance of sea power by examining the economic consequences of the absence of protection of shipping.

In an effort to examine if the theory can be corroborated, a case study was performed on empirical data. In the desired situation, sea power is present and sufficient to effectively protect shipping, deterring any would-be aggressors. As is often the case with protective measures, success renders them invisible, but failure becomes strikingly obvious. Isolating the positive contribution is deemed unfeasible, which is why this article conversely tests the negative influence from failure to protect shipping. It is therefore sought to estimate the influence of sea power and protection of shipping by exploring the consequences of significant disturbances. Attacks on shipping are events that can be temporally and spatially defined, facilitating the analysis of

potential consequences. Specifically, the cases studied are disruptions of oil transportation at sea. The rationale is that attacks upon oil tankers have the potential for far-reaching ramifications.

As described above, the economic mechanisms are complex. Nonetheless, the first order effect to be expected from an attack is that of a price increase in the commodity due to the specific and expected disturbance of supply. Diligence requires mentioning substitution and cross-price effects that may complicate the picture. For instance, since oil is relatively homogeneous, substitution and cross-price effects can be seen between oil qualities as West Texas Intermediate (WTI) and Brent.<sup>94</sup> This notwithstanding, the basic relation for the analysis remains.

As a proxy for prosperity, the second order effect was measured in changes in stock market indices. Financial markets react to changes in future returns expectations of traded instruments.<sup>95</sup> A fundamental principle of financial markets is that to be efficient, securities prices must reflect all relevant information so that investors can make informed decisions. This is commonly known as the Efficient Market Hypothesis. It has

three defined forms based in the information reflected in the price: *weak* with all historic information; *semi-strong* with all publicly available current information; and *strong* when adding privileged information. From the outset it has been held in high esteem with strong empirical evidence.<sup>96</sup> Intensively traded markets generally exhibit at the least semi-strong form. Stock markets quickly process information on influential events to reflect the development in how the market values the shares of companies on intensively traded markets. Although this is only a part of a state's economy it is a reasonable proxy for assessing changes in national wealth for market liberal states. The causal mechanism is overlaid on the theoretic framework in *Figure 4*, below.

The independent variable consists of attacks. These testify of insufficient sea power and resulting failure to protect shipping.

The intervening variable forms an integral part of the causal mechanism, linking from the employment, rather *unsuccessful* employment, of sea power to its strategic implications. The first order effect of an attack is that of the price evolutions for oil, measured in daily closing prices. Even a

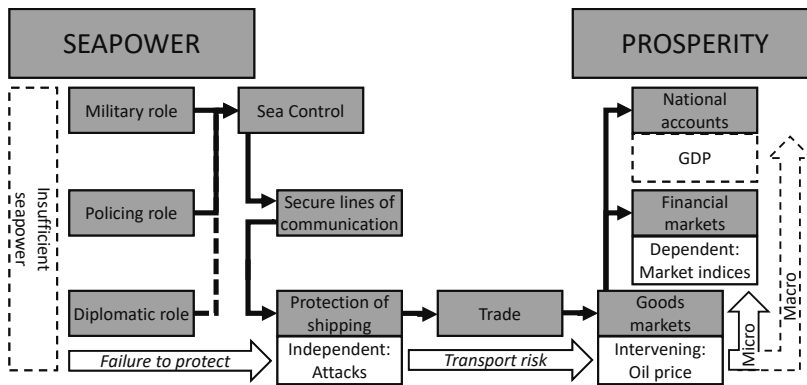


Figure 4: Theoretic framework with causal mechanism overlaid. (Author)

materially minor and local attack can have global impact.<sup>97</sup>

The dependent variable is that of stock market reactions as measured by daily closing quotes of market indices. As a second order effect of an attack, increased oil prices reduce profit expectations of traded companies and share prices fall. The linkages that transfer the impulse induced by an attack are complex, but this should not be understood as prohibiting for the possibility to explore causality.

## Hypothesis generation

The theory test was conducted using Popper's logic of scientific research. The research question's implicit hypothesis was that Sea power contributes to prosperity. The null-hypothesis used for the test was therefore:

$H_0$ : Sea power does not contribute to prosperity.

This overarching hypothesis builds upon two requirements to be tested by separate supporting null-hypotheses. The first of these concerns effects on oil as a key commodity:

$H_{0,1}$ : Attacks on oil shipping do not have a positive impact on the oil price.

Provided this first supporting null-hypothesis can be falsified, the second supporting null-hypothesis tests whether attacks on oil shipping via oil price shocks carries over to stock market returns:

$H_{0,2}$ : Oil price shocks induced by attacks do not have a negative impact on stock market returns.

Testing of the second supporting null-hypothesis is contingent on falsification of the first supporting null-hypothesis. Consequently, falsification of the overarching null-hypothesis

requires that both supporting null-hypotheses can be falsified.

The objective of the hypotheses testing is to investigate if the overarching null-hypothesis can be falsified by reasonable support for the proposition. If an effect can be discerned, the tests can be considered successful, thereby corroborating Mahan's theory. The contingency requirements are depicted in *Figure 5* below, where the hypotheses have been integrated into the research design. First,  $H_{0,1}$  must be falsified for  $H_{0,2}$  to be relevant. Secondly, both supporting null-hypotheses must be falsified to allow for falsifying the null-hypothesis.

## Sequential test by event study

Event studies are frequently employed in financial analyses to gauge the impact on returns from a significant event. An event study is performed in such a way that metrics of a variable within a specific period, event window, are compared to corresponding metrics in relation to a non-event, in an estimation window. The difference between the observed returns in the event window and the estimation window are called Abnormal Returns. By this definition, an event without effect is expected to exhibit zero Abnormal Returns. Given sufficient data, the Abnormal Returns can be statistically tested for statistical significance.<sup>98</sup> The number of observations should preferably be so large that contaminating events can be eliminated and exogenous factors controlled for.

Five choices need to be made when employing the event study method:<sup>99</sup>

1. The duration of the estimation window.
2. The asset to be compared to and measured in the estimation window.
3. Determination of the event window.
4. The frequency of data point collection.
5. The specification of price measurement.

