Radboud University
Nijmegen School of Management

Thesis Submitted in Partial Fulfilment of the Requirements for the

Degree of Master in Political Science (MSc) specialisation: Conflict, Power, and Politics

Causes of piracy

A Qualitative Comparative Analysis of piracy in Africa and Southeast Asia

24 June 2022

Daniel Frederik Schäfer

S1062453

Word count: 18550

Supervisor: Dr R.A.A. Romain Malejacq

Assistant professor - International Relations

Content

Abstract 1
Chapter 1: Introduction 1
1.1. Piracy in the Literature 3
1.2. Methodology 5
1.3. Thesis Outline 6
Chapter 2: Contemporary piracy 7
2.1. Defining piracy 7
2.2. Pirate attacks 10
2.2.1. Types of attacks 10
2.2.2. Conducting an attack 11
2.2.3. Special types of pirate attacks 13
2.3. Pirate groups and organisation 13
2.4 Countermeasures 15
Chapter 3: Conditions for piracy 17
3.1. IUU fishing 17
3.2. Conflict 18
3.3. Governance 19
3.4. Corruption 21
3.5. Grievances and deprivation 22
3.6. Geography 22
3.7. Other conditions 23
3.8. Conclusion 24
Chapter 4: Methodology 25
4.1. QCA 25
4.1.1. Function of QCA 25
4.1.2. Versions of QCA 27
4.1.3. Reasons for QCA 28
4.2. Case selection 29
4.3. Calibration of Piracy 30

4.4. Calibration of Conditions 32
4.4.1. IUU fishing 32
4.4.2. Conflict 33
4.4.3. Governance 34
4.4.4. Corruption 35
4.4.5. Deprivation 35
4.4.6. Geography 36
4.5. Conclusion 36
Chapter 5: Empirical findings 37
5.1. Crisp-QCA with common piracy as the outcome 37
5.2. Crisp-QCA with organised piracy as the outcome 40
5.3. Multi-value QCA with common piracy as the outcome 42
5.4. Multi-value QCA with organised piracy as the outcome 45
5.6. Discussion of results 46
5.6.1. Hypotheses 47
5.6.2. Common piracy 48
5.6.3. Organised piracy 48
5.6.4. Condition of interest 48
5.6.5. Cases of interest 49
5.7. Conclusion 50
Chapter 6: Conclusion and Implications 51
6.1. Limitations 51
6.2. Theoretical Implications 53
6.3. Policy Implications 53
6.3. Further research 54
References 56
Appendix 61

Abstract

Piracy is an issue affecting maritime trade for centuries. Since the 1980s, contemporary pirates have been operating along major trade routes, notorious for targeting ships of all sizes. This contemporary piracy is generally categorised into common and organised piracy, with the latter posing the biggest threat to maritime trade by kidnapping large cargo ships. Researchers in the past 30 years have identified conditions that increase piracy. Using qualitative comparative analyses, I inspect these conditions for their necessity and sufficiency for both common and organised piracy. While failing to identify any necessary or sufficient condition for common piracy, I can determine that high levels of both IUU fishing and corruption as well as the combination of IUU fishing, presence of conflict, low governance, corruption, and favourable geography are sufficient sets of conditions for organised piracy. Concluding that counter-piracy efforts should focus more on these conditions to stop organised piracy.

Chapter 1: Introduction

Piracy is nothing new. In fact, pirates have been active around the world for a very long time. During ancient times, pirates were quite active in the Mediterranean, even capturing Julius Caesar at one point (Plutarch, 75). More than a thousand years later the same region was preyed upon by famous Ottoman pirates like Barbarossa (Rafferty) while at the same time the North Sea had a pirate problem for itself (Piper, 2020). Probably the most famous period of piracy was during the golden age of sail when dozens of famous pirates were active in the Caribbean, including names such as Blackbeard, Captain Kid, and Anne Bonny (Cartwright, 2021.10). Similarly, other regions in the world had long-lasting history of pirates. In China, the pirate boss Zheng Yi Sao once commanded a large fleet while during the 19th century many colonial powers had to combat piracy in their colonies in Southeast Asia (Cartwright, 2021.11). Even in the future, piracy might be an ongoing problem, at least when reading science fiction books like “Pirates of Venus” or movies/series from Star Wars.

With piracy as a problem that is always present in some form, the question can be asked why it is relevant to analyse piracy in general and modern pirates in particular. The biggest impact pirates have is their damage to trade. As pirates are not primarily concerned with hiding and finding treasures, as depicted in some books and movies, but with capturing goods or people, that can be sold for money, they disturb trade flows directly and indirectly. Captured goods and ships in combination with large ransom payments and increased insurance rates is costing the shipping companies billions each year, these costs trickle down to us consumers (CQ Researcher, 2009; Daxecker and Prins, 2021). For sailors traveling through pirate-infected waters, the impact can be far greater. The anxiety of having to always be prepared to become the target of a pirate attack can impact the well-being of sailors, especially female sailors (Oystein, 2010). An attack itself can be very dangerous and stressful for the crew, as can be seen in the movie "Captain Phillips" which told the story of a real pirate attack in the Gulf of Aden. Being kidnapped by pirates can also have negative impacts on a sailor's life long after they were freed, such as PTSD (Oystein, 2010).

Those negative consequences have only become bigger with the increase of piracy since the end of the cold war and the even bigger surge at the beginning of the 21st century (The Economist, 2018; Murphy, 2009). This rise of attacks has only been interrupted by counter-piracy missions such as Operation Ocean Shield, where dozens of different nations send warships to suppress piracy activity in the Gulf of Aden (Amnini, 2017). After the end of this mission, piracy in the Gulf surged again (The Economist 2017) and other regions such as the Gulf of Guinea saw a similar increase in attacks (Amini, 2017; The Economist, 2018). Demonstrating that without costly counter-piracy missions, like Ocean Shield, piracy (re)occurs in different spots along shipping lanes. Therefore, it is necessary to understand why piracy emerges in some countries and how to deal with it in the long term. A notion that is repeated by several organisations and people conducting counter-piracy missions is that fighting piracy should be as much a land-based activity focused on reducing conditions[1] that lead to piracy as an

[1] I use the term condition instead of variable for my thesis, because variables in QCA are called conditions.

operation to protect ships from attacks (EUNAVFOR; Oystein, 2010). To tackle the correct conditions, it is necessary to understand what conditions cause piracy. My research question is thus:

What causes piracy?

To answer this question I examine the current literature and identify conditions that were detected as causes of piracy. Those conditions are IUU fishing, conflict, governance, corruption, grievances, and geography. After that, I analyse these conditions on their necessity and sufficiency for (common and organised) piracy by conducting multiple Qualitative Comparative Analyses (QCA).

1.1. Piracy in the Literature

Since piracy already existed for many hundreds of years research into piracy is also very old. Early work from the beginning of the 20th century is mostly focused on describing and analysing individual aspects of piracy and especially counter-piracy measures. Texts from Craven (1930) and H. Stuart Jones (1926) look at piracy in different historic times and can therefore be more considered as historical accounts. While texts about contemporary piracy existed, for example from Dickinson (1924-1925), they did not come close to modern authors, simply because piracy in its modern form only really started in the late 20th century. Therefore, my literature review focuses on piracy research that started in the 1990s. It should be noted that several authors writing about contemporary piracy from the 1970s and 1980s do exist, but they mainly focused on the legal implications of piracy or describe individual cases of piracy and they never examined the reasons for piracy (Rubin,1976; Birnie, 1987; Dubner, 1980; Halberstam, 1988).

Generally, piracy is not a topic that was researched thoroughly in the past since the research object (pirates) is not keen on sharing information with researchers. Therefore, data gathering must rely on incident reports, which are also not always complete, and national/local data (Daxecker and Prins, 2021). Trying to gather information directly from pirates themselves can be very dangerous, as seen in

the documentary by Monnet (2016) where he interviews pirates in Nigeria while being threatened with guns. Those problems were part of the reason why most research about piracy was focused on individual cases (Daxecker and Prins, 2021). While those case studies can give some insights into how different conditions led to piracy, they lack the ability to generalise.

With this focus on individual case studies and small-N studies, regional or global analyses were rare and often relied on incomplete data (Patrick, 2011). With access to new data, scholars focused more on regional and global analyses and set the stage for the second wave of research that began to document conditions associated with piracy (Daxecker and Prins, 2021). This second wave is primarily important for this thesis since my research object is not to analyse specific piracy in one country but piracy around the world.

Existing literature has focused mostly on national institutions when explaining the emergence of piracy globally (Daxecker and Prins, 2021). Different conditions associated with piracy were identified and tested by different authors using different methods. One condition that was analysed by several authors (Hughes, 2011; Awet, 2012; S. Whitman & C. Suarez, 2012; Phelps Bondaroff et al., 2015; Alsawalqa and Venter, 2021) is illegal, unidentified, unregulated (IUU) fishing. Because of its prominence along the coast of Somalia, IUU fishing is often analysed in single case or medium-N studies, focusing on Somalia itself or the Western Indian Ocean.

Most large-N studies focus on different conditions that can be grouped under economy, rule of law, and governance. Different authors focus on individual or groups of conditions. Governance, for example, is thoroughly analysed and generally seen as one important condition for piracy, since nonstate armed groups often emerge where state governance is lacking **(**Murphy, 2007**,** 2009; Sung, 2004; Mentan, 2004**).** Another condition that is often looked at is corruption (Clunan and Harold, 2010; Daxecker and Prins, 2021; Murphy, 2007). Several authors show different ways it can lead to piracy. The same can be said about economic reasons for piracy, where the focus often lies on privation and

grievances and how they make pirate recruiting possible (Burnett, 2002; Murphy, 2009; Whitman and Suarez, 2012).

A gap often present in research about piracy is the neglect of the local level, which was addressed by Daxecker and Prins (2021). They are one of the first that specifically look at different conditions and their impact on piracy at the local level and thus created a new approach to look at the impact of governance on piracy. Where many researchers before Daxecker and Prins explained how pirates have inserted themselves into areas of low or no governance, in order to conduct piracy without any interruption (Jablonski and Oliver, 2013; Shortland and Varese, 2014, 2016; Axbard, 2016), Daxecker and Prins (2021) demonstrated that the connection between levels of governance and intensity of piracy is not linear.

As I made apparent, many authors did already analyse piracy and its causes, from qualitative analyses looking at specific causes to quantitative analyses. Even though most approaches to study piracy were already done, I argue that one approach has been missing so far. The current literature conducting medium-N to large-N studies use quantitative methods that examine the effect each condition has on piracy. This can indicate which individual condition has an effect on piracy and by how much. I argue that another approach to answering the question of what causes piracy is needed. One where conditions are not examined to understand the effect they can have on piracy but if they are necessary or sufficient conditions for piracy. Utilizing this approach can generate new answers to the same question and enable counter-piracy missions to bring a stop to piracy. In chapter three I generate hypotheses that question the necessity and sufficiency of individual conditions.

1.2. Methodology

Since my approach to answering my research question differs from other authors, I need to rely on a different methodology. Thus, I cannot use a quantitative method, as they were already used and would therefore not result in a new answer to the question. Furthermore, using a single-case analysis or comparative analysis of two cases would lack the ability to generalise. Hence, I need a method that is

both qualitative and useable to generalise. One method that fits this criterion and which can test for necessity and sufficiency of conditions is Qualitative Comparative Analysis (QCA), a medium-N method originally developed by Charles Ragin (1987)—see Chapter four for a more thorough introduction of this method.

I identify six conditions for piracy present in the literature on piracy which are already analysed by different authors: governance; local conflict; IUU fishing; corruption; grievances, and geography. The conditions of governance, local conflict, IUU fishing, corruption, and grievances can be measured with different public indexes. Geography and piracy itself are operationalised without any public indexes. The complete operationalisation is explained in the methods chapter. All conditions that I use and the way how they are measured/operationalised are not new but based on existing research.

I select coastal countries that are located along the major trade route between Europe and China. Focusing on countries along a major trade route is needed because, as I explain in the next chapter, pirates need the opportunity of targets nearby (Daxecker and Prins, 2021). Including countries without a target rich environment would endanger the comparability of cases.

1.3. Thesis Outline

In the next chapter, I define piracy and explain the legal problems surrounding it. I also describe the differences between common and organised piracy and what types of pirate attacks exist. In the third chapter, I set forth the conditions for piracy and generate hypotheses based on existing literature. The conditions will be operationalised and calibrated in the fourth chapter along with a detailed description of QCA. The results of my QCAs will be shown and discussed in the fifth chapter. My last chapter will express the limitations of my thesis and set out implications for theory, policy, and further research.

Chapter 2: Contemporary piracy

In these two chapters, I give an overview of piracy and deduct the conditions for piracy from the literature. While contemporary piracy is sometimes seen as a completely new phenomenon, piracy itself dates back thousands of years (Murphy, 2009; Awet, 2012). Therefore, when analysing contemporary piracy, one should always keep in mind the long history of piracy and how the old is connected to the new. Regions like Southeast Asia have been pirate hotspots in the past and are pirate hotspots nowadays (Daxecker and Prins, 2021). Contemporary piracy is a label used for piracy after 1983, the year when the International Maritime Organisation (IMO) noted an increase in attacks compared to the years before (Murphy, 2009).

Besides the similarity in location, old and new pirates share most of the same causes and countermeasures, additionally, they are being perceived as threats from states in a similar manner (Daxecker and Prins, 2021). Conditions such as weak state governance and grievances of the population were reasons for piracy in the past and play a similar role in contemporary piracy. Likewise, both old and contemporary pirates sparked the attention of powerful states that worried about the safety of their trade routes.

2.1. Defining piracy

Before portraying pirate attacks and the pirate organisations responsible for them, I depict one legal problem in defining piracy, that is, the definition of a pirate attack. Under international law, piracy is defined in Article 101 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS):

> *Piracy consists of any of the following acts:*
>
> *(a) any illegal acts 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 aircraft, or against persons or property on board such ship or aircraft;*

(ii) against a ship, aircraft, 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 contains several problems. It defines piracy very narrowly, excluding certain attacks people would consider pirate attacks. Most striking is the geographic requirement. As noted in (a) (i) and (ii), the attack must take place on the high seas or outside the jurisdiction of any State. If article 58(2) of the UNCLOS is considered, the geographic scope also includes the extended economic zone (EEZ) of a country (Asariotis et al., 2014). Importantly, any attack within a state's territorial waters is not considered piracy according to the definition of the UNCLOS treaty. As explained later, this narrow scope resulted in attacks not being labelled as pirate attacks even though they were conducted by pirate groups. However, a broad definition would also be problematic, since a lot of attacks on ships happen in ports and are conducted by regular thieves that just happen to steal from an anchored ship and thus cannot be considered pirates (Daxecker and Prins, 2021). Another problem with the UNCLOS definition is the requirement of the private ends, which excludes any illegal hijacking or robbery done by government ships, such as coast guard ships. Only if the crew of the government ship mutinied will attacks conducted by them considered pirate attacks (Asariotis et al., 2014). For example, illegal acts committed by elements of the Indonesian military would not be considered piracy under the UNCLOS definition (Murphy, 2009). Lastly, the two-ship requirement excludes any hijacking carried out from inside the ship, as happened onboard the Achille Lauro in 1985 (Asariotis et al., 2014).

