

# THE PIRATES *of* SOMALIA:

Ending the Threat,  
Rebuilding a Nation



The World Bank  
Regional Vice-Presidency for Africa

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Regional Vice-Presidency for Africa

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## Ending the Threat, Rebuilding a Nation

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# FOREWORD

Until recently, piracy off the Horn of Africa seemed to be prospering, unfettered by the efforts of the international community. Somalia, a country in chaos after years of civil war, was unable to slow the growth of this criminal industry.

Recent events suggest that 2013 may be a year of opportunity. The number of piracy incidents has been falling since 2012, thanks in part to mobilization of international naval forces and the adoption by the shipping industry of best practices to fend off pirate attacks. Meanwhile, Somalia has a new administration. Along with the daunting tasks it faces of rebuilding the state and putting the country back onto the track of prosperity and growth come tremendous opportunities.

This report, “The Pirates of Somalia: Ending the Threat, Rebuilding a Nation,” shows that it is in the international community’s common interest to find a resolution to Somali piracy, and more generally to help the government of Somalia to rebuild the country. Its findings reinforce the case for action. The costs imposed by Somali pirates on the global economy are so high that international mobilization to eradicate piracy off the Horn of Africa not only has global security benefits, it also makes ample economic sense.

However, Somalia cannot buy its way out of piracy; nor can the international community rely solely on its law enforcement agencies to defeat pirates, whether at sea or on land. As the report shows, the solution to Somali piracy is first and foremost political. Pirates rely on onshore support to conduct negotiations and to secure safe access to coastal territories. In turn, politically powerful figures capture large portions of the profits associated with piracy. Any solution therefore will involve forging a political contract with local stakeholders—a shift in attention, in other words, from the perpetrators to the enablers of piracy.

This report affirms that, beyond its firepower and financial resources, the international community can and should assist Somalia with *generating knowledge*—knowledge of how local power dynamics shape the rules for resource-sharing, how they drive clan and sub-clan relationships, and ultimately how they determine national political stability—to find solutions to the piracy problem. The report exemplifies the value of using rigorous analytical tools to address some of the pressing problems of Africa.



Collectively we have learned from our successes and failures, such as the opium poppy eradication programs in Afghanistan, the oil revenue distribution arrangements in the Niger delta, and the coastal resource management policies in the Philippines. Collectively, we can help the government of the Federal Republic of Somalia to build institutions that crowd in rather than crowd out positive change.

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# ABBREVIATIONS AND ACRONYMS

AIS	Automated Information System
AFCS4	Seychelles Country Management Unit of the Regional Vice-Presidency for Africa
AFRCE	Office of the Chief Economist of the Regional Vice-Presidency for Africa
AFTP2	Poverty Reduction and Economic Management Unit of the Regional Vice-Presidency for Africa
ARS	Alternative Remittance Services
ASWJ	Ahlu Sunna Waljama'a
AMISOM	African Union Mission in Somalia
AU	African Union
BMP	Best Management Practices
CCRA	Constant Relative Risk Aversion
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CTF-151	Combined Maritime Task Forces 151
CGPCS	Contact Group on Piracy off the Coast of Somalia
COMESA	Common Market for Eastern and Southern Africa
COMTRADE	Commodity Trade Statistics Database
DCCTF	Djibouti Code of Conduct Trust Fund
DEC	Development Economics Vice-Presidency
DID	Difference-in-Difference
DPLD	Disruption of Pirate Logistic Dumps
DWT	Dead Weight Tonnage
EAC	East African Community
EAP	East Asia and Pacific
EC DG TRADE	European Commission Directorate General for Trade
ECA	Europe and Central Asia

EEAS	European External Action Service
EEZ	Exclusive Economic Zone
ESA-IO	Eastern and Southern Africa and Indian Ocean
EU	European Union
EUNAVFOR	European Union Naval Force
FATF	Financial Action Task Force
FSNAU	Food Security and Nutrition Analysis Unit
GDP	Gross Domestic Product
GPS	Global Positioning Systems
GSDPM	General Services Department Printing & Multimedia
HHPN	Hobyo-Harardheere Piracy Network
HRA	High Risk Area
HS-6	6-digit Harmonized Commodity Description and Coding System (COMTRADE)
ICU	Islamic Courts Union
IGAD	Intergovernmental Authority on Development
IMB	International Maritime Bureau
IMO	International Maritime Organization
INTERPOL	International Criminal Police Organization
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
ISCs	Information Sharing Centers
ITC	International Trade Center
ITF	International Transport Workers' Federation
K&R	Kidnap and Ransom
LAC	Latin America and Caribbean
LAS	League of Arab States
LLAR	Low level armed robbery
MCH	Major criminal hijack
MENA	Middle East and North Africa
MLAAR	Medium level armed assault and robbery
MSA	Maritime Situational Awareness
MSC HOA	Maritime Security Center Horn of Africa
MV	Motor Vessel
NA	North America
NATO	North Atlantic Treaty Organization
NGOs	Non-Governmental Organizations
NOAA	National Oceanic and Atmospheric Administration
OBP	Oceans Beyond Piracy
OECD	Organisation for Economic Co-operation and Development
OPSFN	Center on Conflict, Security and Development, Nairobi
PIU	Project Implementation Unit
PPN	Puntland Piracy Network
PMPF	Puntland Maritime Police Force

RAPPICC	Regional Anti-Piracy Prosecutions Intelligence Co-ordination Centre
ReCAAP	Regional Cooperation Agreement on Combating Piracy & Armed Robbery against Ships in Asia
RPG	Rocket-Propelled Grenades
SA	South Asia
SADC	Southern African Development Community
SHADE	Shared Awareness and Deconfliction
SSA	Sub-Saharan Africa
SEMG	Somalia and Eritrea Monitoring Group
SNM	Somali National Movement
SUA	Suppression of Unlawful Acts Against the Safety of Maritime Navigation (Convention)
SUV	Sport Utility Vehicle
TFG	Transitional Federal Government
UAV	Unmanned Aerial Vehicle
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNITAR	United Nations Institute for Training and Research
UNOCHA	United Nations Office for the Coordinator of Humanitarian Affairs
UNODC	United Nations Office of Drugs and Crime
UNPOS	United Nations Political Office for Somalia
UNSC	United Nations Security Council
UNWTO	United Nations World Tourism Organization
VDP	Vessel Protection Detachments
WB	World Bank
WFP	World Food Program
YOAP	Youth Organization Against Piracy



## MAP OF SOMALIA



# EXECUTIVE SUMMARY

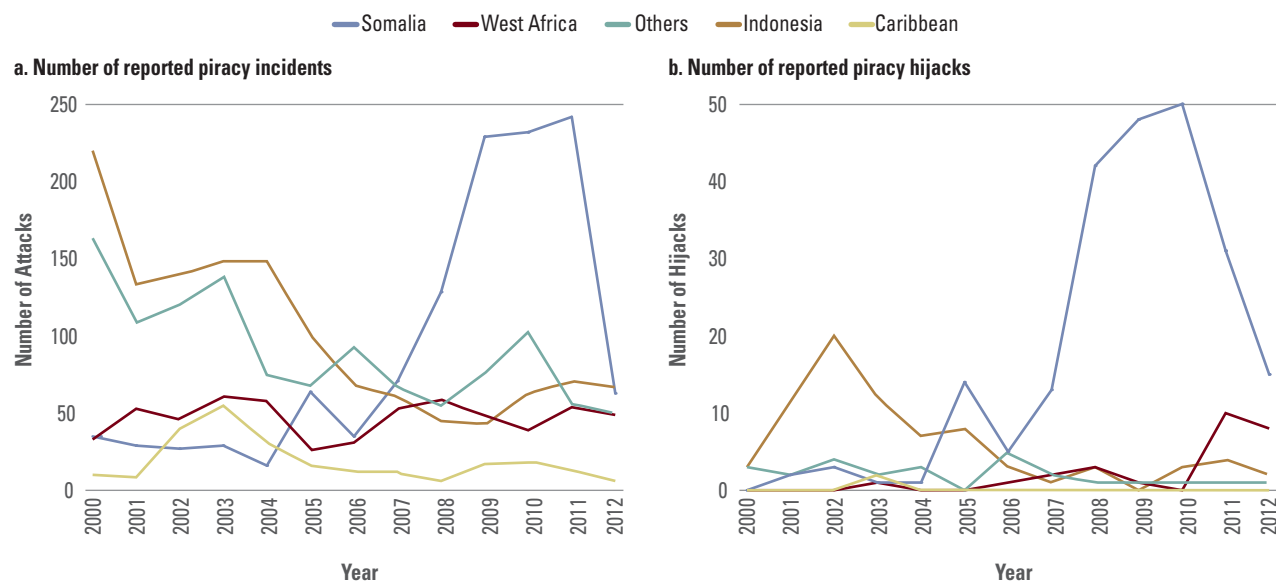
## Context

Somali piracy attacks surged between 2005 and 2011. Although maritime piracy is as old as seaborne trade, and currently pirates also prey on ships in the Straits of Malacca and the waters of Southeast Asia, the Caribbean seas, and the Gulf of Guinea, what is unique about Somali pirates is the high frequency of attacks. Figure 1.a plots the number of reported incidents since 2000 in various regions. Piracy incidents off the coast of Somalia rose dramatically after 2005 and reached a high of 243 in 2011 but then plunged in 2012 to 63 reported attacks and 15 hijackings as of September.

Somali pirates almost exclusively attack vessels to hold cargos and crews hostage and negotiate their release in exchange for ransom. Figure 1.b shows the patterns of hijackings globally since 2005, further illuminating how Somali piracy is unique. Since the first known Somali hijacking in April 2005, 149 ships have reportedly been ransomed for an estimated total of US\$315–US\$385 million. Finally, the large number of Somali incidents is matched by the remarkably wide catchment area, deep into the high seas well beyond Somalia's territorial waters (see Figure 2).

The international community has mobilized to combat the surge of piracy off the Horn of Africa. Over 40 countries are involved in military counter-piracy operations, in a national capacity or through three coalitions: the European Union Naval Force Somalia through Operation Atalanta, the Standing Naval Group of the North Atlantic Treaty Organization (NATO) through Operation Ocean Shield, and Combined Task Force 151. Since 2008, the United Nations (UN) Security Council has adopted 13 resolutions to support counter-piracy action off the Horn of Africa. Beyond the UN, the European Union (EU), the African Union (AU), the League of Arab States, and NATO have all moved to fight piracy off the Horn. The UN Monitoring Group on Somalia was established by a UN Security Council resolution in 2003 to document violations of the arms embargo; its mandate has since expanded to monitoring piracy. The Contact Group on Piracy off the Coast of Somalia was established in 2009, pursuant to UN resolution 1851, to facilitate coordination of the 60 countries and 20 international organizations working to prevent

**FIGURE 1: PIRACY IN NUMBERS**



Sources: IMB 2012; UNODC-WB 2012.

piracy. Several other institutional, national, and regional initiatives, such as the Djibouti Code of Conduct, the Regional Anti-Piracy Prosecutions Intelligence Co-ordination Centre, and the Indian Ocean Commission Anti-Piracy partnership program, complement the international mobilization.

Why another report on Somali piracy, and how can it inform the debate? While the recent drop in pirate attacks has been attributed to counter-piracy policies, whether they will continue to be suppressed is a major question. This study therefore conducted two types of analysis to inform the policy dialogue and shape, or reshape, the debate on prospects for long-term eradication of piracy off the Horn of Africa:

1. It assessed the global human and economic costs and security risks of piracy, thereby quantifying the global benefits of a piracy-free Somalia.
2. It analyzed the piracy business model and the factors that allow it to thrive.

Taken together, the findings constitute the knowledge base for design of policy responses.

## Human, Economic, and Global Security Costs

The scale, geographic scope, and violence of Somali piracy operations have created public concern throughout the world. As many as 3,741 crewmembers of 125 different nationalities have fallen prey to these pirates, with detention periods as long as 1,178 days.

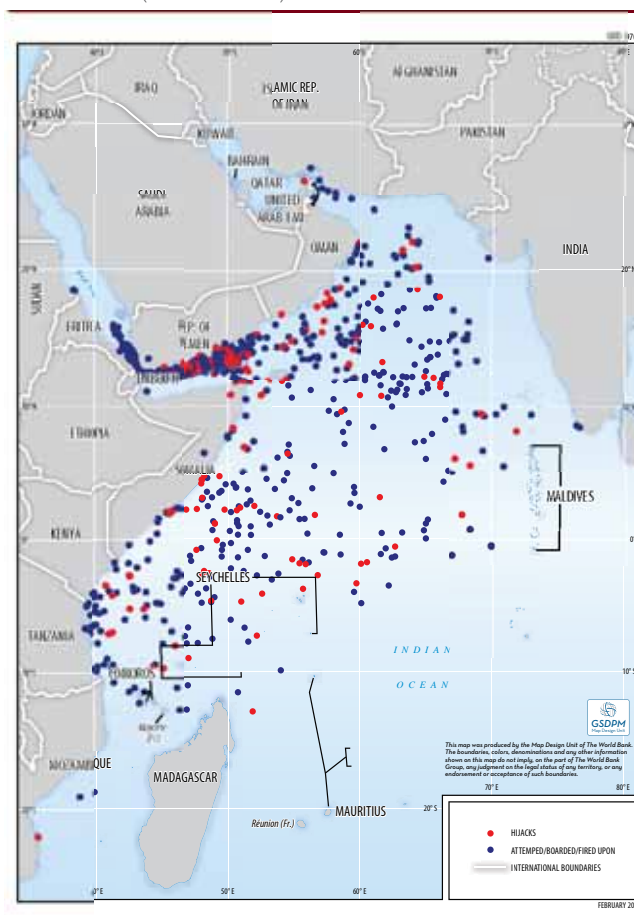
Reportedly, 82 to 97 seafarers have died either during the attacks, in detention after poor treatment, or during rescue operations.

