# UNIVERSITY OF PIRAEUS

# DEPARTMENT OF MARITIME STUDIES –
## MSc in Shipping Management

## Cost of Piracy in Shipping Industry

# Georgios Frantzis

### Thesis statement

**Which was submitted to the Department of Maritime Studies of University of Piraeus as part of the requirements for obtaining a postgraduate degree in Shipping Management.**

### Piraeus

### November 2023

**Δήλωση αυθεντικότητας / Ζητήματα Copyright**

**Τριμελής Εξεταστική Επιτροπή**

«Η παρούσα Διπλωματική Εργασία εγκρίθηκε ομόφωνα από την Τριμελή Εξεταστική Επιτροπή που ορίσθηκε από τη ΓΣΕΣ του Τμήματος Ναυτιλιακών Σπουδών Πανεπιστημίου Πειραιώς σύμφωνα με τον Κανονισμό Λειτουργίας του Προγράμματος Μεταπτυχιακών Σπουδών στην Ναυτιλιακή Διοικητική.

Τα μέλη της Επιτροπής ήταν:

- Βασίλειος Χρήστος Ναούμ
- Λαγούδης Ιωάννης
- Πολέμης Διονύσιος

Η έγκριση της Διπλωματική Εργασίας από το Τμήμα Ναυτιλιακών Σπουδών του Πανεπιστημίου Πειραιώς δεν υποδηλώνει αποδοχή των γνωμών του συγγραφέα.»

**Ευχαριστίες**

Θα ήθελα να απονείμω ευχαριστίες τόσο στον Καθηγητή Βασίλειο Χρήστο Ναούμ για την πολύτιμη βοήθεια του στην επιστημονική έρευνα, όσο και στους συγγενείς μου που με στήριξαν για την φοίτησή μου στο Μεταπτυχιακό πρόγραμμα MSc In Shipping Management του Πανεπιστημίου Πειραιώς. Ιδιαίτερες ευχαριστίες πρέπει να αποδοθούν και στον πολύτιμο φίλο μου Ιωάννη Μπαντούνα, διδάκτορα του Πανεπιστήμιου Πειραιώς για την αμέριστη συμπαράσταση του στην προσπάθεια μου.

**SUMMARY**

The purpose of this paper is to examine the phenomenon of piracy against ships which has strongly re-emerged in maritime transport in recent years. Also, there is a historical review of piracy and then refer to the causes of the phenomenon, making a special case of Somali piracy. Because piracy is also an important insurance risk, there is a reference to the marine insurance industry and the way in which the risk of piracy is dealt with in insurance. Then we address the costs you incur from the occurrence and treatment of the phenomenon, as well as the best practices for managing it to reduce the risk of attacks. Furthermore, we refer suggestions for eliminating the phenomenon both by suppressing it and by preventing it. Finally, by studying historical data we create a ship piracy prediction model.

# Contents

# Figures

# Chapter 1 Introduction

The objective of this research is to investigate the reemergence of piracy as a significant danger to the maritime transportation sector, specifically targeting vessels. Initially, an analysis of the historical context around the phenomena of piracy is undertaken, followed by a detailed examination of its underlying reasons. Particular attention is devoted to the situation of Somalia. In addition, this discourse will address the financial implications of piracy and strategies to combat it, alongside the most effective managerial approaches to mitigate the threat of pirate assaults. Additionally, subsequent recommendations for mitigating and proactively addressing this specific menace will ensue. Moreover, we examine the effects of the event on Greek shipping and what measures have been taken to deal with it. Ultimately, through an examination of historical data, we will develop a model that forecasts for maritime pirate incidents.

The analysis reveals the profound implications of piracy on global maritime companies, encompassing significant financial losses, reputational damage, and operational challenges. The estimated global economic impact underscores the magnitude of the financial burden imposed by piracy attacks, with maritime companies worldwide bearing a disproportionate share of the losses. Moreover, negative media coverage has tarnished the reputation of the maritime sector globally, potentially influencing clients to seek alternative carriers perceived as safer. Despite these challenges, maritime companies have demonstrated resilience by implementing various mitigation measures, resulting in a reduction in piracy incidents involving global-owned vessels in recent years. The reliance on data from the International Maritime Organization underscores the importance of utilizing credible sources for informed decision-making and policy formulation within the maritime industry. Overall, the analysis highlights the multifaceted nature of piracy's impact and underscores the need for continued vigilance and collaborative efforts to safeguard the integrity and security of global maritime trade.

# Chapter 2 Piracy in Maritime Law

## 2.1.1 Definitions

Piracy, in accordance with Article 101 of the United Nations Convention on the Law of the Sea (UNCLOS), is defined as:

1. "Piracy" means any of the following acts:

(a) any illegal act of violence or detention, or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed:

(i) on the high seas, against another ship, or against persons or property on board such ship;

(ii) against a ship, persons or property in a place outside the jurisdiction of any State;

(b) any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft;

(c) any act of inciting or of intentionally facilitating an act described in subparagraph (a) or (b).

This definition emphasizes the illegality of any force, detention, or act of seizure committed by a person on a ship or aircraft against another person, the property of the ship or aircraft. However, it should be noted that this definition only applies to any of the described illegal acts committed either on the high seas or outside the jurisdiction of any state. Thus, technically any of the described acts taking place within the jurisdiction of a state does not fall within the definition of Article 101. Technically aware of this, the International Maritime Organization (IMO, 2010) has classified violent and unlawful acts against ships as  or property and cargo on ships, carried out in ports or territorial waters as "armed robbery." This technical possibility of Article 101 is related to the nature of the Law of the Sea (LOS) Convention which concerns the relationship between the regulation of international relations and cooperation between states but does not limit the concept of "piracy". Section 101 simply means that an act of piracy committed on the high seas or outside the jurisdiction of any state

falls within the scope of this provision. However, it does not imply that such an act is not a criminal offense if committed within the coastal jurisdiction of a state.

The definition of modern maritime piracy has been described by the International Maritime Bureau (IMB) as "an act of boarding any vessel with the intention of committing theft or any other crime and with the intention or ability to use force to promotion of the act in question". This definition is much broader than its counterpart in Article 101 of the LOS Convention in two respects (John Mo 2002): First, the IMB definition includes an act of 'theft' supported by the intention or ability to use force to promote the act. Such an act is not covered by section unless the 'thief' has actually used force or violence in the commission or attempt of an act of theft. However, an act of theft which has been completed without immediate conflict with the seamen on board the "seized" vessel may or may not, depending on the interpretation of the term "seizure" against a vessel or property on board, as referred to in section 101 (a), come within the category of piracy, even if the act has occurred in open sea without immediate conflict with the seamen on board.Second, the definition of IMB is broader than that in Article 101 in that it refers to an act of violence against a vessel or goods and persons on board and within the territorial waters of a State (Holds, 2010).

## 2.2 Piracy as a crime of universal jurisdiction

The act of piracy has been observed throughout history and is not a recent occurrence. Since ancient times, the phenomenon has afflicted the oceans, causing disruptions to maritime commerce routes and posing risks to the well-being of sailors. The Barbary pirates of the Mediterranean and the Golden Age of Piracy in the Caribbean are recognized as significant historical instances. The occurrence of pirate incidents has necessitated international cooperation in the formulation and implementation of countermeasures to address this menace. The concept of universal jurisdiction arose as a mechanism to guarantee that those engaged in piracy would not be able to evade accountability just by operating in international seas or finding sanctuary in nations with lenient legal frameworks.

The classification of piracy as a crime of universal jurisdiction is supported by many grounds. To begin with, the act of piracy is a criminal offense that exerts its impact on a global scale, as it disrupts international trade, poses threats to human lives, and undermines the stability of marine security. The worldwide influence of this

phenomenon requires a synchronized reaction, regardless of geographical limits. Furthermore, the considerable mobility exhibited by pirate organizations, coupled with their adeptness in exploiting jurisdictional loopholes, renders universal jurisdiction a viable and effective technique for prosecuting these entities. Ultimately, the utilization of universal jurisdiction is consistent with the overarching values of accountability, justice, and deterrence (Klein, 2010).

Although the notion of universal jurisdiction for piracy is commendable, its execution encounters several difficulties and disputes. A significant obstacle lies in the possibility of powerful governments using the issue of piracy as a means to further their political objectives. The aforementioned concept additionally gives rise to inquiries regarding the implementation of punishments and the manner in which pirates are handled in nations that possess divergent legal frameworks and diverse records on human rights. The task of reconciling the pursuit of justice for acts of piracy with the preservation of individual rights is a multifaceted challenge.

The establishment of universal jurisdiction in relation to acts of piracy establishes a notable precedent for the handling of many other transnational criminal activities. This exemplifies the dedication of the international community to fostering collaboration and ensuring common security. In order to completely use the potential of universal jurisdiction, it is imperative for nations to bolster systems for exchanging information, fortify legal frameworks, and guarantee trials that are fair and impartial. The facilitation of these advancements can be significantly enhanced by collaborative endeavors conducted by international organizations such as the International Maritime Organization (IMO) (Murphy, 2001).

## 2.3 The association of piracy and terrorism as global crimes

Piracy and terrorism are two discrete yet interconnected transnational criminal phenomena. Historically, piracy has encompassed illicit activities perpetrated in maritime environments, including the unlawful seizure of vessels, the abduction of crew members, and the misappropriation of cargo. However, terrorism comprises a diverse array of actions that are intended to induce fear, inflict harm, or promote political, ideological, or religious objectives. Both criminal activities exist beyond the confines of established legal and moral standards, so posing a challenge to the international community's endeavors to uphold order and security.

The correlation between piracy and terrorism arises from a number of overlapping attributes. It is worth mentioning that both criminal activities take use of the weaknesses in governance within certain regions, flourishing in places characterized by restricted state authority, inadequate law enforcement, and political instability. Consequently, both illegal activities have the potential to result in substantial economic benefits, frequently serving as a means to finance further illicit or extremist activities. The coexistence of maritime piracy and terrorist networks in locations such as the Gulf of Guinea and the Horn of Africa is notably apparent as a result of inadequate governance (Palk, & Aldrich, 2017).

Moreover, there are notable parallels in the strategies employed by pirates and terrorists. Both sides employ tactics of asymmetrical warfare, including elements of surprise, brutality, and intimidation as means to accomplish their respective goals. There is a potential for collaboration between pirates and terrorists in order to support logistical operations, secure financing, and acquire weapons. This collaboration can lead to a blurring of the boundaries between their distinct illegal activities. The collective endeavors have the capacity to enhance the overall influence of transnational criminal networks (Crenshaw, 2011).

The correlation between acts of piracy and acts of terrorism holds substantial ramifications for the realm of global security. As the convergence and collaboration of various criminal activities occur, the complexities they provide are heightened. The use of conventional remedies aimed at mitigating a specific type of crime might unintentionally facilitate the increase of another type of crime. As an illustration, the implementation of strict measures against piracy might unintentionally result in the displacement of individuals engaged in illicit activities, leading them to resort to terrorism as an alternative source of financial gain and power.

Moreover, the confluence of piracy and terrorism presents a multifaceted challenge for law enforcement and military entities. Distinguishing between pirate groups and terrorist organizations is an escalating challenge, as the demarcation between criminal intent and political motive becomes increasingly blurred. Therefore, it is imperative for international endeavors aimed at addressing these offenses to adopt a comprehensive strategy that takes into account the wider framework of criminal and terrorist actions (Krasner, 2004).

## 2.4 The historical evolution of the phenomenon of piracy

Piracy has plagued the seas for at least 40 centuries, and it posed a significant challenge for explorers from various civilizations. The pirates were targeting trade either as simple booty or as a means of war, or as their own inalienable right. Most states throughout history have used three strategies against pirates: Cooperation, suppression, or tolerance. From Cilicia, Greece, the Chinese, the Barbary pirates in North Africa, such as the pirates of the Caribbean, to the Somalis, to the piracy of the Malacca Straits, to the South China Sea and West Africa and their pirates today, who act in the absence of state power, in cooperation with it (Klein, 2017).

Looking back at the ancient world from approximately 2000 to 800 BC, pirates have been a threat to sailors for as long as mankind has engaged in sea trade. Piracy was a ubiquitous part of Mediterranean life in the ancient world. For many years pirates would ravage shipping, and invade coastal villages, plundering and arresting the inhabitants for slaves. Sumerians, King Minos, Egyptians, Greeks and others all faced encounters with pirates. The Cretan fleet of King Minos was specially made to protect itself from the Lukkan (Turkish) pirates.