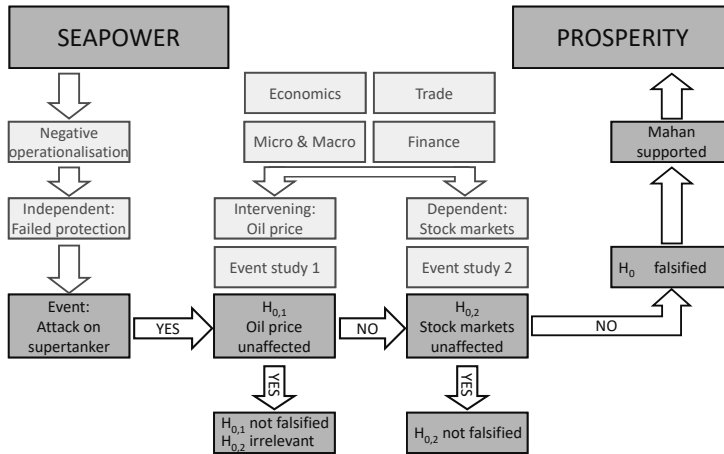


Figure 5: Integrated research design and hypotheses flow chart. (Author)

The estimation window is set to 20 days, days  $t = -20$  through  $t = -1$ , to calculate the non-event average return, capturing the prevailing market regime prior to the event.

Information on events occurring at sea is sometimes delayed and markets are not always active. The event window is therefore set to the first trading day after the event is known to markets,  $t = 0$ , and the following trading day,  $t = +1$ . This is meant to eliminate time zone effects and to ensure that the full effects of the event is captured but not diluted by other trading information in the markets. Previous findings show that oil price developments are quickly reflected by stock markets.<sup>100</sup>

Average returns are used for the reference estimation period, in a Constant Mean Return model. This choice stems from this being the most accessible model, but also from the characteristics of the measured assets, since these cannot be compared to market indices as easily as individual stocks. All return calculations are lognormal to allow for cumulating by addition. Cumulative Abnormal Returns (CAR) are summed for each case by adding the two daily Abnormal Returns in the event window. In this study, returns on oil prices and on stock market indices are measured.

The estimation and event windows are depicted in Figure 6 with schematic data to

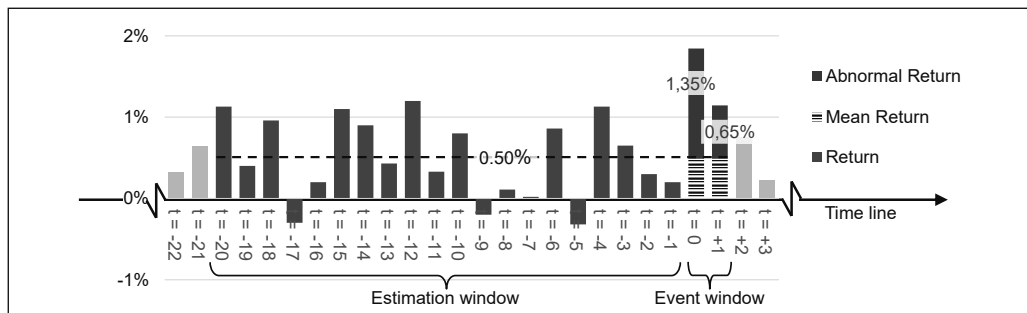


Figure 6: Schematic event study time-line. (Author)

offer an illustrative example of the method. In the estimation window, the schematic data show an average return of 0.50 per cent. Comparing to the event window returns of 1.85 per cent and 1.1 per cent, this results Abnormal Returns of 1.35 per cent and 0.65 per cent, respectively, and a Cumulative Abnormal Return of 2.00%.

Based on the CARs obtained, a Cumulative Average Abnormal Return (CAAR) is calculated across the cases. The CAAR is subsequently analysed against the supporting hypotheses to test for significance of the results. In essence this means testing whether the CAAR exhibits characteristics that allow for statistically inferring that the deviation from the expected zero Abnormal Return is not random.

Student's *t*-test is employed for the parametric test.<sup>101</sup> The use of Student's *t*-test is meant to facilitate statistical inference on whether the mean of the observations (in this case CAAR) differs from that of the population, when the distribution of the population is unknown and small sample size is small.<sup>102</sup>

In addition, Cowan's standardised sign test, a non-parametric test, is conducted to support the parametric test.<sup>103</sup> The latter explores the relation between positive and negative observations to infer the likelihood of the dominant side being a correct representation of the population.

The choice of an estimation period prior to the event introduces a risk of a period specific bias in the data. However, more importantly it precludes potential lingering effects from contaminating the estimation period. Threats to shipping can be part of a wider political and security problem and be perceived indicators of increased geopolitical risk, which in turn risks changing the market sentiment after an event.

The choice of the preceding 20 days is made to strike a balance between the estimation period being long enough to obtain representative non-event returns, while being short enough not to include contaminating trading information from other events in the return structure. This is a considered decision to obtain an adequate representation of the market sentiment and dynamic, for fair comparison.

### Case selection logic

Employing a typological approach, the cases selected represent severe disruptions to oil shipping to bear relevance for the analysis. Specifically, for sufficient impact the cases are highly valuable super tankers and attacks resulting in at least a temporary elimination from the market of a ship and its cargo. Therefore only successful hijackings and potentially total losses are considered. Supertankers are Very and Ultra Large Crude Carriers (VLCC and ULCC), vessels over 200,000 tonnes and 320,000 tonnes deadweight, the standard measure for cargo capacity in the maritime industry. They are the work horses of the oil circulation, carrying crude oil from sources to refineries.

The selection criteria to be fulfilled are:

1. Event type: Severe disruption, hijacking, seizure or serious damage from attack.
2. Vessel type: Crude carrying tanker.
3. Vessel size: Super tanker, deadweight in excess of 200,000 tonnes.

This represents but a limited part of the property space, which would theoretically also include other disruptions, types and sizes of vessels. Although potentially interesting for research, those parts of the property space fall outside the scope for this thesis.



## Sources

To ensure proper reliability, plurality of sources was sought to build the theoretical framework and to obtain empirical data. A balance was striven for, with diversity across eras and regions for sources on theory. Technical matters and data were extracted from the most adequate and current sources. To reduce the risk of bias in data selection or analysis the data and analysis are presented with transparency for facilitating reviewing.

The sources used to describe and compare theories and postulations vary between primary sources, as in the original works by practitioners and theorists on strategy and sea power, and secondary sources, for instance, monographs. These works are either of an older date or compiled from such work. Recent studies and articles have been included to complement and update the theoretic basis. For elements from Economics, sources are mainly subject-specific books and journal articles. In combination these form the structure for the typological theory developed for the analysis.

These sources were complemented by a broad reading of articles across the naval, maritime and economic domains. An informational unstructured interview with a shipbroker was used for verification. These were used as an inductive element in building the typological theory and to verify the construct validity of the analysis. They also served as an effort at plurality of strategies to gauge the plausibility of findings by statistical methods.

Information on threats and attacks was obtained via compilations obtained from the International Maritime Organization, (IMO) in Maritime Safety Committee 4, Piracy Matters (MSC.4) and from the START Global Terrorism Database. Additional data on at-

tacks were found in academic literature and news reporting.

Data on vessels, primarily deadweight, were collected via two Internet information services; Baltic Shipping and Marine Traffic.