Beyond the human tragedy, although certainly in part because of it, Somali piracy has imposed significant global costs, particularly on nearby economies. Increased insurance premiums, expenditures for on-board security measures, and rerouting or cancellation of shipments are among the many channels through which pirates have affected the world economy. To evaluate the global cost, this report analyzes changes in world trade patterns that coincided with and might be explained by the onset of Somali piracy. Compared to pairs of countries that trade through other sea routes, all other things being equal trading partners for which the shortest shipping route goes through the Arabian Sea saw a drop of 7.4 percent in the value of their yearly trade—the same effect as would result from imposing an additional 1.1 percent ad valorem tax on all shipments through the zone where Somali pirates operate (see Figure 2). Considering Somali piracy as an increased cost of trade translates into an estimated US\$18 billion yearly loss to the world economy—an amount that dwarfs the estimated US\$53 million average annual ransom payment since 2005.

Piracy has not only imposed a hidden tax on world trade generally, it has severely affected the economic activities of neighboring countries. Since 2006 East African countries have seen a marked decline in tourist arrivals and fishing yields. In the booming tourism sector, spending in East Africa since the surge in pirate activities has grown 25 percent more slowly than in other sub-Saharan African countries. The growth slowdown is mostly attributable to fewer visits from citizens of member countries of the Organization for Economic Cooperation and Development (OECD), who are now 8.6 percent less likely to choose East African countries as vacation destinations. Similarly, exports of fish products from piracy-affected countries compared to other regions have dropped by 23.8 percent since 2006, in part due to falling production. Total catches of tuna in the Western Indian Ocean have declined by 26.8 percent as vessels relocated to safer fishing grounds.

The actual and potential links between pirates and Islamist insurgents are another source of global concern. This report evaluates the nexus between pirates and terrorist organizations. While Somali piracy seems unlikely to morph into a politically motivated criminal organization, the analysis does not rule out the possibility of individual initiatives

**FIGURE 2:** REPORTED SOMALI PIRACY INCIDENTS (2000–2012)



Sources: IMB 2012; UNODC–WB 2012.

in that direction. Nonetheless, the potential scope and actual extent of mutually beneficial cooperation between pirates and some members of the Islamist insurgent group al-Shabaab is significant; because it might contribute to instability in Somalia, the possibility of enhanced cooperation between pirates and al-Shabaab is a threat to global security.

## The Business Model of Somali Piracy

The Somali pirate business model relies heavily on onshore support infrastructure to conduct ransom negotiations. Generically a pirate operation consists of armed offshore operations with onshore support that provides shelter for returning pirates and access to markets for stolen goods and for the goods, services, and manpower needed for pirate attacks. Because Somali piracy is largely a hijack-for-ransom enterprise, its onshore operations also require reliable sources of food, water, energy, and especially *khat*—a leafy narcotic—for the militia-

men in charge of guarding hijacked ships throughout the ransom negotiation process. Somali pirates therefore need, explicitly or implicitly, to be granted access to the coast and obtain protection against both national and international law enforcement and competing criminal groups.

The spatial distribution of anchorage locations of hijacked vessels along the Somali shoreline (see Figure 3) reflects the ability of pirates to win support from, among many others, government officials, businessmen, clan elders and members, militia and religious leaders, and members of local communities. In these places, pirates have been able to use a mixture of financial inducements and physical coercion to obtain access to the coast for extended periods of time.

Financial inducements may take the form of an “anchorage” or “development” fee, such as the Islamist insurgent group al-Shabaab charges for use of territory under its control in Central Somalia, or of a bribe paid to a government official in Puntland for not interfering in piracy business. More indirectly, suppliers of food and *khat*, militiamen, and providers who can move and launder ransom proceeds can charge pirates significant markups on their goods and services. Finally, politically powerful local figures capture large portions of the profits through direct involvement in piracy. It is estimated that commanders and instigators in the Somali piracy

**FIGURE 3: ANCHORAGE LOCATIONS OF HIJACKED SHIPS**



Sources: IMB 2012; UNODC-WB 2012.

business split 70 to 86 percent of piracy proceeds with these stakeholders, without the support of whom anchorage of hijacked boats would not be feasible.

Understanding Somali piracy requires acknowledging that the distribution of power among stakeholders is rooted in a long and rich history centered on the clan. Clan and subclan affiliation is a major organizing factor in Somali society. Political power was traditionally vested in clan leaders, yet throughout Somalia's modern history internal and external forces have conspired to challenge their authority. Formal entities, from colonial rulers to the successive national governments and regional administrations, have concentrated power at the expense of local governance institutions; and powerful businessmen, pirates, warlords, and insurgent groups compete with traditional leaders for effective political control. At stake is the distribution of resources—such as the proceeds from piracy. Recognizing the geographical heterogeneity and time variability of these interactions and the central role of clan and subclan affiliations is a prerequisite to explaining why a hijacked ship is anchored in a given place at a given time; it is therefore integral to the design of policies to durably eradicate piracy.

## Reshaping the Policy Dialogue

The dramatic discrepancy between the revenues pirates enjoy and piracy's global cost offers a powerful rationale for the international community to support the administration of the Federal Republic of Somalia.

Current and proposed onshore or offshore policies for curbing Somali piracy are either ineffective or unsustainable. Such onshore interventions as local economic development or law enforcement initiatives aim at discouraging young Somalis from becoming pirates. They do so by increasing the cost of foregoing alternative livelihoods or by promising lengthy prison terms in case of capture. However, the response of the piracy industry will likely be to offer higher compensation so as to neutralize the intended deterrence. This can easily be done without significantly affecting profitability, given how pervasive poverty is in the communities recruits are typically drawn from. And while offshore initiatives such as navy patrols and onboard security are believed to explain why piracy plunged in 2011 and 2012 (see Figure 1), these are only effective as long as they remain in place: they would have to be permanent to prevent any resurgence of piracy. Because of their high cost, in the long run they may simply be unsustainable.

Given the business model of Somali piracy, effective and sustainable interventions over the long term will require shifting focus from the perpetrators to the enablers of piracy. Negotiating an end to piracy with the latter requires that they have a legitimate representative to defend their interests and that they be held accountable to the government and its partners for progress in eradicating piracy. Such representation of a diffuse group of individuals and communities whose interactions with one another go well beyond the realm of piracy implies that *the long-term solution to piracy off the Horn of Africa cannot be dissociated from construction of a Somali state that is viable at both central and local levels*. This report does not advocate a particular structure of federalism or decentralization; it simply opens up the topic for discussion on the basis of new evidence.

As it engages with the government of the Federal Republic of Somalia, the international community should acknowledge the complexity and volatility of local politics. Piracy can thrive in selected safe havens along Somalia's coastline because pirates are able to navigate the local political economy landscape, selectively using financial inducements and physical coercion to create an environment in which to operate that is safe and secure. Similarly, the Somali government and its partners will need to understand the idiosyncratic realities of Somalia's local politics so that they can be addressed with an appropriate mix of development assistance and law enforcement initiatives; these are necessary to change the incentives of stakeholders from condoning to condemning piracy. Recognizing what is needed to overcome local political economy constraints is a prerequisite not only to ending the threat of piracy, but also—and much more fundamentally—to rebuilding the Somali state.



# OVERVIEW AND METHODOLOGY

# 1

The “enemies of all mankind” are still roaming the seas off the Horn of Africa. Since January 2005, pirates from Somalia have carried out 1,068 attacks. Of these, 218 resulted in successful hijackings with abduction of at least 3,741 crewmembers of 125 different nationalities, and payment of US\$315million–US\$385 million in ransoms. Between 82 and 97 non-Somali seafarers are believed to have died in attacks, detention, or rescue operations.

The rise of piracy off the Horn of Africa has mobilized extensive international resistance. More than 40 countries are involved in military counter-piracy operations in a national capacity or through three naval coalitions: the European Union Naval Force Somalia (EUNAVFOR–Atalanta), the Standing Naval Group of the North Atlantic Treaty Organization (NATO) through Operation Ocean Shield, and Combined Task Force 151. The navies have been granted an exceptional right to operate in Somali sovereign waters and coastal land to fight pirates.

Since 2008 the United Nations (UN) Security Council has adopted 13 resolutions related to counter-piracy off the Horn of Africa. Most notably, these have reduced barriers to prosecution by member states, facilitated international cooperation, and highlighted the need to address the underlying causes of Somali piracy. Beyond the UN, the European Union (EU), the African Union (AU), the League of Arab States (LAS), and NATO have all moved to fight piracy off the Horn.

In 2003 the Security Council set up the Monitoring Group on Somalia to investigate violation of the arms embargo; its mandate now also encompasses Somali piracy. In 2009 the UN also established a Contact Group on Piracy off the Coast of Somalia (CGPCS), pursuant to UN resolution 1851, to facilitate coordination of the work of 60 countries and 20 international organizations to prevent piracy. Their work is complemented by other institutional, national, and regional initiatives, such as the Djibouti Code of Conduct, the Regional Anti-Piracy Prosecutions Intelligence Coordination Centre (RAPPICC), and the Indian Ocean Commission Anti-Piracy partnership program.



The central objective of this report is to understand how the piracy industry in Somalia works and why it has flourished practically unfettered, despite international anti-piracy activity, for such a long time. The ultimate goal is to propose policy directions that would help the international community to find a cost-effective long-term solution to a local organized crime problem that has international economic and security repercussions.

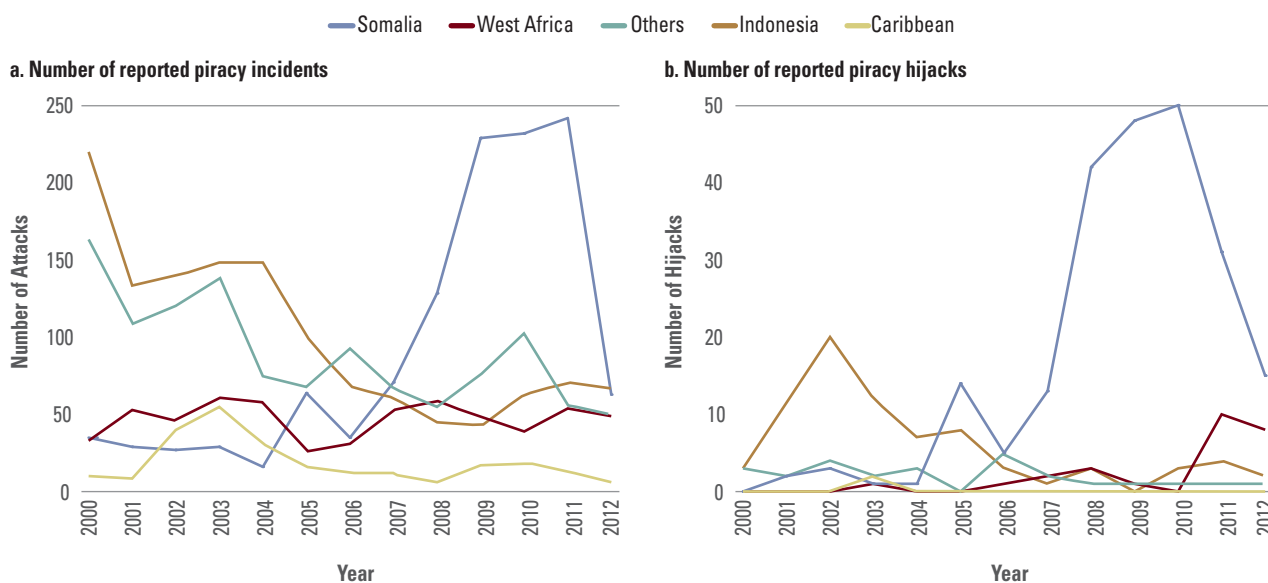
This report has three parts: Part I evaluates the global implications of Somali piracy. To better understand it, and therefore combat it, Part II investigates its core characteristics. Finally, Part III reviews efforts to curb piracy to date and proposes new policy directions.