*Figure 1 : Lukkan Pirates (Source: http://piracyinmediterranean.blogspot.com)*

Later, from 800 BC to 200 AD, Rome allows piracy, as their pirate fleets helped them cripple enemies and created new commercial opportunities. However, when pirate began to threaten the Roman ships, the Romans were forced to answer. Pompey attacked the pirates of Cilicia resulting in the death of 10,000 pirates and the destruction of 500 ships. As a result, piracy remained subdued in the Mediterranean until the fall of Rome. From approximately 100 BC to 800 AD, Chinese piracy made its appearance that wasn't limited to the West. The first Chinese piracy was recorded during the Han

Dynasty. Since then, the Chinese and Southeast Asian piracy was impacting their trade and the authority of the dynasties and empires they controlled. The South China Sea is ideal for pirates and remains a problem from the colonial period to the present day. This was followed by the Pirates of the Caribbean, which remain famous in modern culture, mainly due to the recent homonymous movie. They appeared shortly after the European conquest of the New World, where the Golden Age of piracy began. Following Spain and Portugal, which claimed to control the world's oceans, the other European powers used pirates to obstruct Spanish and Portuguese shipping and increase their maritime influence. American colonists exploited the black market facilitated by the pirates and offered them shelter. With the prevalence of English rule, the pirates lost their space and smuggling diminished[1].

During the Middle Ages the pirates were mainly Gepids (Germans), Danes and the Saxons who raided all over Northern Europe and Britain. They had managed to prevail against the Vikings towards the end of the first millennium. In the North Atlantic, the creation of the Hanseatic League, a cooperation of states, was significant in Eastern Europe to deal with the Black Sea phenomenon. The loose feudal system of medieval Europe left room for the pirates to spread out and made their suppression difficult.

In the South China Sea Chinese piracy re-emerged in early 1500s in response to the strict control of the Ming Dynasty on foreign trade. Black markets were favored, provided they offered goods much cheaper for the locals. This fact provided opportunity for trade opportunities to the Europeans, (eg the Dutch East India Company) who were willing to cooperate with pirates in order to avoid duties. Over 70,000 Chinese pirates were active in the region. The strict measures of the Ming dynasty were unable to suppress its piracy. Chinese piracy waned in the late 1800s thanks to international maritime cooperation (OBP, 2010).

Modern piracy occurs mainly in the Straits of Malacca, the South China Sea, off the coast of Somalia, and in the Gulf of Guinea.These areas show different forms piracy. In Somalia, pirates use kidnapping for ransom, taking advantage of the absence of state power. In the Gulf of Guinea, pirates steal oil, while in Asia, pirates focus on robberies and thefts at sea.In the Gulf of Guinea and Asia piracy occurs mainly in territorial

---

[1] For more details see http://www.anistor.gr/english/enback/v042.htm.

waters in contrast with the region of Somalia where the attacks are made up to hundreds miles off shore[2].

## 2.5 The causes of the phenomenon

Maritime piracy is usually a crime of opportunity, and therefore pirates, like other criminals, will avoid acting in difficult environments. But if they manage to control the wider environment, then the likelihood of piracy occurring increases along with the severity of the piracy attacks. The main reasons for the emergence of piracy are social acceptance, the lack of seriousness legal background from governments, chronic unemployment, and opportunity. All play a role in supporting the criminal enterprise.

### 2.5.1 Social acceptance of piracy

Even today in the modern age of shipping, there are some ports of convenience where the population levies an unofficial tax on the ships that visit them. This usually involves breaking into the equipment or holds, and most of the time, there is no direct contact between the pirates and the crew. Any theft can lead to additional losses if it involves critical tools or supplies necessary for the journey to continue smoothly. The type of piracy that costs the shipping industry by estimate 7-15 billion dollars a year is very different from crimes near ports. This type of piracy is about situations of crew and vessel being held for ransom. Some hostage situations last over a year and captives they die of malnutrition or disease until the ransom, which can be several million dollars, is paid.

In the areas where pirates operate they have public acceptance as they are usually economically depressed areas and these crimes bring additional capital to the local economy. The majority of the money will go to other areas, outside the community, but many pirates living in these areas, with the money they spend, reheat the local markets (Brouno, 2013).

### 2.5.2 Long-term unemployment

In this case, we are not talking about the kind of persistent unemployment that the residents of developed countries are familiar with. Persistent unemployment in developing areas means they will never be able to find a job. So, some people may

---

[2] For more details see https://www.jstor.org/stable/48531052.

practice piracy occasionally in the form of informal work until a small opportunity is found in the future. There is a serious argument invoked by many analysts of the phenomenon. This can be summed up in the phrase "either feed them or shoot them". This argument is extreme but describes the two ends of the spectrum, showing that poverty is an important motivation for the pirates. The pirate's life is hard, and often ends in death, so desperation is almost always a precursor to piracy (references).

### 2.5.3 Technological Advancements and Modern Implications

In the modern-day setting, the dynamics of piracy have been altered by technology breakthroughs. Contemporary pirates employ GPS technology, satellite communications, and sophisticated weaponry to enhance their operational efficiency in targeting vessels and evading apprehension. Moreover, the emergence of cyber piracy underscores the remarkable flexibility exhibited by criminal entities, who use vulnerabilities inside digital platforms to undermine marine infrastructures. The longevity of historical causative elements is exemplified by the thriving of modern piracy in places characterized by inadequate law enforcement, political instability, and economic inequality (Cordingly, 1995).

### 2.5.4 Inadequacy of Government Policy

In some cases, political disputes and claims between states or groups can lead to a kind of national piracy. This is often a territorial dispute over maritime borders or resources in the region, most notably Somalia.

### 2.6 The Rise of Somali Piracy

Somali piracy has its roots in the collapse of the country's government in the early 1990s. The country's coast guard was disbanded and unable to patrol any of the country's 3,025 km of coastline and 200 nautical miles of Exclusive Economic Zone (EEZ), which is a vast fishing zone. As an EEZ, according to the 1982 UN International Convention on the Law of the Sea (LOS), is considered the sea area within which a state has the right to research or otherwise exploit marine resources, including water and wind power generation.

The absence of authority has allowed greedy foreign fishermen using advanced technology and high-quality vessels to prey on Somalia's fish-rich waters, causing a form of "reverse piracy". Estimates put the value of poaching at $300 million a year, an astronomical sum in a country with nine million citizens, representing just over 5% of its Gross National Product (GDP). Somalia. Simultaneously, as contraband is being moved from Europe and Asia into the region, ships heading to Somali waters are illegally dumping toxic industrial waste, a clear violation of United Nations Environmental Law. Indications suggest that even nuclear waste may have been deposited in the Somali marine area, posing a threat to the entire region's contamination and affecting the health of residents and, globally, those who consume the fish caught there.

The pirates claim that, in order to protect Somalia's fishing and earn a living, they act as guardians in the area to control foreign trawlers with and without fishing licenses. Ship owners operating in the area, knowing that their vessels were violating international fishing laws in Somali waters, tended to quickly finance anyone to avoid scrutiny. The interesting thing is that the pirate gangs are using the ``National Volunteer Coast Guard of Somalia'' as a guise, which in the absence of a government acts like a gang. Many of the participants in the crime feel that it is their duty to protect the natural resources and that ransoms they collect should be considered a form of "legal taxation". Experts say that pirates today, however, are not poor fishermen but fighters from Somalia's many Clans seeking control of the country and seeking sources of funding to seize state power in the country (Osei-Tutu, 2013).

# Chapter 3 The cost of piracy

## 3.1 The difficulties of calculating the cost

The cost of piracy is very difficult to calculate. A 2010 actuarial study by the General Insurance Research Organization on the same issue concluded that the challenge for actuaries involved in pricing marine insurance products is significant. Information about attacks issued by shipping is often unclear. Ship owners understandably do not wish to further encourage acts of piracy. However, without knowing the full figures, we cannot accurately arrive at the true cost. Strong disagreements exist between shipping representatives, governments, and insurance company representatives regarding the cost of piracy.

One Earth Future (OEF) identifies some of the most difficult challenges faced during the calculation of the cost of piracy:

- The limitation of data: as previously mentioned it is very difficult to determine the actual number of pirate attacks, as there is no mechanism that obliges ships and their management companies to report every incident. Thus the declaration of an attempt or possibly a minor incident will probably be avoided by ships if the risk is avoidable or is insignificant for the continuation of the voyage Even if such a process had been foreseen somewhere, its complexity and universality problem would now shift the blame to the agencies (state, multinational, private, etc.) for full exchange of information and cooperation to issue joint outcomes regarding incidents. However, the same would probably not happen for the data on costs, as practice has shown that it is difficult for stakeholders (ship owners, insurance companies, governments) to agree on these figures, and it is much more difficult to publicize their data.
- Incomplete reporting on piracy: The IMB and IMO are generally accepted as the world's leading source of piracy information. However, many of the attacks go unreported. It is estimated that about half of all pirate attacks go unreported. In some cases the shipowner prevents the captain from filing a report of assault. This is because they want bad publicity or their ship being delayed for the investigation of the incident. Others estimate that only 30-40 percent of pirate attacks on merchant ships are reported.

- Separating the impact from general economic and political instability: It is incredibly difficult to account for the impact of piracy on macroeconomic variables, such as the reduction of foreign direct investment, tourism, or inflation of commodity prices. Since piracy often occurs in poor, developing regions or failed states prone to political instability. The current global economic downturn is another complicating factor. It is challenging to determine whether the changes in the shipping sector are related to piracy or to the overall deflation of the industry, leading to a reduction in demand for maritime transport.

## 3.1.1 Piracy Costs on Global Maritime Trade

In the realm of international maritime trade, piracy stands as a persistent threat, not only endangering lives but also inflicting substantial economic burdens on the global economy. The year 2022 witnessed staggering figures in terms of both financial and human costs attributed to piracy incidents worldwide[3].

In 2022, piracy inflicted an approximate $18 billion toll on the global economy. This sum encompasses various facets of economic detriment. Firstly, the loss of cargo alone accounted for a staggering $12 billion, encompassing goods ranging from raw materials to finished products, whose seizure or destruction at the hands of pirates translates into significant financial losses for both companies and nations. Secondly, the need for increased maritime insurance premiums in the wake of piracy threats amounted to $3 billion, as shipping companies sought to mitigate risks through higher insurance coverage, further adding to the financial burden of piracy. Thirdly, operational costs incurred in response to piracy threats, including enhanced security measures and rerouting of vessels, amounted to $2 billion. These expenses, while essential for safeguarding crew and cargo, contribute to the overall economic toll of piracy. Additionally, miscellaneous expenditures, such as legal fees and ransom payments, reached $1 billion, highlighting the multifaceted economic impact of piracy on global maritime trade. Regions bearing the brunt of high piracy costs include the Gulf of Guinea, with economic losses totaling $8 billion, Southeast Asia at $5 billion, and Latin America at $3 billion.

---

[3] See https://www.icc-ccs.org/piracy-reporting-centre

Beyond its economic ramifications, piracy exacts a profound human toll on the lives of seafarers and their families. In 2022, a total of 132 piracy incidents were recorded across the globe, each leaving an indelible mark on human lives. Of these incidents, 130 resulted in the abduction of 135 seafarers, subjecting them to harrowing ordeals of captivity and uncertainty. Moreover, one tragic incident led to the loss of life, with one sailor succumbing to violence at the hands of pirates. Additionally, another incident resulted in injuries to five seafarers, underscoring the physical risks and psychological trauma endured by those navigating piracy-prone waters[4].

## 3.2 The cost of insurance

In response to the growing threat and cost of ransoms, the insurance industry has increased shipping premiums, particularly in designated "high risk areas" for piracy. But let's see how marine insurance is divided into four basic types of insurance: war risk, kidnapping for ransom (kidnap and ransom), the insurance of the cargo (cargo), and insurance coverage of the ship (hull & machinery), it is necessary to understand the origin of these increases.