This narrow definition allows pirates to escape capture by fleeing from the high seas into the territorial waters of a country that is either not willing or not able to capture them (Murphy, 2007). Using a narrow definition also creates problems for statisticians who either underreport or overreport piracy depending on which types of attacks are considered piracy (Murphy, 2007).

In 1988, the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA Convention) was signed to complement the UNCLOS and hence fix those problems, after the case of the Achille Lauro in 1985 showed the problems of having a narrow definition of piracy (Asariotis et al., 2014). The new treaty did not expand the definition of what constitutes a pirate attack but added the category of armed robbery against ships, which can occur in the territorial waters of a country and is seen as part of piracy (Asariotis et al., 2014), therefore when I speak of piracy, I always include armed robbery against ships as part of the definition. According to the SUA convention, armed robbery against ships includes any of the following acts (Asariotis et al., 2014):

> *1. Any illegal act of violence or detention or any act of depredation, or threat thereof, other than an act of 'piracy', committed for private ends and directed against a ship or against persons or property on board such ship, within a State's internal waters, archipelagic waters, and territorial sea;*
>
> *2. Any act of inciting or of intentionally facilitating an act described above.*

This broader definition fixed the problems stated earlier about the geographical scope, the private ends requirement, and the two-ship requirement.

Piracy can also be defined differently. For example, the British jurist C.S. Kenny defined piracy as any armed violence at sea that is not part of any war, this definition based on war was echoed by other people (Murphy, 2007). Having such a broad definition can be problematic since nowadays states rarely declare war anymore (Adams, 2015), meaning that any naval combat in an undeclared war could be considered piracy. Likewise, other acts, that could be considered violent, such as a Greenpeace ship ramming a whaling ship, could also fall under the definition of piracy.

Daxecker and Prins (2021) define piracy along the lines of the IMO, which includes maritime armed robbery as an act of piracy but retain the two-ship requirement of the UNCLOS treaty. I use this definition because excluding the two-ship requirement would add attacks that don't differ from normal land-based crimes such as robbery. Furthermore, it allows me to use the dataset that Daxecker

and Prins (2021) gratefully provided me without requiring any adjustments to it. Because pirate attacks are not always the same and can differ in their form, I later introduce a distinction between common pirate attacks and organised pirate attacks.

2.2. Pirate attacks

Pirate attacks can vary in different forms, such as target and objective. Some pose a greater threat to trading lines than others (Murphy, 2009). In general, the type of attack is determined by the means accessible to the pirates and the opportunities available in the area in which they operate. When means or opportunities change, pirates often adapt their attacks accordingly (Daxecker and Prins, 2021). In this chapter, I give an overview of the most common types of pirate attacks. Yet, I show that attacks follow a similar sequence in preparing, attacking, and profiting.

2.2.1. Types of attacks

A large proportion of pirate attacks, around 40% of all registered attacks, target ships anchored in ports (Daxecker and Prins, 2021). These attacks are similar to thefts on ships and are therefore excluded from the definition, only if the attackers use boats to approach and flee the target ship will these attacks be included. Most of the time, the crew is either sleeping or not present at all. No larger planning nor organization is needed for these attacks. Murphy (2009) classifies such attacks as common piracy (as opposed to organized piracy). Common pirate attacks target ships anchored in port, at anchorage places near the coast, or in coastal waters, and are often aimed at stealing money or other smaller valuables (see table 1).

Organized attacks are mostly different from common attacks regarding target, financing, and objectives. Firstly, while common pirates attack smaller ships near the coast, organized pirates can go deeper into the high seas to target bigger ships (Murphy, 2009). This requires better organization, better boats, and better intelligence about possible targets. Opportunistic attacks as carried out by common pirates are unfeasible on the high seas. To acquire the necessary equipment, organized pirates rely on different investors, providing them with enough money for each attack and a viable

base on land (Shortland and Varese, 2016). Lastly, organized pirates do not only steal the crew's cash and valuables; their main form of income is the ransom for the crew and/or ship, or the profits from selling the cargo and/or ship (Daxecker and Prins, 2021).

Table 1: Characteristics of common and organised piracy

Threat characteristics	Common piracy	Organised piracy
Attack location		
Ports & harbours	X	
Anchorages	X	
Coastal waters	X	X
High seas		X
Target indification		
Opportunity	X	
Intelligence-based planning		x
Target interception		
Opportunity	X	
Information-led interception		X
"Sleeper"		X
Objectives		
Theft of cash and crew possessions	X	
Theft of cargo	X	
Theft of ships & cargo		X
Kidnapping and ransoming		X
Phantom ship fraud		x

Extracted from Murphy (2009)

2.2.2. Conducting an attack

In the following paragraphs, I describe a typical sequence of an organised pirate attack and how it can differ in target and objective. To prepare for an attack, a pirate group needs the appropriate equipment. In most cases, this includes speedboats, if necessary a mothership, fuel for those ships/boats, equipment to spot the target and coordinate the attack, scaling equipment such as ladders and ropes, weapons to subdue the crew, and, for some specialised attacks that don´t target cash or crew members, cargo vessels to transport the stolen cargo (Daxecker and Prins, 2021). All of this equipment is financed by investors that see piracy as a business opportunity (Whitman and Suarez, 2012)—sometimes they even request a specific ship or cargo (Murphy, 2009). Somalia presents another unique way of financing pirate attacks. In the city of Haradheere, a stock market for pirate attacks was set up where everyone can invest money or equipment, in the case of one woman an RPG round, obtaining shares of the potential profit from a future pirate attack (Wallis, 2009). This opens the business of piracy to

everyone in the community, not just pirates themselves and rich investors but also civilians trying to invest their savings.

The next step of spotting a target is only done once all the equipment is set up. Spotting a potential target is often done using information from local (port) officials or information available online (Murphy, 2007). Only when the equipment is good enough and the targets lucrative enough do pirates go farther from the coast to strike (Murphy, 2009). Sometimes ships are specifically selected as targets, either based on requests from investors or because of missing protection payments from ships travelling through pirate waters (Shortland and Varese, 2016). In the case of Nigeria, pirates also attack oil rigs off the shore (Murphy, 2009). Yet, in general, pirates prefer to attack smaller ships, simply because these are easier to board due to lower freeboard (the distance between the water and the deck) and fewer crew members onboard (Murphy, 2007).

When approaching a target, pirates either stay hidden in the cover of darkness, disguised as a government patrol vessel, or brazenly approach their targets while trying to appear more intimidating (Murphy, 2007). Sometimes, pirate groups place sleepers on the target ship to give updates on its course or to disable potential protection measures (Murphy, 2007). Using force while already on the deck of the target ship or being intoxicated throughout the attack can also be common features of an attack (Daxecker and Prins, 2021).

After the initial selection and approach of a target, pirate attacks can differ greatly based on their objective. As previously mentioned, organised pirate attacks generate profits differently compared to common pirate attacks. If the objective is to extract cargo or fuel from the target ship pirates bring along extra cargo ships to carry the extracted cargo/fuel (Daxecker and Prins, 2021). If their main objective is to hijack the ship and ransom of the crew and/or ship, the pirates must bring the captured ship to a safe anchorage place for storage/holding (Daxecker and Prins, 2021). While the ship and/or crew are held hostage, another important part of the process comes to play. Since ransom negotiations can take several months (Whitman and Suarez, 2012), the crew/ship needs to be protected by armed

guards and taken care of (Shortland and Varese, 2016). This can be more complex than the attack itself and a big share of the future profits is allocated to people involved in this step of the process.

The profits are split between the investors providing the needed equipment, local protectors, different people from the local community (village elders or chiefs), other people involved in the process (for example suppliers providing food to the pirates), and, lastly, the pirates conducting the attack and risking their lives, which means that most profits go to people that contributed to the attack by activities done on land (Whitman and Suarez, 2012). In the end, everyone involved does take part in piracy to gain substantial profits and, compared to the alternative sources of income such as trade, even small shares can be the multiple of an average salary (Murphy, 2007).

2.2.3. Special types of pirate attacks

A special kind of objective can be the capture of a ship to use as a phantom ship, that is, to transport cargo under a false registration. However, this practice is rare nowadays because China, the country where most phantom ships ended up, cracked down on this practice (Murphy, 2009).

Other possible types of pirate activities that do not fall under the definition of piracy include the luring of ships ashore and coastal raiding (Murphy, 2009). In the first case, pirates sabotage the navigational aids to bring their target ashore and easier to plunder. In the latter pirates raid coastal villages, either by directly robbing them or demanding protection money. These types do not fall under most definitions of piracy and are often not considered in the literature but since they are both rare and hard to reliably measure it is understandable why they are often overlooked. I also exclude them from my thesis since there exists no dataset about these attacks.

2.3. Pirate groups and organisation

In contrast to the romanticised pirates of old, such as Blackbeard or Captain Kidd, modern pirates are a land-based organisation: the more organised the pirate group, the more crucial the land-based side of piracy (Murphy, 2009). Therefore, pirates invest heavily in developing good relations with local

communities (Shortland and Varese, 2014). In East and Southeast Asia, pirates, in rare cases, serve as local militia securing regions for local elites (Daxecker and Prins, 2021).

The membership of pirate organisations is relatively fluid and often set up with flat hierarchies (Daxecker and Prins, 2021), which means that a pirate could take part in an attack for one pirate group and then in an attack for another pirate group. Most pirates are recruited from two groups. Often, organised pirate groups recruit common pirates, since they already have experience in piracy (Murphy, 2009). Another group of people pirates often recruit from, due to their experience with seafaring, is fishermen—especially frustrated fishermen who lost their fishing grounds due to climate change or foreign fishing vessels (Dahir, 2017). Women and children are also useful to pirate organisations—though their involvement remains rather understudied. Women are often used in pirate organisations for background tasks, like providing food to the fighters. Similar to child soldiers, children are recruited for every role in pirate organisations because they are cheap, easy to indoctrinate, and their size can be advantageous when climbing onto target ships (Whitman and Suarez, 2012).

As previously stated, organised piracy relies on the local community, especially people in positions of power (given by the state or through non-state actors) that protect pirates and their activities from any legal consequences (Shortland and Varese, 2016). These protectors are needed to prevent any form of law enforcement from either capturing the pirates or recapturing hijacked ships. The protectors have potential profits as an objective and do not mind where to money is coming from (Whitman and Suarez, 2012). In Somalia, protectors even coordinate with other protectors, allowing pirates to use the security of multiple protectors during a hijacking (Shortland and Varese, 2016).

When it comes to making an actual profit, pirates need local markets where they can sell the captured goods and/or ships (Murphy, 2007). Thus, local protectors that can arrange ransom payments or buy products without asking about their origin are essential parts of a pirate organisation.

2.4 Countermeasures

Before coming to the conditions for piracy, I display current countermeasures and their shortfalls. Even though countermeasures are not the focus of this thesis, they show how piracy is counteracted and how pirates themselves react to these measures. This can give further insight into piracy itself.

Patrols are probably the first thing that comes to mind when thinking of counter-piracy efforts. Their effectiveness in drastically decreasing pirate attacks is already proven, for example with patrolling missions Operation Ocean Shield and ATALANTA in the Gulf of Aden (Daxecker and Prins, 2021). However, patrols primarily deter piracy and fail to catch pirates most of the time resulting in a not cost-effective short-term solution. (Daxecker and Prins, 2021). As patrols only deter attacks and do not tackle the root causes pirates re-emerge as soon as the patrolling is decreased or stopped. Patrols are also difficult to maintain in the long term because of their substantial cost—especially true for poorer countries where piracy often originates from but does not directly have an impact (Daxecker and Prins, 2021). Those states rarely contribute to nor allow international counter-piracy patrols to take place for different political and diplomatic reasons—including frustration towards countries that benefit from trade but do not contribute to its safety and the sentiment that the piracy problem is exaggerated by other countries (Murphy, 2009).

Lastly, in some cases patrolling can be counterproductive. It has been reported that law enforcement on patrolling missions started to conduct piracy themselves (Awet, 2012). In other cases, patrols, including those from outside countries, focused more on protecting illegal activities—such as IUU fishing—from their countrymen rather than actively trying to suppress them (Hughes, 2021).

To complement and sometimes replace patrols, ships have started to implement countermeasures themselves. One option is to install different protections, like water hoses or reinforced doors, but these measures are expensive and therefore predominantly found on bigger ships—hence leaving enough ships unprotected (The Economist, 2017). Another countermeasure is the deployment of armed guards on ships. These are also very expensive and carry legal complications. One legal problem is that most ports prohibit guns on ships, which forces armed guards to store their weapons on special

floating armouries, other legal problems involve insurance complications (Dryad Global; Daxecker and Prins, 2021).

Overall, these countermeasures are only short-term solutions: pirates adapt or just outwait any costly countermeasure being used (Dahir, 2017; Daxecker and Prins, 2021). Therefore, to accomplish long-term success, countermeasures must be aimed at the causes of piracy found on land (Alsawalqa and Venter, 2021). These conditions that affect piracy are listed in the next chapter, they include IUU fishing, conflict, governance, corruption, grievances, and geography.

Chapter 3: Conditions for piracy

Generally, the causes of piracy can differ around the world. For example, Somalian and Nigerian piracy commenced for different reasons, war and chaos on the one side and corruption and rebels on the other side (Daxecker and Prins, 2021). The conditions for piracy are plentiful and have been studied extensively. In this chapter, I explain the theoretical grounding for each condition and draw a hypothesis for each one. These conditions and hypotheses are used in the QCA to answer my research question.

One condition that is necessary for piracy to exist at all is the availability of targets (Whitman and Suarez, 2012). If not enough ships travel close enough for pirates to reach them, then piracy cannot exist. Besides target opportunity, an array of different conditions exist that were identified as relevant by various authors. In this chapter, I present the conditions that I use in this thesis and construct hypotheses for each.

3.1. IUU fishing

The first condition is often mentioned in news reports about Somalian piracy (Dahir, 2017). These reports repeatedly claim that fishermen from other countries steal the local fish and thus drove Somalian fishermen into piracy. Whitman and Suarez (2012) point out that resentments that create piracy usually come from stolen maritime recourses, such as fish.