## Piracy in Numbers

The analysis in the report relies heavily on detailed data collected by the International Maritime Bureau (IMB). The IMB Piracy Reporting Center collects information on maritime incidents across the globe. A wide array of attributes is recorded for each incident, such as location, date, boat, and crewmember characteristics (crew size and member nationalities), boat type, tonnage, and flag as well as the circumstances of the incident. Although not all incidents are reported and the extent of under-reporting may have changed as awareness increased, the IMB has the most comprehensive public database on piracy.

The IMB data suggest that the magnitude and suddenness of Somali piracy set it apart from most other forms of contemporaneous piracy. Somali piracy (see Figure 1.1.a) represented 7.5 percent of attacks reported worldwide in 2002; by 2005 its share had more than tripled to 23 percent, and by 2011 it had reached 55.6 percent. In the last four years, one of every two vessels that reported a piracy-related incident had been attacked off the Horn

**FIGURE 1.1: PIRACY IN NUMBERS (2000–2012)**



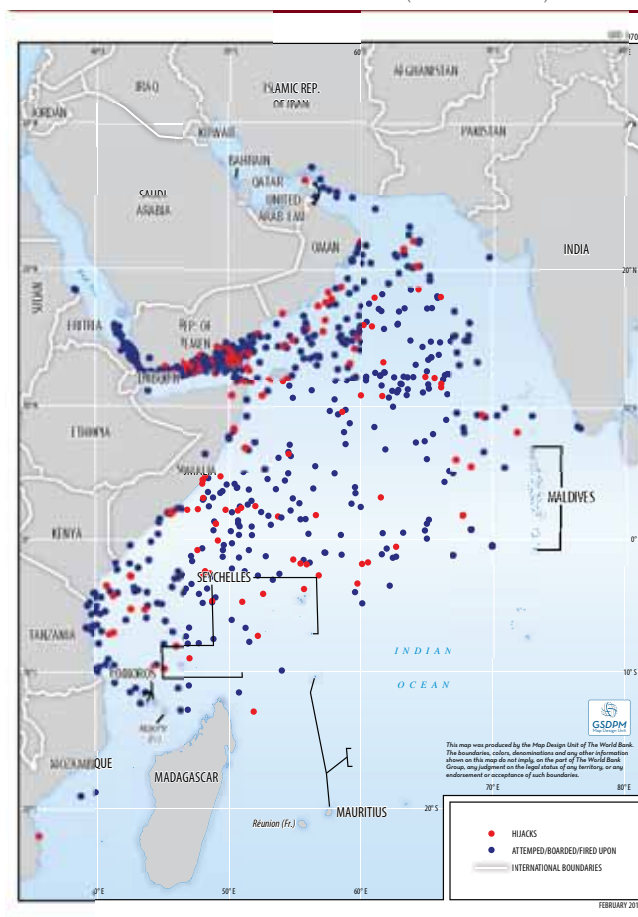
Sources: IMB 2012; UNODC-WB 2012.

of Africa. Over the last decade, no other maritime area, even the Malacca Strait, had suffered so much.

Somalia piracy is distinguished by the speed of its growth. Figure 1.1.a illustrates that between 2006 and 2009, the number of attacks off the Horn reached an average annual growth rate of 87 percent, though it has since stagnated. Meanwhile, the number of successful hijackings in other areas held steady or plunged. The trend for the number of successful hijackings (Figure 1.1.b) tracks the increase in the number of attacks: In 2004 pirates conducted only one successful hijacking off the coast of Somalia; in 2010 there were 50. Attacks in Somalia peaked in 2011, dropping by about 70.1 percent in the first three quarters of 2012; the number of actual hijackings peaked in 2010, dropping by 38 percent in 2011 and by another 51.6 percent in 2012. The slide in attacks after 2011 and hijackings after 2010 has often been attributed to increasing international navy mobilization and growing adoption by the shipping industry of best management practices.

The magnitude of piracy off the coast of Somalia is also noteworthy for the extent of the geographical area affected. Worldwide, most piracy takes place close to shore or in narrow nearby shipping lanes (Murphy 2009). Yet between 2000 and 2011 Somali pirates traveled considerable distances to find prey. Attacks attributed to Somali pirates (both red and blue in Figure 1.2) extend far from land, deep into the western Indian Ocean (in red are attacks that led successfully to hijacking). The pirate hunting ground stretches from the Red Sea to the Gulf of Oman in the north, from the Mozambique Channel to the Maldives in the south, and along Indian territorial waters in the east. In 2007, the farthest pirate attack took place 800 km from Eyl, the original pirate hub on the Somali coast. The distance then extended to 1,410 km in 2008, 2,030 km in 2009, and 3,655 km in 2010 before regressing to 2,200 km in 2011. Elsewhere in the world most incidents of maritime crime occur in major ports and their associated anchorages.

**FIGURE 1.2: LOCATION OF REPORTED SOMALI PIRACY INCIDENTS (2000–2012)**



Sources: IMB 2012; UNODC-WB 2012.

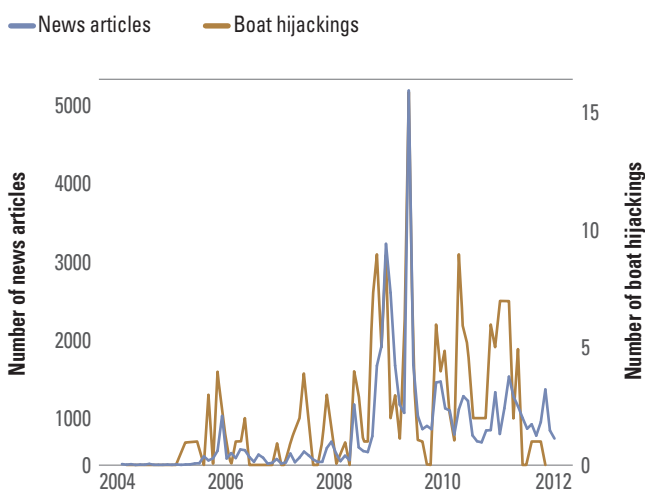
Piracy off the Horn of Africa is remarkable not only for its scale and geographic scope but also for its violence. It is targeted almost exclusively to hijacking a vessel either for ransom or for use as a mother ship from which to launch attacks on other vessels. Ultimately, the business objective of Somali piracy is to exchange the captured crew and cargo for money. As Figure 1.1.B illustrates, between 2005 and 2011 Somali pirates hijacked 80 percent of the vessels seized worldwide. At the peak, 96 percent of worldwide hijackings were taking place off the Horn of Africa. As of May 2012, an estimated 3,741 crewmembers from 125 different nations had become the victims of Somali pirates, with some being detained as long as 1,178 days—more than three years. So far, 82 to 97 seafarers are believed to have died, directly or indirectly, as a result of hijackings (Compass Risk Management 2012; Foreign Affairs Committee 2012; Oceans Beyond Piracy 2012). As for the pirates, the few who ventured to give an estimate put the number of casualties anywhere between 300 and 500.<sup>1</sup> These figures are certainly lower-bound estimates, since none account for those who die at sea without ever engaging in an attack due to rough weather or exhaustion of food or fuel (Oceans Beyond Piracy 2012).

## Part I: A Local Threat with Global Implications

The three chapters in Part I look at the economic consequences of Somali piracy. To assess its economic impact, it was necessary to observe how it has affected trade flows, tourist visits, and fishing yields. All first three chapters had to deal with similar methodological challenges, such as (1) determining the date when Somali piracy became salient to economic actors; (2) identifying countries considered to be “affected by piracy”; and (3) accounting for factors other than piracy that may have had a bearing on the observed outcomes.

The first step is to determine when the surge in Somali piracy began. While pirate attacks off the coast of Somalia go as far back as the 1980s, the first reported hijacking, of the Motor Vessel (MV) *Feisty Gas*, took place in April 2005 (IMB 2012). That date matters to this report for two related reasons: (1) it marks the beginning of the piracy-for-ransom model that is the main cause of economic disruption throughout the globe; and (2) it corresponds to the beginning of international awareness, as reflected in media reports, that piracy is a serious threat. Figure 1.3 plots the number of attacks over time and overlays the number of news articles published in the English-speaking media outlets covered by Factiva between January 2004 and December 2011 that contained the words “Somalia” and “pirates.” Media attention started in earnest in November 2005 with the

**FIGURE 1.3:** SOMALI PIRACY AND MEDIA COVERAGE (2004–2011)



Sources: IMB 2012; Factiva Dow Jones 2012.

release after ransom payment of the MV Panagia and the unsuccessful attack on the luxury cruise liner MV Seabourn Spirit. From then on, press coverage seems to have tracked hijackings closely. For the purpose of assessing its impact, this analysis therefore takes 2006 as the starting point of Somali piracy.

The next step is to identify the Somali pirate catchment area to determine which countries were and are directly affected by piracy. The catchment area has been progressively expanding from close to the Somali shore deep into the southwestern Indian Ocean. This report is not able to exploit that dynamic component, partly because expansion of the catchment area is in part driven by how economic systems adapted to the piracy threat; it therefore defines as the *Affected Region* the countries of Comoros, Djibouti, Kenya, Mozambique, Madagascar, Mauritius, the Seychelles, Somalia, Tanzania, and Yemen in addition to Pakistan and the countries of the Persian Gulf.

Finally, econometric analysis makes it possible to isolate the specific effect of piracy from that of other factors that could also have affected economic outcomes. In particular, the dramatic growth in East Africa—despite the 2007–08 post-election crisis in Kenya, Madagascar’s 2009 political crisis, and the 2008 global financial crisis, soon followed by the 2008–2009 trade collapse—sets the region apart from the rest of the world. Thus, the impact of piracy is less to translate into a drop in economic activity than into relatively slower growth. How much slower? Answering that question is the main methodological challenge that the first three chapters in Part I attempt to address. The crux of the exercise is to identify countries or sectors that can reasonably be considered unaffected by piracy and use those as a benchmark against which the performance of affected countries or sectors is gauged. How robust the measurement of impact is to the choice of benchmark will help assess how confident it is reasonable to be about the proposed cost estimates.

Chapter 2 investigates the likely disruption to trade from, to, or transiting the piracy-affected region. This chapter relies on analysis of bilateral trade data compiled by the UN Commodity Trade Statistics (COMTRADE 2012) database. Compared to pairs of countries that trade through other sea routes, all other things being equal trading partners for which the shortest sea route is through the Affected Region saw the value of their bilateral trade drop by 7.4 percent. This suggests that the impact of piracy on world trade is equivalent to the effect of a hypothetical 1.1 percent ad valorem tax on all bilateral goods traded through the Gulf of Aden. Given that goods worth US\$1.62 trillion transited through the Affected Region in 2010, the global cost of piracy that year is estimated to have been US\$18 billion ( $\pm$ US\$6 billion). If piracy is allowed to continue disrupting global trade, annual costs can be expected to be in the same range.

Next the report zeroes in on two industries that are especially important for countries of the southwestern Indian Ocean: tourism (Chapter 3) and fisheries (Chapter 4). It appears from the UN World Tourism Organization (UNWTO) database on arrivals (UNWTO 2012) that piracy has been discouraging tourists from OECD countries from visiting the Affected Region. Although overall arrivals increased, particularly from other countries in sub-Saharan Africa (SSA), tourism revenues fell because OECD tourists tend to spend more than SSA tourists. The fisheries sector has been similarly disrupted: exports of fish-related products from the Affected Region dropped by about 23.8 percent, partly because,

according to analyses of data from the Indian Ocean Tuna Commission, catches in the southwestern Indian Ocean fell by about 26.8 percent (IOTC 2012).

Chapter 5 discusses whether it is plausible to link piracy and terrorism. Analyzing the history of conflict and cooperation between pirates and Islamic insurgents in Central Somalia, it shows that in recent years benefits from cooperation have risen for both sides, and there is detailed evidence that pirates pay al-Shabaab militias to tolerate ransom operations in Harardheere. However, cooperation has been individual rather than institutional. While cooperation might be closer in the future, transition of pirate activities to maritime terrorism is unlikely. First, since al Shabaab's legitimacy is founded on governing according to Sharia principles, piracy is a problematic source of funding. More importantly, the Somali piracy business model centers on the ability of pirates to anchor ships safely along the coastline, which does not confer a comparative advantage for launching terrorist attacks in the high seas. Nonetheless, successful individual pirates may well use their wealth to finance terrorist activities in Somalia, or anywhere else in the world.

## Part II: Understanding Somali Piracy

To combat piracy based on more comprehensive information, Part II analyzes quantitative and qualitative information from a variety of sources. The IMB (2012) database contains a wealth of data that make it possible to unveil noteworthy statistical patterns concerning attacks and hijackings attributed to Somali pirates. The IMB database was augmented with additional information on ransom payments from the International Maritime Organization (IMO), EUNVAFOR, law firms, law enforcement agencies, and open source data, resulting in the joint UN Office of Drugs and Crime–World Bank dataset on ransom payments to pirates (henceforth UNODC–WB 2012). Information from news articles, policy reports, and scholarly articles was used to document and support the quantitative and qualitative assumptions. Finally, extensive interviews of individuals in Somalia and focus groups conducted in Mogadishu, the capital of Somalia, and Garoowe, the capital of Puntland, support the arguments in this report.