## 3.2.1 War risk

War risk poses an excessive burden for a vessel crossing a war zone. The Gulf of Aden has been classified as a war risk area by the Lloyds Market Association (LMA) since May 2008. Since that date, the cost of passage and war risk premiums have increased 300 times, from $500 per ship and per trip reached $150,000 per ship per trip. And other areas affected by piracy in the past have also been designated as high-risk war zones, a feature example the Malacca Straits in Asia between the years 2005 and 2006.

## 3.2.2 Kidnapping and Ransom

Generally K & R (Kidnapping and Ransom) insurance covers the crew when demanding ransom, but not the ship or the cargo. However, some marine insurance companies have recently expanded to cover both the crew and their property. Insurance giant Munich Re estimates that K & R premiums increased tenfold between 2008 and 2009.

---

[4] See https://www.maritime-executive.com/

### 3.2.3 Cargo

Cargo insurance covers goods transported by a vessel. The transit fee for cargo passing through piracy zones is estimated to have risen from between $25 to $100 per container in recent years.

### 3.2.4 Hull & machinery

Hull&machinery insurance covers damage to the ship and its machinery, including damage from bad weather, collision, sinking, capsize, grounding, fire or piracy. It is estimated that piracy has double the cost of hull insurance.

When calculating the global cost of marine insurance, the largest premiums are related to piracy (war risk and K&R) which are multiplied by 90% of all ships passing through the high risk area of the Gulf of Aden (approximately 30,000 ships per year time).

### 3.3 The cost of rerouting

For some vessels, particularly slow and undrafted vessels, they are the ones most at risk from piracy, so avoiding danger zones can ultimately be a safer and cheaper option. For example, some ships may choose to avoid the risk of transiting the Gulf of Aden and the Suez Canal, and instead circle Africa around the Cape of Good Hope.

While there is no data on the percentage of ship owners and masters who reroute their vessels via this longer route, some companies have announced the diversion of their fleet around Africa. For example, AP Moller Maersk, Europe's largest shipowner, has diverted all its tankers (83 in number), also Norway's Stolt (with a fleet of tankers), Odfjell shipping group (with a fleet of 90 tankers) as well and Frontline, one of the largest oil carriers in the world.

### 3.4 The cost of safety equipment and deterrent forces on board

Shipowners can also attempt to protect their property and crew from pirate attacks and prepare their ships with security equipment or personnel before crossing a high-risk zone. Some of these practices have been proposed by the international organizations dealing with shipping and have also been provided for in the national legislations of the states participating in these organizations. Data on how much ships spend on deterrent equipment, and the type of deterrent equipment, is not readily accessible.

The organization One Earth Future, which is an organization that funds initiatives aimed at improving the systems and services that prevent and stop armed conflicts estimates that, if a ship were to buy all forms of security equipment and guards, on average, it would pay about 134,000 dollars per trip. 10% of total shipping traffic, as previously admitted, may choose to reroute around the Cape of Good Hope and avoid the purchase of security equipment and armed guards.

Deterrent measures, such as the deployment of naval patrols and the utilization of private security teams, are of utmost importance in the prevention of piracy, smuggling, and other unlawful activities inside maritime domains. The utilization of armed guards aboard maritime boats has emerged as a prevalent strategy with the purpose of reducing the likelihood of pirate assaults, particularly in regions characterized by elevated risk levels such as the Gulf of Aden.

The cost of security staff, training expenses, and equipment procurement significantly contributes to the financial obligations of shipping businesses in terms of operational costs. According to the Institute of Shipping Economics and Logistics (ISEL, 2020), the prioritization of security measures in the marine sector not only enhances safety but also incurs additional costs for the industry.

The safety equipment present aboard maritime boats covers a diverse array of instruments and technology that have been specifically developed to avoid accidents, reduce hazards, and safeguard the physical and mental well-being of crew members. This encompasses a range of equipment such as navigation aids, fire suppression systems, lifeboats, and communication devices. The financial burden associated with the acquisition, installation, and upkeep of such equipment is substantial for shipowners and operators.

The International Maritime Organization (IMO) has reported that ship operators allocate significant financial resources each year towards the procurement of safety equipment and implementation of compliance measures in order to adhere to international safety requirements (IMO, 2019).

## 3.5 Cost of Naval Forces
More than 27 countries today contribute naval forces in the direction of preventing piracy. Most military and naval attention is given to the Horn of Africa, where the

biggest problem occurs. The piracy missions focus on: Operation Atalanta, Operation Ocean Shield and Combined Task Force (CTF) 151. Operation Atalanta was launched in November 2008 by the European Union, with the primary objective of protecting vessels which belonged to the World Food Program to provide aid to Somalia. Operation Ocean Shield is a NATO initiative to protect maritime transport in the region. CTF151 is a multinational task force established in January 2009 in the Gulf of Aden and the east coast of Somalia. Together, the three military multinational efforts have more than 43 vessels patrolling off the Horn of Africa and the Indian Ocean.

## 3.6 The Costs of Criminal Prosecutions Against Piracy

Under universal jurisdiction over piracy, any state can prosecute the crime, regardless of whether it has a direct link (eg nationality of the shipowner, nationality of the ship, nationality of the crew), in practice. Due to the poor justice system in the countries where the pirates come from (such as Somalia), the international community has provided financial support for countries in the region to encourage them to conduct their own anti-piracy. For example, in recent years, Kenya and the Seychelles have signed memoranda of understanding with the European Union, the United States, the United Kingdom, Canada, Denmark and Australia, declaring their intention to also accept the Netherlands, Pakistan, Portugal, Russia, Saudi Arabia, Seychelles, Singapore, Spain, Sweden, Switzerland, Thailand, Turkey, United Arab Emirates, United States, United Kingdom, and Yemen.

Improving the conditions of administration of justice in the countries of the region has its costs. In May 2009, the United Nations Office on Drugs and Crime (UNODC) received $10 million in funds from the European Commission, the United Nations, the United States of America and Canada, for this purpose. Many of these funds are devoted to building prisons for pirates, such as Shimo La Tewa Prison in Mombasa. Another part of the funds was spent on training the judges of these regions.

## 3.7 The cost of increased speed

The practice of increasing the speed of ships in dangerous areas transit is one of the most effective ways to prevent a piracy attack according to the IMO guidelines for best management practices from 2011, referred to in BMP4 version. In fact, these guidelines recommend that all vessels travel at a speed of at least 18 knots when passing through the HRA (High Risk Area). According to the OVR organization, no ship has ever been

captured by pirates sailing with a speed over 18 knots speed. However, this defensive measure, as well everything else, is an additional cost for ship owners and managers companies. Figures obtained for the cost of increased speed are from a satellite information system AIS (Automatic Information System) that all ocean-going vessels must carry according to IMO and provides data on the position, course, and speed of each ship. This data is freely available for some coastal areas, while for the open sea it is collected by the company Exact EarthCorporation, which gives access only to its subscribers.

According to industry analysts, the cost of increased speed is important in today's era of high fuel prices. For example, according to the OBP, it is estimated that a very large crude oil carrier (VLCC), which passed the HRA during October 2012 at a speed of 17.9 knots, 5.1 knots above its economic speed of 12.8 knots, incurs an additional cost per day of $88,681. Given that oil prices as well as ship technology have not changed significantly since 2012, we can estimate the effect of this burden on today's transport costs as well.

### 3.8 The Labor Cost

Over the last period of time, according to the OBP there has been a decrease in the number of hostages held or killed by pirates. While the possibility of a sailor's life being suddenly lost during a pirate attack is much greater than in the past. This results from the use of armed guards by the ships and the exchange of force with attacking pirates. The human cost of piracy to seafarers cannot and should not be ignored. Nevertheless, the only costs that can be measured are the financial ones associated with being a seafarer as an employee, i.e., hazard allowances, wages paid during arrest, as well as compensation costs in case of deaths or treatment due to injuries (Widd, 2008).

There are various agreements that have been developed to compensate seafarers for the additional risk of passing through dangerous areas. The first of these is a framework agreed upon between the International Transport Workers' Federation (ITF) and shipowners through the International Bargaining Forum (IBF). In the context of this international agreement, it is defined that 'the seafarer should receive an allowance equal to 100% of the basic salary for the duration of the ship's stay in an area of hostilities (including piracy), subject to a minimum stay of five days.' The ITF represents 600,000 seafarers worldwide.

A second but equally important demand for additional pay for seamen is the enactment by the Philippine government of a law requiring that in all contracts with Filipino seamen providing for danger, the payment of wages and allowances during passage through danger zones shall be doubled. The compensation system was created by Philippine Overseas, a maritime agency based in the Philippines. It is worth mentioning that out of a total of 1,370,000 seafarers worldwide, approximately 160,000 to 250,000 seafarers are Filipinos. Apart from the above cases and regardless of any other compensation, the seamen's pay is doubled in the case of captivity and for its entire duration.

## 3.9 The Money Path

As we conclude from the above, piracy is a very expensive case for the global community. A joint UN report, by Interpol and the World Bank, published in November 2013, entitled 'On the Paths of Piracy,' describes very precisely the business model of piracy in Somalia. Through this report, we find that the amateur pirates that started before 2008 have evolved into a well-organized network, which is organizationally structured into three main categories: large companies, cooperatives, and individuals in correspondence with market organization.

According to this report, it is estimated that the low-level pirates, those who participate in the attacks, receive only 0.01 to 0.0025% of the profits. The financiers of the pirated companies receive 30-75% of the profits. The rest can be said to be the cost of business that is allocated to local markets. This money is usually not invested in Somalia, as the lower ranks buy expensive cars, watches, and other consumer products with it, and the financiers usually take it outside the borders and try to launder it, mainly through the purchase of real estate. A portion of that revenue naturally goes back to fuel new hacking attacks.

# Chapter 4 Best Management Practices – BMP

## 4.1 Risk assessment

According to the Best Management Practices guide (BMP4), which resulted from the cooperation of almost all non-governmental organizations involved in shipping and piracy, but also with the participation of NATO, the British Navy, the European Force in Somalia, and Interpol, it was published in 2011 and is a global shipping benchmark for safe passage through areas of piracy. We recommend that before passing through the high-risk area, the ship's management company and the masters should carry out a thorough risk assessment of the possibility and consequences of piracy attacks on the vessel, based on the latest available information. The risk assessment should identify prevention, mitigation, and deterrence measures, to be combined with institutional regulations and complementary measures to combat piracy. It is important that the risk assessment for the vessel and voyage is specific and not general. The key factors to consider when assessing risk according to BMP4 guidelines are the following:

**1. Crew Safety**

The primary concern must be to ensure the safety of the crew. Care should be taken when taking measures to prevent illegal boarding and external access to the interior of the ship, so that crew members will not be trapped inside and should be able to escape in the event of another type of emergency, such as, for example, a fire. Particular attention should be paid to the location of the panic room (citadel). Emphasis should also be placed on the ballistic protection of the crew who may need to remain on the bridge during a pirate attack, recognizing that pirates will fire weapons at the ship's bridge to force it to stop.

**2.Deck height**

It is likely that the pirates will try to board the ship from the lowest point, above the waterline, making it easier for them to climb aboard. These points are often either on the side or the stern of the ship. Experience shows that ships with a freeboard height of more than eight meters have a much greater chance of being saved from a piracy attempt than those with a lower height. A large freeboard will provide little or no protection if the ship's construction provides access for pirates looking for a way to get on board,

and therefore further protective measures should be considered necessary. The high freeboard may not be enough to prevent a pirate attack.

**3.Speed**

One of the most effective ways for a ship to defeat a pirate attack is by using speed to try to outrun the attackers or make it difficult for them to board. To date, there have been no reported attacks where pirates have boarded a ship that has a speed of over eighteen knots. It is possible, however, that hacker tactics and techniques are developed to be able to board even the fastest moving ships.

So, ships are recommended to develop maximum speed or at least 18 knots during their passage through the high-risk area. It is very important that speed be increased to a safe maximum immediately after any suspicious vessels are detected and as soon as possible. If the vessel is part of a 'Transit group' (vessels sailing together under warship protection), speed may need to be adjusted as directed by the commander.

**4.Sea condition**

Pirates carry out their attacks from very small boats (skiffs) even when supported by larger boats or "Mothers", which tend to limit their activities even in moderate sea conditions. It is likely to be more difficult to operate small boats effectively in sea state three and above.