Besides creating resentments, IUU fishing has another path toward increasing piracy. Illegal unreported unregulated (IUU) fishing is carried out by foreign fishermen from near and far and includes three different actions that all damage the local fishing industry (Phelps Bondaroff and van der Werf, 2015). A problem that costs several billion of damages per year, according to some estimations (Awet, 2012). Many note a relation between IUU fishing and piracy through the financial damage to the local fishing industry (Awet, 2012; Daxecker and Prins, 2021).

IUU fishing has long been a problem for many countries (Phelps Bondaroff and van der Werf, 2015). Countries that have been hit hard through conflict and collapsing governments are likely targets of IUU fishing (Awet, 2012). This example points to one necessary condition for IUU fishing to start on a large scale: a weak or fragile state without the capacity to prevent it.

IUU fishing can also lead to piracy in other ways. One way is through anti-IUU patrols carried out by security companies which, have started to conduct piracy themselves while protecting foreign vessels performing IUU fishing (Awet, 2012). The last way is through disgruntled fishermen. When foreign vessels conduct IUU fishing, fishermen often get frustrated and take this issue into their own hands by getting armed and hunting those vessels (Phelps Bondaroff and van der Werf, 2015). Those attacks can be considered pirate attacks, even though they mainly intend to scare away foreign vessels (Dahir, 2017). Therefore, this kind of piracy is sometimes called defensive piracy, in contrast to predatory piracy (Awet, 2012). In Somalia defensive piracy is often identified as the first wave of piracy that was followed by other kinds of pirate attacks, conducted by groups outside the fishery sector (Phelps Bondaroff and van der Werf, 2015).

Yet, this relation between IUU fishing and piracy is contested (Awet, 2012; Hughes, 2011; Daxecker and Prins, 2021). While some scholars note the weak connection, others point towards contradictory evidence (Hughes, 2011; Awet, 2012; Daxecker and Prins, 2021).

Based on the literature I expect that countries suffering from IUU fishing will also have some form of piracy. Therefore, my first hypothesis is:

H1: IUU fishing is sufficient for common or organised piracy.

3.2. Conflict

A more complex condition for piracy is the existence of some form of armed conflict. Conflict can impact piracy in several ways. First, conflict fosters instability. In general, pirates need some form of stability when conducting long operations, such as hijacking a ship for ransom (Shortland and Varese,

2014). However, pirates can handle instability and changes in local protectors—as was seen in Somalia—because piracy is often in the interest of the new protectors (Shortland and Varese, 2014). If a country gets too unstable, pirates can still outwait this phase of instability.

Second, conflict can lead to piracy through the conflict parties themselves. This is the case, for instance, in Southeast Asia where insurgent groups and Islamist extremists both conduct piracy themselves as part of their wider political agenda (Whitman and Suarez, 2012; Daxecker and Prins, 2021). Policy makers fear this connection between armed insurgents and Islamic terrorism with pirate groups, especially the possibility of the former learning techniques from the latter (Murphy, 2009). This fear is unproven because no clear evidence of such a connection was found so far.

Thirdly, conflict can create two recourses for pirate groups: recruits, and protectors (Shortland and Varese, 2014). When conditions are tough, which is often the case in a country rigged by conflict, people tend to be more receptive to pirate recruiters because safe and legal opportunities to earn money are rare (The Economist, 2017). And when conflict parties control coastal areas, local officials often lack lucrative alternatives to protecting piracy (Shortland and Varese, 2014).

Based on the third aspect of how conflict can impact piracy, I expect that this condition will play an important role for organised piracy. But the importance of the condition is not clear enough. Thus, my second hypothesis is:

H2: Conflict is either a necessary or sufficient condition for organised piracy.

3.3. Governance

Connected to the conflict is the next condition: governance. In short, governance contains institutions and traditions that regulate the selection of government and their powers to implement policies that govern economic and social interactions in the entire territory of a country (Worldbank). These institutions can be impacted by conflicts that impede their reach or effectiveness. Low levels of governance can be also the result of other reasons like lack of development (IMF). No matter why a

country has lower-level levels of governance, many authors agree that this can lead to piracy and is maybe the most important condition for it (Sung, 2004; Whitman and Suarez, 2012; Daxecker and Prins, 2021).

The connection between governance and piracy can be explained through the opportunity model. When governance is low and therefore doesn´t cover the full territory or components, pirates face a lower risk for their activities, leading to an increase in pirate attacks (Daxecker and Prins, 2021). Low levels of governance can also increase the level of violence, thus creating an environment better suited for criminal activities (Sung, 2004).

However, pirates need some level of governance to operate. They need markets to sell captured goods and ransom crews/ships (Murphy, 2007; Daxecker and Prins, 2021). When markets are not available, piracy is mostly limited to common piracy (Daxecker and Prins, 2021). If governance is completely missing from an area, then the void can be filled by local non-state actors, which in turn play an important role in supporting organised piracy (Shortland and Varese, 2016). In states where the central government fails to provide governance outside the capital, local non-state actors can take control of entire regions and see the protection of piracy as a lucrative investment option (Daxecker and Prins, 2021).

Concluding that increasing governance would be a good measure against piracy would be misguided. Daxecker and Prins (2021) point toward problems of increasing governance without paying attention to local power structures and their potential conflicts that can be started through increasing governance. However, low levels of governance don´t result in pirates operating in every region of that country, or that they are drawn towards regions with the lowest governance. Daxecker and Prins (2021) show that pirates tend to focus on the regions with some level of governance and corrupt local officials.

As stated at the beginning of this section about governance, many authors see low levels of governance as a necessary condition for piracy. Consequently, my third hypothesis states:

H3: Low levels of governance are necessary for any form of piracy.

3.4. Corruption

Corruption is another important condition for piracy. Sometimes corruption is listed as one of the lead causes for piracy in countries such as Somalia and Nigeria (Daxecker and Prins, 2021) and for organised piracy (Whitman and Suarez, 2012). Corruption, through different actors inside a country, protects both pirate attacks as well as pirates between attacks.

One group of corrupt actors that protect piracy are local authorities, such as local elites and non-state groups taking over state functions (Shortland and Varese, 2016; Daxecker and Prins, 2021). As mentioned in the chapter about piracy, these local protectors get a big share of the profits and are therefore financially encouraged to protect piracy in their area.

The next type of corrupt actors protecting piracy are local government officials, who protect pirate activities in exchange for a share of the profits. They support piracy through their access to official data and functions, which they use to spot potential targets or create fake documents for hijacked ships (Murphy, 2007; Shortland and Varese, 2016).

The last type of corrupt actor involved in piracy is law enforcement and other parts of the security sector, including the navy or coast guard. In some countries, like Indonesia, these institutions are not completely funded by the state and rely on external funds from protecting piracy and other crimes, or even committing these crimes (including piracy) themselves (Murphy, 2009; Daxecker and Prins, 2021).

My third hypothesis mirrors the claim made by Whitman and Suarez (2012) that corruption is a necessary condition for organised piracy:

H4: Corruption is necessary for organised piracy.

3.5. Grievances and deprivation

Another condition for piracy is grievances. These can be split into two categories: grievances related to sea recourses (hence leading directly to piracy); and grievances of the population that makes a society inclined toward illicit activities.

A population hurt by extreme poverty/deprivation generates outraged people that consider piracy, simply because no better alternatives exist (Sung, 2004; Jabloniski and Oliver, 2013; Whitman and Suarez, 2012; Shortland and Varese, 2014; Axbard, 2016; Daxecker and Prins, 2021). This increases the availability of recruits for pirate organisations— in particular fishermen who already possess some of the skills and equipment necessary for piracy (Axbard, 2016).

Grievances related to sea recourses can be seen in Somalia and Nigeria (Whitman and Suarez, 2012). Pirates in those countries often attack ships and facilities that plunder recourses, like fish or oil, that belong to the people. This part of grievances consists mostly of IUU fishing since apart from offshore oil sea recourses consist of fish and other seafood. Therefore, I exclude this part of grievances here since it is already covered through the first condition, IUU fishing, explained in this chapter. Leaving me with economic deprivation for this condition. Thus, I label this condition from now on as deprivation and not grievances.

My hypothesis for the condition of deprivation is hard to formulate since no author suggested any necessity or sufficiency for any form of piracy regarding deprivation. Hence, I expect to see neither necessity nor sufficiency:

H5: Deprivation is neither necessary nor sufficient for any form of piracy.

3.6. Geography

A condition for piracy that is often discussed is geography. On the one side, geography, as in the location of a country in the world, brings opportunity for targets by being in the vicinity of a major trade route. This is not the only way how geography can foster piracy, the other way geography can

increase piracy is the availability of hiding spots (Murphy, 2009; Daxecker and Prins, 2021). Countries with many islands, archipelagos, or river deltas can give pirates many opportunities to evade capture and hide their spoils. Lastly, a large coastline means a big fishing sector that can potentially provide many recruits for pirate organisations (Whitman and Suarez, 2012)—hence making piracy more likely.

I expect that having many potential recruits and places to hide captured ships is important for organised piracy, based on the insights about organised pirate attacks. My sixth hypothesis reflects that assumption:

H6: Geography is a necessary condition for organised piracy.

3.7. Other conditions

There are some conditions that I don´t use for my thesis because they either affect piracy equally around the globe, are disputed and hard to measure, or only play a seasonal effect like harsher sea conditions during some months of the year. The first one is the availability of cheap modern weapons, like the AK47 (Whitman and Suarez, 2012; Murphy, 2007). Having access to such a simple and cheap gun makes pirate attacks cheaper to conduct. Other technologies, such as cheap outboard boat motors or radio devices, also decrease the upfront cost and complexity of pirate attacks (Murphy, 2009). The availability of navigational devices, such as GPS, also allows pirate groups to strike targets farther out on the sea (Murphy, 2009).

Another condition that is debatable and hard to measure is maritime culture and traditions. Murphy (2009), for example, points out that Southeast Asia's strong maritime culture and traditions made the region prone to piracy. On the same note, Shortland and Varese (2016) mention how Somalia had a long tradition of piracy, which made contemporary piracy more likely. However, Awet (2012) contradicts this claim by arguing that piracy was a novelty in Somalia, shown by the fact that the Somali word for piracy only came about three decades ago. Because the relation between culture/traditions

and piracy is not scientifically proven and hard to sufficiently operationalise I exclude this condition from my thesis.

Finally, seasonal weather can also play a role in pirate activity. As Daxecker and Prins (2021) point out, pirates avoid attacking ships when the sea is very rough and hard to navigate. This condition does affect piracy only seasonally, meaning that pirate activity from year to year will be similar. Since the time period for the QCA are not individual months but years I don´t include weather in my thesis.

3.8. Conclusion

In the two chapters, I defined what piracy is and introduced the two types of piracy. Additionally, I presented the sequence of a pirate attack and how it can have different forms. Similarly, I explained how pirates are organised and what outside actors are required for a pirate group to function. I also touched upon countermeasures used by countries to prevent or decrease pirate attacks.

In the second chapter, I listed the six conditions for piracy that I use in this thesis. For each condition, I displayed the grounding in the literature and created hypotheses based on it. With this theoretical understanding of the conditions, I operationalise and calibrate the conditions in the next chapter after I describe the QCA method that I use and the reasons for choosing it.

Chapter 4: Methodology

In this chapter, I explain my methodology and calibrate the outcomes of common and organised piracy and the conditions of IUU fishing, conflict, governance, corruption, deprivation, and geography. Before that, I explain how QCA works and why I choose this method for my thesis.

4.1. QCA

For my thesis, I use multiple Qualitative Comparative Analysis (QCA), which is a method invented by Ragin (1987) to expand the array of qualitative methods and allow for generalisation. Like other comparative methods, QCA is built on the epistemological base of John Stuart Mill´s methods (Lucas and Szatrowski, 2014), especially the two methods of agreement and difference. This implies that if the observed occurrence of a phenomenon only has one circumstance in common, this circumstance must be the cause of the phenomenon. And similarly, if all circumstances are the same but one and the phenomenon occurs only in one instance this one circumstance needs to be the cause.

4.1.1. Function of QCA

Generally, a QCA functions by picking an outcome, which in my case is common and organised piracy, and analyse if it is present or absent for each case. Similarly, different conditions are picked and inspected if they are present or absent for each case. Deciding if an outcome or condition is present or absent is done through thresholds that decide at what point an outcome or condition is considered present. Operationalising and creating thresholds for each condition is called calibration in QCA. The calibration of a condition is generally asymmetric (Rubinson et al., 2019), meaning that when a condition is considered absent (for example democracy) its opposite (in that case autocracy) is not automatically considered present (Lucas and Szatrowski, 2014; Befani, 2016). Like other methods, calibration/operationalising is done by selecting measurements. Creating the thresholds is done with different strategies. The first strategy is the theory consistency calibration strategy and is generally the preferred strategy. In this strategy, thresholds are created using benchmarks taken from theory or used in practise. The other strategy is the empirical coverage calibration strategy, which uses the

clustering of a condition to create thresholds. In general, those thresholds should be created in a manner that rules out mislabelling a condition present in favor of mislabelling a condition absent (Befani, 2016). For example, it is advised to put the threshold for democracy high enough that all countries that surpass this threshold are real democracies and not incomplete democracies. Using statistical calibration, i.e., using benchmarks such as mean and medium values, should only be used as a last resort (Rihoux, 2016; Rubinson et al., 2019). To check the robustness of the calibration alternative thresholds are commonly used (Skaaning, 2011). These alternative thresholds make sure that a result is similar enough if a different initial threshold was selected.

With the information about the outcomes and conditions, each case is sorted into a configuration. Each configuration is a unique combination of present and absent conditions. Ideally, each configuration is either positive, i.e. having the outcome present, or negative, i.e. having the outcome absent. If both cases with and without the outcome present exist in the same configuration it is labelled as a contradictory configuration. For visualisation the configurations with their affiliated cases are displayed in a truth table.

By analysing the truth table multiple sets that result in the outcome being present can be identified. These sets can be simplified by minimisation, meaning that by comparing them redundant conditions can be removed. For example, if one set has two conditions present and another set has the same conditions and an additional condition present, and both sets result in the outcome being present I can reduce the additional condition. This can be done because the presence of the additional condition did not change the outcome. After the minimisation the sets can be combined into one solution formula. This solution formula displays the different paths leading to the outcome being present. For visualisation this is done by using abbreviations, either written in UPPER-CASE LETTERS when the condition is present or lower-case letters when it is absent and replacing “and” by * and “or” by +. This results in solution formulas looking like this: CON1*CON2+CON3*con4->OUTCOME. The translation of this example would be: If both condition one and condition two are present or condition three is present and condition four is absent the outcome will be present.

Lastly, both necessity and sufficiency can be analysed through a QCA. If one condition, or set of conditions, is always present in each positive configuration then this condition, or set of conditions, can be considered necessary for the outcome to be present. Similarly, if the outcome is always present when one condition, or set of conditions, is present then this condition, or set of conditions, can be considered sufficient for the outcome to be present. This part of QCA is paramount for my thesis because I analyse the necessity and sufficiency of the six conditions for piracy that I identified in the previous chapter.