The analytical approach consists of characterizing the combination of “factors of production” that defines Somali piracy. The analysis distinguishes three broad categories that make a piracy operation feasible: manpower, financial resources, and political capital.

*Manpower* is the most visible input. It refers first to crewmembers who sail boats toward their prey, attack and board ships, and redirect captured vessels to the Somali coast for ransom negotiations. There are also pirate militia and others who guard hijacked ships during the negotiations. The time pirate commanders and instigators spend to organize missions and coordinate ransom negotiators and guards is also considered to relate to piracy manpower.

*Money* finances expenditures from the time a pirate crew leaves the shore through keeping the hijacked boat anchored off the Somali shore until its release. From the purchase of motor boats equipped with powerful engines to the procurement of weapons (AK47s and ammunition, rocket-propelled grenades, etc.) and navigation and communication instruments, financial resources contribute decisively to piracy. Investors also finance food, energy, drinking water, and *khat* (a leafy narcotic) for the guards during negotiations.



Finally, *political capital*, though less visible, is a defining feature of Somali piracy. While recruiting crewmembers and mobilizing financial resources for an illegal activity like piracy requires access to networks of would-be pirates and financiers, political capital is instrumental in allowing pirates to anchor hijacked boats for not just months but sometimes years (IMB 2012). The ability to create an enabling environment by inducing officials, militia commanders, religious leaders, members of local communities, clan representatives, and others to condone piracy is the third factor of production in Somali piracy operations.

Manpower, financial resources, and political capital are not necessarily separable. This conceptualization is flexible enough to allow individuals to contribute in many different ways to the piracy business model. For example, commanders who invest their own cash, organize crews and missions, and also sway politicians and local leaders to condone piracy are contributing all three factors at once. Similarly, crewmembers, guards, and militias, because they are often drawn from a powerful clan or other politically influential entity, bring, beyond their labor inputs, political support to the piracy business from their own social networks.

The proposed trichotomy, which defines the business model, makes it possible to assess how market forces and policies affect the sustainability of the piracy business model. The returns to manpower are responsive to market wages, and the returns on cash are responsive to market interest rates. The adopted methodology makes it possible to determine quantitatively the average share of ransom proceeds that end up being paid for each of the three factors of production. This lays the foundation for assessing the effectiveness and sustainability of policies for eradicating Somali piracy by evaluating how much they affect the returns accruing to each factor.

Opening Part II, Chapter 6 combines analysis of IMB (2012) and UNODC–WB (2012) data with qualitative information obtained from open sources and from on-the-ground interviews to produce a description of a typical Somali pirate operation. Acknowledging that pirate operations differ from one another and have over time become ever more sophisticated, the constant and exclusive goal of pirates has been to hijack vessels, cargos, and crews and negotiate their release in exchange for ransom. The analysis documents the formidable growth in attacks since 2005 and its stagnation and drop since 2011, as well as the erosion of the hijacking success rate in recent years as the international community stepped up anti-piracy efforts. Noteworthy patterns emerge: (1) The area of operation expanded after 2005 in response to the counter-piracy measures, the pirates having learned from previous attacks, successful and unsuccessful. (2) The characteristics of the target and the place of attack predict the chance of success; the size of the ship, the nationality of crewmembers, and the number of ships held concomitantly by pirates predicts the ransom amount. Analysis of determinants of ransom amounts makes it possible to impute unknown ransom values and estimate the total amount of ransoms paid as between US\$315 million and US\$385 million.

Chapter 7 defines and identifies Somali piracy's factors of production and estimates returns to each. Manpower, financial resources, and access to land are central to any piracy operation. This chapter highlights the importance of political capital, which is needed to build local stakeholder willingness to provide secure anchorage and supply lines for ships while ransoms are negotiated. The returns on manpower and cash merely exceed the

risk-adjusted market rate because these factors are likely to be in abundant supply. By contrast, only a few anchorages can provide pirates with long-term security and a reliable supply infrastructure, making access to land, acquired by mobilizing political capital, the scarcest factor. Therefore, people with political capital (individuals or groups who can veto pirate use of an anchorage) will capture the residual of ransom payments after labor and capital have been paid a risk-adjusted return. After carefully calibrating the returns to labor and capital that compensate participants for the high risks involved in pirate ventures, it was found that up to 86 percent of ransom proceeds go to remunerate individuals, inside and outside the industry, whose political and social connections allow Somali piracy to thrive.

Chapter 8 delves into the political economy of Somali piracy. The Somali pirate business model is critically dependent on secure and sometimes long-term anchorage for captured ships (IMB 2012). Chapter 8 examines the complex local power dynamics that determine whether pirates can obtain safe and reliable access to these anchorages. It starts with the observation that captured ships are anchored in only a few locations along the Somali shoreline and all those locations are not necessarily always active. It thus postulates the geographical heterogeneity and time variability of stakeholder interactions embedded in a rich history centered on the clan.

## Part III: Reshaping the Policy Dialogue

Finally, the report brings together the findings of Parts I and II. Assessing the global costs of piracy, Part I makes the case for international support for Somali government efforts to eradicate piracy. Part II analyzes the Somali piracy business model and identifies its “bottlenecks”—the areas where policy actions could be most effective and the challenges lying ahead.

Chapter 9 begins Part III with a review of current and proposed policies using the analytical lens presented in Part II. Most policies fall into one of two categories. Some increase the cost to young Somalis of becoming pirate crewmembers by either providing alternative livelihoods or ensuring that those who are captured are prosecuted and imprisoned. Others increase the risk in attacking. Whether navies escort ships or armed guards are more regularly on board, these interventions aim to lower the probability that a pirate attack will become a hijacking, and therefore act as a deterrent in the first place. The first type of intervention at best translates into increased wages for pirates without affecting the profitability of the overall business model. The second, while potentially more effective at curbing piracy and often associated with the plunge in reported incidents in 2012 (SEMG 2012; IMB 2012), is characterized by the need for constant naval pressure and ship-owner investment in on-board security, which raises concerns about its sustainability.

Chapter 10 argues that the dramatic discrepancy between the revenues the pirates enjoy and piracy’s global cost offers a powerful rationale for the international community to support the administration of the Federal Republic of Somalia. It further proposes a paradigm shift in the approach to eradicating Somali piracy. Because the “market” interventions to increase either the opportunity cost of becoming a pirate or the risk of failure of

a pirate operation are either ineffective or unsustainable, the alternative is a *political* resolution targeting the enablers rather than the perpetrators of piracy. The discussion in this chapter is articulated in terms of the need for formalized and accountable local governance institutions and for an incentivized path toward a piracy-free Somalia. Involvement of the international community in support of the new government of the Federal Republic of Somalia can be structured around building partnerships, generating knowledge, and providing finance. The chapter further draws attention to the lessons learned as here reported and how these can be applied.



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## Datasets

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- IMB (2012): International Maritime Bureau Database on Piracy Incidents
- UNODC-WB (2012): Joint UNODC-WB Database on Anchorage Information and Ransom Payments Made to Somali Pirates.

## Notes

1. Lang (2011) cites a UNODC estimate of 200 to 300 pirates not returning home since the emergence of piracy in 2005. For the April 2008 to April 2011 period, Bruxelles2 (2011) estimated the number of casualties at 105, and Oceans Beyond Piracy (2012) estimates at 111 the number of pirates killed for 2011 alone. For 2012 and 2013, 25 pirate deaths have been confirmed (*Guardian* 2012a; *Le Marin* 2012; *Somalia Report* 2012). The number of pirate deaths, however, is likely to be under-reported since navies or coalition forces no longer communicate their statistics and private guards operate in a legal vacuum with no rule of engagement against pirates (*Guardian* 2012b) and no obligation to report incidents they engage in (Liss 2012).



PART I:  
A LOCAL THREAT WITH  
GLOBAL IMPLICATIONS



# A SIGNIFICANT “TAX” ON WORLD TRADE

# 2

## Introduction

This chapter assesses the impact of Somali piracy on global trade.<sup>1</sup> Somali piracy is unusually disruptive because it takes place in a region that is systemically important for world trade, an estimated 8 percent of which passes through the Suez Canal alone (*Economist* 2011).

Econometric techniques were used to isolate the specific impact of piracy on trade. In essence, how trade flows have evolved since the onset of piracy in 2006 were compared along sea routes affected by piracy and those not affected. The first step was to identify which routes are affected. To do so, detailed data were collected on port-to-port shipping distances between every possible pair of countries in the world; each pair was then tagged according to whether the shortest route goes through the Affected Region. The impact of piracy on international trade volumes was then estimated using the theoretically founded gravity framework, which provides a good empirical model of bilateral trade. The objective is to net out the impact of all other determinants of trade to zero in on the impact of piracy alone. In other words, if trade is still affected after accounting for all other possible factors (such as country income or geographic variables), the change can reasonably be attributed to piracy.

The main finding is that piracy imposes a distortion on trade that has a high absolute cost. When the shortest shipping route between two countries is through piracy-infected waters, the additional cost of trade between them is equivalent to an increase of 0.75 to 1.49 percentage points (with a mean estimate of about 1.1) in total ad valorem trade costs. In absolute terms, the impact is large: since about US\$1.62 trillion in global trade traveled along routes affected by piracy in 2010, that year Somali piracy cost the global economy an estimated US\$18 billion, with a margin of error of roughly US\$6 billion. If piracy continues to disrupt global trade as it has done, similar amounts will be lost every year.

These estimates are in line with the few other attempts made to cost the impact of Somali piracy. Oceans Beyond Piracy (2012) has undertaken to measure the costs of piracy

directly by adding up ransoms, insurance, the cost of private security, added costs due to re-routing or increased speed, and a variety of other possible costs. Its estimate of the cost of Somali piracy in 2010 was US\$7–US\$12 billion—on the same order of magnitude as the values obtained here using a very different methodology. The main merit of the *Oceans Beyond Piracy* (2012) study is that it breaks out the costs. The drawback is that by perhaps leaving out some cost factors, it may be underestimating the total burden of piracy. For instance, any substitution from sea to air would not be captured in its direct estimates. This study infers the impact of piracy by analyzing how much trade flows changed along piracy-affected routes relative to an appropriate comparison group in order to estimate how much trade costs must have increased to account for the observed change. This approach is less intuitive but more comprehensive because it captures all piracy-related costs, not just those that can be measured directly.

Other studies arrive at similar orders of magnitude. Using dry bulk shipping contracts Besley, Fetzer, and Mueller (2012) calculated that Somali piracy caused about an 8 percent increase in shipping costs and a welfare loss due to those higher costs of US\$0.9–US\$3.6 billion. Again, although this approach has the advantage of directly observing shipping costs, it runs the risk of missing important aspects of how piracy affects trade overall (see below). Martínez-Zarzoso and Bensassi (2011a, b) found that for each additional 10 ships hijacked, trade volumes fall 11 percent, and a single additional hijacked ship increases maritime shipping costs by 1.2 percent. The two papers consider only Europe–Asia trade and thus do not exploit the differences between affected and unaffected routes at a given point to estimate the effect. Though their results are not directly comparable to the results reported here, they also found a definite disruption of world trade.

## Sea Shipping Lanes: Defining Exposure to Piracy

To begin, for this study comprehensive data were collected on (i) bilateral trade flows between each pair of countries in the world, for each year (COMTRADE 2012); (ii) geographical variables for distance between them and common borders (CEPII 2012); and (iii) measures for whether shipping routes for each pair have been affected by piracy. The analysis covers 2000–10. There are 150 countries in the baseline analysis. The first two categories are standard. The third category was constructed by collecting sailing distances between the principal ports in each country via different routes.<sup>2</sup> For each pair of countries it was asked whether the shortest water route between them passes through the Affected Region. If so, trade between them is likely to be affected by piracy.

Although trade with East African countries is obviously affected, disruption has a far wider range. Consider the options for sailing from Liverpool in the U.K. to Mombasa in Kenya. The shortest route, 6,363 nautical miles, is via Gibraltar and the Suez Canal, which exposes the shipment to piracy risk. The next best alternative is to sail around the Cape of Good Hope, but at 8,981 nautical miles this route is far longer (see Figure 2.1.a). Countries need not be anywhere near the Horn of Africa, as Kenya is, for Somali piracy to affect their shipping routes. Figure 2.1.b shows two routes between Marseille, France, and Sydney, Australia. The route through the Suez Canal is 10,381 nautical miles; at 12,217

**FIGURE 2.1: SHIPPING ROUTE EXAMPLES**

a. Liverpool, UK, to Mombasa, Kenya



b. Marseille, France to Sydney, Australia





nautical miles, the route through Gibraltar and the Cape of Good Hope is nearly 20 percent longer.