## 4.2 Additional protection measures on board

1. The placement of cameras on the outer decks to monitor the sea area around the ship is essential for warning the master of any suspicious activity in a timely manner. Additionally, effigies of people dressed in bright colors should be strategically positioned in conspicuous places. This ensures they can be noticed from a distance, creating the impression that the attackers have been observed. This proactive approach helps to thwart the initial surprise attack, buying valuable time for the ship.

*Figure 3 Human effigy on the deck of a ship (Source: BMP, 2021)*

2. Installing bars on the ship's bridge windows serves as a protective measure. Even if pirates manage to board, gaining control of the ship becomes significantly more difficult. Additionally, it is advisable to erect a metal fence in the surrounding areas of the bridge to redirect access.



*Figure 4 / Shielding of ship bridge glazing (Source: https://www.imorules.com)*

3. Deploying physical obstacles around the vessel's perimeter is essential to impede pirates from boarding. This involves installing layers of barbed wire like those used in military barracks for increased effectiveness.

4. Establishing a network around the ship's perimeter that ejects pressurized water or foam into the sea serves the purpose of impeding pirates from approaching the vessel.



*Figure 5 Water jet under pressure while sailing to prevent pirate attack. (Source https://www.sail-world.com).*

5. The ship should be prepared to execute a series of maneuvers when an attacking vessel approaches. This can create artificial waves, making it difficult for the attackers to approach.

6. Closed-circuit television should be installed throughout the ship to detect any suspicious movements on board and monitor the actions of attackers in case they manage to board the ship.

7. Every ship is required to have an armored space capable of accommodating all personnel on board. If the crew manages to enter this space, they can remain safe, and potential assistance from armed warships in the area won't pose a danger to the crew.

8. It is recommended that any ship operating at night in pirate-prone areas turn off all lights, including those required for navigation. This measure makes it more difficult for pirates to detect the ship.

9. Finally, the use of guards, armed or not, is now mandatory. The choice is left to the master and the management company of the ship, depending on the policy they apply. However, the selection of this staff should be done with proper criteria, as they are perhaps the last shield of the ship.



*Figure 6 Armed guards repel a pirate attack with gunfire (Source: seanews.com).*

# Chapter 5 Suggestions to eliminate the phenomenon

## 5.1 IMO Anti-Piracy Action

The escalation of piracy at sea in recent years has become one issue of great concern to the maritime community. The IMO was asked to make combating piracy a central working theme on World Maritime Day in 2011. The reality is that piracy is too complex an issue, and no single entity can effectively deal with it on its own. The United Nations, governments acting collectively or individually, military forces, shipping companies, ship managers, and ship crews have an important role to play in shipping to rid us of this crime. What is needed is a collective effort. That's why the IMO finally chose the title 'Piracy: Orchestrating the Response' as the theme for World Maritime Day 2011, from which very useful conclusions were drawn. The IMO has devised a multi-pronged action plan to tackle the problem at many levels. Due to the fact that the waters off the coast of Somalia and in the wider Indian Ocean are a 'hot spot' for piracy, the IMO action plan is based on the creation of a common reference framework for all states in the region. (Bueger, 2013).

Thus, the Djibouti Code of Ethics was introduced by the IMO to enhance regional capacity to respond to piracy in the Gulf of Aden and the western Indian Ocean. It is a crucial element of the Organization's counter-piracy strategy. The countries that have signed the code include Comoros, Djibouti, Egypt, Eritrea, Ethiopia, Jordan, Kenya, Madagascar, Maldives, Mauritius, Oman, Saudi Arabia, Seychelles, Somalia, Sudan, the United Arab Emirates, the United Republic of Tanzania, and Yemen. This agreement entails the obligation of signatories to cooperate in various activities, including the following:



*Figure 7The flags of the countries that have signed the Djibouti Code of Conduct*

1) Facilitate the investigation, arrest, and prosecution of individuals reasonably suspected of having committed acts of piracy and armed robbery against ships, including those who incite or intentionally facilitate such acts.

2) Prohibit the recognition of property rights for pirates and the seizure of suspected piracy vessels.

3) Rescue ships, persons, and goods subject to piracy and armed robbery, facilitating their receipt of appropriate care or treatment, as well as the repatriation of seafarers, fishermen, or other victims, personnel, or passengers of the attacked ships.

4) Conduct joint operations of naval fleets both among the signatory states and with countries outside the region to enforce the law and restore security. There is also an obligation to establish groups of ships to patrol and ensure stability and security in the region.

The signatories of the code also undertake to revise their national legislation to ensure the existence of laws capable of criminalizing the crimes of piracy and armed robbery against ships. They should make adequate provisions for exercising jurisdiction, conducting investigations, and prosecuting alleged offenders (Mitropoulos, 2011).

The post-2011 IMO anti-piracy goals are summarized as follows:

1. To increase the pressure at the political level to ensure the release of all the hostages held by the pirates

2. To review and improve the IMO Guidelines for Shipping Companies and Seafarers and promote compliance with Best Management Practices and recommended preventive actions and defensive measures that ships should follow on a case-by-case basis.

3. To promote support and cooperation with the naval forces active in the region at higher levels.

4. To establish procedures for coordination and cooperation to promote anti-piracy action between the Members of the agreement and the regional forces active in the area, as well as the shipping industry in general.

5. To help the states around the areas manifesting piracy phenomena to develop their interception capabilities and institutions for controlling illegal activity in their area.

6. Finally, to provide care for those who were attacked by the pirates and their families.

## 5.2 The proposals of the World Bank

A new World Bank analysis of the human and economic cost of the piracy problem poses the rhetorical question, 'Can't Somalia 'buy' its way out of piracy?' Nor can the international community rely solely on law enforcement agencies to defeat pirates either at sea or on land.

In 2013, with the support of President Hassan Sheikh Mohamud, a new World Bank report was drawn up in Mogadishu titled 'Somalia's Pirates: Ending the Menace and Rebuilding a Nation.' The title suggests that a sustainable solution to stop piracy will only come with the restoration of a viable Somali State that can provide the necessary services across the country to reduce poverty and create opportunities. We should also recognize the complexity and volatility of local politics in shaping how to provide the best health, education, nutrition, and other services for Somalis, especially those living in areas where piracy flourishes (Diop, 2013).

As outlined in the report above, 'the solution to Somali piracy is primarily political,' according to Makhtar Diop, World Bank Group Vice President for Africa, and Kaushik Basu, World Bank Group Chief Economist. This report confirms that beyond firepower and financial resources, the international community can and should assist Somalia by providing expertise on how local dynamics shape the rules for resource allocation, how tribes and sub-tribes (factions), and finally how to achieve national political stability to find solutions to the problem of piracy as well.

Somali piracy is, to a large extent, a result of ransom demands from shipping companies, relying mainly on support from the land and the infrastructure of a mechanism that provides food, water, fuel, drugs, and also 'militaria' to guard ships captured throughout the ransom negotiation process. Therefore, Somali pirates must ensure regular access to the coast and protection from national and international law enforcement agencies, as well as competing criminal groups. The fact that pirates can anchor their ships freely along the Somali coastline reflects their ability to win the support of government officials, business people, clan leaders, militias, and local

communities. At anchorages, pirates are able to use a mixture of pay-offs as well as physical coercion to ensure unhindered access to shore for long periods of time. It is estimated that local commanders (chieftains) are moral perpetrators in Somali piracy as they reap profits of 70 to 86 percent of the pirates' profits.

Bella Bird (2013), World Bank Country Director for Somalia, South Sudan, and Sudan, who works closely with the Government of Somalia on its plans to restore basic services to the population of the country and bring the country on a path of growth and prosperity, says: 'Understanding how piracy has been enabled in cities and communities along the coast of Somalia gives the new government in Mogadishu, and the international community, a much better idea of the development policies and alliances that will be needed to end piracy in these hot spots of the country, by creating a prosperous new Somali government to control the situation in East Africa. The current Anti-Piracy Approach Needs Change.

According to a joint report by Interpol, the World Bank, and the UN, only 1 out of 300, or 0.33%, is the percentage that pirates benefit from compared to the annual ransom. This provides a strong case for international support for Somalia. Current land-based or sea-based policy to curb Somali piracy is either ineffective or possibly unsustainable. On-the-ground interventions, such as local economic development initiatives and law enforcement, aim to discourage young people from becoming pirates, increasing the attractiveness of alternative jobs, or with the threat of long prison terms if caught. Analysts warn that pirates will simply offer higher rates of pay to poor and unemployed Somali teenagers and young men to take the risk of capture or death at sea.

The perception in the shipping industry that only with heavy weaponry, guards, and naval patrols can they achieve better security is not correct, as believing that the use of force is the only effective solution only when it is applied at a significant and enduring cost. Quy-Toan Do (2013), a Senior Economist in the World Bank Research Division and Vice President of the World Bank Chair for Africa, in his report on addressing the phenomenon says: "Due to the high cost of these response measures, in the long run may simply not be sustainable. Given that piracy off the Horn of Africa is highly dependent on land, any long-term solution will involve forging a political contract with local leaders who have the power to shape conditions to cut off the pirates from land and provide a solution to the problem" (Diop, 2013).

## 5.3 The positions of other organizations

An alternative proposal was also put forward by Jon Huggins, director of the One Earth Future Foundation's Oceans Beyond Piracy Program. As presented at the conference held in Dubai on September 11-12, 2013, on the topic 'Combating Maritime Piracy: Continued Efforts for Regional Capacity Building,' it raised a number of issues that have nothing to do with repression but with the prevention of the phenomenon through the development of local structures by the Somali state. His proposals are similar to those of the World Bank mentioned above.

## 5.3.1 The need for a coherent framework

The shipping industry wishes to return to a safe maritime environment where the use of armed guards will not be necessary. This can only be achieved by eliminating piracy with an onshore business model for the reasons mentioned above. There are myriad coordination mechanisms to combat piracy, but there is no agreed plan to develop a long-term solution to it. Part of the problem is the nature of the challenge, where many different stakeholders are trying to work together to solve a complex problem without clear lines of authority and responsibility. The collaboration of some stakeholder groups has enabled success in mitigating risk at sea, but the lack of coordination between stakeholder groups has limited progress towards a longer-term solution.

The shipping industry has shown remarkable cooperation in the development of Best Management Practices (BMPs), but they do not always work when there is no cooperation with other stakeholders. Somali authorities have had local successes in combating piracy, but until recently, they have not been effectively involved in developing a long-term policy to eradicate the phenomenon due to a lack of cooperation with international actors operating in the region. Governments and international organizations, through cooperation within the framework of the Contact Group on Piracy off the Coast of Somalia (CGPCS), are trying to get a full picture of the problem and, in cooperation with the Government of Somalia, take political initiatives to address it (Vestergaad, 2013).

Despite all these efforts, to a certain degree, progress in treating the problem has been achieved through the enormous number of resources that states and the maritime industry have contributed when trade routes have been threatened. Because the costs of the initiatives of the parties involved are very high and many times the actions are

uncoordinated or even conflicting, a unified strategy is required which can hardly satisfy the different political imperatives of all the countries and international organizations concerned. Furthermore, it cannot be expected that stakeholders will continue to contribute resources at the same level in the coming years as the number of recorded attacks decreases. Therefore, even if a strategic plan has not been agreed upon, these efforts should be more effectively coordinated to avoid overlaps and mutual interference.

It is expected that the Defense and Security Strategy currently being developed by Somali representatives with international support can be further strengthened and serve as a framework for cooperation and coordination of anti-piracy capacity building in the future. To ensure its success, structural changes should be made, and emphasis should be placed on the priorities agreed upon and signed by the country with international organizations. Therefore, this locally developed strategy should be highlighted as a key element for the future development and capacity building of a security mechanism and control of the Somali maritime area. Otherwise, any new program or cooperation of the international community in the region may be rejected, prolonging the problem on both sides (Houben, 2013).

While if the prospects for an agreement arise regarding one comprehensive plan, there is a realistic expectation that major donors and international organizations, in consultation with the Somali authorities, can agree on key objectives. These goals should support a gradual realignment of resources toward security, development, and eventual investment in Somalia. These measures must be activated simultaneously to provide mutual support and enhance their success. In Somalia's Maritime Resource and Security Strategy, the authorities have identified priority areas for development, including their maritime economy. Recommendations that could be used to maximize multi-stakeholder support for each of these areas are outlined below.