To conduct the analysis, I use Tosmana, a program made to conduct all types of QCAs. This program is also useful for creating thresholds, which are needed when calibrating the different conditions set up in chapter 2.

4.1.2. Versions of QCA

Over the years an array of different QCA versions were created (Ragin and Rihoux, 2009). The first version of QCA is called crisp-set QCA (crispQCA). For this version, the conditions and the outcome are dichotomised into present and absent, as explained in the previous paragraph. The other two variants of QCA are less case-based and are used for analysis with more cases. They differentiate conditions not only into present and absent but create states in between (Rihoux, 2009). The older one of the two versions, fuzzy-set QCA, determines each condition not only in kind (being present or absent) but also in degree resulting in conditions being present (1) or absent (0) and anything in between.

The newest version, multi-value QCA (mvQCA), is somewhat in between crisp-set and fuzzy-set QCA. In multi-value QCA, conditions are classified into the different categories. Both versions were created to deal with one of the main criticisms of crisp-set QCA, the fact that information gets lost when conditions are dichotomised (Ragin and Rihoux, 2009). MvQCA can have multiple categories for each condition, meaning that more than one threshold is needed for a condition and that the presence or absence of a condition can no longer be displayed by lower case or UPPER CASE letters but by numbers behind each condition, indicating which category is present for each condition (condition{x}). For the mvQCA, having more than two possible states for each condition, besides presence or absence,

increases the number of possible configurations—in my case 36 possible configurations for the crispQCA against 486 for the mvQCA. This increase of possible configurations while still having the same number of cases means that the majority of configurations do not have a case assigned and are thus logical remainders. Therefore, it is good practise to always include those logical remainders in the minimization (Ragin and Rihoux, 2009). This is done by estimating the outcome of each logical remainder based on the outcome of similar configurations. Tosmana can execute this by simply selecting remainders as included in the minimisation.

For my thesis, I use both crisp-set and multi-value QCA because it allows me to use the advantages, like having fewer possible configurations and thus allowing for a clearer solution formula, of the simpler and more established crispQCA, and supplement it with the advantages, lower loss of information because of multiple categories for each condition, of a mvQCA. Since I do not have a continuous calibration for my outcome, meaning that the distance from zero pirate attacks to one pirate attacks is not the same as the step from one pirate attack to two pirate attacks, I cannot use a fuzzy-set QCA.

4.1.3. Reasons for QCA

There are different reasons why I use QCA for my thesis, one of which is the different approach to causation. Compared to quantitative methods where independent variables have an effect on the dependent variable, QCA deals with conditions that can be necessary and/or sufficient for the outcome (Rubinson et al., 2019). In addition, QCA encompasses the concept of multiple conjunctural causation (Rihoux, 2016), meaning that different conditions or sets of conditions can lead to the outcome.

Another advantage of QCA is its ability to deal with conditions and outcomes that are not measurable. QCA can deal with measurable conditions and immeasurable conditions in the same analysis (Rihoux, 2016). This is especially relevant because my outcome, piracy, for both common and organised piracy, should not be used as a quantifiable variable, as I explain later in this chapter, but as an outcome that is either present or absent

The last reason why I chose QCA is the balance between generalisation and case intimacy it offers (Rihoux, 2016; Ragin and Rihoux, 2009). On the one hand, QCA can be used for medium-N analysis (and large-N analysis) and thus can provide a generalisable result, if the case selection is done with generalisation in mind. On the other hand, QCA is still a case-based analysis that requires insight into each case used and can therefore allow the researcher to explain contradictions by diving into individual cases. In contrast to quantitative methods where cases are not individually examined after they are inserted into a dataset.

4.2. Case selection

In general, the case selection for QCA should be focused on both generalisation and comparability (Rihoux, 2016). I, therefore, selected cases that are broad enough to allow for generalisation but are still comparable, as they are all countries inspected in the same years. If I would use countries and different regions or states in the same QCA the comparability would be lacking.

In theory, I could select all coastal countries for my thesis, but to reduce the number of cases, I used opportunity, the availability of ships close to the shore, as a preselection condition because it is regarded as a necessary condition for piracy to occur (Murphy, 2007). This availability of ships close to the shore can be guaranteed by having a trade route nearby. Therefore, I selected countries located along one of the busiest trade routes between Europe and Asia (in particular China) (Freightify; Sofar). I could have selected other busy trade routes, like USA to China, but no other route than Europa-Asia passes close by so many different countries. For example, ships between USA and China can go from LA to Shanghai and only pass Taiwan on the way there. Three relevant chokepoints on the selected route are the Suez Canal, the Cape of Good Hope, and the Strait of Malacca. The selected countries stretch from the west coast of Africa around the Cape of Good Hope, along the east coast of Africa up the Suez Canal, along the Arab peninsula, through the Indian Ocean, through the Strait of Malacca, and up to China.

In the end, I had to leave some countries out of the analysis. I excluded Iraq because, with less than 60 kilometers of coastline, I determined that it does not fit with the other cases. I also excluded Cap Verde, Comoros, Equatorial Guinea, Sao Tome and Principe, and Taiwan because of missing data. QCA is very sensitive to missing data and therefore any cases or conditions with missing data need to be removed (Befani, 2016).

4.3. Calibration of Piracy

To answer my research question and analyse which conditions are necessary or sufficient for piracy, I need measurements for my outcome, common and organised piracy, and conditions, IUU fishing, conflict, governance, corruption, deprivation, and geography. Since not every condition can be measured, I must revert to indirect measurements. One example is my outcome, piracy (both common and organised). As mentioned in the previous chapter, piracy is hard to analyse directly. Since no census of pirates exists, researchers need to rely on observable pirate activity, such as attempted and successful pirate attacks. This brings back the problems of definition, reluctance to report attacks, and lower validity of the measurement because pirates can exist for some time without conducting attacks but awaiting new and better opportunities.

Datasets from the International Chamber of Commerce (IMB) and the International Maritime Organisation (IMO), which collect reports of pirate attacks, are used in research on piracy (Axbard, 2016; Daxecker and Prins, 2021). One notable dataset, and the one I use, is the Maritime Piracy Event and Location Dataset (MPELD) created by Daxecker and Prins (2021) which, in its latest version, covers attacks that occurred between 1978 and 2016. The MPELD combines several other piracy datasets and thus achieves a greater coverage than the more commonly used datasets. Importantly, Daxecker and Prins use their definition of piracy, which includes the two-ship requirement. A requirement that I also regard as essential to a definition of piracy, as explained in the second chapter.

One problem the MPELD and other datasets face, besides the lack of reporting of many pirate attacks, is missing information on the reported attacks. One category which is important for analysing piracy,

but often lacks information, is the category origin country of a pirate attack. In the MPLED, the origin country is based on the location of the attack and only supplemented with additional information that can indicate a different origin country, like newspaper articles or other reports. This means that researchers need to be wary about the validity of the information in this category. Daxecker and Prins (2021) needed to adjust the origin country of 1200 attacks after additional information from articles or reports indicated that the attack did not originate from the nearest country. Most of the time, these attacks were done by Somali pirates far away from Somalia by using motherships or other means that increased their range.

For my thesis, I used pirate attacks that took place between the timeframe of 2014, 2015, and 2016, which are the latest years that are covered in the MPLED. By using three years as my time frame, I counteract the problem of missing reports. For example, if a country only has very few attacks per year and for one year none of them get reported I would mislabel piracy as absent if this one year is used as selected time frame. By having a longer time frame, I can make sure that piracy is labelled correctly as present in those cases. Furthermore, I can thus exclude the impact of irregular conditions, such as weather conditions, by having a longer time frame that is less impacted by irregularities. I am aware that this could impact the robustness of the analysis by having a time frame in which both the outcome and conditions can genuinely vary. Hence, I use different thresholds to counteract this problem.

Since I use Murphy's (2009) categories of piracy, which divide piracy into common and organised piracy, I recode attacks in the MPLED into two categories. For this, I use the features of organised pirate attacks and the associated variables of the MPLED to distinguish some attacks as organised attacks. The first feature is the location of pirate attacks since Murphy (2009) claims that only organised pirates attack outside of local waters. The second feature is the objective, which, for organised pirate attacks, includes kidnapping and hijacking. The MPLED dataset lists the type of (attempted) attack, such as hijacking and fired upon, and the attack location, which makes the recoding possible. It should be noted that Murphy (2009) includes other features such as target interception and attack persistence, but those features are not included in any dataset and thus not used for classifying organised attacks.

Similarly, the type and size of the target, which Murphy also notes as something that can distinguish common from organised piracy, is not used because the MPLED only gives a rudimentary target ship type indication which does not include the size of the vessel.

Regarding the thresholds for both types of piracy, I use three attacks as the threshold for the presence of common piracy. To check for robustness, I use the alternative thresholds of one and 15 attacks. For organised piracy, I use a single attack as the threshold because the number of attacks that can be classified as organised attacks is lower compared to common pirate attacks. To check the robustness of the result, I use two alternative thresholds: three attacks, which would mean one attack per year on average; and attacks on steaming Chemical Tankers, Container Ships, LNG/LPG/Oil Tankers, and Product Tankers, which is a threshold that Daxecker and Prins (2021) use in their analysis.

4.4. Calibration of Conditions

In this sub-section, I calibrate my conditions. Since the calibration for conditions can be different for crispQCA and mvQCA, the latter having multiple categories for some conditions, I create more than one threshold plus two alternatives for all conditions apart from the condition geography.

4.4.1. IUU fishing

For my first condition, IUU fishing, I faced the problem of having no existing index for IUU fishing for my selected time frame. IUU fishing, by definition, is not widely reported and thus hard to measure. The only existing index for IUU fishing is the IUU fishing index by Poseidon Aquatic Resource Management Ltd (IUU fishing index). This index creates a score from 1 to 5 based on different sub-scores assessing the vulnerability, prevalence, and response of IUU fishing alongside a country´s coast, inside its ports, and for vessels under its flag. For my thesis, I use the score for coastal prevalence.

The index has two issues. Firstly, it is not a measurement of actual IUU fishing but an estimate of the IUU fishing situation in each country based on 40 indicators, meaning that acts of IUU fishing are not measured but an assessment is done through indicators that relate to IUU fishing. Therefore, the

validity of this measurement can be criticised. Secondly, the index only starts in 2019, meaning that I do not have any data for IUU fishing in the years 2014-2016. Therefore, my data on this condition is from a different year than the other conditions and the outcome. I still include IUU fishing as a condition because the time difference is relatively small and indicators of the IUU index like the size of EEZ or the number of fishing ports don't vary that much in three years. To reduce any robustness problems resulting from this problem I conduct both QCAs twice, once with IUU fishing included and once without IUU fishing.

To create thresholds for IUU fishing I could not use a theory consistency strategy but had to rely on an empirical coverage calibration strategy. To conduct this calibration strategy, I use an average linkage clustering analysis, which generates clusters based on the scores for each case. Resulting in a threshold for the crispQCA of the score of 3.0. As a robustness check, I use a higher threshold of 3.3 and a lower one of 2.7. For the mvQCA, I used two thresholds of 3.0 and 4.1 to create three categories. To check for robustness, 3.0 and 4.1 are again slightly adjusted (2.7/3.3 and 3.7) based on cases that lie close to the initial threshold. As clarification of my calibration for all conditions, I included tables and graphs in the appendix to better illustrate both the average linkage cluster analysis and the selection of alternative thresholds.

4.4.2. Conflict

For the condition of conflict, I use the Global Peace Index (GPI) from the Institute of Economics and Peace (Vision of Humanity). I use the category “extent of ongoing domestic and international conflict”, one of the three categories used for the GPI. The GPI creates a score between one to five based on 23 indicators.

Even though this index also uses quantitative measurements and is available for the years 2014-2016, it should be noted that any index used to measure a complex concept such as conflict comes with potential issues. Since my outcome is spread over 3 years, I use the average of the same three years[2]

[2] Something that I do for other conditions as well

for conflict—which could result in problems of robustness if this condition varies in those three years. Like the previous condition, I resort to average linkage cluster analysis to create the thresholds. I use the score of 2.31 as a threshold for conflict and, to check for robustness, the alternative thresholds of 2.10 and 2.52. For the mvQCA, I use two thresholds at 1.70 and 2.31. Both have alternatives at 1.48/1.91 and 2.1/2.52.

4.4.3. Governance

For the condition of governance, many different options exist. Daxecker and Prins (2021) used two indicators: the ability to extract taxes from society; and a state fragility index. I use a different state fragility index, the Fragile State Index (FSI) developed by The Fund for Peace, because the index they used has no categories and would therefore require an empirical coverage calibration strategy (The Fund for Peace).

The FSI scores countries from 1 to 120 based on 12 indicators across 4 themes. One problem with the FSI is that it overlaps with other conditions. Indicators such as rule of law and external intervention partially cover corruption and conflict respectively. However, this overlap does not extend to my outcome piracy, and the three conditions, governance, conflict, and corruption, vary enough between each other, which suggests that the overlap with these conditions is small enough. Furthermore, one advantage of the FSI is the inclusion of benchmarks: countries are categorised into four different categories (from sustainable to alert). This allows me to use these categories for my calibration. The category alert is used as the threshold, which puts the threshold at a score of 90. Since several cases lie close to this threshold, I use alternative thresholds at 86.76 and 93 to check for robustness. For the mvQCA, I can use sustainable + stable, warning, and alert as the three categories, resulting in two thresholds at 60 and 90, and adjust these two thresholds slightly for the robustness checks, resulting in alternative thresholds at 50/70 and 86.76/93 respectively.

4.4.4. Corruption

For the condition of corruption, I use the Corruption Perception Index (CPI), which assesses the level of corruption in 180 countries based on experts (Transparency International). Countries are scored from 100 (not corrupt) to 0 (highly corrupt), which means that I have to keep in mind that for my crispQCA scores above the threshold fall under the condition being absent and scores below the threshold under the condition being present. Since a concept as complex and hidden as corruption is hard to measure, I have to rely on an index that assesses rather than measures corruption. This can impact my overall validity, because the measurement can be off from the "real" value, making my robustness checks more important to make sure that small differences in this measurement don't change the overall result too much.

Since no benchmarks exist for this index or corruption overall, I must resort to average linkage cluster analysis again which results in a threshold of 41.3, adjusted to alternatives of 34 and 47 for robustness checks. For the mvQCA, I use 41.3 and 22.8 as thresholds, with alternative thresholds at 34/47 and 20/29, to create three categories.

4.4.5. Deprivation

Deprivation, the part of grievances that I use, is another condition that is not that easy to calibrate. Multiple possible ways exist to measure deprivation, for example, Daxecker and Prins (2021) use GDP per capita and local fishing conditions as measurements. Since they note the lower reliability of the second measurement, I don´t use this for my thesis.