Simulations were run using three different definitions of a piracy-affected route. Since estimating the extent to which trade between two countries is affected is inherently difficult (both the difference in distance between the first and second best routes and the exact geographic reach of pirates are debatable), the robustness of the impact assessments was checked in terms of the definition used. The rationale for using a three-tiered classification is that it is simply not possible to know the precise reach of piracy in terms of impact on trade flows. Does it affect only trade shipments originating or terminating in the affected region? Does it affect all trade transiting through seas in which pirates are active? Or is its impact even broader, affecting trade flows that pass through the outer fringes of the area where pirate attacks are possible? In any case, of course, all three definitions are conjectural, and no single one is clearly correct for identifying the true impact of piracy.

In the *narrow* definition, a route was classified as piracy-affected if it passes through the Gulf of Aden, the Red Sea, or the Eastern half of the Arabian Sea—the area where attacks have actually taken place (see Figure 1.2). With this definition, for example, the route from Liverpool to Mombasa through the Suez Canal is classified as affected and the route around the Cape of Good Hope as unaffected (see Figure 2.1.a). Similarly, shipments from the Persian Gulf to Europe through the Suez Canal are classified as affected but from the Persian Gulf to Asia along the coast of India are unaffected. The *wide* definition expands the set of potentially affected routes to cover passage through the Arabian Sea and shipments from East Africa south. In this case all the shipping routes in and out of East Africa, the Persian Gulf, Pakistan, and the western coast of India are affected, as are shipments to or from the Maldives. The wide definition hypothesizes that even a slight chance of pirate attack changes the behavior of traders and explicitly or implicitly increases the costs of shipping. Thus the shipment from Mombasa to Liverpool would be affected even if it is routed around the Cape of Good Hope. However, the shipment from Marseille to Sydney that sails around the Cape of Good Hope is still unaffected because it passes much farther from the Affected Region.

Because affected countries experience the effect of piracy to varying degrees, a *very narrow* definition was also constructed. Since the shortest shipping routes between any country in Europe and in Asia or Australia go through the Suez Canal, all Europe-Asia and Europe-Australia country pairs will be coded as affected by piracy. However, the impact on UK-Australia trade is likely to be muted compared to the effect on the trade of countries in the immediate vicinity of the Affected Region, such as East Africa and the Persian Gulf. This might be because such trade flows, like those from Europe to Australia, are easier to reroute through the Atlantic or the Pacific. Or it may be that these flows tend to occur between countries with considerably higher incomes than those in the Affected Region—countries more likely to be able to afford insurance, armed protection, or a change to air shipping. To zero in on countries that would face the greatest difficulty in overcoming the threat of piracy to their trade, the very narrow definition considers as piracy-affected only shipping routes in and out of East Africa, the Persian Gulf, the western coast of India, and Pakistan. Thus, Europe-Asia and Europe-Australia shipping are assumed to be unaffected.

A relatively small share of world trade can be considered affected. Table 2.1 shows the share of world trade for 2000–10 that traveled through piracy-affected routes. To be precise, these are shares of trade between countries for whom the shortest sea shipping route passes through the piracy-affected region. Because some goods are shipped by air, and perhaps some sea trade goes by a longer route, not all actual trade between those country pairs literally risks being hijacked.

Unfortunately, there is no information for many countries on how much trade is air-borne, and even less on the routes sea trade actually takes. However, appropriate estimation of the global cost of piracy does require looking at total trade irrespective of the mode of transport or the actual route. Among mechanisms through which piracy may affect world trade, rerouting and switches in mode from sea to road or air are two adaptation strategies international shipping companies might opt for. Thus, restricting an impact evaluation analysis to seaborne trade would only *over-estimate* the global cost of piracy, since it would not account for change in transportation mode. Alternatively, shipments that did not transit through the Affected Region in the first place might now face congestion and higher prices because of piracy-induced displacement of shipments to their usual routes or shipping modes. Neglecting that potential mechanism by only looking at seaborne trade would then *under-estimate* the global cost of piracy. The proposed methodology therefore measures the actual impact of piracy on world trade but does not make it possible to identify the mechanisms at work.

According to the narrow definition, 11.2 percent of world trade took place between country pairs affected by piracy. Expanding the affected area using the wide definition, the trade affected rises to 15.2 percent. However, under the very narrow definition, only 1.4 percent is affected. The bulk of world trade occurs within regions entirely unaffected by piracy. To illustrate this, the world was divided into five regions based on the geography of piracy and sea shipping, rather than the usual division by continent. Thus, the Affected Region, comprised of the Persian Gulf and East Africa, India, Pakistan, and the Maldives in South Asia, is considered separately from the rest of sub-Saharan Africa (SSA), which given similarities in location and levels of development is used as a rough comparison group although it has much less exposure to Somali piracy. The other three regions are Europe and the Mediterranean, Asia and Australia, and the Americas. Table 2.2 shows the shares of world trade between these five regions, with importing regions shown vertically and exporting horizontally. Table 2.2 shows clearly why Somali piracy affects only a small minority of world trade. Trade within the Europe and Mediterranean region alone accounts for 28 percent of total world trade, trade within Asia–Australia another 17 percent, and trade within the Americas 11.6 percent—all completely unaffected by piracy. The Affected Region accounts for only 2.5 percent of world imports and 4.6 percent of exports. (Since many of the world’s main oil exporters are in the Affected Region, it runs a large surplus in goods trade.)

**TABLE 2.1:** SHARE OF WORLD TRADE AFFECTED BY PIRACY (PERCENT)

Definition of Affected	
Narrow	11.2
Wide	15.2
Very narrow	1.4

Source: COMTRADE 2012.

**TABLE 2.2:** SHARES OF WORLD TRADE, BY REGION (PERCENT)

		Exporter					Total
		Affected Region	Rest of SSA	Americas	Asia/Australia	Europe-Mediterranean	
Importer	Affected Region	0.40	0.04	0.30	0.90	0.80	2.50
	Rest of SSA	0.10	0.10	0.10	0.30	0.40	1.00
	Americas	0.60	0.50	11.60	8.40	5.20	26.30
	Asia/Australia	2.80	0.50	4.20	17.00	4.10	28.50
	Europe-Mediterranean	0.80	0.60	4.20	6.40	28.20	40.10
	Total	4.60	1.70	20.50	32.80	38.70	

Source: COMTRADE 2012.

Note: SSA = Sub-Saharan Africa.

Trade within regions is impacted to varying extents but most heavily in the Affected Region. Table 2.3 shows the share of trade that goes through piracy-affected routes (narrow definition) for each region pair; that applies, for instance, to 19.8 percent of trade within the Affected Region. This value is relatively low because it is assumed that piracy does not affect trade between countries sharing a border (e.g., Kenya and Tanzania) or within the Persian Gulf (e.g., between U.A.E. to Pakistan). Some individual region pairs are much more affected. For instance, 95.3 percent of Asian and Australian exports to Europe and the Mediterranean are affected by piracy, and 89.6 percent of shipments in the other direction.

The piracy effect is also much more intense between countries in the Affected Region because the second best routes are significantly longer than the best. The difference between the longest shipping route to and from Kenya that avoids piracy-affected waters and the shortest route, for instance, is likely to be much longer than the second-longest shipping route between Europe and Australia. To capture the intensity with which trade is

**TABLE 2.3:** SHARES OF TRADE AFFECTED BY PIRACY, BY REGION (PERCENT)

		Exporter					Total
		Affected Region	Rest of SSA	Americas	Asia/Australia	Europe-Mediterranean	
Importer	Affected Region	19.80	9.50	13.30	12.50	61.80	30.60
	Rest of SSA	11.30	0.00	0.00	7.50	1.90	3.70
	Americas	4.00	0.00	0.00	0.10	0.00	0.10
	Asia/Australia	4.30	9.70	0.60	0.00	89.60	13.50
	Europe-Mediterranean	57.60	2.70	0.00	95.30	0.00	16.20
	Total	14.70	4.00	0.30	18.90	10.80	

Source: COMTRADE 2012.

Note: SSA = Sub-Saharan Africa.

**TABLE 2.4:** PROPORTIONAL INCREASE IN SHIPPING DISTANCE TO AVOID PIRACY, BY REGION

		Exporter					Total
		Affected Region	Rest of SSA	Americas	Asia/Australia	Europe-Mediterranean	
Importer	Affected Region	1.52	1.16	1.07	1.33	1.63	1.42
	Rest of SSA	1.18	1.00	1.00	1.05	1.01	1.03
	Americas	1.02	1.00	1.00	1.00	1.00	1.00
	Asia/Australia	1.11	1.09	1.00	1.00	1.32	1.06
	Europe-Mediterranean	1.63	1.01	1.00	1.35	1.00	1.07
	Total	1.22	1.03	1.00	1.08	1.05	

Source: COMTRADE 2012.

Note: SSA = Sub-Saharan Africa.

affected—not just *whether* it is—an additional indicator was constructed for how costly the alternative route is, and the proportional difference in shipping distance between the best and second-best routes was computed. Because a shipment from Liverpool to Mombasa (see Figure 2.1) would travel 6,363 nautical miles through the Suez Canal but 8,981 nautical miles around the Cape of Good Hope, the gross proportional increase in distance is 41 percent ( $8,981/6,363 = 1.41$ ). By contrast, the proportional increase in shipping distance between Marseille and Sydney that avoids the Suez Canal is only 18 percent ( $12,217/10,381 = 1.18$ ). (For routes completely unaffected by piracy, the shortest sea distance and the shortest route avoiding piracy are the same, so the ratio is 1.)

Factoring in intensity of disruption to trade and the volumes concerned, the largest effect is observed for trade between the Affected Region and the Europe and Mediterranean region. Table 2.4 shows the trade-weighted increase in the shipping distance for each pair of regions. For instance, within the Affected Region, sea shipments would need to travel 51.6 percent farther to avoid piracy-affected routes. The trade-weighted increase in shipping distance is 42.2 percent for the Affected Region's imports and 21.9 percent for its exports; since these are by a sizable margin by far the largest numbers for all regions, the Affected Region is suffering the most.

Because the Affected Region is one of the poorest in the world, Somali piracy disproportionately affects low-income countries. Table 2.5 reports the shares of trade affected by piracy by income group rather than region, using World Bank income group definitions. Both imports and exports of low-income countries are most affected by piracy, with about

**TABLE 2.5:** SHARES OF TRADE AFFECTED BY PIRACY, BY INCOME GROUP (PERCENT)

	High Income	Low Income	Lower-middle Income	Upper-middle Income
Exports from	10.30	25.40	15.50	4.10
Imports to	11.10	22.40	12.10	6.00

Source: COMTRADE 2012.

**TABLE 2.6:** PROPORTIONAL INCREASE IN SHIPPING DISTANCE TO AVOID PIRACY, BY INCOME GROUP

	High Income	Low Income	Lower-middle Income	Upper-middle Income
Exports from	1.041	1.260	1.080	1.027
Imports to	1.044	1.271	1.082	1.036

Source: COMTRADE 2012.

25 percent of trade classified as affected. Only about 10 percent of trade in high-income countries is affected. The same picture emerges for intensity. Table 2.6 shows that for low-income countries, the piracy-unaffected route is 26–27 percent longer, by far the highest percentage among income groups.

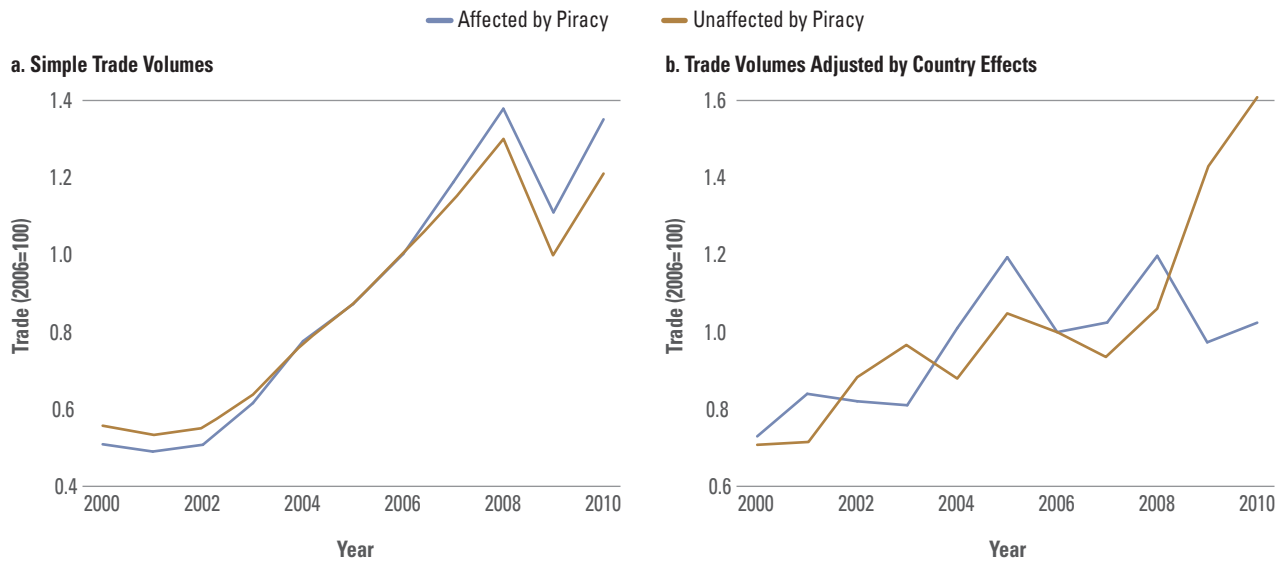
## Estimating the Cost of Somali Piracy: A US\$18 Billion Question?