### 5.3.1.1. Security

Significant gains in maritime security have largely been achieved by international navies. However, creating a regional force to undertake the corresponding mission and extending security ashore will be much more difficult.

Development capabilities for maritime security should be Somali-led once priorities are agreed upon, as outlined in the Somalia Maritime Security and Marine Resource Protection Strategy that emerged in September 2013 from the collaboration of eighteen international organizations and eight states concerned with the problem and has been accepted by the Somali people.

The international side must understand that Somalia's priorities are consistent with those of sovereign nations. Consequently, Somali authorities place a high priority on securing sovereignty over their territorial waters and Exclusive Economic Zone, protecting against illegal, unregulated fishing, and preventing other maritime crimes such as smuggling and human trafficking. Somalia's coasts are close to major commercial shipping lanes, and the shipping industry should be considered a full partner in defining the requirements for smoothing maritime transport in this region.

## 5.3.1.2 Development

Development efforts by governments, international organizations, and non-governmental organizations must be coordinated with local authorities to ensure that the efforts of these groups are mutually supportive.

The international community must assist the Somali authorities in identifying and avoiding exploitative contracts involving the extractive industry and non-renewable resources (oil, ores, etc.). The involvement of private investors in this sector should be carefully considered to ensure that it does not compromise the priorities of the Government of Somalia and the long-term prosperity of the region. Economic and security development could be targeted at specific geographic areas identified by Somalis for their potential to support the flow of trade and encourage regional investment. Ports identified by Somali authorities include Berbera, Bosasso, Mogadishu, Kismayo, and Hobyo.

The "internal strategy" developed by regional organizations should be aligned with port and maritime development to ensure the necessary infrastructure (roads, utilities, services) that will be able to support access to markets for the development of port zones. The shipping industry should be encouraged and assisted with "in-kind" donations and expertise needed to improve ports and infrastructure in line with Somalia's port development goals.

### 5.3.1.3 Investments

While security remains the most difficult hurdle for investors, there are a number of other issues that need to be addressed to lead to a normalization of the investment climate. Governments should work with local authorities and regional ministries and regulatory agencies to ensure that appropriate market laws and regulations are in place so that investments can be made. The international community, together with the private sector, should continue to work to increase the transparency of governance and money transfer systems to ensure that investment capital and remittances can continue to flow to Somalia.

The country's Navy and other organizations working to secure port infrastructure should ensure that their interventions are focused on reducing the risk to Somalia's ports and eliminating large surcharges on cargo entering Somalia's ports.

In conclusion, Somali piracy has cost the international economy many billions of dollars in recent years. So far, most of the spending has been on suppressing piracy at sea or other expensive but effective mitigation measures. However, with the recent positive political developments in Somalia, there is a window of opportunity to invest in a sustainable long-term solution, which will support the Somali authorities in building maritime security and promoting economic development in their country. Only when this is achieved will the human and financial costs of piracy be largely eliminated.

## Chapter 6 Piracy for the Greek Maritime Industry

### 6.1 The Impact of Piracy on Greek Shipping Companies

Piracy presents Greek maritime companies with a complex and diverse array of challenges, encompassing economic and human dimensions. As companies reroute their vessels to avoid high-risk areas and invest in additional security measures, insurance premiums have skyrocketed in response to the increase in piracy incidents. Furthermore, the human toll is significant, as crew members are exposed to increased levels of tension, possible injury, and even fatalities.



*Figure 81 Greek ship that was attacked (Source: https://astraparis.gr)*

Greek shipping has historically played a pivotal role in the country's economy, substantially bolstering its development and affluence. Nevertheless, over the past ten years, the maritime sector has encountered a significant obstacle in the shape of piracy, which has havoc on commerce and endangered the well-being of vessels and personnel.

### 6.2 Cost of insurance

Greek maritime industry is among the largest in the world, with more than 4,000 ships under Greek ownership and more than 333 million tons of cargo. The sector makes a substantial economic contribution to Greece, constituting more than 7% of the nation's gross domestic product and employing more than 200,000 individuals. The Greek shipping companies have encountered considerable difficulties due to piracy, which has resulted in substantial financial setbacks and disrupted their operations[5].

A significant consequence of piracy for Greek maritime enterprises is the substantial escalation in insurance premiums. In order to cover the risks associated with piracy,

---

[5] See https://www.greeknewsagenda.gr/greek-shipping-remains-the-worlds-leading-maritime-force/

maritime insurance companies have been compelled to increase premiums as the number of piracy attacks continues to rise. In recent years, the cost of maritime insurance for vessels operating in high-risk piracy regions, such as the Indian Ocean and the Gulf of Aden, has increased by more than 200 percent, according to a report by the International Maritime Bureau (IMB). The escalation in insurance premiums has substantially affected Greek shipping enterprises, particularly those engaged in operations within high-risk regions.

## 6.3 Loss of revenues

Piracy in Greece also causes substantial financial losses for maritime companies as a result of revenue forfeitures and ransom demands. Consequences for Greek shipping companies include financial losses due to the loss of vessels and precious cargoes as a result of pirate attacks. The global economic impact of piracy attacks in 2011 was estimated to be between $6.6 billion and $6.9 billion, according to a report by Oceans Beyond Piracy. The aforementioned amount encompasses various expenditures, including insurance premiums, ransoms, and security measures. Greek shipping companies were the most severely impacted by piracy attacks, accounting for 17% of all piracy incidents involving Greek-owned or operated vessels, according to the report.

Piracy has additionally had an impact on the standing of the Greek maritime sector. The negative media attention given to piracy assaults targeting Greek-owned vessels has contributed to the perception that the safety of the Greek maritime industry is compromised. The adverse perception has had an impact on the operations of Greek shipping companies, potentially leading clients to choose alternative carriers that are considered secure.

Greek maritime companies have implemented numerous measures to mitigate the impact of piracy on their operations, including the deployment of armed security, vessel hardening, and rerouting vessels away from high-risk areas. In recent years, the frequency of piracy incidents involving Greek-owned vessels has been reduced, in part, due to these measures.

The total data on piracy incidents used in our research comes from the International Maritime Organization (IMO) and results from processing its published monthly reports on piracy. It refers to the period from January 2021 to July 2023, during which a total of 316 incidents of attacks on ships were recorded. The IMO is a highly reliable

source of information on shipping due to its universal acceptance by the industry, the seriousness and credibility with which it addresses shipping problems, and the influence that its findings have on the entire shipping world. It adds the dynamism and necessary prestige to interact with shipping businesses and be aware at all times of the real state of world shipping. The IMO was founded in Geneva in 1948 and is a specialized department of the United Nations.

# Chapter 7 Data Description

## 7.1 Introduction to Maritime Security Incidents Dataset Analysis

Global trade, economic growth, and sustainable development all depend on the safety and security of international shipping. The International Maritime Organization (IMO) is the United Nations specialized organization charged with regulating and improving the safety, security, and environmental performance of international shipping to safeguard the well-being of nations and people around the world.

Based on the data extracted from the International Maritime Organization's (IMO) Piracy and Armed Robbery module within the Global Integrated Shipping Information System (GISIS), our dataset comprises reports of actual and attempted attacks by pirates and armed robbers against ships. These reports are continuously promulgated by the IMO as soon as they are received from Member States and reporting organizations, subject to registration.

The data used for our analysis spans from January 2021 to July 2023, capturing incidents recorded within this timeframe. These incidents are classified as acts or attempted acts of piracy and armed robbery against ships, with piracy occurring in international waters and armed robbery against ships occurring within a State's territorial waters.

The IMO's Piracy and Armed Robbery module provides comprehensive information on these incidents, allowing users to create and download customized reports based on geographical area or time period. While the monthly circulars containing reports on incidents were discontinued at the Committee's ninety-ninth session in May 2018, the Secretariat continues to make monthly reports available for easy reference.

These reports, based on data and information submitted by IMO Member Governments, regional, and international organizations, aim to provide an overall view of the global threat posed by piracy and armed robbery against ships. The dataset extracted from these reports enables us to conduct detailed analyses and gain insights into the patterns and trends of piracy and armed robbery incidents occurring at sea[6].

---

[6] For all these reports, see https://www.imo.org/en/OurWork/Security/Pages/Piracy-Reports-Default.aspx

Exploring the dataset reveals a plethora of significant factors, each of which contributes to a deeper comprehension of these maritime security incidents:

**Anex:** This crucial variable distinguishes between successful breaches (denoted as "1") and unsuccessful attempts (denoted as "2") following each pirate attack. This contrast highlights how serious security issues are in foreign waterways.

**Date:** This variable offers a chronological lens by providing a timeline of when these episodes occurred. The timeline makes it possible to spot temporal trends, seasonal changes, and long-term trends that could affect marine security.

**Ship Name:** International trade and transportation depend heavily on ships. Understanding the ship's identity in question enables us to track incidents related to specific vessels, scrutinize repeat occurrences, and assess the effectiveness of security measures.

**Type of Ship:** A nuanced viewpoint is necessary given the variety of ships navigating international seas. It is possible to conduct focused analyses of security vulnerabilities across several vessel types by categorizing the type of ship at issue.

**Flag:** Ships proudly fly the flag of the country where they are registered. This variable highlights international affiliations and the potential for diplomatic intervention in resolving security issues, illuminating the geopolitical consequences of incidents.

**Gross Tonnage:** An indication of the scope of these occurrences can be found in the tonnage of each ship. We can determine the possible impact on global trade and commerce by evaluating the size of attacks in relation to a vessel's tonnage.

**Attack Area:** Geographical factors are crucial to maritime security. This variable identifies the precise location of each occurrence, assisting in the assessment of growing hotspots and the identification of areas with higher security threats.

**Territorial Sea:** Based on territorial seas, incidents are divided into three categories: International Waters (I.W.), Territorial Waters (T.W.), and Port Areas (P.A.). This rating gives a clearer picture of how close attacks are to coastal areas and what those attacks can mean.

**Day/Night:** The visibility conditions during events (day or night) have a considerable impact on the attack strategies used by the aggressors and the efficacy of defense measures. This variable illustrates the special difficulties that nocturnal incidents provide.

**Type of Attack:** The attack's coded nature (1 for unarmed or improvised weapons, 2 for knives and swords, 3 for weapons, or 4 for heavy weaponry) provides crucial context for understanding the threat level and the amount of readiness needed to fend off such attacks.

**Type of Aid:** Post-incident aid may come from a number of sources. The response mechanisms in place are made clearer by being aware of the type of assistance received (or the lack thereof). Authorities in the recipient countries, global protection organizations, and other sources can all provide aid.

### 7.1.1 Analysis of Initial Data Visualizations and Statistics

The initial analysis of the dataset reveals valuable insights into maritime security and shipping incidents. Two key visualizations and summary statistics provide a foundation for understanding piracy outcomes and the distribution of ship sizes.
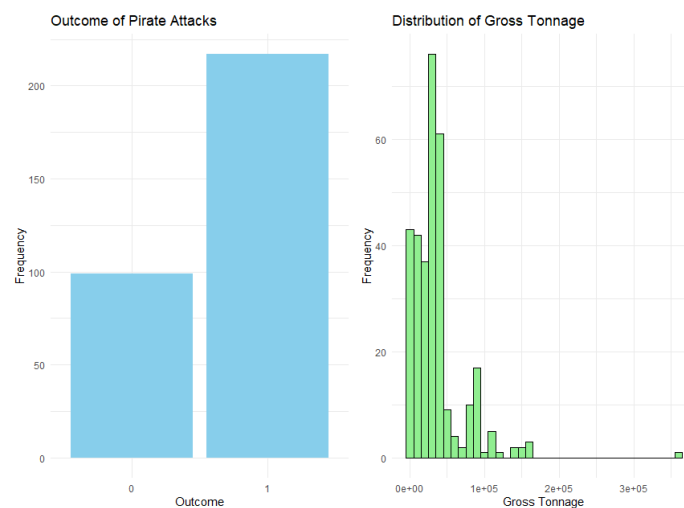


*Figure 9: BarPlot for the Outcome of Pirate Attacks and Histogram of the Gross Tonnage*

The bar plot illustrates the outcomes of pirate attacks, categorizing them as "Successful" (1) and "Failed" (0). Notably, there is a higher frequency of "Failed" attacks, indicating that a substantial number of piracy attempts did not succeed. The histogram presents the distribution of gross tonnage among the ships in the dataset. It reveals that smaller

ships dominate the dataset, with a peak in the lower tonnage range. However, larger vessels are also present.