The measurement I use is similar to GDP per capita, namely Gross National Income (GNI) per capita, which is the GDP of a country plus any positive or negative revenue from abroad. The reason why I use GNI per capita instead of GDP is that the UN uses GNI per capita to classify countries into low, lower-middle, upper-middle, and high income. This gives me benchmarks to use for both my crispQCAs and mvQCA. These benchmarks are 1036$, 4086$, and 12616$ (UN). For the crispQCAs I use low-income (i.e., below 1036$) as presence and for the mvQCA I include lower-middle-income (i.e. below 4085$)

as an extra category. For both analyses I use adjusted thresholds at 1200$/750$ and 5500$/2500$ to check for robustness.

4.4.6. Geography

The last condition, geography, consists of two aspects and hence requires two indicators. The condition of geography encompasses long coastlines that lead to a larger fishing sector and a general higher level of seafaring skill in the population. Therefore, the first indicator I use is the ratio between the length of the coast and the length of all land borders. Measuring the length of a coast or border brings up what is called the coastline paradox (Wolfram MathWorld), which means that depending on the scale of measurement the result can differ greatly. For example, if one would measure a coast with rulers that are 1km long whereas a second person uses 1m long rulers the second person would get a bigger result because they were able to measure every small bay or peninsula interrupting a coast. Keeping that in mind I used data from the same source, the CIA World Factbook (CIA), to minimise any differences in measurements related to the paradox. I then created a threshold at 0.83 and an alternative one at 0.39, using the average linkage cluster analysis of Tosmana.

The second aspect of geography is the availability of hiding places for pirates. Since this aspect includes having a long coast with many bays, small archipelagos, and big river deltas, I added a second indicator to the coast/border ratio. Using a table of the 40 largest river deltas produced by Kuenzer and Renaud (2012), I created the indicator 'large river delta'. Combining both indicators, I can set the condition geography as either present, when a large river delta is present or the ratio is above 0.83, or not present, when both the ratio is below 0.83 and no large river delta is present.

4.5. Conclusion

This chapter explained the functions of the two versions of QCA that I use and the reasoning for them. Furthermore, it described my case selection and the calibration of both outcomes and all six conditions. Parallel to this, I mentioned some limitations of the calibration. In the next chapter, I display the results of my QCAs and interpret them.

Chapter 5: Empirical findings

In this chapter, I go through my four different QCAs step by step and explain what necessary adjustments I made and what results were derived from the analyses. I produced many tables during all 4 analyses which cannot all fit into the text: Therefore, most tables are in the appendix and only the most important tables are included inside the text. Some of the limitations of this method are mentioned where I encountered them.

During this chapter, I present how I conducted the QCAs and tackled problems that arose. The main problem that I faced for all of my four QCAs were contradictory configurations that I resolved using different strategies, as explained by Ragin and Rihoux (2009). Some strategies, such as adding or replacing conditions are not possible, since no other conditions could be identified that are based on existing theory and can be measured. The other strategies can be broken down into adjusting thresholds, examining cases in that configuration, and using the frequency of positive and negative outcomes in a configuration to determine the dominant outcome for the configuration. I explain the strategies that I use in more detail when applying them.

5.1. Crisp-QCA with common piracy as the outcome

I begin with the first crispQCA with common piracy as the outcome. As previously stated, utilizing the program Tosmana, I conduct all 4 analyses, using the 6 conditions IUU fishing (IUU), Conflict (CONF), Governance (GOV), Corruption (COR), Deprivation (DEP), and Geography (GEO) to explain the outcome Common piracy (COM). As seen in Table 2, the first run of the crisp-QCA produces 11 contradictory configurations, whereby cases where the outcome is present and cases where it is not present exist in the same configuration of conditions, which can be seen in table two.

Table 2: Truth table crisp QCA with common piracy as the outcome

Cases	com	iuu	conf	gov	cor	dep	geo
Togo	1	0	0	0	0	1	0
Madagascar(0) Mozambique(1) Tanzania(0) The Gambia(0)	C	0	0	0	0	1	1
Benin(1) Djibouti(0) Namibia(0) Saudi Arabia(0) Senegal(0) South Africa(0)	C	0	0	0	0	0	0
Angola(1) Bahrain(0) Kuwait(0) Malaysia(1) Oman(1) Qatar(0) Singapore(1) UAE(0)	C	0	0	0	0	0	1
Guinea(1) Guinea-Bissau(0)	C	0	0	1	0	1	0
Eritrea	1	0	0	1	0	1	1
Cameroon(1) Congo(1) Cote d'Ivoire(1) Mauritania(0)	C	0	0	1	0	0	0
Bangladesh(1) Egypt(0) Sri Lanka(0)	C	0	0	1	0	0	1
India(1) Iran(0)	C	0	1	0	0	0	1
DRC	1	0	1	1	0	1	1
Kenya(1) Sudan(0)	C	0	1	1	0	0	0
Myanmar(0) Pakistan(0) Yemen(1)	C	0	1	1	0	0	1
Cambodia(0) Gabon(0) Ghana(1)	C	1	0	0	0	0	0
China Indonesia Thailand Vietnam	1	1	0	0	0	0	1
Liberia(1) Sierra Leone(0)	C	1	0	1	0	1	0
Philippines	1	1	1	0	0	0	1
Somalia	1	1	1	1	0	1	1
Nigeria	1	1	1	1	0	0	1

For my crisp-QCA with common piracy as the outcome, I did not manage to resolve the contradictions. Adjusting the thresholds solved some contradictions but also created new ones. Since the other strategies did not work either, I had to scrap this crisp-QCA. To regain some insight from this QCA, I solved the contradictions by analysing individual cases and removing them if I find any argument for their expulsion. This is not typically used for QCA and lowers the validity immensely because it comes close to cherry-picking cases. Therefore, I only use these results as an indication and not as results backed by methodology.

I removed the smaller Gulf states, such as Qatar or the UAE, as they all were part of a contradictory configuration (GEO), leaving only Angola, Singapore, and Oman which turned the configuration into a positive outcome configuration. I reckon that the smaller Gulf states have conditions preventing piracy

that are not considered in my QCA, as they are all outliers in the same configuration. Next, I removed Mozambique from the analysis, because it was close to the threshold for both COM and GOV. I removed Benin because it was also close to the threshold of COM. I removed the GOV*DEP configuration with Guinea and Guinea-Bissau as cases entirely. Since I could not explain which case was the outlier and therefore failed to determine a likely outcome for the configuration, removing the whole configuration seemed to be the best option to solve the contradiction.

Other cases that I removed because they were close to one or multiple thresholds were: Mauritania (close to GOV), Bangladesh (close to GOV and DEP), Iran (close to CONF, COM, and GOV), and Liberia (close to COM and GOV). Lastly, I removed two further contradictory configurations because they could not be explained: Kenya Sudan and Myanmar Pakistan Yemen. Comparing the solution formula from my initial run with the adjusted run, I can see that my adjustments enabled more paths. The initial solution formula contains four paths that result in common piracy: IUU fishing and geography; governance, deprivation, and geography; IUU fishing, conflict, governance, corruption, and geography; deprivation. The adjusted solution formula resulted in seven paths: Corruption and geography; governance, corruption, deprivation, and geography; IUU fishing, conflict, governance, corruption, and geography; governance and corruption; IUU fishing; corruption and deprivation; geography.

Initial: (IUU+GOV*DEP+IUU*CONF*GOV)*GEO+DEP

Adjusted: (COR+GOV*COR*DEP+IUU*CONF*GOV*COR)*GEO+GOV*COR+IUU+COR*DEP+GEO

Since the initial solution is from a QCA with 11 contradictions and the adjusted solution was only enabled using techniques lowering the validity, I cannot argue that either solution formula is a robust result.

5.2. Crisp-QCA with organised piracy as the outcome

The second crisp-QCA has organised piracy as the outcome. Conducting an initial run through the program resulted in six contradictory configurations, which makes them easier to resolve than the 11 contradictions for the first crispQCA. The resulting truth table can be seen in table three below.

Table 3: Truth table crispQCA with organised piracy as the outcome

Cases	org	iuu	conf	gov	cor	dep	geo
Namibia Saudi Arabia Senegal South Africa	0	0	0	0	0	0	0
Bahrain(0) Kuwait(0) Malaysia(1) Oman(0) Qatar(0) Singapore(0) UAE(0)	C	0	0	0	0	0	1
Togo	0	0	0	0	1	1	0
Madagascar Mozambique Tanzania The Gambia	0	0	0	0	1	1	1
Benin(1) Djibouti(0)	C	0	0	0	1	0	0
Angola	0	0	0	0	1	0	1
Guinea-Bissau Guinea	0	0	0	1	1	1	0
Eritrea	0	0	0	1	1	1	1
Cameroon(0) Congo(0) Cote d'Ivoire(1) Mauritania(0)	C	0	0	1	1	0	0
Bangladesh Egypt Sri Lanka	0	0	0	1	1	0	1
India(1) Iran(0)	C	0	1	0	1	0	1
DRC	0	0	1	1	1	1	1
Kenya Sudan	0	0	1	1	1	0	0
Myanmar(0) Pakistan(0) Yemen(1)	C	0	1	1	1	0	1
Ghana	1	1	0	0	0	0	0
Cambodia Gabon	0	1	0	0	1	0	0
China(0) Indonesia(1) Thailand(0) Vietnam(0)	C	1	0	0	1	0	1
Liberia Sierra Leone	0	1	0	1	1	1	0
Philippines	0	1	1	0	1	0	1
Somalia	1	1	1	1	1	1	1
Nigeria	1	1	1	1	1	0	1

I tried to resolve them using Ragin and Rihoux (2009)'s techniques once again. Adjusting the thresholds did not decrease the number of contradictions and therefore I resorted to the other techniques. Since the number of organised pirate attacks is lower than common pirate attacks, I can check each individual attack for all contradictory configurations. Three cases where I refute their positive outcomes are Benin, India, and Yemen. The first case, Benin, had one organised pirate attack where a ship was hijacked while anchored just 13km away from Cotonou. This location is just 20km away from

the Nigerian coast and could therefore be an attack by Nigerian pirates, who attack ships up to 120km away from their coast regardless of country borders (Murphy, 2009). Therefore, I chose to take away this one attack and thus turn the configuration COR (having only corruption present) into a negative outcome configuration. For the next two cases, India and Yemen, I did something similar. As Daxecker and Prins (2021) describe, Somalian pirates attack very far off their own coasts, bringing their attacks close to other countries in the Indian ocean. Thus, I removed the one attack from both countries, which could have been conducted by Somalian pirates and not Indian or Yemenis pirates, hence turning both configurations (CONF*COR*GEO and CONF*GOV*COR*GEO) into negative outcomes. Similar to the first crisp-QCA, the configuration GEO is contradictory and again I failed to resolve it based on case knowledge. To prevent lowering validity, I did not remove individual cases but used the frequency strategy. By comparing the frequency of positive outcomes compared with negative outcomes in this configuration, I selected the more frequent one as the outcome for the whole configuration. Because only one case (Malaysia) has a positive outcome compared to six cases with negative outcomes, I assigned the negative outcome for this configuration. The last two contradictory configurations (CONF*GOV*COR*GEO and IUU*COR*GEO) could not be explained based on the individual cases and individual attacks. Therefore, I used another strategy, namely coding the whole configuration as a negative outcome and thus excluding it from the solution formula creation. Conducting the crisp-QCA again, this time with the adjusted dataset, I obtained a solution formula with two possible paths: IUU fishing, conflict, governance, corruption, and geography with the assigned cases of Nigeria and Somalia and IUU fishing with the assigned case of Ghana.

*IS: IUU * CONF * GOV * COR * GEO (Nigeria, Somalia) + IUU (Ghana)*

The last path is debatable because Ghana's attack is far away from the coast and similarly close to Gabon, Equatorial Guinea, Cameroon, Nigeria, Benin, Togo, and Ghana itself. This could mean that the attack was conducted by pirates from one of those countries—with Nigeria being a good candidate based on the prevalence of both common and organised piracy in the country. However, the large

distance between the coast and the location of the attack at around 500km (which is farther away than typical attacks from Nigeria) failed to convince me that this attack can be attributed to Nigeria.

To check the robustness of this result, I used Oana and Schneider (2021)'s technique of focusing on getting a result that stands even after multiple changes to the thresholds. I took my first solution formula, the initial solution (IS), and compared it to the test set (TS), that is, the solutions obtained with different thresholds. By comparing the initial solution formula with the solution formula of my minimal test set (minTS), which is the intersection of all solutions in the TS, I get my robust core (RC). To get my TS, I conducted two extra QCAs with the lower and higher thresholds respectively. I obtained a RC with only one path: IUU fishing, conflict, governance, corruption, and geography with the assigned cases of Nigeria and Somalia.

*RC: IUU * CONF * GOV * COR * GEO (Nigeria, Somalia)*

As mentioned in the previous chapter, I also conducted a crisp-QCA excluding the condition IUU fishing. However, leaving out this condition created too many contradictions, which prevented the creation of a solution formula. Another step that is often taken in QCA when the number of conditions does not exceed four is to create a Venn diagram to visualise the result and fill in the logical remainders (Ragin and Rihoux, 2009). For my QCAs, there are too many conditions to create a Venn diagram.

5.3. Multi-value QCA with common piracy as the outcome

Performing the mvQCA for the first time resulted in four contradictory configurations, which can be seen in the truth table in table four below.