Data on times of reporting of incidents were obtained by using the time stamp of news agencies reports as a proxy for when the information is made available to markets. There are several alternative sources available, some of which may on occasion be quicker at reporting. The function of reporting time is to identify the event window, which as described above, is when the information can be traded upon. Consequently, for each event the report with the earliest time was selected.

For the financial part of the analysis, quotes on daily closings on oil prices and stock market indices were obtained from Nasdaq OMX, Deutsche Börse, Euronext, London Stock Exchange, NASDAQ and the websites *finance.yahoo.com* and *investing.com*. For all these sources, the provision of precise and accurate financial reporting is instrumental, reinforcing why they are considered sufficiently reliable for the purposes of this thesis.

Brent futures are contracts for future delivery of oil. Since commodities require physical delivery, futures contracts are a means for trading risk. This makes them suitable to gauge the impact of disturbances to the supply chain. Brent has been found to be an adequate proxy for oil price volatility and superior to the alternative West Texas Intermediate.<sup>104</sup>

The indices were selected for their representation: OMX Stockholm 30 as a trade dependent small state; DAX, CAC 40 and FTSE 100 as European G7 economies--the first two are primarily continental powers, the third is a maritime power. NASDAQ Composite represents the US, a maritime super power.

## Analysis

Starting with the cases that fulfil the criteria for the analysis, this chapter presents the event study tests on the two supporting null-hypotheses. The latter are assessed using a parametric and a non-parametric test to obtain statistical significance levels.

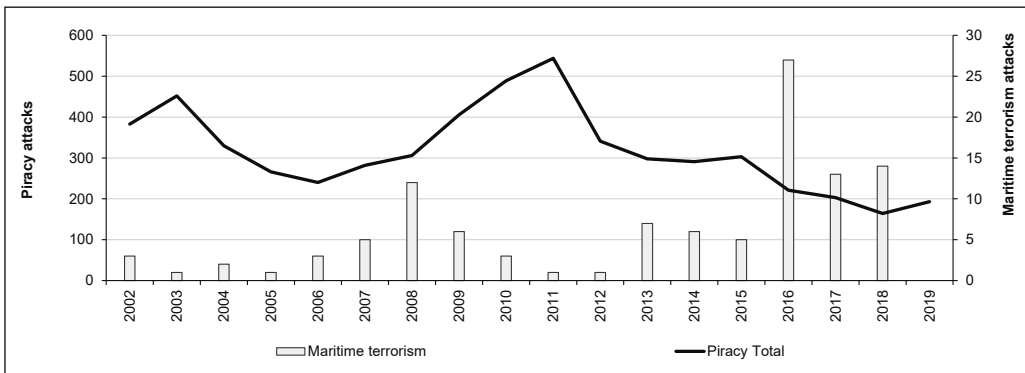
Through the ages, seaborne trade has been threatened by thieves, robbers, pirates and states; recently also by terrorists.<sup>105</sup> During the analysed period, there were 5,712 reported acts of piracy and 110 maritime terrorist attacks (the total number for 2019 was not available at the time of writing). *Figure 7* is a graphic of these two primary threats to shipping besides armed conflict.

## Cases

### Cases

As described above, the cases included are those of hijacking, seizure or attacks on super tankers, which according to the causal theory are expected to induce oil price increases and stock market index drops. From a grand list of 45 attacks, the net list of eight cases of incidents that met the criteria developed from the theory is exhibited in *Table 1*.

*Figure 8* shows the geographic locations of the incidents.



*Figure 7: Piracy and terrorism 2002–2019. (Author, based on IMO MSC.4 circulars and START Global Terrorism Database.)*

Vessel name	Deadweight	Incident date	Incident type
Limburg	299,364	2002-10-06	Sabotaged
Sirius Star	319,430	2008-11-15	Hijacked
Maran Centaurus	300,204	2009-11-29	Hijacked
M.Star	314,016	2010-07-29	Sabotaged
Irene SL	319,247	2011-02-09	Hijacked
Abqaiq	302,986	2018-04-03	Attacked
2 unnamed Saudi tankers	“VLCC”	2018-07-25	Attacked
Amjad	298,886	2019-05-12	Sabotaged

*Table 1: Net list of cases.*



Figure 8: Map of cases. (Author)

### Event study tests

Taking the above eight observations, an event study was performed on Brent oil futures. As described above, according to the theoretic framework an attack constitutes a supply disturbance, which is expected to cause an increase in the price of Brent. The resulting abnormal returns are shown in Figure 9.

For the analysis, the Cumulative Average Abnormal Return (CAAR) was calculated based on the Cumulative Abnormal Return (CAR) of each case. A statistical Student's *t*-test was then run on the results to determine the significance level at which the series of observations of attacks on super tankers could support falsification of  $H_{0,I}$ . With eight observations and consequently seven degrees of freedom, this returned a significance level of 0.1 per cent. Although this seems plausible and also visually reasonable

as in Figure 9, there are severe limitations to statistical tests on such a small number of observations.

As a control measure for the analysis, a non-parametric test was run as this is less dependent on return distribution characteristics. Cowan's generalised sign test returned a significance level of 2.5 per cent. This is not as strong as the parametric test above but still high. The results are shown in Table 2.<sup>106</sup>

The positive results from the first test justified proceeding to performing the second, contingent test. Under the theoretical frame, to be relevant this second test required falsification at a satisfactory significance level of the first supporting null-hypothesis.

In a similar vein as to the testing of the first supporting null-hypothesis, a second test was performed on stock index data to examine whether there is covariation be-

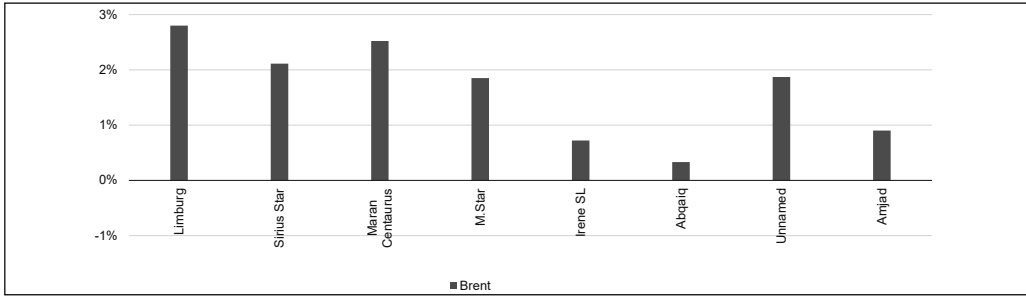


Figure 9: Oil price Cumulative Abnormal Returns. (Author)

	Positive / Negative	Cumulative Average Abnormal Return	Parametric test significance level	Non-parametric test significance level
<b>Brent futures</b>	8:0	1.64%	$p = 0.001^{***}$	$p = 0.025^{**}$

Table 2: Brent statistical results.

tween attacks on oil shipping and negative stock market index returns. According to the theory, the increased cost of oil is expected to have a negative impact on stock indices.