The Figure 10 visualizes the distribution of pirate attacks across different months. It provides insights into when these attacks tend to occur most frequently.
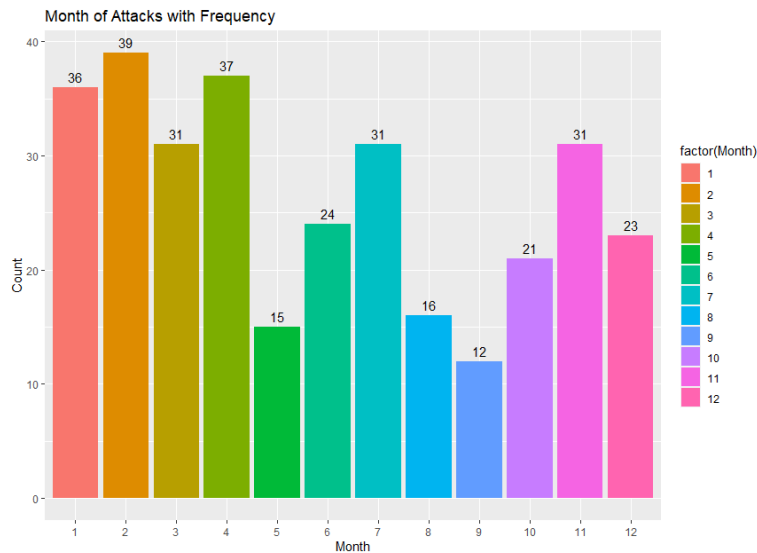


*Figure 10: Month of Attacks with Frequency*

By examining the graph, we can quickly identify which months experienced a higher frequency of pirate attacks. Months with taller bars and larger numbers on top of them indicate periods when attacks were more common. As we can see, the first months of the year show higher frequencies and the last months also. Fewer attacks are happening during the summer months indicating seasonal patterns or trends in pirate attacks. Possibly, weather conditions, shipping routes, or other factors may be the reason for this seasonality.

In addition, Figure 11 displays the frequency of different types of ships that have been involved in pirate attacks. Each bar represents a specific type of ship, and the height of the bar corresponds to the number of times that particular type of ship has been attacked. We can observe that there are several different types of ships represented. By examining the heights of the bars, we can identify the most common ship types that are frequently targeted by pirate attacks. These ships have the highest counts. Therefore, bulk carriers experience the highest frequency of attacks, with containerships ranking second in terms of incidents.
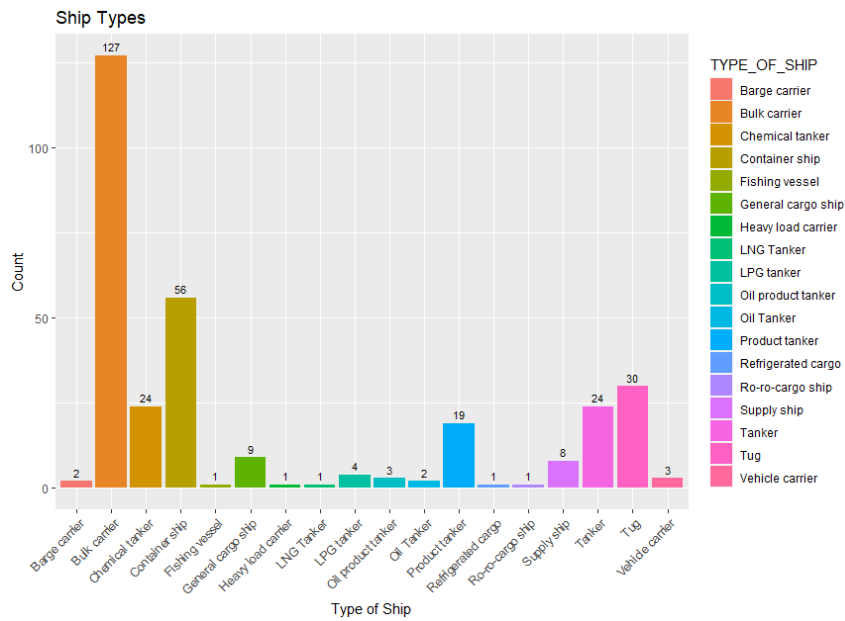
*Figure 11: Ship Types*

Figure 12 visualizes the distribution of pirate attacks across different geographical areas. It appears that attacks are concentrated in specific geographical areas. Certain areas seem to be hotspots for pirate attacks, as they have significantly higher frequencies compared to others.
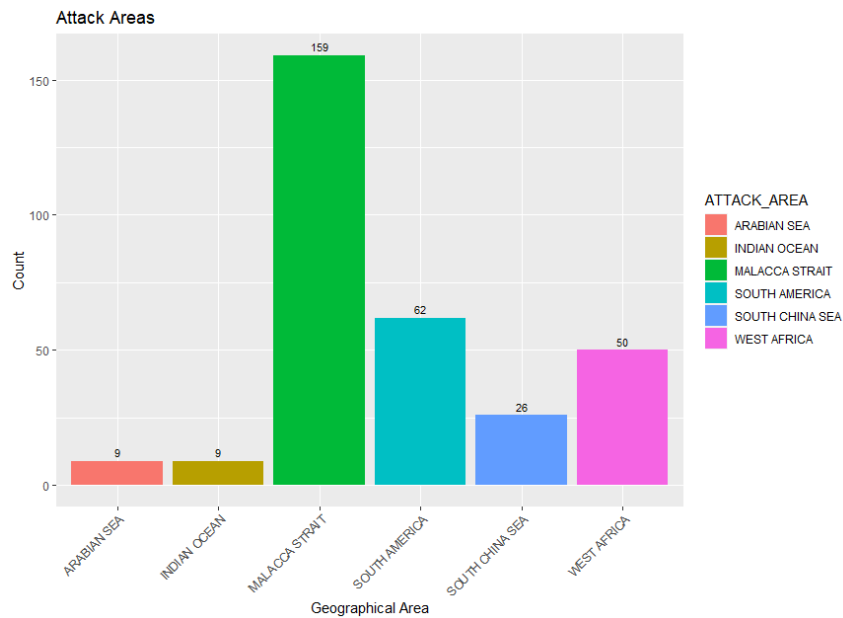


*Figure 12: Attack Areas*

So, based on this graph, we observe that the Malacca Strait is the most frequently attacked area and South America is second most frequently attacked area. Nevertheless,

we observe attacks at many other areas like the Arabian Sea and the Indian Sea with lower frequency.

The pie presented in Figure 13 provides an insightful breakdown of maritime attacks based on visibility conditions. The chart distinguishes between attacks that occurred during the day (D) and those that took place at night (N).
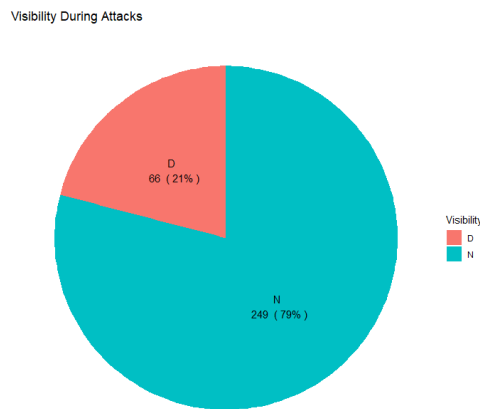


*Figure 13: Visibility During Attacks*

As we can observe, the 79% of the attacks have been done during the Night. The larger portion of the pie chart, representing attacks during the night, indicates that a significant number of incidents occurred when visibility conditions were not favorable. Pirates might have chosen the cover of darkness to conduct surprise attacks.
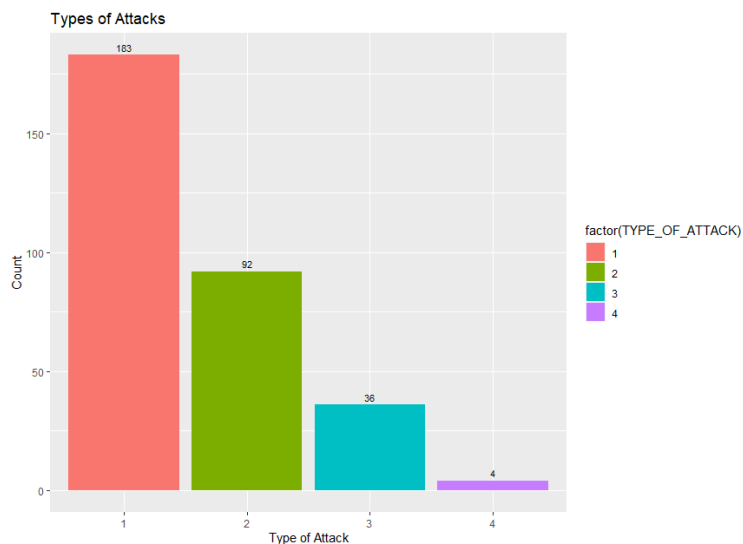


*Figure 14: Types of Attacks*

Moreover, we provide an analysis for the Types of Attacks which provides the distribution of different types of attacks on maritime vessels based on the provided dataset. The graph categorizes attacks into various types, each denoted by a unique label. As shown, Figure 14 reveals that the most common types of attacks on maritime vessels are them of type 1, which did not receive help and the second category is that who received aid from country authorities.

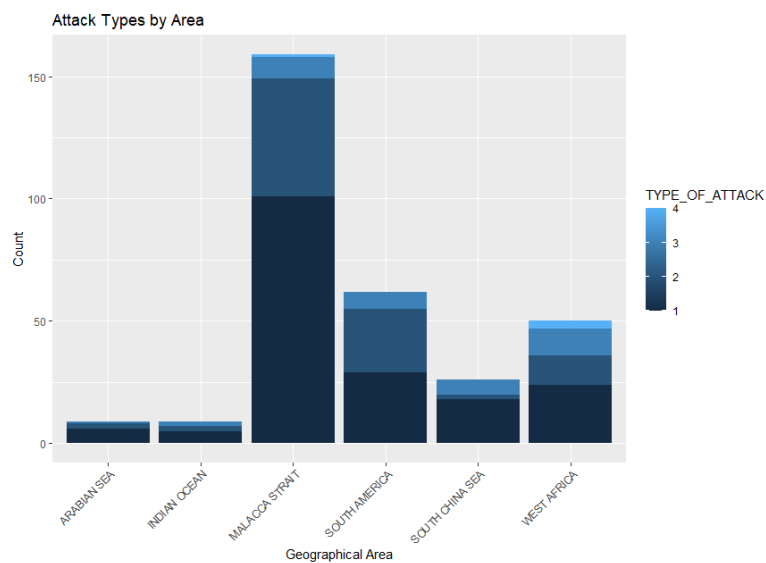We are also going to create some more graphs based on combinations of the data.



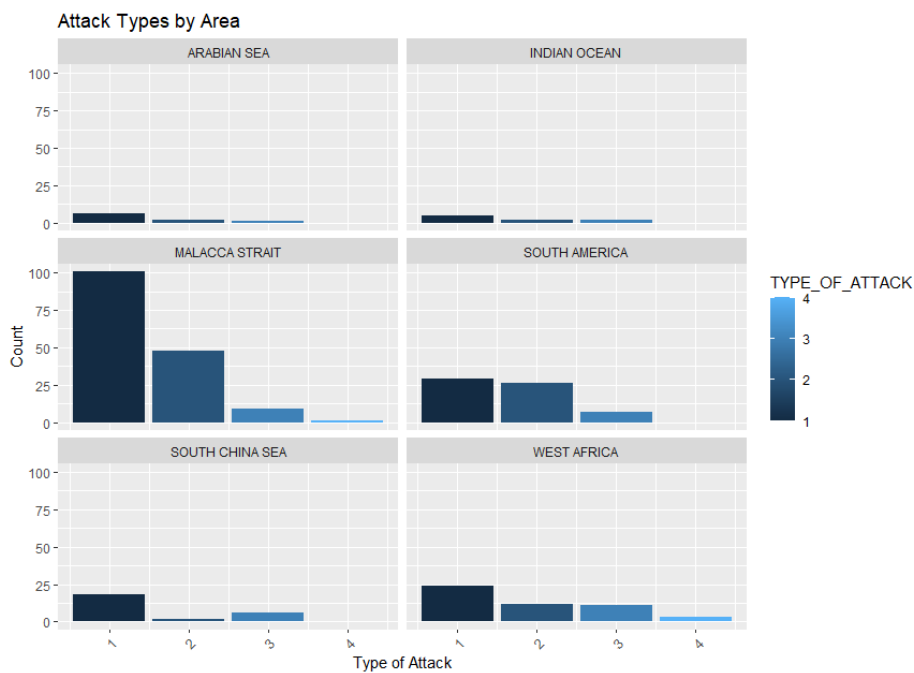*Figure 15: Geographical Area by Type of Attack*



*Figure 16: Barplots of Attacks by Area and Type of Attack*

As presented in Figure 15, especially in Malacca Strait where the frequency of the attacks is the most, most of them is of type 1, and 2, as expected based on the total picture of the whole data. The same analysis is shown in Figure 16 which gives the total attacks by Area and Type of Attack.