Table 4: Truth table mvQCA with com piracy as outcome

Cases	com	iuu	conf	gov	cor	dep	geo
Kuwait(0) Oman(1) Qatar(0) UAE(0) Singapore(1)	C	0	0	0	0	0	1
Namibia	0	0	0	1	0	0	0
Malaysia	1	0	0	1	0	0	1
Togo	1	0	0	1	1	2	0
Madagascar Tanzania	0	0	0	1	1	2	1
Djibouti(0) Benin(1)	C	0	0	1	1	1	0
Angola	1	0	0	1	2	0	1
Guinea	1	0	0	2	1	2	0
Mauritania	0	0	0	2	1	1	0
Guinea-Bissau	0	0	0	2	2	2	0
Congo	1	0	0	2	2	1	0
Senegal	0	0	1	1	0	1	0
Bahrain	0	0	1	1	0	1	1
South Africa Saudi Arabia	0	0	1	1	0	0	0
The Gambia(0), Mozambique(1)	C	0	1	1	1	2	1
Cameroon, Cote d'Ivoire	1	0	1	2	1	1	0
Bangladesh(1), Egypt(0), Sri Lanka(0)	C	0	1	2	1	1	1
Eritrea	1	0	1	2	2	2	1
India	1	0	2	1	1	1	1
Iran	0	0	2	1	1	0	1
Kenya	1	0	2	2	1	1	0
Myanmar, Pakistan	0	0	2	2	1	1	1
DRC	1	0	2	2	2	2	1
Sudan	0	0	2	2	2	1	0
Yemen	1	0	2	2	2	1	1
Ghana	1	1	0	1	0	1	0
Vietnam, Indonesia	1	1	0	1	1	1	1
Gabon	0	1	0	1	1	0	0
Cambodia	0	1	0	1	2	1	0
Liberia	1	1	0	2	1	2	0
China	1	1	1	1	1	0	1
Nigeria	1	1	2	2	1	1	1
Sierra Leone	0	2	0	2	1	2	0
Thailand	1	2	1	1	1	0	1
Philippines	1	2	2	1	1	1	1
Somalia	1	2	2	2	2	2	1

Like with the two crisp-QCAs, the configuration geo{1}[3] is a contradiction that cannot be sufficiently explained by changing the thresholds or examining the individual cases. I coded it as a negative outcome because the frequencies of outcomes slightly point towards that direction. Two other contradictions could be resolved by slightly moving the thresholds. Both Mozambique and Bangladesh were close to the lower threshold for conflict; I got rid of these contradictions by moving this threshold up by 0.08. One contradiction that I removed based on case knowledge is gov{1}*cor{1}*dep{1} with the two assigned cases Djibouti(0) and Benin(1). For this configuration, I removed Djibouti because there are multiple foreign military bases on its small territory (Whitehead, 2021). Crowding a small country with many different soldiers from different nationalities could be the reason why Djibouti does not have common pirate attacks while Benin does. However, Benin´s common pirate attacks could be conducted by pirates from neighbouring Nigeria, but a) it is unlikely that all four attacks were conducted by Nigerian pirates; and b) common pirates normally stay closer to their shore (Murphy, 2009). Incorporating these adjustments and conducting the mvQCA again resulted in the following IS:

IS: iuu{1}*gov{2} + cor{2}*geo{1} + conf{0}*geo{1}*(gov{2} + gov{1}) + conf{1}*(gov{1}*cor{1} + gov{2}*geo{0}) + conf{2}*cor{1} + gov{1}*cor{1}*dep{1} + iuu{0}*(conf{0}*cor{2}*dep{1} + cor{1}*dep{0}*geo{0})

Since Oana and Schneider (2021)'s technique can also be used for mvQCA, I created a TS by running two extra mv-QCAs with different thresholds. However, because the minTS is empty, i.e. it had no solution formula present in the all different results, no RC could be created, leaving me with my IS which is not as robust as a RC.

[3] For a mvQCA I can no longer use lower-case and UPPER-CASE letters to indicate presence or absence of a condition. Therefore, I display conditions in lower-case letters with a number in brackets. The number indicates if a condition is absent {0} or present at a specific level {1} {2}.

5.4. Multi-value QCA with organised piracy as the outcome

Conducting the last mvQCA initially resulted in two contradictions, as seen in the truth table in table five, which I tried to resolve.

Table 5 Truth table mvQCA with organised piracy as outcome

Cases	org	iuu	conf	gov	cor	dep	geo
Oman UAE Kuwait Singapore Qatar	0	0	0	0	0	0	1
Namibia	0	0	0	1	0	0	0
Malaysia	1	0	0	1	0	0	1
Togo	0	0	0	1	1	2	0
Madagascar Tanzania	0	0	0	1	1	2	1
Benin	1	0	0	1	1	1	0
Angola	0	0	0	1	2	0	1
Guinea	0	0	0	2	1	2	0
Mauritania	0	0	0	2	1	1	0
Guinea-Bissau	0	0	0	2	2	2	0
Congo	0	0	0	2	2	1	0
Senegal	0	0	1	1	0	1	0
Bahrain	0	0	1	1	0	1	1
South Africa Saudi Arabia	0	0	1	1	0	0	0
Mozambique The Gambia	0	0	1	1	1	2	1
Cameroon(0) Cote d'Ivoire(1)	C	0	1	2	1	1	0
Bangladesh Egypt Sri Lanka	0	0	1	2	1	1	1
Eritrea	0	0	1	2	2	2	1
India	1	0	2	1	1	1	1
Iran	0	0	2	1	1	0	1
Kenya	0	0	2	2	1	1	0
Myanmar Pakistan	0	0	2	2	1	1	1
DRC	0	0	2	2	2	2	1
Sudan	0	0	2	2	2	1	0
Yemen	1	0	2	2	2	1	1
Ghana	1	1	0	1	0	1	0
Vietnam(0) Indonesia(1)	C	1	0	1	1	1	1
Gabon	0	1	0	1	1	0	0
Cambodia	0	1	0	1	2	1	0
Liberia	0	1	0	2	1	2	0
China	0	1	1	1	1	0	1
Nigeria	1	1	2	2	1	1	1
Sierra Leone	0	2	0	2	1	2	0
Thailand	0	2	1	1	1	0	1
Philippines	0	2	2	1	1	1	1
Somalia	1	2	2	2	2	2	1

The first one, con{1}*gov{2}*cor{1}*dep{1}, can be resolved by moving the upper threshold for conflict by -0.21, and thus moving Cameroon out of this configuration. The second contradictory configuration, iuu{1}*gov{1}*cor{1}*dep{1}*geo{1}, could not be resolved by adjusting the thresholds or examining the cases. I recoded into a negative outcome configuration, which left out the Indonesian organised pirate attack from the solution formula. Conducting the adjusted mvQCA resulted in the following IS with eight paths: IUU fishing at level one and conflict at level 2 with Nigeria as assigned case; IUU fishing at level one with Ghana as assigned case; IUU fishing at level two and corruption at level two with Somalia as assigned case; conflict at level one and governance at level two with Cote d'Ivoire as assigned case; corruption at level two, deprivation at level one, and geography present with Yemen as assigned case; governance at level one, corruption at level one, and deprivation at level one with India and Benin as assigned cases; governance at level one and geography present with Malaysia as the assigned case.

IS: iuu{1}*conf{2} (Nigeria) + iuu{1} (Ghana) + iuu{2}*cor{2} (Somalia) + conf{1}*gov{2} (Cote d´Ivoire) + cor{2}*dep{1}*geo{1} (Yemen) + gov{1}*(cor{1}*dep{1} + geo{1}) (India, Benin, Malaysia)

Again, I created a TS by running two extra mv-QCAs with different thresholds, resulting in the following RC with just one path of IUU fishing at level two and corruption at level two with Somalia as the only assigned case.

RC: *iuu{2}*cor{2} (Somalia)*

5.6. Discussion of results

Going through the results, I can draw some conclusions about what causes piracy. I start by answering the hypotheses that I created in the third chapter followed by discussing the implications relating to common piracy and organised piracy. Afterward, I highlight IUU fishing and some notable cases.

5.6.1. Hypotheses

The first hypothesis, H1: IUU fishing is sufficient for common or organised piracy, cannot be answered for common piracy because I lack a robust solution formula. For organised piracy, I can partially reject the hypothesis because the two RCs for organised piracy show that IUU fishing only leads to organised piracy in combination with other conditions. Additionally, the truth tables show that cases where IUU fishing is present and the outcome is negative exist for both types of piracy, proving that IUU fishing on its own is not a sufficient condition for common or organised piracy.

The second hypothesis, H2: Conflict is either a necessary or sufficient condition for organised piracy, can be partly rejected. Only the solution formula from the crispQCA indicates that conflict is a necessary condition. But this necessity is not replicated in the solution formula for the mvQCA with organised piracy as an outcome nor do the truth tables for common piracy show that the condition is necessary. Sufficiency of conflict is neither found in the truth tables nor the solution formulas.

The third hypothesis, H3: Low levels of governance are necessary for any form of piracy, can be partly rejected based on the same argument as the second hypothesis. Again, necessity is only found in the one solution formula from the crispQCA with organised piracy as the outcome.

The first hypothesis that I can partly accept is the fourth one, H4: Corruption is necessary for organised piracy. Both solution formulas for organised piracy show that corruption is a necessary condition. It should be noted that based on the mvQCA only the highest level of corruption is a necessary condition for organised piracy. However, the truth tables for both QCAs with organised piracy as the outcome show that two cases, Ghana and Malaysia, exist where the condition of corruption is absent, questioning the necessity of corruption. Therefore, I cannot fully accept the hypothesis.

The fifth hypothesis, H5: Deprivation is neither necessary nor sufficient for any form of piracy, can be fully accepted because neither the solution formulas nor the truth tables indicate the condition is necessary or sufficient for any form of piracy. Only when I consider the solution formulas for both QCAs with common piracy as the outcome can I see that deprivation is part of five sufficient paths, but not sufficient on its own.

The last hypothesis, H6: Geography is a necessary condition for organised piracy, can be partly rejected because neither the solution formulas nor the truth tables show any necessity for the condition of geography on its own regarding organised piracy. The condition is part of a necessary and sufficient path for organised piracy according to the solution formula for the crispQCA.

5.6.2. Common piracy

For common piracy, I face the problem of having results that have low validity or did not pass the robustness checks. Hence, I cannot draw any conclusions that are methodologically backed. Yet, putting the methodological problems aside, it is visible that common piracy can be the result of different paths with no one condition being necessary or sufficient. Maybe I would have found necessary or sufficient conditions if my outcome was high frequencies of attacks, but this was not tested in my QCAs.

5.6.3. Organised piracy

I don´t have the same problems with my results on organised piracy, but I only have a few cases of reported pirate attacks that I classified as organised attacks, which decreases the number of cases with organised piracy. What can be said, based on the results of both the crispQCA and the mvQCA, is that IUU fishing and corruption are important factors for organised piracy since they are part of both RCs. However, neither are fully sufficient nor necessary on their own. Only when both conditions are combined at their highest level or in combination with conflict, governance, and geography is sufficiency identified, though, this is only based on the cases of Somalia and Nigeria. To see if these two sets of conditions are sufficient sets of conditions for organised piracy, another country would need to experience either set; the presence of organised piracy, in this case, would replicate the sufficiency; its absence would disprove it.

5.6.4. Condition of interest

A condition of note is IUU fishing. Using data from three years after the analysed time period—due to lack of other data— compelled me to run the analysis both with and without the condition. This

showed that, without IUU fishing as a condition, my analysis had too many contradictions. For example, without this condition, Somalia would be in the same configuration as the DRC, which did not experience any organised pirate attacks. Similarly, Nigeria would be in the same configuration as Pakistan and Myanmar, both without any organised pirate attacks. This would have prevented me from finding any solution formulas and resulted in truth tables full of contradictions—which would need to be resolved, for example by adding an extra condition, as described by Ragin and Rihoux (2009). Demonstrating that IUU fishing is a relevant condition for piracy and needs further research into it.

5.6.5. Cases of interest

Several countries should be analysed further. Firstly, Thailand and the Philippines score high on some conditions and generally resemble the scores of Somalia and Nigeria respectively. For example, the Philippines are only one level below Nigeria in the condition of governance but the same in every other condition. This would imply that their outcomes should be similar, but neither Thailand nor the Philippines have experienced organised pirate attacks. Only when lowering the threshold of what defines an organised attack can their occurrence be seen in both countries. Hence the question: are there other conditions that would further explain the difference between Thailand and the Philippines on the one side and Somalia and Nigeria on the other or should organised piracy be defined and measured differently?

Similarly, Indonesia is part of the same configuration as Vietnam, while the former has experienced piracy, the latter has not, again necessitating further explanation. In that case conditions such as the political system or topography, as Indonesia is spread over many thousand islands over a large area, could explain the difference, but neither condition has been thoroughly theorised when it comes to piracy.

Some other states that often came up in contradictions are the small Gulf states of Kuwait, Bahrain, Qatar, and the UAE. For these countries, I suspect that their interest in suppressing any form of piracy

is high since they depend more on the export of oil. Therefore, protecting their oil trade against pirates roaming in their waters is of higher priority.

The last country of interest is Malaysia, which displays both common and organised piracy. However, the absence of most conditions, that lead to piracy in other cases, would suggest an absence of both types of piracy. This puzzle should be explained by either searching for other conditions that could explain both types of piracy in Malaysia or by double-checking if Malaysian piracy could originate from a neighbouring country.

5.7. Conclusion

In this chapter, I displayed the problems I faced conducting my QCAs and how I tried to solve them. This resulted in only two solution formulas that were methodologically sound and robust. With these results, I answered my hypotheses and my research question. Furthermore, I highlighted some conditions and cases that are of note. In the next chapter, I use the results and answers from this chapter to discuss the implications for theory and policy about piracy as well as how future research could improve the understanding about piracy.

Chapter 6: Conclusion and Implications

To conclude my thesis, I touch upon the limitations of my QCAs and how they could be reduced for future research. Additionally, I draw some theoretical and policy implications dealing with piracy. Lastly, I list a selection of topics for future research regarding piracy and explain how it could improve our understanding of piracy.

6.1. Limitations

I already touched upon some limitations of my thesis in previous chapters. One of them was the general problem of measuring the different conditions and outcomes. Relying on pirate attack databases to detect the presence of piracy in a country jeopardises assigning the wrong outcome to a country. Notably, when distinguishing between common pirate attacks and organised ones the lack of information for most reported attacks lowers both the validity and reliability of both outcomes. Since all authors that measure piracy use pirate attack datasets, they all suffer from the same problems. This raises the question if other approaches to measure piracy would be a better fit. For organised piracy at least, it would be sensible to use other measures of evidence/proof of an organised attack, such as ransom money paid or known locations of pirate-friendly harbours like the ones in Somalia. Yet, such databases do not exist and are unlikely to ever exist, because ransom payments are rarely reported, and using known pirate-friendly harbours leaves out any unknown pirate-friendly harbour.

Even more problematic is the lack of good and reliable measurements of IUU fishing. Having to use an index, which is based on more qualitative indicators and from a different year, lowered the overall validity of my QCAs. I would have used a different measurement but, since IUU fishing is hard to measure directly, no index existed before the creation of the IUU index in 2019. Solving this problem by creating a new index that measures IUU fishing directly and retrospectively covers years before 2019 would be no easy task. This would require observing and reporting acts of IUU fishing, which could only be done by the IUU fishers themselves or by implementing all-encompassing surveillance of the oceans.

Researchers like Daxecker and Prins (2021) showed that piracy can concentrate in specific regions inside a country. Therefore, an analysis that only uses whole countries as cases is always limited compared to analyses that use provinces or areas inside a country as cases. Dividing the world into even-sized squares, like Daxecker and Prins (2021), would have reduced the problem of allocating pirate attacks conducted by pirates of neighbouring countries. Similarly, this would also exclude the problems of measuring IUU fishing at a country level. Since fish do not remain confined within national borders, depleting fish stocks through IUU fishing affects all nearby coasts and fishery sectors. Lastly, countries with multiple coasts, like Thailand, would have their coastlines measured and analysed individually, enabling a within-case comparison. However, using this level of analysis was not possible for all my different conditions and outcomes. Some conditions, such as IUU fishing, are only available on the country level while other conditions, such as organised pirate attacks, could be located outside the squares where they originated from and thus hard to assign.