The test was performed independently but with the same event study methodology as for oil. Figure 10 shows the Cumulative Abnormal Returns for the indices.

The equivalent statistical test for determining the support for falsification of  $H_{0,2}$  was run on all observations with cross-sectional parametric and non-parametric tests

for  $t$ -values. The results are exhibited in Table 3, below.<sup>197</sup>

The case of Maran Centaurus stands out. Upon closer investigation, a strong uptick across global stock markets was found on 1 December 2009, attributed by financial analysts to positive housing finance figures from the US. Positive returns across all markets on this, the second event period date ( $t = +1$ ), more than offset the losses from the first date ( $t = 0$ ), making the Cumulative Abnormal Returns positive. In a separate

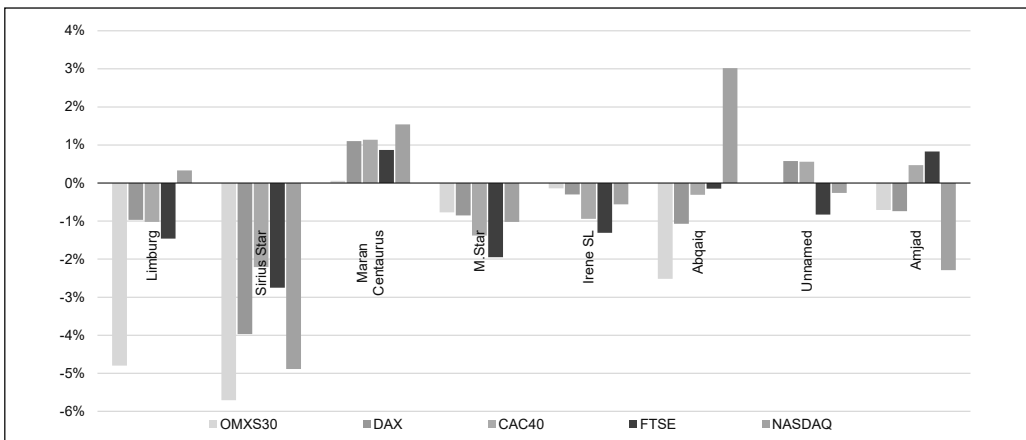


Figure 10: Stock market indices Cumulative Abnormal Returns.(Author)

	Positive / Negative	Cumulative Average Abnormal Return	Parametric test significance level	Non-parametric test significance level
<b>OMX 30</b>	1:7	-1.82%	$p = 0.05^{**}$	$p = 0.05^{**}$
<b>DAX</b>	2:6	-0.78%	$p = 0.10^*$	$p = 0.10^*$
<b>CAC 40</b>	3:5	-0.46%	$p = 0.15$	$p = 0.20$
<b>FTSE</b>	2:6	-0.84%	$p = 0.10^*$	$p = 0.10^*$
<b>NASDAQ</b>	3:5	-0.52%	$p = 0.50$	$p = 0.25$

Table 3: Stock markets statistical results.

	Positive / Negative	Cumulative Average Abnormal Return	Parametric test significance level	Non-parametric test significance level
<b>OMX 30</b>	0:8	-2.05%	$p = 0.025^{**}$	$p = 0.025^{**}$
<b>DAX</b>	1:7	-1.08%	$p = 0.05^{**}$	$p = 0.025^{**}$
<b>CAC 40</b>	2:6	-0.76%	$p = 0.05^{**}$	$p = 0.10^*$
<b>FTSE</b>	1:7	-1.11%	$p = 0.025^{**}$	$p = 0.05^{**}$
<b>NASDAQ</b>	3:5	-0.69%	$p = 0.25$	$p = 0.25$

Table 4: Adjusted stock markets statistical results.

analysis, the returns for  $t = +1$  for Maran Centaurus were removed, by which all stock market indices except NASDAQ exhibited  $t$ -values supporting falsification at the 5% significance level, as seen in *Table 4*.

## Discussion

Following a discussion on the findings, ethical and methodological considerations, and particularly significant issues are presented.

## Findings

The results exhibit consistency with the posit-ed theoretical model. Despite a small number of cases, it was possible to build a functioning test by consecutive event studies, showing that attacks have a positive impact on oil prices and indicatively negative impact on stock markets. With the exception of the US index NASDAQ Composite, the observed effects on stock indices in the eight cases are in line with the theoretic framework.

The effect on the oil price is conclusive. The effect on stock markets is less strong but, with the exception of NASDAQ, by no means inconclusive at significance levels of 10%, or at least 15%. The effect on stock markets exceeded expectations, since the impact of an attack on a super tanker could very well have been diluted to be indiscernible by the aggregate of the many other factors that affect stock markets.

At least three observations can be made from *Figure 10*, above. First: that attacks on super tankers cause a downtick in stock markets. Second: that the impact on NASDAQ Composite is varied. Third: that it appears that the effect has weakened over time, becoming less pronounced across all indices.

The second observation can possibly be attributed to the increase in US oil production over the analysed period, see *Figure 11*. This has changed the industry structure, resulting in more complex stock market responses to disturbances, as seen in Çakır Melek.<sup>108</sup>

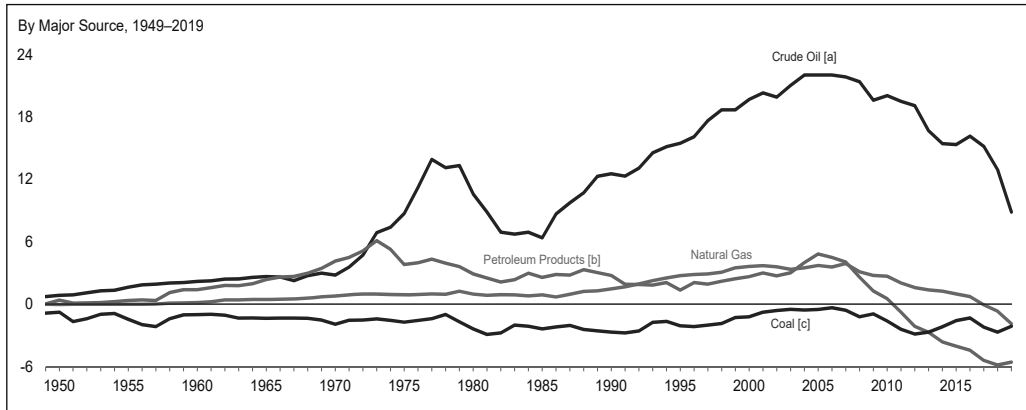


Figure 11: US energy net import in quadrillion British thermal units. (U.S. Energy Information Administration, March 2020 Monthly Energy Review, 2020 p. 12.)