As presented in Figure 15, especially in Malacca Strait where the frequency of the attacks is the most, most of them is of type 1, and 2, as expected based on the total picture of the whole data. The same analysis is shown in Figure 16 which gives the total attacks by Area and Type of Attack.

## 7.1.2 Analysis for the succeeded attacks

In this section, we delve into a detailed analysis of the "Anex" variable from our dataset, which informs us about the success or failure of pirate attacks on vessels. We aim to shed light on the prevalence and implications of succeeded attacks, as well as their impact on the maritime industry.
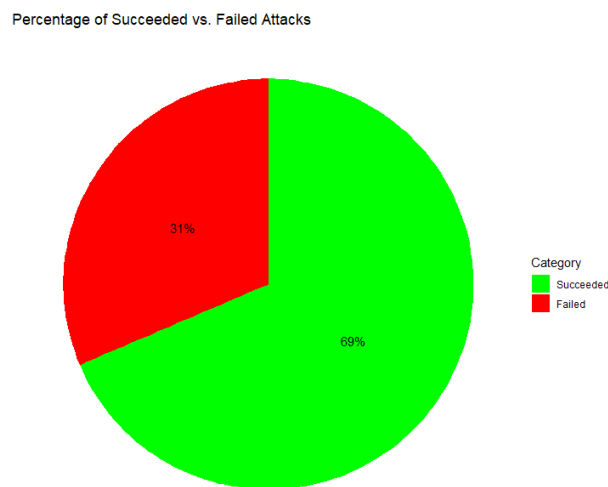


*Figure 17: Pie graph of the succeeded attacks*

Figure 17 visualizes the distribution of succeeded and failed pirate attacks in maritime incidents. The chart is based on a dataset of maritime attacks, with two main categories:

**Succeeded Attacks** (Green): This category represents incidents where pirates successfully carried out their attacks and achieved their objectives. The chart shows that succeeded attacks constitute the majority, accounting for approximately 69% of the total incidents.

**Failed Attacks** (Red): This category represents incidents where pirates attempted an attack but were unsuccessful in achieving their goals. This could be due to the crew's defensive actions, intervention by naval or law enforcement authorities, or other factors. Failed attacks make up the remaining approximately 31% of the incidents.

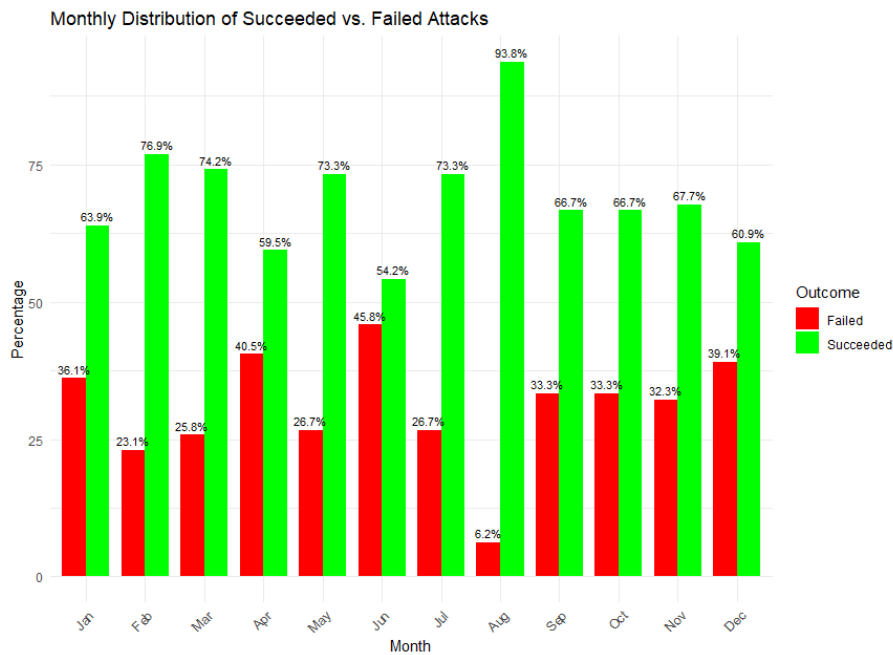A deeper analysis of the data, based on the month of the incidents is shown in Figure 18.



*Figure 18: Succeeded and Failed Attacks by month*

From this graph, we can draw many conclusions. From the majority of the attacks, during the summer period it seems that most of them is successful. On the other hand, during the other months, the percentages seem to be more random. Another interesting graph is presented in Figure 19 which shows the succeeded percentages of attack by month. In this graph, we added a red dashed line which shows the average percentage of succeeded attacks. As we can see, the lowest percentage of succeeded attack happened in June while in August this percentage is 93.8% which is very high.

A possible explanation of the phenomenon is that the weather conditions prevailing in the month of August significantly helped the pirates to have a successful attempt. Also, with the use of Figure 11 we find that our claim has a basis since there is a deviation in the specific month.
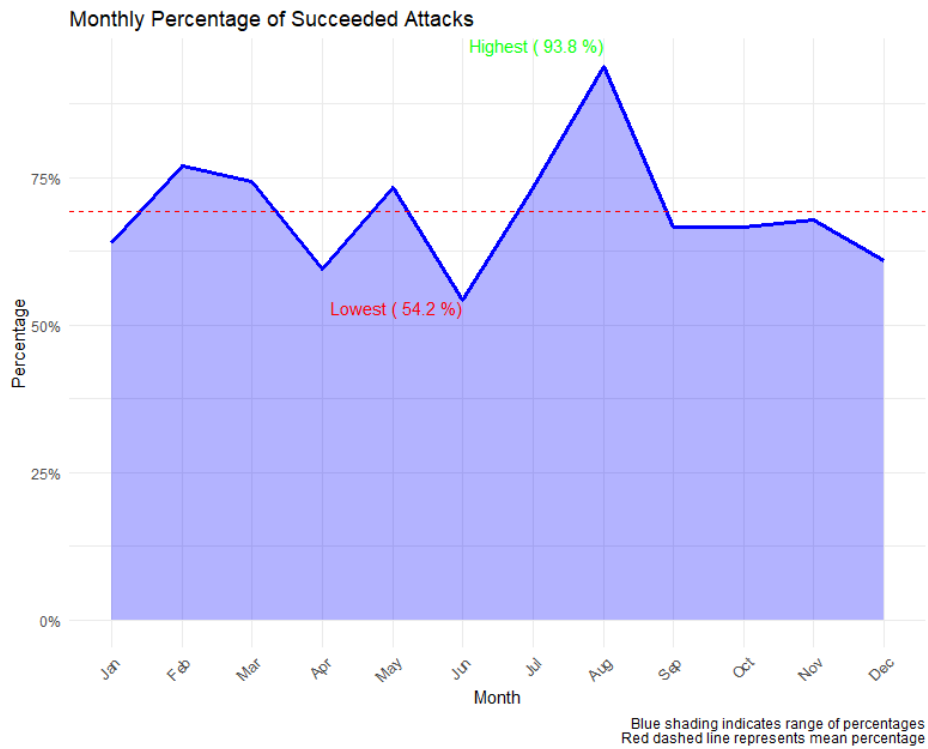
*Figure 19: Percentage of succeeded attacks by month*

In Figure 20 we are going to examine the percentage of succeeded attacks based on the year.
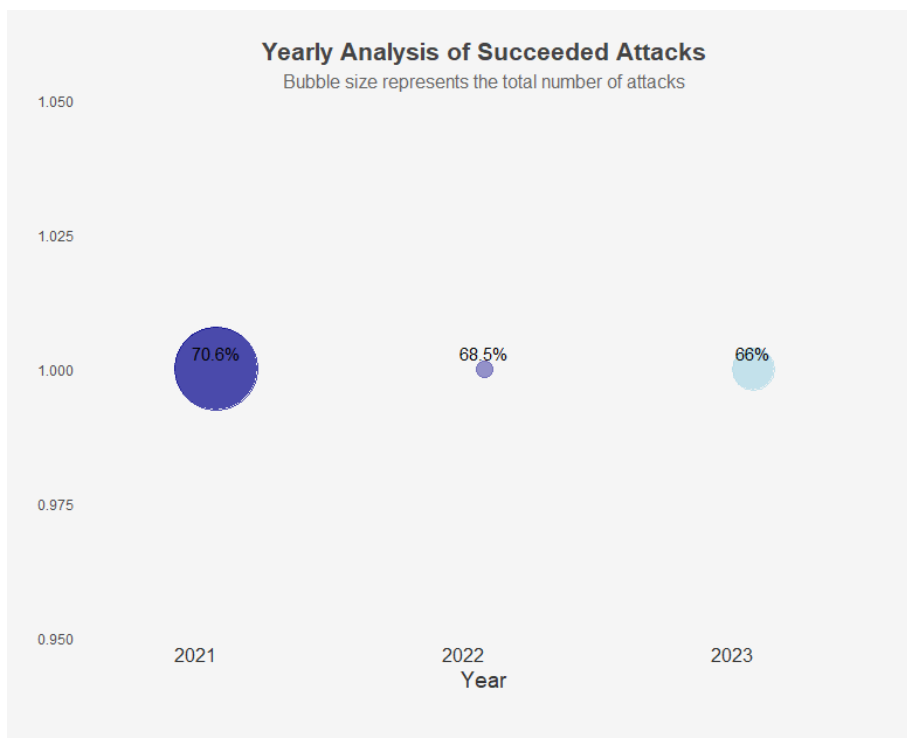


*Figure 20: Succeeded attacks by year*

One of the notable trends observed from this graph is a gradual decrease in the percentage of succeeded attacks over the three-year period. In 2021, the percentage stood at 70.6%, indicating that a significant majority of pirate attacks resulted in success. However, this percentage decreased to 68.5% in 2022 and further dropped to 66% in 2023. This pattern suggests a decreasing success rate for pirate attacks, which may be attributed to enhanced security measures, international cooperation, or changes in pirate tactics. The decline in the success rate of pirate attacks may be indicative of improved security measures adopted by vessels, maritime authorities, and international organizations. It is possible that ships have implemented stricter security protocols, such as increased onboard security personnel, fortified ship designs, or improved communication systems, to deter and respond to pirate threats effectively. The shift in the success rate may also reflect changes in pirate tactics and strategies. Pirates may be facing challenges in adapting to evolving security measures, leading to a reduced likelihood of successful attacks. A reason for causing more piracy attempts could be that in 2021 with Covid21 there was a boom in shipping, so more ships crossed the global sea space. So, pirates could approach more ships for an attempted piracy.

### 7.1.3 Prediction of the Probability of a successful attack

In this section, we will employ statistical regression models to assess the likelihood of a ship facing a successful attack, based on various data variables. Our approach involves utilizing the logistic regression model, with the "Anex" variable as the dependent factor and all other collected information as independent variables. The choice of logistic regression is essential, as the "Anex" variable is dichotomous, making it unsuitable for analysis using a linear regression model.

To ensure a more robust analysis, we made the decision to consolidate the data related to the "Flag" variable. This variable initially presented 40 distinct values, some of which had negligible frequency concerning the "Anex" values. After data consolidation, we derived a refined frequency table:

| Anex | Hong Kong | Liberia | Malta | Marshall Islands | Panama | Singapore | Other |
|------|-----------|---------|-------|------------------|--------|-----------|-------|
| 0    | 7         | 13      | 6     | 18               | 14     | 13        | 28    |
| 1    | 14        | 25      | 12    | 31               | 20     | 43        | 71    |

We also standardized the GROSS_TONNAGE variable in order to avoid the large variance of this variable.