Piracy off the Horn of Africa has coincided with a fast rise in trade, but that is not the whole story. To determine whether trade flows adjusted as a response of piracy, the behavior of trade between countries affected by piracy was compared to trends in unaffected areas, using the narrow definition of piracy's effect. Figure 2.2.a plots the evolution of total trade on affected and unaffected routes relative to a 2006 index number. It is not immediately obvious that piracy has had any effect, since trade flows grew faster along the affected routes than along unaffected ones. However, this simple analysis clearly confounds the impact of piracy per se with a host of other factors, including economic conditions in affected countries and their trading partners. Many of the countries in the Affected Region experienced economic booms during the same period the pirates have been active, so that if there were no piracy, trade volumes might have been much larger. Thus, it is not possible to simply compare trade in and out of affected countries with trade elsewhere in the world.

Once confounding factors are netted out, it is clear that piracy has a significant distortive effect on trade. To isolate its specific impact, the effect of country trends in import demand and supply was netted out. Figure 2.2.b plots the share of trade volumes that is not explained by import demand and supply changes in the trading countries.<sup>3</sup> Once each country's growth trends are accounted for, it is obvious that trade has grown less in piracy-affected routes. To clarify why Figures 2.2.a and 2.2.b are so different, suppose that piracy-affected and unaffected economies differ from each other in two ways:

1. Economic growth in piracy-affected countries is much faster over a given period (gross domestic product [GDP] growth rates are 5 percent higher than in unaffected countries). If growth translates one-for-one into import demand, demand grows 5 percent faster in piracy-affected countries than in the slower-growing rest of the world.
2. If piracy translates into higher trade costs in affected countries, leading to a 3 percent drop in trade, trade still grows faster in those countries than in the rest of the world (5 percent – 3 percent = 2 percent).

**FIGURE 2.2:** INTERNATIONAL TRADE, AFFECTED AND UNAFFECTED ROUTES (2006 = 100)

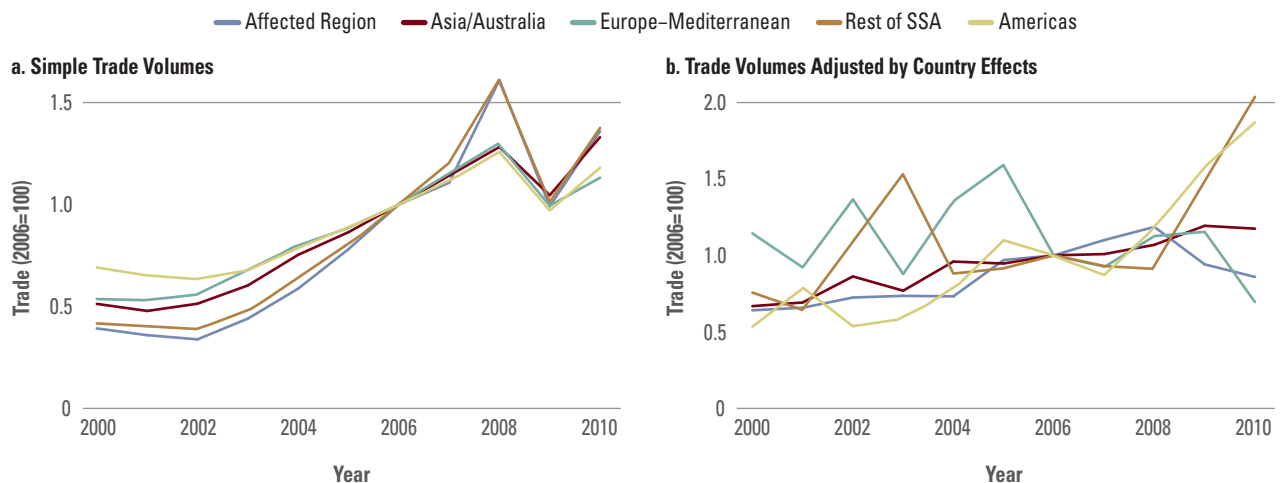


Source: COMTRADE 2012.

Clearly, positive growth does not mean that piracy had no effect, much less a positive one. The negative impact of piracy is simply masked by the positive effect of unrelated trends. Figure 2.2.b sets aside these unrelated trends, and the more sensible result is that piracy hurt trade volumes.

Compared with other regions, the Affected Region has experienced both the highest increase in trade and the steepest negative effect of piracy. Figure 2.3.a depicts trends in

**FIGURE 2.3:** TRADE VOLUMES BY REGION (2006 = 100)



Source: COMTRADE 2012.

exports from various regions, each normalized as an index number relative to 2006. The Affected Region has shown the fastest growth in trade since 2006. A similar boom has occurred in the rest of SSA. Growth has been slower in Asia/Australia, Europe/Mediterranean, and the Americas. However, once the effects of importer and exporter growth are accounted for, as Figure 2.3.b shows clearly, the Affected Region had much slower export growth. This is especially evident when contrasted to the rest of SSA, the most natural comparison group. Once country conditions are accounted for, the rest of SSA shows a clearly higher upward trend than the Affected Region's.

While the onset of piracy is here set as 2006, the major divergence between the Affected Region and the rest of SSA took place in 2008–10. Not surprisingly, 2008 corresponds to a surge in piracy-related incidents off the coast of Somalia (see, e.g., Figure 1.1), which brought increased international awareness and adoption by shippers of best management practices (see Chapter 9 for detailed counter-piracy measures).

A gravity relationship model was used to net out confounding factors beyond piracy and convert total piracy-related costs into a single metric. The full cost of piracy in terms of trade distortions can be estimated by calculating the increase in the ad valorem trade cost that would have generated a reduction similar to that seen along the affected routes. The advantage is that with this approach it is possible to pick up the total impact of changes in *all* types of trade costs: direct shipping costs, insurance, private security, rerouting to other sea routes or air shipping, and so on. The disadvantage is that the trade costs are inferred rather than directly observed, and thus it is not possible to disentangle them from each other. For instance, it might be that for country pairs for which rerouting is not too costly, the increased cost will be borne by taking longer routes, whereas for country pairs for which rerouting is impractical, the extra cost consists of higher insurance premiums. Also, *Oceans Beyond Piracy* (2012) argues that the costs of rerouting and increased speeds vary by type of ship (tanker, bulk carrier, or container carrier).

The gravity relationship model decomposes trade flows between pairs of countries using a handful of variables. While detailed technical discussion of the model is left to Annex 2.A, the main thrust of the approach is that though traditionally trade was explained by importer GDP, exporter GDP, and bilateral variables meant to proxy for trade costs, such as distance between countries, or whether the countries share a common border, as an empirical model the gravity relationship is remarkably successful in explaining more than two-thirds of the variation in trade flows with just three variables: the GDP of each country plus the distance between them. Thus, the modern version of the gravity relationship is used as the workhorse model to estimate the impact on trade flows of a variety of phenomena. As with Figures 2.2 and 2.3, the intent is to explain bilateral international trade flows over time as a function of conditions in the importing and the exporting country plus such proxies for trade costs as distance from each other. Once the traditional variables have been given a chance to explain trade flows, the question becomes whether piracy has contributed to changes in flows.

Piracy is seen to have a clear and sizable effect on trade flows. Tracking flows between 150 countries for 2000–10 and using the data on shipping routes described earlier, country pairs were classified as affected or unaffected by piracy and it was assumed that piracy began to affect trade flows in 2006. The procedure showed unambiguously that trade



volumes were lower between pairs of countries whose trade is affected by piracy from 2006 through 2010. Using the narrow definition, the loss in volume was about 7.4 percent. The conceptual framework and the estimation equation are formally laid out in Annex 2.A, which also contains tables of results and robustness checks.

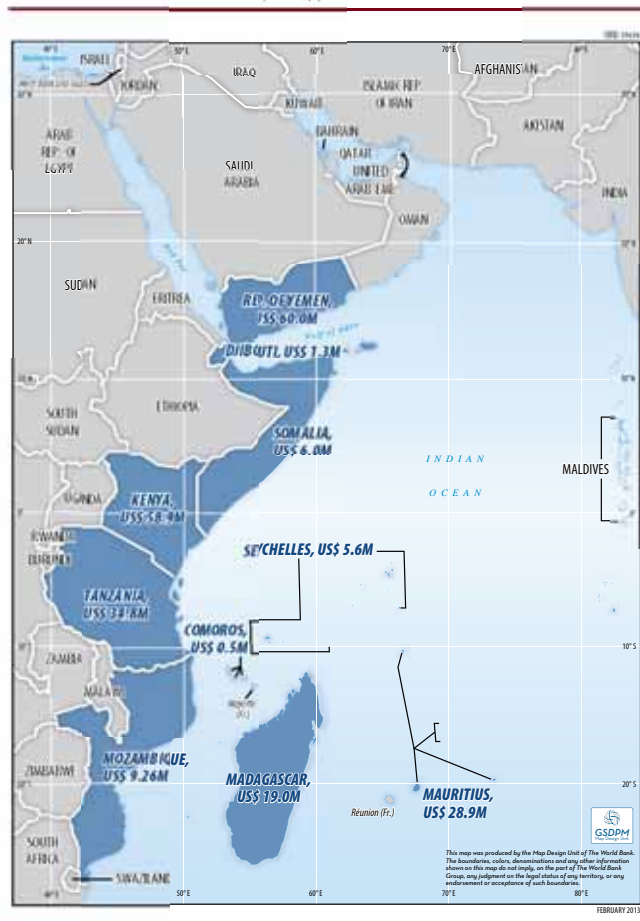
From these estimates it is possible to infer the total absolute cost of Somali piracy borne by the trading countries. The estimates state directly only how much trade *flows* fell in response to piracy, not how much the trade *costs* to countries rose, but they do make it possible to infer the latter by making an assumption about how trade flows respond to trade costs (formally, the elasticity of trade flows to trade costs). As a guide for what that value should be, from the range of values suggested in the literature (see, among many others, Anderson and van Wincoop 2004) it appears that a 7.4 percent fall in trade corresponds to a 0.74–1.49 percent increase in trade costs, with an average of 1.1 percent. This approach thus reveals what *must have been* the total increase in trade costs that is related to the observed drop in trade flows. An alternative is to interpret this result as the equivalent of an ad valorem tariff. The estimates imply that piracy reduced trade flows by as much as would a 0.74–1.49 percent ad valorem tariff imposed on all trade potentially affected by piracy. As a comparison, OECD (2006) reports that trade-weighted average import tariffs on manufacturing products are about 4 percent among high-income countries and about 13 percent in the least-developed countries, such as most of those in the Affected Region.

In 2010 some US\$1.62 trillion in global trade occurred between pairs of countries for which the shortest sea route is through the piracy-affected area. It is therefore possible to conclude that the piracy-related costs borne by the world were between US\$12 and US\$24 billion, with an average of US\$18 billion. This is an estimate of the yearly cost of piracy; as long as the impact of piracy is felt at the same magnitude (0.74–1.49 percent higher trade costs along affected routes), the dollar cost of piracy in a given year will be the same percentage of the total volume of trade along affected routes, but would change with both trade volumes and the estimated impact of piracy on trade costs as those change over time.

This number is larger than alternative estimates in part because it measures the encompassing effect of piracy on world trade, while the approaches used by other studies, though more direct, are narrower in scope. Two studies that provide a cost estimate are Oceans Beyond Piracy (2012) and Besley, Fetzer, and Mueller (2012). Although the former can highlight precise mechanisms through which piracy affects the world economy, it ignores possible changes in transportation modes that can also affect airborne and land-based trade. Although these estimates, like others, are inherently imprecise and accompanied by non-negligible margins of error, it is reassuring that the estimates proposed here and by the Oceans Beyond Piracy (2012) are of the same order of magnitude. Besley, Fetzer and Mueller (2012), on the other hand, estimate not the overall cost of piracy but rather the effect of the increase in the frequency of monthly attacks from 2.8 before May 2008 to 17.1 after. Thus, it is narrower, computing just the marginal effect post-May 2008. These authors also assume that the rise in trade costs due to piracy is fully reflected in shipping costs (the directly measured outcome variable), whereas shipping represents only a small share of total trade costs (Anderson and van Wincoop 2004). Moreover, Besley, Fetzer, and Mueller (2012) estimate the increase in shipping costs per ton (not the value) of *dry bulk* cargo, and



**FIGURE 2.4: ESTIMATED ANNUAL COST OF PIRACY (US\$)**



Source: COMTRADE 2012.

then compute the increase in total shipping costs by applying that estimate to the total tonnage passing through the affected region. However, dry bulk is only one-third of global sea shipping, and it is not clear whether the non-dry bulk two-thirds saw a larger or smaller increase in shipping costs. While dollar cost per tonnage may be the right metric for dry bulk, it is likely to be less so for such shipping types as container, for which the value of what is being shipped is likely to matter much more than the tonnage. In addition, like *Oceans Beyond Piracy* (2012), Besley, Fetzer, and Mueller (2012) use observed shipping tonnage by sea as the base for the calculation, which does not capture substitution of airborne shipping.