The third observation is not unexpected given previous findings on oil price shocks and market regimes. Before the COVID-19 Crisis hit, global stock markets had experienced a long Bull market from 2009 to 2019, implying that all but the first two incidents occurred under a high mean, low volatility regime. The higher volatility of the first two cases was also clearly reflected in the descriptive statistics. That six of eight cases occurred during a disadvantageous market

regime furthermore makes the test more challenging for the theory and thus adds weight to the positive results.

In Figure 12 the US index is removed and the average CARs for each case is added, whereby a visual appreciation can be derived that is consistent with the reasoning above.

It is also possible that the less pronounced effect on the oil price and on stock markets exhibited towards the end of the analysed period may be attributable to increasing-

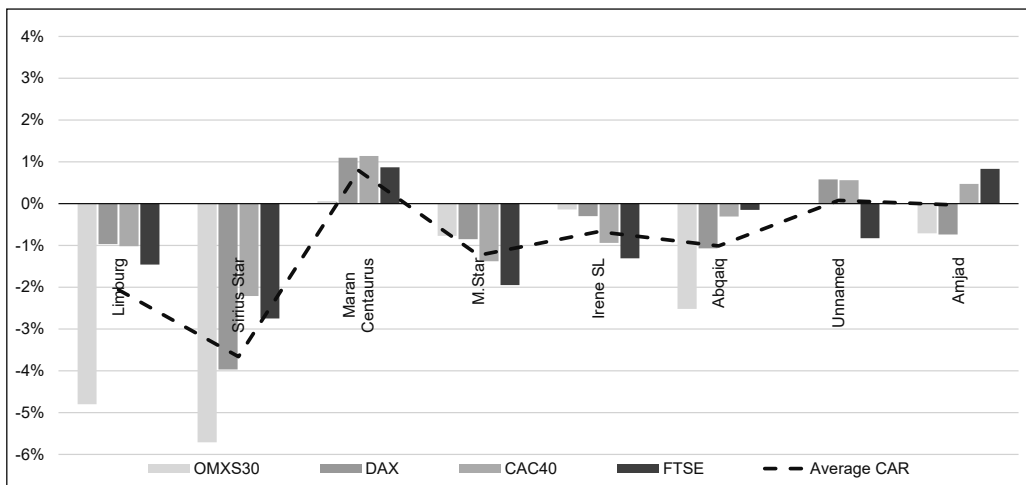


Figure 12: Cumulative Abnormal Returns of non-US indices. (Author)

ly more agile response from market actors along the oil value chain, which can offset the pricing effect. Consequently, the secondary effect on market indices may dissipate quickly or not be sufficiently pronounced to be visible. Potentially, this could be overcome by looking at intraday trading data, where price development directly subsequent to information on attacks can be analysed more closely.

Even if dependence has fallen, oil remains a crucial commodity for the majority of states, influencing the economic development of both exporters and importers.<sup>109</sup> Nonetheless, since the 1970s, concomitant effects have reduced the impact of oil shocks. Alternative energy sources have substituted oil and oil expenditures have fallen as a share of Gross Domestic Product as seen in *Figure 13*. The first factor reduces the effect of attacks on super tankers, the latter dilutes the relative impact of oil price shocks.

Attacks on super tankers may thereby have less impact on the oil price and the second order effects on stock markets may become less pronounced.<sup>110</sup> This does not make protection of shipping less important. However, it may imply that there is ample space for other research on sea power in a

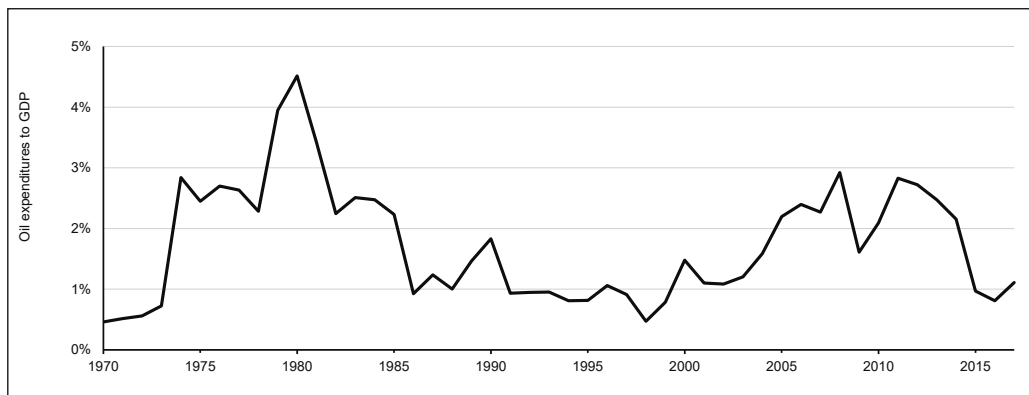
modern, interdependent and complex system where trade and security interests overlap.

## Theory test results

The standard significance levels of 5 per cent or 10 per cent are not achieved for all indices but the results appear strong enough to lend credence to the hypothesis behind the operationalisation. As discussed, statistical testing for significance levels has limited applicability when the number of cases is small which is why the final analysis also relies on qualitative reasoning in assessing the null-hypothesis. The results are shown in *Table 5*.

The quantitative results and qualitative interpretations of the tests support falsification of both supporting null-hypotheses and consequently also of the null-hypothesis  $H_0$ : *Sea power does not contribute to prosperity* as exhibited graphically in *Figure 14*.

This study was built as a deductive theory test using an analytical tool from another discipline. It was conducted on a series of observations selected by a typology, such that they would be expected to have significant impact on the independent variable, contingent on an intervening variable to suit the causal mechanism postulated.



*Figure 13: Oil expenditures to Gross Domestic Product. (Author based on The World Bank)*

		OIL MARKET REACTION	
		Negative or neutral	Positive
STOCK MARKET REACTION	Positive or neutral	H <sub>0,1</sub> Cannot be falsified H <sub>0,2</sub> Irrelevant H <sub>0</sub> Cannot be falsified	H <sub>0,1</sub> Falsified H <sub>0,2</sub> Cannot be falsified H <sub>0</sub> Cannot be falsified
	Negative	H <sub>0,1</sub> Cannot be falsified H <sub>0,2</sub> Irrelevant H <sub>0</sub> Cannot be falsified	<b>H<sub>0,1</sub> Falsified</b> <b>H<sub>0,2</sub> Predominantly falsified</b> <b>H<sub>0</sub> Falsified</b>

Table 5: Hypotheses testing outcome.