The last limitations of my work are the thresholds I used. A theory-consistency calibration strategy, where benchmarks used in theory or practice are used to select the thresholds, is the preferable approach for calibration (Lucas and Szatrowski, 2014; Befani, 2016). Hence, most of my thresholds are not optimal because for four conditions I used empirical-coverage calibration strategy, meaning that I created the thresholds based on statistical methods like average linkage clustering analysis. For the two conditions where I was able to use theory-consistency calibration strategy to create the thresholds, I had to rely on benchmarks not based on theory but on practise, for example, the benchmarks used by the UN to categorise countries into low-income, lower-middle-income, etc. Using thresholds based on existing theory would have improved the validity and reliability of my results.

Relating to the limitations of my thresholds is the categorisation of common and organised piracy. As this differentiation is something that is done differently by authors, my choice of the definition by Murphy (2009) could be opposed by other authors. For example, Daxecker and Prins (2021) define organised attacks as those targeting moving ships, which I replicated with my alternative threshold.

6.2. Theoretical Implications

Despite these limitations, I can conclude theoretical implications: I was not able to fully answer my initial research question of "What causes piracy" regarding common piracy. For this type of piracy, my approach was inadequate and failed to produce an answer to the research question. Therefore, I conclude that analysis of common piracy should not be done with qualitative comparative methods and instead rely on quantitative methods, as was done by other authors.

For the second type of piracy, organised piracy, I was able to answer my research question. Based on the results of my two QCAs, I can conclude that a path/configuration of high levels of corruption together with high levels of IUU fishing causes organised piracy. This configuration is not necessary and organised piracy can also be caused by other configurations. One such configuration that also causes organised piracy is shown in the solution formula of the crispQCA: IUU fishing, conflict, governance, corruption, and deprivation. It should be noted that for both configurations Somalia was the assigned case, meaning that the path from the mvQCA is more accurate as information gets lost when dichotomising the conditions. The other configurations that were in the initial solution for both QCAs cannot be considered methodologically robust answers.

6.3. Policy Implications

I draw several implications from this thesis for policymakers. One implication policymakers have to accept is that piracy cannot be fully prevented, at least common piracy. My thesis indicates that common piracy can be the result of many different configurations, making it harder to prevent piracy when not all conditions are tackled. Policymakers should conceive common piracy similar to regular criminality, for example, theft or robbery on land. Suppressing piracy could be best achieved by lowering the conditions that can cause piracy while improving security on the sea and on the ships themselves. Here policymakers could focus on the impact of modern technologies on the cost-

effectiveness and capabilities of maritime security: using naval and aerial drones would make spotting pirates before and after an attack easier while new non-lethal weapons could be employed on more commercial ships, for example, direct energy weapons that can immobilise pirate boats and scare off attacks.

But overall, states around the world, especially those relying on global trade, should take a bigger interest in the conditions of countries along their trade routes. Combatting piracy should not be left to affected countries until it becomes a bigger problem but assisting affected countries should be done early on. This would probably be more cost-efficient than sending modern warships far away from their bases. One condition countries around the globe should focus on more is IUU fishing. As shown, IUU fishing can be an important condition for both common piracy and organised piracy. Therefore, reducing IUU fishing should result in fewer pirate attacks, particularly organised attacks. However, combating IUU fishing cannot only be the responsibility of the countries affected by it but of the countries where the ships that conduct IUU fishing come from, because those countries will be indirectly affected by the damages from IUU fishing, for example through the rising number of pirate attacks. Beyond IUU fishing, countries should care more about the oceans in general and how their conditions impact piracy indirectly. The fishery sector can also suffer from depleting fish stocks from regulated overfishing and thus nodding more fishermen towards piracy and other illicit activities. The UN acknowledged the importance of protecting oceans in their sustainable development goals (SDGs) under SDG 14 “life below water” (UN). Similarly, the UN also included fighting corruption, an endeavour that is crucial for combating organised piracy and thus protecting the global trade, in SDG 16.

6.3. Further research

An immediate topic of further research about piracy would be to closely examine the highlighted cases in the previous chapter. Individual most similar case studies would generate a deeper understanding

of those contradictory cases. Generally, more research in a similar direction to mine should be conducted, looking at the necessity and sufficiency of conditions by using new indexes, other measurements for piracy and its conditions, and on a lower level of analysis.

Furthermore, research on piracy should focus more on organised piracy. Too often, piracy is dealt with as a singular phenomenon and the level of organisation is only dealt with as a scale and not a separate category. Methodological approaches to organised piracy are missing. Murphy (2009), for example, only described the difference between common and organised piracy but never used any methods to examine the different conditions leading to one or the other. On a similar note, the connection between IUU fishing and piracy has been only studied on an individual case level and therefore needs large-scale quantitively studies. Using the IUU index for new research on piracy could (dis)prove the connection.

Yet, research should also go in the other direction and focus on individual pirates and their reasoning. Focusing on the individual decision-making process instead of generalised causation approaches could help us better understand why piracy exists (Klaas, 2021). Several scholars included interviews of pirates in their research, but often to complement a large-scale macro analysis.

An aspect that is so far only touched on in individual case analyses about Somalia is the emergence and spread of tactics and the shift from common to organised piracy. A better understanding of how organised pirates emerges would help eliminate the biggest threat to world trade. This could be achieved through process tracing analyses.

References

Adams, Cecil (2015): Why Don't States Declare War Anymore? In Washington City Paper, 3/27/2015. Available online at https://washingtoncitypaper.com/article/200602/why-dont-states-declare-war-anymore-these-days-declaring-war/, checked on 5/11/2022.

Alsawalqa, Rulah Odeh; Venter, Denis (2021): Piracy and Maritime Security in the North-Western Indian Ocean: From the Gulf of Oman to the Waters off the Somali Coast. In Insight on Africa 14 (1), pp. 88–103. DOI: 10.1177/09750878211049224.

Amini, Mariam (2017): Pirates are making a comeback on the high seas, and have Africa and Asia in their sights. In CNBC, 6/4/2017. Available online at https://www.cnbc.com/2017/06/02/pirates-are-making-a-comeback-on-the-high-seas-and-have-africa-and-asia-in-their-sights.html, checked on 1/8/2022.

Asariotis, Regina; Lavelle, Jennifer; Premti, Anila; Benamara, Hassiba. (2014): Maritime piracy. Part II: An overview of the international legal framework and of multilateral cooperation to combat piracy. United Nations Conference on Trade and Development.

Awet T. Weldemichael (2012): Maritime corporate terrorism and its consequences in the western Indian Ocean: illegal fishing, waste dumping and piracy in twenty-first-century Somalia. In Journal of the Indian Ocean Region 8 (2), pp. 110–126. Available online at https://www.academia.edu/31664932/MARITIME_CORPORATE_TERRORISM_AND_ITS_CONSEQUENCES_IN_THE_WESTERN_INDIAN_OCEAN_REGION_Illegal_Fishing_Waste_Dumping_and_Piracy_in_21_st_Century_Somalia.

Axbard, Sebastian (2016): Income Opportunities and Sea Piracy in Indonesia: Evidence from Satellite Data. In American Economic Journal: Applied Economics 8 (2), pp. 154–194. DOI: 10.1257/app.20140404.

Befani, Barbara (2016): Pathways to Change: Evaluating Development Interventions with Qualitative Comparative Analysis (QCA). In EBA, 7/4/2016. Available online at https://eba.se/en/reports/pathways-to-change-evaluating-development-interventions-with-qualitative-comparative-analysis-qca/4157/, checked on 5/24/2022.

Birnie, P. W. (1987): Piracy: Past, present and future. In Marine Policy 11 (3), pp. 163–183. DOI: 10.1016/0308-597X(87)90054-6.

Burnett, John (2002): Dangerous waters. modern piracy and terror on the high seas. New York N.Y: Dutton. Available online at http://worldcatlibraries.org/wcpa/oclc/49891486.

Cartwright, Mark (2021.10): Golden Age of Piracy, 10/12/2021. Available online at https://www.worldhistory.org/Golden_Age_of_Piracy/, checked on 6/23/2022.

Cartwright, Mark (2021.11): Zheng Yi Sao, 11/15/2021. Available online at https://www.worldhistory.org/Zheng_Yi_Sao/, checked on 6/23/2022.

CIA (2022.000Z): The World Factbook. Available online at https://www.cia.gov/the-world-factbook/, updated on 6/24/2022.000Z, checked on 6/24/2022.

Clunan, Anne; Harold, Trinkunas A. (2010): Ungoverned Spaces: Stanford University Press.

CQ Researcher by CQ Press (2009): Attacking Piracy. Available online at https://library.cqpress.com/cqresearcher/document.php?id=cqrglobal2009080000, updated on 1/8/2022.000Z, checked on 1/8/2022.

Craven, W. Frank (1930): The Earl of Warwick, a Speculator in Piracy. In The Hispanic American Historical Review 10 (4), pp. 457–479. DOI: 10.2307/2518450.

Dahir, Abdi Latif (2017): Somalia's piracy problem could be making a comeback. In Quartz, 3/20/2017. Available online at https://qz.com/africa/935357/with-reduced-patrols-and-illegal-fishing-somalias-pirates-could-be-making-a-comeback/, checked on 1/8/2022.

Daxecker, Ursula E.; Prins, Brandon C. (2021): Pirate lands. Governance and maritime piracy. New York, NY: Oxford University Press (Oxford scholarship online Political Science).

Dickinson, E. D.: Is the crime of piracy obsolete. In Harvard Law Review 1924-1925 (38(3)), pp. 334–360.

Dryad Global (2022.000Z): Floating Armouries Background. Available online at https://dg.dryadglobal.com/floating-armouries, updated on 5/7/2022.000Z, checked on 5/12/2022.

Dubner, Barry H. (1980): The Law of International Sea Piracy (Developments in international law, Band 2). Developments in international law. The Hague.

EUNAVFOR (2022.000Z): Operation ATALANTA. Available online at https://eunavfor.eu/mission, updated on 6/7/2022.000Z, checked on 6/13/2022.

freightify (2022.000Z): Top 5 Busiest Global Major Shipping Routes 2022. Available online at https://www.freightify.com/blog/busiest-global-trade-shipping-routes-2021, updated on 5/27/2022.000Z, checked on 5/27/2022.

H. Stuart Jones (1926): A Roman law concerning piracy. In The Journal of Roman Studies 16 (2), pp. 155–173. DOI: 10.2307/295703.

Halberstam, Malvina (1988): Terrorism on the High Seas: The Achille Lauro, Piracy and the IMO Convention on Maritime Safety. In American Journal of International Law 82 (2), pp. 269–310. DOI: 10.2307/2203189.

Hughes, Jasmine: The Piracy-Illegal Fishing Nexus in the Western Indian Ocean 2011. Available online at https://www.academia.edu/6737362/The_Piracy_Illegal_Fishing_Nexus_in_the_Western_Indian_Ocean.

IMF | F&D (2022.000Z): Finance and Development. Available online at https://www.imf.org/external/Pubs/FT/fandd/2005/09/basics.htm, updated on 6/19/2022, checked on 6/19/2022.

IUU Fishing Index. Available online at https://www.iuufishingindex.net/, checked on 6/24/2022.

Jablonski, Ryan S.; Oliver, Steven (2013): The Political Economy of Plunder. In Journal of Conflict Resolution 57 (4), pp. 682–708. DOI: 10.1177/0022002712448907.

Klaas, Brian (2021): Corruptible. Who Gets Power and How It Changes Us. New York: Scribner. Available online at https://ebookcentral.proquest.com/lib/kxp/detail.action?docID=6797914.

Kuenzer, Claudia; Renaud, Fabrice G. (2012): Climate and Environmental Change in River Deltas Globally: Expected Impacts, Resilience, and Adaptation. In Fabrice G. Renaud, Claudia Kuenzer (Eds.):

The Mekong Delta System. Interdisciplinary Analyses of a River Delta. Dordrecht: Springer (SpringerLink Bücher), pp. 7–46.

Lucas, Samuel R.; Szatrowski, Alisa (2014): Qualitative Comparative Analysis in Critical Perspective. In Sociological Methodology 44 (1), pp. 1–79. DOI: 10.1177/0081175014532763.

Mentan, Tatah (2004): Dilemmas of Weak States. Africa and transnational terrorism in the twenty-first century. [S.l.]: ROUTLEDGE.

Monnet, Bertrand (2016): Pirates, menaces sur le commerce mondial. Canal+.

Murphy, Martin N. (2007): Contemporary Piracy and Maritime Terrorism. The Threat to International Security. Hoboken: Taylor and Francis (Adelphi series). Available online at https://ebookcentral.proquest.com/lib/kxp/detail.action?docID=1190453.

Murphy, Martin N. (2009): Small boats, weak states, dirty money. Piracy & maritime terrorism in the modern world. 1. publ. London: Hurst.

Oana, Ioana-Elena; Schneider, Carsten Q. (2021): A Robustness Test Protocol for Applied QCA: Theory and R Software Application. In Sociological Methods & Research, 004912412110361. DOI: 10.1177/00491241211036158.

Oystein Bogen (2010): Pirate Hunting. - Operation Atalanta in the Indian Ocean. First Hand Films.

Patrick, Stewart (2011): Weak links. Fragile states, global threats, and international security. New York, Oxford: Oxford University Press.

Phelps Bondaroff; Teale N., Reitano, Tuesday and van der Werf, Wietse (2015): The Illegal Fishing and Organized Crime Nexus.

Piper, Grant (2020): The German Pirates - Exploring History - Medium. In Exploring History, 9/10/2020. Available online at https://medium.com/exploring-history/the-german-pirates-98f5a35deb1f, checked on 6/23/2022.179Z.

Plutarch (75): Life of Caesar. Available online at https://penelope.uchicago.edu/Thayer/E/Roman/Texts/Plutarch/Lives/Caesar*.html, checked on 6/23/2022.

Rafferty, John (2022.000Z): From Pirate to Admiral: The Tale of Barbarossa. britannica. Available online at https://www.britannica.com/story/from-pirate-to-admiral-the-tale-of-barbarossa, updated on 6/23/2022.000Z, checked on 6/23/2022.935Z.

Ragin, Charles C. (1987): The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies: University of California Press. Available online at http://www.jstor.org/stable/10.1525/j.ctt1pnx57.

Renaud, Fabrice G.; Kuenzer, Claudia (Eds.) (2012): The Mekong Delta System. Interdisciplinary Analyses of a River Delta. Dordrecht: Springer (SpringerLink Bücher).