By applying the logistic regression model to the data, we finally reached that the best model which can be used to predict the possibility of a successful or not successful attack at a ship consists of the following 4 independent variables presented in the coefficient's regression table:

|  | Estimate | Std Err | z-value | p-value | Lower 95% | Upper 95% |
|---|---|---|---|---|---|---|
| (Intercept) | 0.7632 | 0.3513 | 2.172 | 0.030 | 0.0746 | 14.517 |
| TYPE_OF_AID2 | 0.5581 | 0.2828 | 1.973 | 0.048 | 0.0037 | 11.125 |
| TYPE_OF_AID3 | 20.976 | 0.7778 | 2.697 | 0.007 | 0.5732 | 36.220 |
| TYPE_OF_AID4 | 13.676 | 11.036 | 1.239 | 0.215 | -0.7955 | 35.306 |
| TERRITORIAL_SEAP.A | 11.663 | 0.3362 | 3.469 | 0.001 | 0.5073 | 18.252 |
| TERRITORIAL_SEAT.W | 0.3738 | 0.3215 | 1.163 | 0.245 | -0.2563 | 10.040 |
| DAY_NIGHTN | -0.8257 | 0.3554 | -2.323 | 0.020 | -15.222 | -0.1291 |
| GROSS_TONNAGE | -0.5704 | 0.1560 | -3.658 | 0.000 | -0.8761 | -0.2648 |

Based on the model, we also present the Cook's distance graph which shows that some of the data could be outliers. The first and the most significant is the Bulk Carrier ship named Pacific Tamarita.
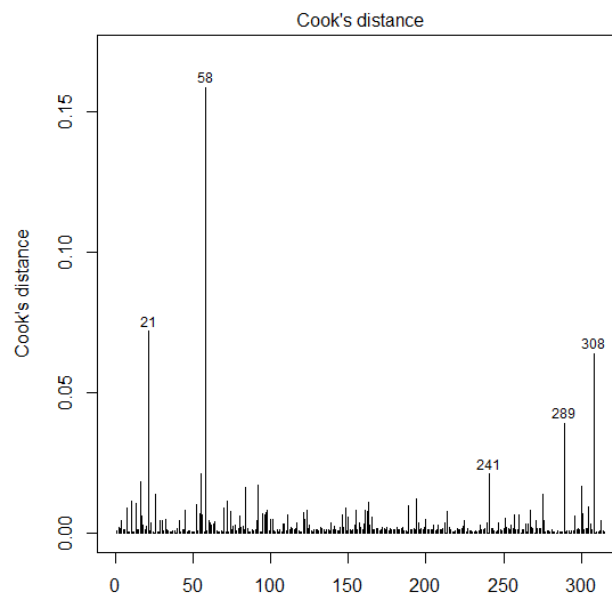


Figure 21: Cook's Distance Plot

Once the coefficients have been estimated, it is a simple matter to compute the probability of a successful attack. Mathematically, using the coefficient estimates from our model we have the following prediction model:

$$\hat{p}(X) = \frac{e^{\hat{b}_0 + \hat{b}_1 X_1 + \cdots + \hat{b}_p X_p}}{1 + e^{\hat{b}_0 + \hat{b}_1 X_1 + \cdots + \hat{b}_p X_p}}$$

Let's give an example of prediction for a case of the data we used for the estimation of the model. We will predict the case of the following ship:

```
  Anex TYPE_OF_SHIP            FLAG GROSS_TONNAGE    ATTACK_AREA TERRITORIAL_SEA DAY_NIGHT TYPE_OF_ATTACK TYPE_OF_AID
5    1 Bulk carrier Marshall Islands    0.2158502 MALACCA STRAIT            T.W         N              1              2
```

As we can see for that ship, the attach was successful (Anex = 1). The probability of a successful attach for that ship is:

$$\hat{p}_5(X) = \frac{e^{0.7632 + 0.5581 + 0.3738 - 0.8257 - 0.5704 * 0.2158502}}{1 + e^{0.7632 + 0.5581 + 0.3738 - 0.8257 - 0.5704 * 0.2158502}} = 67.84\%$$

# Chapter 8 Conclusions and Discussion

In the preceding chapters, we have delved into the multifaceted realm of maritime piracy, exploring its historical evolution, causes, and the significant costs it imposes on the global shipping industry. Our analysis has extended to the specific impact on maritime companies, shedding light on the intricate web of financial ramifications and operational challenges posed by piracy incidents.

## 8.1 Key Conclusions

From our extensive data analysis, several key conclusions emerge, underlining the severity and urgency of addressing the piracy menace:

**Global Ramifications:** Piracy transcends geographical boundaries and impacts the entire global shipping industry. The rise of piracy, particularly in areas like the Yemen region, demands a concerted international effort to safeguard maritime routes and ensure the smooth flow of trade.

**Financial Toll:** The financial implications of piracy are profound, ranging from escalated insurance premiums to direct costs associated with rerouting, safety equipment installation, and the deployment of naval forces. Shipping companies, in particular, bear a substantial burden, facing heightened insurance costs and revenue losses.

**Complex Factors:** The causes of piracy are rooted in a complex interplay of social, economic, and political factors. Long-term unemployment, technological advancements, and inadequacy of government policies contribute to the perpetuation of this criminal activity.

## 8.2 Summary of Findings and Recommendations

Finally, we conducted a comprehensive analysis of maritime security incidents using data extracted from the International Maritime Organization's (IMO) Piracy and Armed Robbery module within the Global Integrated Shipping Information System (GISIS). Spanning from January 2021 to July 2023, our dataset comprises reports of actual and attempted attacks by pirates and armed robbers against ships.

Through exploratory data analysis, we gained valuable insights into various aspects of maritime security incidents. Visualizations such as bar plots, histograms, and geographical maps provided a nuanced understanding of attack outcomes, ship characteristics, attack frequencies over time and location, and the impact of visibility conditions on attack strategies.

Notably, our analysis revealed a gradual decrease in the percentage of succeeded attacks over the three-year period from 2021 to 2023. This trend may be attributed to enhanced security measures, international cooperation efforts, changes in pirate tactics, and external factors such as global trade patterns and weather conditions.

Furthermore, logistic regression models were employed to predict the likelihood of a ship facing a successful attack based on key variables such as Type of Aid, Territorial Sea, Day/Night, Gross Tonnage, and Type of Attack. The analysis identified potential outliers, with the Bulk Carrier ship named Pacific Tamarita being a significant outlier.

In conclusion, our analysis provides valuable insights into the dynamics of maritime security incidents, contributing to a deeper understanding of piracy and armed robbery against ships. Future research could explore additional factors influencing attack outcomes and further investigate outlier observations to enhance the accuracy and robustness of predictive models.

## 8.3 Future Proposals and Recommendations

In light of our findings, it is imperative to outline future proposals aimed at not only mitigating the immediate impact of piracy but also fostering a comprehensive, long-term solution:

**Enhanced Data Analysis:** There is a critical need for an in-depth analysis of the dataset, exploring additional variables related to ships, crew demographics, and environmental conditions. This approach can unveil nuanced patterns and identify potential risk factors that contribute to piracy incidents.

**Collaborative International Efforts:** Governments, maritime industry stakeholders, and international organizations should collaborate to formulate a unified strategy

against piracy. This entails sharing intelligence, coordinating naval patrols, and establishing a coherent framework that addresses security, development, and investments.

**Investment in Prevention:** Rather than solely focusing on reactive measures, there should be a shift towards proactive prevention strategies. This includes investing in advanced technology, implementing best management practices, and fortifying vessels against potential pirate attacks.

**Public Awareness and Advocacy:** Raising public awareness about the pervasive impact of piracy on daily life is crucial. Advocacy efforts should emphasize the interconnectedness of the maritime industry with our everyday lives, highlighting the potential consequences of piracy on the cost and availability of essential goods.

## 8.4 The Urgency of Action

As piracy continues to persist as a global challenge, the urgency of collective action cannot be overstated. The international community must recognize piracy as a shared problem requiring shared solutions. Governments, industry players, and citizens alike must unite in a commitment to safeguarding the seas, ensuring the uninterrupted flow of commerce, and ultimately preserving the prosperity and security of nations.

In conclusion, while the piracy issue remains complex and formidable, our commitment to understanding, analyzing, and proposing solutions marks a crucial step towards a safer and more secure maritime environment. It is our hope that this thesis serves as a catalyst for further research, dialogue, and decisive action against the scourge of piracy that threatens the very foundation of our interconnected world.

# References:

1. Bowden, A., (2010). The Economic Cost of Maritime Piracy, One Earth Future Working Paper, USA.
2. Brouno, P., (2013). What is the Cause of Sea Piracy?, About: Money, Maritime Safety and Security.
3. Bueger, Christian, 'Orchestrating the Response: Somali Piracy and Ontological Complexity', Global Policy 4/1 (2013), 86–93. doi:10.1111/j.1758-5899.2012.00194.x.
4. Bueger, C., & Stockbruegger, J. (2016). "Piracy studies: academic responses to the return of an ancient menace." WMU Journal of Maritime Affairs, 15(2), 223-242.
5. Chalk, P. (2018). Maritime Piracy. Oxford Bibliographies.
6. Crenshaw, M. (2011). Explaining Terrorism: Causes, Processes and Consequences. Routledge.
7. Cordingly, D. (1995). Under the Black Flag: The Romance and Reality of Life Among the Pirates. Random House.
8. Diop, M., Bella, B., Quy-Toan Do, (2013). The Pirates of Somalia: Ending the Threat, Rebuilding a Nation, The World Bank Regional Vice-Presidency for Africa report 2013, Washington DC.
9. Holds, L., (2010). Defining Piracy. Maritime Terrorism Research Center, Herzliya, Israel. Available at http://www.maritimeterrorism.com.
10. International Maritime Organization (IMO). "Guidance to shipowners and ship operators, shipmasters and crews on preventing and suppressing acts of piracy and armed robbery against ships. (2022).
11. International Maritime Organization (IMO). "Global Piracy and Armed Robbery Situation." (2021).
12. International Maritime Organization IMO. (2020). "Cyber Risk Management in Safety Management Systems.
13. International Maritime Organization . "IMO's Work on Maritime Security.(2022).
14. International Maritime Bureau. "Piracy and Armed Robbery Against Ships - 2022 Annual Report."
15. Institute of Shipping Economics and Logistics (ISEL). "Maritime Security – Costs and Benefits." (2020).
16. Klein, Natalie. "Universal Jurisdiction and Piracy." American Journal of International Law, vol. 104, no. 3, (2010), pp. 457-491.
17. Klein, I. (2017). Pirates: The Golden Age of Piracy: A History from Beginning to End. Hourly History.
18. Krasner, S. D. (2004). Governance and the Limits of Authority: The Incomplete Revolution. Prospect.
19. Mitropoulos, E.E., (2011). World Maritime Day 2011, Circular letter No.3210/2011 of Secretary-General of the International Maritime Organization, London.
20. Murphy, Martin N. "Universal Jurisdiction over Crimes against Humanity: A Critique of the Doctrine's Application in Belgium." The George Washington International Law Review, vol. 32, no. 4, (2001), pp. 723-764.
21. ROBINSON, M., (2005) Universal Jurisdiction, National Courts and the Prosecution of Serious Crimes Under International Law, University of Pennsylvania, USA, 16.

22. Palk, J., & Aldrich, D. (Eds.). (2017). Pirates, Terrorists, and Warlords: The History, Influence, and Future of Armed Groups around the World. Naval Institute Press.

23. OBP, (2010). Evolution of Piracy: Historical Piracy, An Ocean Beyond Piracy essay, USA.

24. Osei-Tutu, J.A., (2013). The Root Causes of the Somali Piracy. Kofi Annan International Peacekeeping Training Center (KAIPTC), Ghana.

25. Vestergaard, M., Conor S., Brandt K., Purser B., Randall H., Roy K., (2013). The State of Maritime Piracy 2013. Oceans Beyond Piracy Project, One Earth Future Foundation.

26. Widd, P.G., (2008). The Seafarer, Piracy And The Law: A Human Rights Approach, University of Greenwich, pages 21-58.