In short, the finding is that ineffective sea power results in attacks on oil transports which via a supply induced oil price shock has a negative impact on stock markets. These cases can be considered Most Likely cases, by the same token crucial cases, for the theory. Naturally, more pronounced effects and, ambiguously, more cases would have been desirable. Even so, the results are deemed sufficient to establish that these cases support Mahan’s theory.

### Ethical and methodological considerations

The operationalisation and analysis cannot be isolated from the subjective understanding of the researcher. Therefore previous research formed the basis; referencing was precise; and methodological choices were diligently presented in the subsections below for transparency. Efforts were also made to include a variety of traditions and aspects,

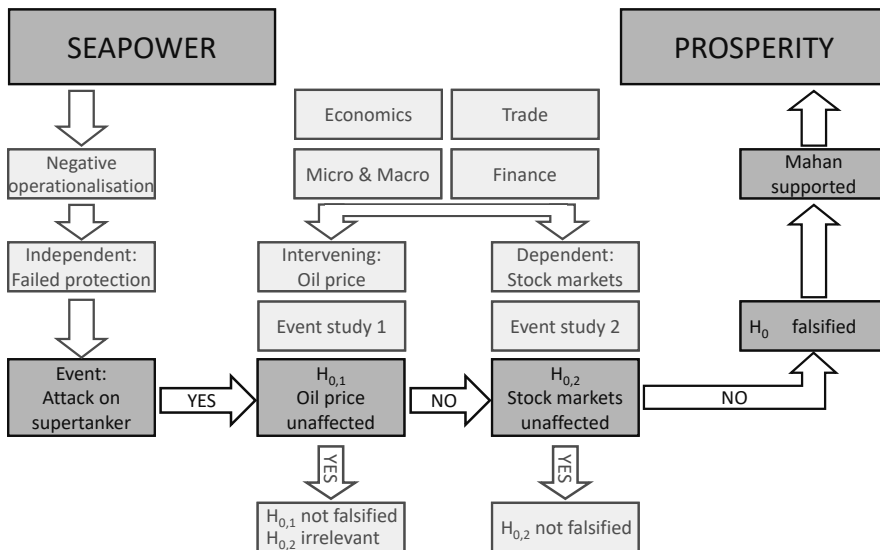


Figure 14: Hypotheses flow chart, results. (Author)



as well as alternative and critical perspectives, to broaden the theoretical basis for the analysis.

The operationalisation rests upon established economic theory and prior research. Sea power encompasses many missions, only one of which is protection of shipping. Maintaining secure sea lines of communication is a core function, in peace and war, and can thus reasonably be considered an indispensable component of sea power at the side of deterring adversaries or winning wars. With regard to Mahan's theory and the dependent variable, prosperity, this potentially lopsided operationalisation can be considered reasonable, even if it remains a single case study of attacks on super tankers with a limited number of observations. Although allowing for extrapolation, the author does not purport to use the findings to make conclusive generalisations on the full validity of the theory, nor to make inferences on sea power and prosperity under wartime conditions.

Although the operationalisation and ensuing choices for case selection and tests represent only a portion of Mahan's theory, broad reading and an interview were carried out to ensure their adequacy and potential for generalisation. These choices were meant to augment conceptual validity for theory testing; to ensure research quality for the thesis; and to facilitate efforts at reviewing. Relying on official reports and published material for the analysis reduced ethical concerns from data collection, with the exception of the interview. The latter was performed under informed consent and a confidentiality undertaking.

The selection criteria define the property space and enable comparisons between cases. The number of attacks on shipping with potential impact on stock markets is limited. The relative impact of each individual case

makes case selection bias avoidance instrumental. Specifying the criteria based on the independent variable was an effort to mitigate this concern. Employing established methods and, as was found, being able to compare with previous research increases reliability and reduces the risk of bias in case selection and analysis. Official reporting and independent news organisations offer good quality of data for the analysis and reliability for similar results to be obtained if the operationalisation is recreated.

The small N is a consequence of the case selection criteria, including only vessels above 200,000 tonnes deadweight. Lowering the threshold to allow for more cases would mean an extension beyond the type of ships that represents the supreme category to be reckoned with for oil transports and that represents a significant economic value. Effecting such a change would be detrimental for the theoretic frame and causal mechanism.

Strict adherence to the criteria limited the number of cases and consequently also the potential for generalisation. The study straddles the line between qualitative and quantitative approaches. Specificities from a single case are influential, as seen with the case of Maran Centaurus where a contaminating event diluted the results. To ensure proper reliability, this case was discussed but left unaltered in the main analysis. A test conducted on adjusted data was included only for reference.

## Conclusion – old ideas in a new age

Although the operationalisation is based on a portion of the theory and only eight cases could be identified, the results provide additional corroboration for Mahan's theory. In retrospect, revisiting the influence of sea power upon prosperity and seeking an

economic proof via financial markets may seem to have been an unnecessary undertaking. It is as intuitive now as when it was written 130 years ago. However, sea power and the capability to secure sea lines of communication today appears difficult to achieve even for the US, explaining why, at least to the author, the subject was worthy of attention. This is particularly true with the return of great power competition that has replaced the period of primarily irregular threats. Against the backdrop of previous research combined from different fields and with the interpretation of the results, the finding of this article is that there is reason to believe that Mahan's theory remains valid. The study naturally cannot by itself provide conclusive evidence on the validity but rather represents a contribution to the body of research on the influence of sea power.

## Looking forward

Protection of shipping is a system with several mutually supporting activities performed by a wide range of actors. Charterers, ports and ship operators as well as governmental bodies such as coast guards and navies all strive to secure the transport chain from port to port.<sup>111</sup> Protection of shipping must be maintained over time and adapted to the prevailing conditions. Securing communications, including civilian shipping, is instrumental already under peacetime conditions and must continue in wartime even if means and ways change with the threat. A sustained effort must be maintained even under demanding conditions. The threats to shipping have morphed over time but recent increases in piracy have sparked an increase in protective measures taken and a return to Generation Zero's hardening and arming of civilian vessels. The introduction of grey zone activities and counter-scouting

deception measures may even increase the risk for civilian shipping.

Contributing directly or indirectly, naval forces are critical to secure shipping but priorities are difficult to make as the limited number of units cannot balance the numerous and vast trade activities. In light of this, renewed interest in container based weapons systems to arm civilian vessels is logical.<sup>112</sup> It does, however, also re-introduce the risk of merchant vessels as Trojan horses with containerised weapons systems onboard, such as the Russian Club-K, Israeli LORA or Australian EOS R400.