The estimated cost of piracy indicates that the perceived cost of falling into the hands of pirates is high. The actual probability of being hijacked for ships travelling in the troubled waters is believed to be between 1/750 and 1/1,100, based on estimates by Mejia Jr., Cariou, and Wolff (2009), Newsome (2009), and Psarros et al. (2011). With an average ransom for shipping vessels of about US\$3.3 million (see Chapter 6 for details) and foregone revenues of a detained ship no higher than US\$2.5 million, shipping companies also factor in the cost associated with potential crewmember loss of life. While putting a price tag on such a loss is inherently arbitrary, this research relied on the “value

of statistical life” concept (see, for example, Viscusi and Aldy, 2003) and estimated that cost to be about US\$2 million.<sup>4</sup> Totaled, the three costs imply that on average each hijacking costs the ship owner about US\$7.8 million. The fact that shipping companies are willing to pay 1.1 percent more to avoid an event that happens with less than 0.1 percent probability and would cost only about US\$7.8 million suggests there is a very large psychological cost associated with the prospect of long detentions and uncertain outcomes.

The cost implications for countries in the Affected Region depend on how much they rely on international trade. What does a 1.1 percent increase in trade costs mean for those countries? For each country in the Affected Region for which data are available, Figure 2.4 shows the average yearly loss to piracy due to increased trade costs. These numbers are obtained by applying a 1.1 percent cost to *affected* trade. For island countries like the Seychelles, Comoros, Madagascar, or Mauritius, that would mean *all* trade. On the other hand, for Kenya it would exclude trade with Tanzania, Ethiopia, Somalia, and landlocked

bordering countries, such as Uganda and Rwanda. While there might be some maritime trade between, say, Kenya and Tanzania, a land border implies an easy shift to land shipping in response to the piracy threat, and thus trade between adjacent countries is classified as unaffected. To estimate these numbers, it was also assumed that the increased costs of trading with countries in the Affected Region are shared equally by those countries and their trade partners. For Somalia, since COMTRADE (2012) does not report data on imports, information on Somali trade is obtained from CIA (2012), ITC (2012), and EC DG TRADE (2012). These sources estimate that for 2006–10 average total trade varies from US\$1,040 million to US\$1,565 million. This implies that piracy costs Somali trade between US\$4.16–US\$6.96 million every year of that period, with a median cost of US\$6.0 million.

Note that these numbers include only economic losses stemming from increased costs of trading goods. Losses to tourism and fisheries, which are not accounted for, are analyzed separately in Chapters 3 and 4.

## Conclusion

Somali piracy has rattled shipping around the Horn of Africa. Because a significant share of global trade flows passes through the Affected Region, piracy there is a major force disrupting world trade. This chapter combines comprehensive data on worldwide trade flows for 2000–10 with a novel dataset of shipping distances between pairs of countries to examine econometrically the impact of piracy on trade flows. Piracy risk represents the equivalent of about a 1 percent ad valorem rise in trade costs. Because more than US\$1 trillion of international trade passes through the Affected Region, the dollar cost of piracy thus amounts to about US\$18 billion.

While the world is resilient enough to absorb that much disruption, the cost is large compared to the actual revenues pirates get from their illegal activities. As will be documented in detail below, for the entire period 2005–12 ransom payments were about US\$350 million. The huge asymmetry between the gains to pirates and the costs to the rest of the world warrants a global effort to make Somalia piracy-free. The rest of the report investigates that goal.

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## Datasets

CEPII 2012: Centre d'Études Prospectives et d'Informations Internationales Database  
CIA 2012: The World CIA Factbook  
COMTRADE 2012: United Nations Commodity Trade Statistics Database  
EC DG TRADE 2012: European Commission Directorate General for Trade Database  
ITC 2012: International Trade Center Trade Map Database

## Notes

1. Unless otherwise specified, only trade in goods is considered here. For an analysis of the impact on tourism, see Chapter 3.
2. Most countries have only one principal port and all ports face the same sea, so focusing on a single port per country is usually appropriate. For the few countries that either border more than one sea (e.g., the United States, Canada, Mexico, Russia, India, France, and Spain) or have very long coastlines (e.g., China and Brazil), sea distances were collected for two ports, either each facing a different sea or the two far apart.
3. Technically, bilateral trade values are regressed on importer and exporter fixed effects and the residuals plotted.
4. The statistical value of life for an average crewmember on board a vessel reported in the IMB (2012) database is derived using nationality-based income (US\$5,514). Given a US\$7 million value for a U.S. citizen, applying an income-elasticity of 0.5, an average crew size of 22.54, and a 2 percent probability of death once hijacked, the final statistical value of a life for an average vessel sailing in the Affected Region is roughly US\$2 million.

## Annex 2.A: Conceptual and Econometric Framework

Numerous models, including Armington, Ricardian, and (with some allowance for fixed costs) monopolistic competition, imply the following model for trade between two countries (see, among many others, Eaton and Kortum 2002, Anderson and van Wincoop 2003, Chaney 2008):

$$(2.A.1) \quad X_{ijt} = \tau_{ijt}^{-\theta} \frac{X_{it} X_{jt}}{P_{it}^{-\theta} \Xi_{ji}},$$

where  $t$  is the time period,  $X_{ijt}$  is imports to country  $i$  from country  $j$  in year  $t$ ,  $X_{it}$  is total spending in country  $i$ ,  $P_{it}$  is the price level in country  $i$  in year  $t$ , and  $\Xi_{ji}$  is a term that varies by source country and time. Bilateral trade costs are denoted by  $\tau_{ijt}$ ; they will vary by source, destination, and time. Empirically, geographical variables capturing distance between countries are a very good proxy for bilateral trade costs. The approach is to use distance and a common border dummy variable as the non-time-varying proxies for trade costs. To those is added an indicator for whether a country pair has been affected by piracy. Thus the model for bilateral trade costs is:

$$(2.A.2) \quad \tau_{ijt} = d_{ij}^{\alpha_1} e^{\alpha_2 b_{ij}} e^{\alpha_3 \text{piracy}_{ijt}} \epsilon_{ijt},$$

where  $d_{ij}$  is the bilateral distance between countries  $i$  and  $j$ ,  $b_{ij}$  is a dummy for whether the countries share a common border, and  $\text{piracy}_{ijt}$  is an indicator for whether the shortest shipping route between countries  $i$  and  $j$  is subject to piracy risk in year  $t$ . There is an error term,  $\epsilon_{ijt}$ .

Plugging the model for trade costs (2.A.2) into the gravity relationship (2.A.1) and taking natural logs, the estimating equation becomes:

$$(2.A.3) \quad \log X_{ijt} = -\theta \alpha_1 \log \text{dist}_{ij} - \theta \alpha_2 b_{ij} - \theta \alpha_3 \text{piracy}_{ijt} + \log \left( \frac{X_{it}}{P_{it}^{-\theta}} \right) + \log \left( \frac{X_{jt}}{\Xi_{ji}} \right) + \log \epsilon_{ijt}$$

The terms  $\log \left( \frac{X_{it}}{P_{it}^{-\theta}} \right)$  and  $\log \left( \frac{X_{jt}}{\Xi_{ji}} \right)$  are unobservable. Luckily, they only vary at the country-time level and thus can be controlled for by country-time effects. In addition, since the sample combines different years for the same country pair, to check robustness non-time-varying bilateral trade costs (distance and common border plus many others, such as linguistic similarity or trade policies) are controlled for by using country-pair fixed effects instead of explicit geographical proxies. Replacing the unobservable terms with the fixed effects, the estimating equation becomes:

$$\log X_{ijt} = \beta_1 \text{piracy}_{ijt} + \beta_2 \log \text{dist}_{ij} + \beta_3 b_{ij} + \delta_{it} + \delta_{jt} + v_{ijt},$$

where  $i$  and  $j$  are index countries and  $t$  indexes time. This equation says that the natural log of imports to country  $i$  from country  $j$  is a function of (log) distance between the countries, whether they share a common border ( $b_{ij}$ ), and whether the route between the two countries is affected by piracy in year  $t$ :

$$piracy_{ijt} = route\_affected_{ij} \cdot piracy_t,$$

where  $route\_affected_{ij}$  is the indicator for whether sea shipping between countries  $i$  and  $j$  is affected by piracy, according to the narrow, wide, or very narrow definition, and  $piracy_t$  is an indicator for whether pirates are active in year  $t$ .<sup>1</sup> Alternatively, the continuous indicator of the intensity of piracy impact (the proportional increase in sea distance used to avoid the piracy-affected area) is multiplied by  $piracy_t$  to get a time-varying nonbinary measure.

Finally, time-varying importer and exporter fixed effects,  $\delta_{it}$  and  $\delta_{jt}$ , control for the evolution of supply and demand in the trading countries. As Figures 2.2 and 2.3 demonstrate, it is essential to include these in order to obtain reliable estimates of the piracy effect.

Table 2.A.1 reports the results of estimating the main empirical model;  $piracy_t$  is set equal to 1 for every year from 2006 onward and robustness was checked to alternative timing assumptions about the onset of piracy. Standard errors are clustered at the country-pair level to control for autocorrelation in the error terms.

When focusing on the binary indicators, there appears to be some marginally statistically significant evidence that piracy lowered trade. In the narrow sample, the coefficient

**TABLE 2.A.1: MAIN RESULTS**

Dep. Var: Bilateral Trade	Panel A: Binary Indicators			Panel B: Continuous Indicators		
Piracy – Narrow	–0.0740* (0.0409)			0.0452 (0.0564)		
Piracy – Wide		–0.0873* (0.0466)			–0.114 (0.0766)	
Piracy – Very Narrow			–0.0294 (0.0683)			0.154** (0.0647)
Log (Distance)	–1.787*** (0.0220)	–1.786*** (0.0221)	–1.790*** (0.0218)	–1.791*** (0.0218)	–1.788*** (0.0219)	–1.789*** (0.0218)
Common Border	0.0350 (0.139)	0.0323 (0.139)	0.0340 (0.139)	0.0374 (0.139)	0.0262 (0.139)	0.0383 (0.138)
Importer*year fixed effects	yes	yes	yes	yes	yes	yes
Exporter*year fixed effects	yes	yes	yes	yes	yes	yes
Observations	155,169	155,169	155,125	155,169	155,169	155,125
R-squared	0.756	0.756	0.756	0.756	0.756	0.756

Source: COMTRADE 2012.

Standard errors clustered by country pair in parentheses.

\*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

of  $-0.074$  implies that compared to non-piracy-affected country pairs, piracy-affected pairs had 7.4 percent less trade. The t-statistic for this estimate is 1.81, with the corresponding p-value of 0.07.

It is possible to calculate an ad valorem trade cost equivalent of being affected by piracy from the coefficient estimates by using the gravity specification for trade costs and adopting common values of the elasticity of trade flows with respect to true (unobserved) trade costs. The elasticity range that has been suggested in the literature implies that piracy raises ad valorem trade costs by 0.007 to 0.015, that is, by about 1 percent.

The results for the wide and the very narrow piracy definitions are inconclusive. The coefficient for the wide sample is slightly higher in absolute value at  $-0.087$  with a p-value of 6.1 percent; the coefficient for the very narrow definition is much lower and statistically insignificant.

Turning to the continuous indicators, the results are much less coherent. Two of the three coefficients are negative but insignificant, and the coefficient under the very narrow definition is significant but with the wrong sign: piracy seems to increase trade.

The consistency of the results was assessed in a number of ways. First, all possible timing definitions for the onset of  $piracy_t$  from 2006 to 2010 were tested. The results, reported in Table 2.A.2 for the narrow definition, are quite insensitive to how piracy onset is defined. Column 1 reports the coefficient for a 2006 onset, reproducing column 1 of Table 2.A.1. The following columns present the coefficients for defining onset as in later years. In general the coefficient magnitudes are quite similar and until 2010 are not significant even at 10 percent. In 2010 the coefficient is somewhat larger at  $-0.101$ , which is significant at the 4.9 percent level. This suggests that the impact of piracy may be increasing slightly over time.