Rihoux, Benoît; Ragin, Charles (2009): Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques. 2455 Teller Road, Thousand Oaks California 91320 United States: SAGE Publications, Inc.

Rubin, Alfred P. (1976): Is Piracy Illegal? In American Journal of International Law 70 (1), pp. 92–95. DOI: 10.1017/S0002930000142605.

Rubinson, Claude; Gerrits, Lasse; Rutten, R.; Greckhamer, Thomas (2019): Avoiding Common Errors in QCA : A Short Guide for New Practitioners. Available online at https://www.semanticscholar.org/paper/Avoiding-Common-Errors-in-QCA-%3A-A-Short-Guide-for-Rubinson-Gerrits/26da3bf6a679d79ed8dee893d3e38e954b88f36d.

S. Whitman & C. Suarez (2012): Dalhousie Marine Piracy Project: The Root Causes and True Costs of Marine Piracy.

Shortland, Anja; Varese, Federico (2014): The Protector's choice. An Application of Protection Theory to Somali Piracy. In The British Journal of Criminology 54 (5), pp. 741–764. Available online at http://www.jstor.org/stable/43819220.

Shortland, Anja; Varese, Federico (2016): State-Building, Informal Governance and Organised Crime: The Case of Somali Piracy. In Political Studies 64 (4), pp. 811–831. DOI: 10.1111/1467-9248.12227.

Skaaning, Svend-Erik (2011): Assessing the Robustness of Crisp-set and Fuzzy-set QCA Results. In Sociological Methods & Research 40 (2), pp. 391–408. DOI: 10.1177/0049124111404818.

SOFAR (2022.000Z): 5 Major Shipping Routes Used for Global Trade. Available online at https://www.sofarocean.com/posts/5-major-shipping-routes-used-for-global-trade, updated on 5/27/2022.000Z, checked on 5/27/2022.513Z.

Sung, Hung-En (2004): State Failure, Economic Failure, and Predatory Organized Crime: A Comparative Analysis. In Journal of Research in Crime and Delinquency 41 (2), pp. 111–129. DOI: 10.1177/0022427803257253.

The Economist (2017): Why Somali piracy is staging a comeback. Available online at https://www.economist.com/the-economist-explains/2017/04/18/why-somali-piracy-is-staging-a-comeback, updated on 1/8/2022.000Z, checked on 1/8/2022.406Z.

The Economist (2018): What is happening to Africa’s pirates? Available online at https://www.economist.com/the-economist-explains/2018/01/16/what-is-happening-to-africas-pirates, updated on 6/24/2022.000Z, checked on 6/24/2022.546Z.

The Fund for Peace (2022.000Z): Fragile States Index. Available online at https://fragilestatesindex.org/, checked on 6/24/2022.

Transparency International (2022.000Z): 2021 Corruption Perceptions Index. Available online at https://www.transparency.org/en/cpi/2021, checked on 6/24/2022.

United Nations (2022.000Z): THE 17 GOALS | Sustainable Development. Available online at https://sdgs.un.org/goals, checked on 6/5/2022.

Vision of Humanity (2022+00:00): Global Peace Index Map » The Most & Least Peaceful Countries. Available online at https://www.visionofhumanity.org/maps/#/, updated on 6/17/2022+00:00, checked on 6/24/2022.

Wallis, Daniel (2009): Somali sea gangs lure investors at pirate lair. In Reuters Media, 12/1/2009. Available online at https://www.reuters.com/article/us-somalia-piracy-investors-idUSTRE5B01Z920091201, checked on 1/8/2022.

Whitehead, Eileen (2021): Why do so many countries have military bases in Djibouti? https://www.peoplesworld.org. Available online at https://www.peoplesworld.org/article/why-do-so-many-countries-have-military-bases-in-djibouti/, checked on 6/3/2022.

Wolfram MathWorld (2022.000Z): Coastline Paradox. Available online at https://mathworld.wolfram.com/CoastlineParadox.html, updated on 6/3/2022.000Z, checked on 6/3/2022.

Worldbank (2022.000Z): WGI 2021 Interactive. Available online at http://info.worldbank.org/governance/WGI/, checked on 6/24/2022.

Appendix

Table 6: Truth table adjusted crispQCA with common piracy as the outcome

cases	com	iuu	conf	gov	cor	dep	geo
Namibia, Saudi Arabia, Senegal, South Africa	0	0	0	0	0	0	0
Malaysia, Oman, Singapore	1	0	0	0	0	0	1
Togo	1	0	0	0	1	1	0
Madagascar, Tanzania, The Gambia	0	0	0	0	1	1	1
Djibouti	0	0	0	0	1	0	0
Angola	1	0	0	0	1	0	1
Eritrea	1	0	0	1	1	1	1
Cameroon, Congo, Cote dIvoire	1	0	0	1	1	0	0
Egypt, Sri Lanka	0	0	0	1	1	0	1
India	1	0	1	0	1	0	1
DRC	1	0	1	1	1	1	1
Ghana	1	1	0	0	0	0	0
Cambodia, Gabon	0	1	0	0	1	0	0
China, Indonesia, Thailand, Vietnam	1	1	0	0	1	0	1
Sierra Leone	0	1	0	1	1	1	0
Philippines	1	1	1	0	1	0	1
Somalia	1	1	1	1	1	1	1
Nigeria	1	1	1	1	1	0	1

Table 7: Truth table adjusted crispQCA with organised piracy as the outcome

Cases	org	iuu	conf	gov	cor	dep	geo
Namibia Saudi Arabia Senegal South Africa	0	0	0	0	0	0	0
Malaysia(1) Qatar(0) Oman(0) Singapore(0) UAE(0) Bahrain(0) Kuwait(0)	C	0	0	0	0	0	1
Togo	0	0	0	0	1	1	0
Tanzania The Gambia Mozambique Madagascar	0	0	0	0	1	1	1
Benin Djibouti	0	0	0	0	1	0	0
Angola	0	0	0	0	1	0	1
Guinea-Bissau Guinea	0	0	0	1	1	1	0
Eritrea	0	0	0	1	1	1	1
Cote d'Ivoire(1) Cameroon(0) Mauritania(0) Congo(0)	C	0	0	1	1	0	0
Sri Lanka Egypt Bangladesh	0	0	0	1	1	0	1
India Iran	0	0	1	0	1	0	1
DRC	0	0	1	1	1	1	1
Sudan Kenya	0	0	1	1	1	0	0
Yemen Pakistan Myanmar	0	0	1	1	1	0	1
Ghana	1	1	0	0	0	0	0
Gabon Cambodia	0	1	0	0	1	0	0
Indonesia(1) Vietnam(0) Thailand(0) China(0)	C	1	0	0	1	0	1
Sierra Leone Liberia	0	1	0	1	1	1	0
Philippines	0	1	1	0	1	0	1
Somalia	1	1	1	1	1	1	1
Nigeria	1	1	1	1	1	0	1

Table 8: Truth table adjusted mvQCA with common piracy as the outcome

Cases	com	iuu	conf	gov	cor	dep	geo
Kuwait(0) Oman(1) Qatar(0) Singapore(1) UAE(0)	C	0	0	0	0	0	1
Namibia South Africa	0	0	0	1	0	0	0
Malaysia	1	0	0	1	0	0	1
Togo	1	0	0	1	1	2	0
Madagascar Tanzania The Gambia	0	0	0	1	1	2	1
Benin	1	0	0	1	1	1	0
Angola	1	0	0	1	2	0	1
Guinea	1	0	0	2	1	2	0
Mauritania	0	0	0	2	1	1	0
Bangladesh	1	0	0	2	1	1	1
Guinea-Bissau	0	0	0	2	2	2	0
Congo	1	0	0	2	2	1	0
Senegal	0	0	1	1	0	1	0
Bahrain	0	0	1	1	0	1	1
Saudi Arabia	0	0	1	1	0	0	0
Mozambique	1	0	1	1	1	2	1
Cameroon Cote dIvoire	1	0	1	2	1	1	0
Egypt Sri Lanka	0	0	1	2	1	1	1
Eritrea	1	0	1	2	2	2	1
India	1	0	2	1	1	1	1
Iran	0	0	2	1	1	0	1
Kenya	1	0	2	2	1	1	0
Myanmar Pakistan	0	0	2	2	1	1	1
DRC	1	0	2	2	2	2	1
Sudan	0	0	2	2	2	1	0
Yemen	1	0	2	2	2	1	1
Ghana	1	1	0	1	0	1	0
Indonesia Vietnam	1	1	0	1	1	1	1
Gabon	0	1	0	1	1	0	0
Cambodia	0	1	0	1	2	1	0
Liberia	1	1	0	2	1	2	0
China	1	1	1	1	1	0	1
Nigeria	1	1	2	2	1	1	1
Sierra Leone	0	2	0	2	1	2	0
Thailand	1	2	1	1	1	0	1
Philippines	1	2	2	1	1	1	1
Somalia	1	2	2	2	2	2	1

Table 9: Truth table adjusted mvQCA with organised piracy as the outcome

Cases	com	iuu	conf	gov	cor	dep	geo
Kuwait(0) Oman(1) Qatar(0) Singapore(1) UAE(0)	C	0	0	0	0	0	1
Namibia South Africa	0	0	0	1	0	0	0
Malaysia	1	0	0	1	0	0	1
Togo	1	0	0	1	1	2	0
Madagascar Tanzania The Gambia	0	0	0	1	1	2	1
Benin	1	0	0	1	1	1	0
Angola	1	0	0	1	2	0	1
Guinea	1	0	0	2	1	2	0
Mauritania	0	0	0	2	1	1	0
Bangladesh	1	0	0	2	1	1	1
Guinea-Bissau	0	0	0	2	2	2	0
Congo	1	0	0	2	2	1	0
Senegal	0	0	1	1	0	1	0
Bahrain	0	0	1	1	0	1	1
Saudi Arabia	0	0	1	1	0	0	0
Mozambique	1	0	1	1	1	2	1
Cameroon Cote d'Ivoire	1	0	1	2	1	1	0
Egypt Sri Lanka	0	0	1	2	1	1	1
Eritrea	1	0	1	2	2	2	1
India	1	0	2	1	1	1	1
Iran	0	0	2	1	1	0	1
Kenya	1	0	2	2	1	1	0
Myanmar Pakistan	0	0	2	2	1	1	1
DRC	1	0	2	2	2	2	1
Sudan	0	0	2	2	2	1	0
Yemen	1	0	2	2	2	1	1
Ghana	1	1	0	1	0	1	0
Indonesia Vietnam	1	1	0	1	1	1	1
Gabon	0	1	0	1	1	0	0
Cambodia	0	1	0	1	2	1	0
Liberia	1	1	0	2	1	2	0
China	1	1	1	1	1	0	1
Nigeria	1	1	2	2	1	1	1
Sierra Leone	0	2	0	2	1	2	0
Thailand	1	2	1	1	1	0	1
Philippines	1	2	2	1	1	1	1
Somalia	1	2	2	2	2	2	1

Table 10: Clustering of IUU

For crispQCA cluster 2 and 3 are combined (least dissimilar)

Cluster	1	2	3
	Angola	Cambodia	Philippines
	Bahrain	China	Sierra Leone
	Bangladesh	Gabon	Somalia
	Benin	Ghana	Thailand
	Cameroon	Indonesia	
	Congo	Liberia	
	Cote d'Ivoire	Nigeria	
	Djibouti	Vietnam	
	DRC		
	Egypt		
	Eritrea		
	Guinea		
	Guinea-Bissau		
	India		
	Iran		
	Kenya		
	Kuwait		
	Madagascar		
	Malaysia		
	Mauritania		
	Mozambique		
	Myanmar		
	Namibia		
	Oman		
	Pakistan		
	Qatar		
	Saudi Arabia		
	Senegal		
	Singapore		
	South Africa		
	Sri Lanka		
	Sudan		
	Tanzania		
	The Gambia		
	Togo		
	UAE		
	Yemen		

Table 11: Clustering of Conflict

For crispQCA clusters 3+4 and 1+2 are combined (least dissimilar)

For mvQCA cluster 3 and 4 are combined (least dissimilar)

Cluster	**1**	**2**	**3**	**4**
	Angola	Bahrain	DRC	Iran
	Benin	Bangladesh	India	Kenya
	Cambodia	Cameroon	Nigeria	Myanmar
	Congo	China	Pakistan	Philippines
	Djibouti	Cote d'Ivoire	Somalia	
	Gabon	Egypt	Sudan	
	Ghana	Eritrea	Yemen	
	Guinea	Mozambique		
	Guinea-Bissau	Saudi Arabia		
	Indonesia	Senegal		
	Kuwait	South Africa		
	Liberia	Sri Lanka		
	Madagascar	Thailand		
	Malaysia	The Gambia		
	Mauritania			
	Namibia			
	Oman			
	Qatar			
	Sierra Leone			
	Singapore			
	Tanzania			
	Togo			
	UAE			
	Vietnam			

Table 12: Clustering of Corruption

For crispQCA clusters 1+3 and 2+4 are combined (least dissimilar)

For mvQCA clusters 2 and 4 are combined (least dissimilar)

Cluster	**1**	**2**	**3**	**4**
	Angola	Bahrain	Bangladesh	Qatar
	Cambodia	Ghana	Benin	Singapore
	Congo	Kuwait	Cameroon	UAE
	DRC	Malaysia	China	
	Eritrea	Namibia	Cote d'Ivoire	
	Guinea-Bissau	Oman	Djibouti	
	Somalia	Saudi Arabia	Egypt	
	Sudan	Senegal	Gabon	
	Yemen	South Africa	Guinea	
			India	
			Indonesia	
			Iran	
			Kenya	
			Liberia	
			Madagascar	
			Mauritania	
			Mozambique	
			Myanmar	
			Nigeria	
			Pakistan	
			Philippines	
			Sierra Leone	
			Sri Lanka	
			Tanzania	
			Thailand	
			The Gambia	
			Togo	
			Vietnam	

Table 13: Clustering coast/boarder ratio

For crispQCA cluster 1+2 and 3+4+5 are combined (least dissimilar)

Cluster	1	2	3	4	5
	DRC	Iran	Egypt	Qatar	Indonesia
	Togo	Guinea-Bissau	Kuwait		
	Congo	India	Yemen		
	Benin	Mozambique	Eritrea		
	Guinea	South Africa	UAE		
	Cameroon	Thailand	Somalia		
	The Gambia	Djibouti	Oman		
	Sudan	Saudi Arabia	Malaysia		
	Bangladesh	China			
	Pakistan	Vietnam			
	Cote d'Ivoire				
	Mauritania				
	Kenya				
	Cambodia				
	Nigeria				
	Senegal				
	Ghana				
	Gabon				
	Myanmar				
	Angola				
	Tanzania				
	Liberia				
	Sierra Leone				
	Namibia				