In the wake of the COVID-19 Crisis, a potential 13 per cent to 32 per cent drop in international trade is expected.<sup>113</sup> This notwithstanding, trade is critical due to the insufficient self-sustaining rate of crucial goods in most countries. Even if settling on a lower level, international maritime exchange will remain indispensable. Trade is often forwarded as conducive to democratisation but such claims have come into disrepute in light of contrary developments in China and Russia in the past decade. Tensions between the US and China are rising, despite substantial trade exchanges.<sup>114</sup> Mahan's observation that commerce can contribute to détente as well as to confrontation remains pertinent today.<sup>115</sup> Parallels have also been made between the US-Chinese competition and that of the Anglo-German in the early 20<sup>th</sup> century.<sup>116</sup> To exacerbate matters, in the wake of fading Pax Americana, even NATO allies rattle sabres as seen with aggressive manoeuvring and overlapping claims of boundaries between Turkey and Greece.

The third generation of cooperative protection of shipping may therefore already be in the process of being substituted. Traditional sea power is coming back to the fore as both China and Russia strive to reassert themselves on the world oceans.<sup>117</sup> Recent Russian

strategic documents echo Gorshkov's ambitions, once again starting with ventures into the Mediterranean.<sup>118</sup> In a recent report by RAND on China's grand strategy it is assessed to comprise a far reaching extension of the Chinese sphere of influence by soft and hard power. For the latter, massive reforms are in progress to ensure that the Chinese People's Liberation Army is capable of supporting the long-term grand strategic objectives.<sup>119</sup>

With Southeast Asia being the factory of the world, securing imports of raw materials and export of products has become more important to China and conversely less so to many Western nations.<sup>120</sup> Based on increased maritime interests, Chinese scholars advocate cooperation, as long as it occurs on Chinese terms.<sup>121</sup> While the U.S. Navy may be the preferred military partner for states in the Western world, China is striving to become a maritime partner for Nordic countries, emphasising economic interests and downplaying political concerns.<sup>122</sup> This may complicate strategic decision-making as security and trade interests collide when the key players in each domain grow more confrontational to each other. It is difficult to gauge what this transition entails for small states, all the more stressing the necessity to influence the strategic environment rather than merely being subjected to it.<sup>123</sup>

### Suggestions for further research

The US is responding to the Chinese challenge, focussing on control of sea lines of communication and trade.<sup>124</sup> Whether this will result in continued collaboration as peers, in demarcation between spheres of interest or in low- to high-intensity conflict is difficult to assess.<sup>125</sup> Till argues that the first two scenarios can exist side-by-side but paints a darker picture of the third scenario,

a confrontation with unimpeded hybrid measures, lacking even the rules that could vouch for the stability under tension that prevailed through the Cold War.<sup>126</sup>

A broadening of the understanding of sea power for both the current and future order would be beneficial, in particular in the light of the potential Sino-American jockeying for the position as hegemon on the oceans, with the repercussions for major and minor maritime powers it would entail.<sup>127</sup> Whether weaker powers, as well as ascending sea powers such as China, will ally with or counter the leading power is debated.<sup>128</sup> The turn to the 20<sup>th</sup> century and the Tirpitz plan suggest it may not be peaceful cooperation. This may in turn reinforce the influence of sea power in Mahanian terms and thereby the interest in revisiting earlier generations of thinking on sea power.

The problematics of developing naval strategy have been exacerbated by new challenges from grey zone activities and hybrid threats.<sup>129</sup> These reinforce the connection to civil-military relations to ensure proper appreciation of potentially hostile activities within the full strategic context, since the adversary can be expected to exploit the fact that seeing is not necessarily believing. Deeper understanding of the complexities inherent to naval and maritime strategies across the full conflict spectrum from peace to high-intensity conflict therefore merits exploring for states with any level of sea power. Theory development with economic and technological elements would also have policy implications beyond defence strategy, incorporating more aspects of sea power as an instrument of grand strategy.

The latter is particularly relevant for the small state, under the combined pressures of international interdependence and a widened conflict spectrum. Securing its interests and shouldering its share of the burden will re-

quire of it to operate in distant waters without leading to sub-optimisation.<sup>130</sup> Adapting equipment and doctrine for such operations is probably difficult to reconcile with optimisation for national defence. The conflicting and overlapping requirements present a challenging balance to strike. Developing force composition and employment concepts for the small state under modern complexities, in a similar vein to Aube and Corbett, would provide a scientific contribution by complementing existing theories.

### Implications for small navies

As seen in the analysis, OMX 30 Stockholm exhibited the most pronounced reactions, underlining the relevance of Mahan's theory also for small states. The aforementioned lack of capacity of major powers in extension constitutes an imperative for small navies. This is particularly so when the rules based order is challenged and major powers increasingly act in direct self-interest.

Unfortunately, sea power has mainly been studied from a major power perspective and there is limited research on small state sea power. Complementing previous research the development of economic aspects in this article may contribute to an understanding of sea power as a wide-reaching strategic instrument for achieving peace and prosperity. Despite strong dependence on overseas trade, small states rarely maintain navies corresponding to their trade dependence or even to the size of their merchant navies.<sup>131</sup> Instead, the small state's prosperity hinges to a greater or lesser extent upon trade being secured by others.

Sprung from an initiative to prevent terror attacks using merchant ships as vectors in the aftermath of the 9/11 attacks, IMO developed rules for civilian maritime security, the ISPS Code (International Ship and Port

Facility Security Code of 2004, implemented as an annex to Chapter XI-2 of the SOLAS Convention of 1974). This has brought regulatory requirements that have significantly hardened merchant vessels against attacks by terrorists, pirates and other criminals as in Generation Zero.<sup>132</sup> These also partially mitigate the small state's inadequacy at providing distant protection of shipping.

Small navies are by definition incapable of independently exercising sea control in distant waters.<sup>133</sup> They are thereby compelled to seek coalitions, as in the US-Swedish counter-piracy example mentioned in the introduction. Several of them have deployed units far from their home waters to participate in maritime security operations to the benefit of international trade.<sup>134</sup> Even the landlocked Czech Republic has contributed staff officers to counter-piracy operations off Somalia.

Somali piracy has long been a cause for concern. Reports have assessed the total costs to between 7 and 30 billion USD.<sup>135</sup> The width of the estimation span aside, it is clear that failure to protect shipping incurs substantial costs. As pointed out, the capacity limitations of major powers require small states to contribute to maritime security. Even a limited increase in the number of ships can have a significant impact on the outcome of a campaign or even a war.<sup>136</sup> This was corroborated in a study of the Gulf of Aden, where a mere handful vessels made a decisive difference.<sup>137</sup>

In addition to the sheer numerical addition, small states can provide distinctive strategic culture and military capabilities adequate for the task.<sup>138</sup> Depending on the operation, the contribution of small navies' niche capabilities can be necessary, not just important. Till argues that when properly leveraging off a high level of technology

and skills small navies can achieve disproportional strategic effect.<sup>139</sup>

### The Swedish example

Sweden holds an exposed geostrategic position in the European perimeter, with its surrounding seas dominating its economic and trade interests as well as its security situation. Even so, its defence policies have not always exhibited a sufficient appreciation of this insular situation to successfully harness the advantages offered by naval strategy. Defence strategy has been hampered by inter-branch budget rivalry and significant capacity limitations.<sup>140</sup> Despite this, Sweden's repeated participation in maritime security operations in the Indian Ocean and the Mediterranean exemplify the prioritisation of these missions, even when capacity is limited.<sup>141</sup>

During the Second World War, Sweden shifted the bulk of internal transports from shipping along the coast and canals to land traffic by rail and road. Nonetheless, petroleum products are still shipped by coastal tankers. Shipping also carries the majority

of external trade, which is crucial both for sustenance and for the economy.<sup>142</sup> The relative importance of shipping is clearly exhibited in *Figure 15*.

Disturbances to external exchange entail economic consequences for import and export industries, critical for economic survival.<sup>143</sup> However, the effects are far-reaching. For instance, estimates of the level of Swedish self-sustaining capacity for foodstuffs vary but 46 per cent of Swedish farming's energy usage in 2018 was petroleum based. For this fuel to reach farming machinery, not only does the crude oil have to arrive to Swedish refineries, the refined products have to be shipped along the long coast to where they are needed.<sup>144</sup>

Russian crude represented almost half of Swedish import as late as 2014, to which should be added petroleum products refined from Russian crude imported from the eastern shores of the Baltic.<sup>145</sup> The Russian propensity to employ the 'energy weapon' entails a risk that not only the Swedish east coast, but also Finland and the Baltic states, will require provisioning of petroleum products

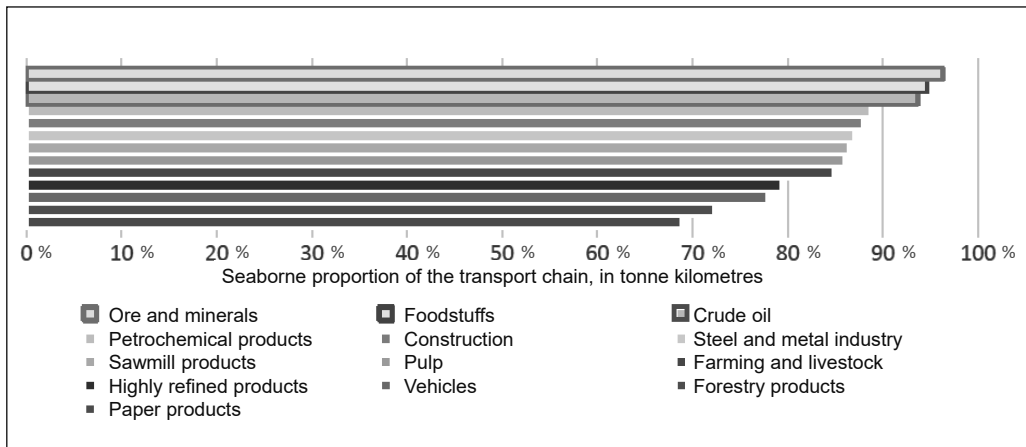


Figure 15: Seaborne proportion of import and export transport chain. (Adaptation by the author, based on *Trafikanalys 2017*, p. 12.)

from the outside the Baltic. This would further increase the influence of Swedish waters for both its national security and that of the region.<sup>146</sup>

Despite the revival of the incontrovertible tasks of territorial integrity and national defence, future challenges for the Swedish Navy are expected to continue to include operations in regional and global settings.<sup>147</sup> Even if allies and partners were to secure the oceanic crossing, the final stretch as well as the critical internal seaborne trade must be secured by the coastal state. For Sweden as a coastal state, the sheer geopolitical position incurs legal obligations and security interests. Due to the limited capacity and operational prioritisation of partners, it also incurs a regional responsibility that cannot be abdicated from. It should also be kept in mind that coastal defence through sea control, or at least sea denial, simultaneously implies achieving a degree of protection of shipping by restricting the aggressor's reach.

The Swedish Defence Commission states that sealines of communication westwards must be viewed in an international perspective, albeit without elaborating further on the subject.<sup>148</sup> Considering Norwegian and Danish priorities for the North Atlantic and North Sea, this seems unrealistic. It furthermore appears unsatisfactory with regard to requirements on the coastal state under international law. Moreover, it would reduce the possibilities of ensuring that external military assistance arriving to and through Sweden does so in a manner that is most beneficial for Sweden.

Sweden's self-perception appears to be that of a continental state. Yet, in practice it is an insular state relying almost exclusively on seaborne trade. Beyond that, its geopolitical position, sovereignty and rights to the largest share of the Baltic constitute an imperative for the capability to ensure national

defence and contribute to regional security. The understanding of the necessity to secure Swedish and adjacent waters, for national as well as for neighbouring countries' survival, enjoys political consensus.<sup>149</sup> Still, it seems that the conclusions to be drawn from this have yet to sink in to be reflected in financing and procurement bills. Unfortunately, this seems to be a perennial challenge, recognised already in the reply to the acceptance speech in the introduction.<sup>150</sup>

Sweden possesses the longest shoreline and largest sea territory in the Baltic<sup>151</sup> while Russia musters the greatest military capacity in the region. The other Baltic states have limited capacity even if Germany is exhibiting renewed interest for the southern parts of the Baltic. Denmark and Norway are focussed on the North Sea and the North Atlantic.

No nation can afford to build its security on the hope of others rushing to its rescue. Relying on foreign benevolence and military support is risky, requiring careful balancing of both friends and foes.<sup>152</sup> When allies and partners lack capacity and need time to deploy, time that may be very scarce in a future conflict setting, having the naval capability to fend for oneself is not only a moral obligation but an inescapable requirement for survival.

## Closing remarks

The studied incidents were relatively limited and occurred in peacetime, yet these had significant economic impact. The focus on prosperity did not include the immeasurable values of freedom and sovereignty. If the consequences of insufficient sea power appear taxing in peacetime, they may prove catastrophic in war.

This influence of sea power remains as true as when Mahan wrote his opus in 1890. For the closing remarks from this academ-

ic endeavour, the author returns to Bengt Ferner and his obligating words:

*Bruka, kära fädernesland, de förmåner  
som naturen nedlagt i ditt sköte,  
belägenhet, hamnar, utrymme och alt,  
som til skeps utredning någonsin hörer.  
Om dermed vederbörligen hushålles,  
så skal med GUDs hjälp innan kårt ej  
finnas någon vik i hela verlden, derest  
Svenska flaggan ej är känd och vördad.*

Bengt Ferner<sup>153</sup>

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## Notes

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