**TABLE 2.A.2: ROBUSTNESS**

Dep. Var: Bilateral Trade					
Year of the onset of piracy	2006	2007	2008	2009	2010
Piracy – Narrow	$-0.0740^*$ (0.0409)	$-0.0678$ (0.0420)	$-0.0705$ (0.0435)	$-0.0676$ (0.0456)	$-0.101^{**}$ (0.0515)
Log (Distance)	$-1.787^{***}$ (0.0220)	$-1.788^{***}$ (0.0220)	$-1.788^{***}$ (0.0219)	$-1.789^{***}$ (0.0218)	$-1.790^{***}$ (0.0218)
Common Border	0.0350 (0.139)	0.0348 (0.139)	0.0347 (0.139)	0.0346 (0.139)	0.0346 (0.139)
Importer*year fixed effects	yes	yes	yes	yes	yes
Exporter*year fixed effects	yes	yes	yes	yes	yes
Observations	155,169	155,169	155,169	155,169	155,169
R-squared	0.756	0.756	0.756	0.756	0.756

Source: COMTRADE 2012.

Standard errors clustered by country pair in parentheses

\*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels

Robustness was also checked by (i) narrowing the sample of countries from about 150 (which incorporates many very small Pacific and Caribbean islands) to about 90; (ii) estimating the specification in repeated cross-sections for each year; (iii) stopping the sample in 2007 because the great 2008–09 trade collapse may have confounded the effects; and (iv) using country-pair fixed effects instead of distance and common border variables to capture all the time-invariant features of trade costs between each pair of countries. All these robustness checks confirm that there is no consistently significant negative impact of piracy on world trade.

To back out the ad valorem equivalent of piracy-induced trade cost, some common values were adopted for  $\theta$ , backing out the value of  $\alpha_3$  as implied by the coefficient estimate of  $-0.074$ , and plugging it back into the formula for bilateral trade costs (2.A.2). The literature has identified values of  $\theta$  in the range of 5 to 10 (Anderson and van Vincoop 2004), which are the values used in this calculation.

## Notes

1. Using the wide definition, for some countries—Pakistan and countries in East Africa and on the Persian Gulf—all shipping routes are assumed to be affected by piracy. Thus, for them, taken seriously, the continuous indicator must take the value of infinity. In order to keep those countries in the estimation sample, the continuous indicator is set to the 99<sup>th</sup> percentile value in the rest of the sample of values strictly greater than 1.





# THE FEAR FACTOR: IMPACT OF SOMALI PIRACY ON REGIONAL TOURISM

## 3

### Introduction

This chapter examines the impact of Somali piracy on tourism in neighboring countries. Since 2006 the 177 pirate hijacks near East African shores have had a clear effect on world trade patterns. It is believed that piracy has also affected tourism in East African coastal countries and the Middle East. In particular, recent attacks on yachts, cruise ships, and diving boats have made tourists potential victims of Somali pirates. Tourism is a first-order issue for analysis here given its importance to the region, particularly for island countries like Mauritius and Seychelles.

Identifying the effects of piracy on tourism is methodologically challenging. First, tourism to countries in and near the Affected Region has been growing steadily in recent decades. To properly assess any impact of piracy, it is necessary to construct a “counterfactual” in order to compare observed trends with what would have happened without piracy. Would the sector be growing even faster? Would tourists be spending more on their visits? Second, besides piracy tourist decisions are influenced by such factors as exchange rates, oil prices, economic crises, and health epidemics. Therefore, to properly identify the impact of piracy, its role must be isolated from the other factors.

This chapter seeks to quantify the impact of Somali piracy on such tourism outcomes as the inflow of visitors and where they come from. The tourism patterns of coastal countries of East Africa and the Middle East were examined before and after piracy became a threat, real or perceived, to travelers and were then compared to patterns over time in other countries. This made it possible to isolate the specific influence of piracy on tourism and to calculate tourism outcomes for affected countries if there were no piracy.

**TABLE 3.1: COUNTRIES AFFECTED BY SOMALI PIRACY, BY REGION**

Sub-Saharan Africa	Middle East and North Africa
Comoros	Bahrain
Eritrea	Djibouti
Kenya	Iran
Madagascar	Iraq
Mauritius	Jordan
Mozambique	Kuwait
Reunion	Oman
Seychelles	Qatar
Somalia*	Saudi Arabia
Sudan	United Arab Emirates
United Republic Of Tanzania	Yemen

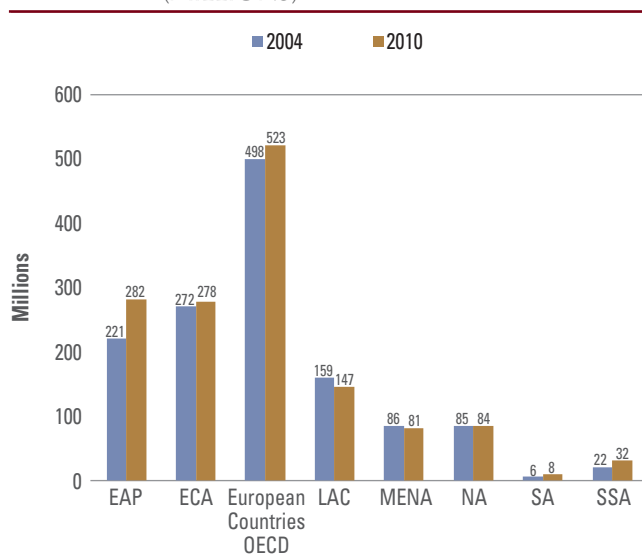
Note: \* Somalia is excluded from the analysis due to the lack of tourism data.

Piracy seems to have affected tourism to coastal countries of East Africa in terms of both volume and composition. Compared to other countries, after the onset of piracy annual visitor arrivals in affected SSA countries declined by 6.5 percent. After 2006, visitors from OECD countries particularly were less likely than before to vacation in East African coastal countries. The main reason why tourism did not drop—and in fact continued to rise—is that there was a surge in visitors from other SSA countries. But the substitution of high-income OECD visitors by lower-income tourists is likely to have negatively affected tourism receipts: since pirate attacks began, tourist expenditures have increased less in piracy-affected countries than in other countries in the same region.

## Tourism to Affected Regions: Context, Facts, and Trends

In this study, coastal countries in close proximity to Somali piracy attacks comprise the Affected Region (see Table 3.1). They are concentrated in SSA and the Middle East and North Africa (MENA).<sup>1</sup>

**FIGURE 3.1: TOTAL VISITOR ARRIVALS BY REGION (MILLIONS)**



Source: UNWTO 2012.

The magnitude of the tourism industry in the two regions is substantially different. Although in SSA tourism has been gaining importance steadily for years, tourism to MENA is significantly higher and more developed. Relative to other regions, in SSA there is still substantial potential for growth. In terms of tourist arrivals, as Table 3.2 shows, while Latin American countries receive on average 3.4 million visitors annually, SSA countries receive only 547,100. Most tourist arrivals are in countries in North America (NA), which receive 44.1 million annual visits; Europe and Central Asia (ECA), 8.2 million; and East Asia and the Pacific (EAP), 5.7 million visits. MENA countries are comparable to Latin American and Caribbean (LAC) countries in tourist arrivals but report even higher tourist expenditures. SSA and South Asian countries report the lowest expenditures.<sup>2</sup> There are 22

**TABLE 3.2:** DESCRIPTIVE TOURISM STATISTICS BY REGION (AVERAGES FOR 1995–2010)

	Number of Countries	Countries Affected by Somali Piracy (%)	Average Visitors (Thousands)	Average Total Expenditure (US\$ million)	Tourists Arriving by Water (%)
<i>All sample</i>	204	10.3	6,136.9	4,685.2	15.1
East Asia and the Pacific (EAP)	36	0.0	5,763.1	4,946.9	13.5
Europe and Central Asia (ECA)	33	0.0	8,226.4	2,108.3	7.4
Latin America and the Caribbean (LAC)	46	0.0	3,442.7	1,389.8	26.8
Middle East and North Africa (MENA)	19	57.9	3,205.5	2,560.6	6.7
North America (NA)	2	0.0	44,153.3	68,330.4	2.1
South Asia (SA)	7	0.0	837.4	1,381.0	0.4
Sub-Saharan Africa (SSA)	43	23.3	547.1	425.5	4.4
European OECD countries (EUR)	18	0.0	24,635.0	18,100.4	12.7

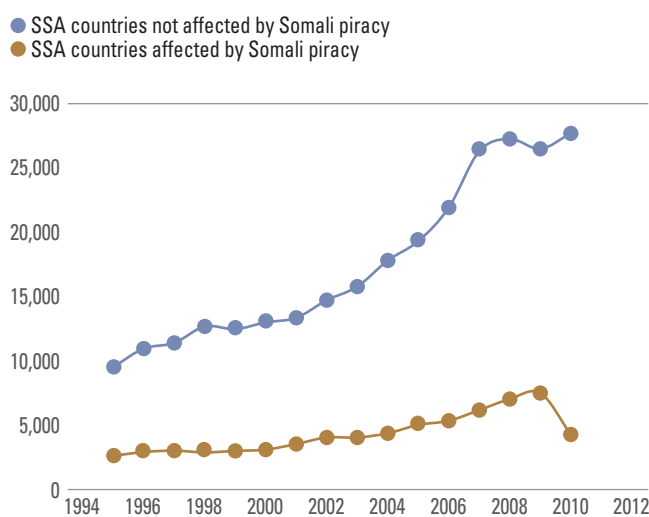
Source: UNWTO 2012.

countries with coastlines close to areas where Somali pirates have attacked vessels; almost 60 percent of all MENA countries and 23 percent of all SSA countries are considered to be affected.

Tourism is increasingly important for African economies. Even though Africa's tourism is not as developed as that of other regions, in 2011 it contributed 7 percent to the region's GDP, directly supported 2.4 percent of total employment, and generated 6.1 percent of total investment in the region (WTTC 2012).

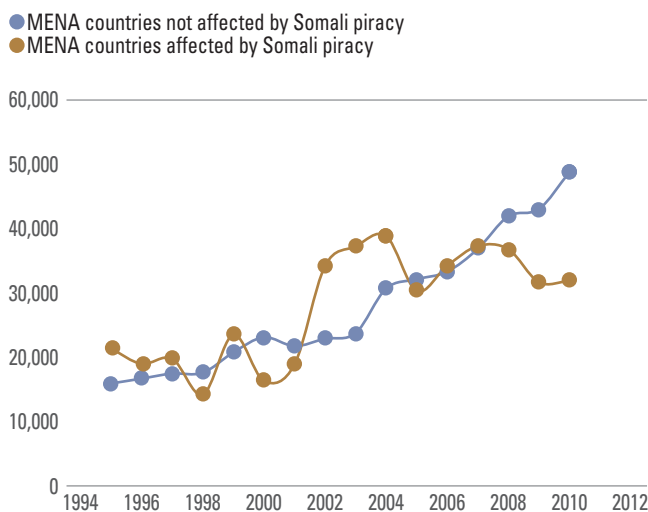
Moreover, visitor arrivals to SSA have grown faster than in other regions (Figure 3.1). While the number of visitors to SSA rose by 45 percent from 2004 to 2010, in other regions, such as Latin America and North America, arrivals were almost unchanged. Interestingly, Africa was the only region that saw an increase in tourism throughout the global economic crisis of 2008–09 (Blanke et al. 2011; World Bank 2010).

Though tourism to SSA and MENA has been rising for two decades, its growth has varied substantially by country. In particular, annual visitors to countries affected by Somali piracy have lagged behind other countries in those same regions (see Figures 3.2 and 3.3). Next analyzed is whether this can be attributed to the surge in piracy in the West Indian Ocean.

**FIGURE 3.2:** ANNUAL VISITORS TO SSA

Source: UNWTO 2012.

**FIGURE 3.3: ANNUAL VISITORS TO MENA**



Source: UNWTO 2012.

## Anecdotal Evidence of a Negative Link between Piracy and Tourism

Piracy off the Horn of Africa may have tarnished the image of the region as a stable and safe holiday destination. The first piracy attacks off the coast of Somalia took place in late 2005 and attacks surged through 2008. Abundant media coverage would suggest that the general public, especially travelers, became acutely aware of attacks in real time, and as the number of attacks increased, so did the media coverage (see Figure 1.3).

While attacks are usually concentrated off the Somali coast, they have occasionally reached far beyond. Some have already occurred off the coasts of Seychelles, Kenya, Tanzania, Mozam-

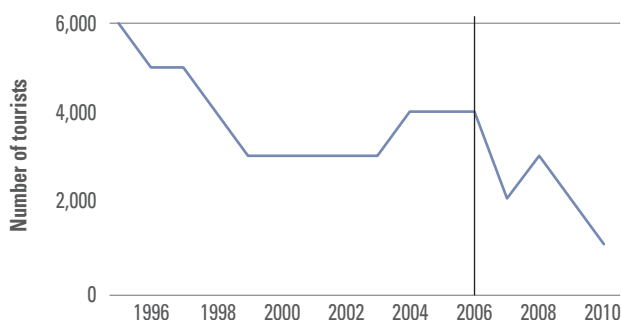
bique, and Madagascar (Mbekeani and Ncube 2011) and even inland, as when tourists were abducted from one of Kenya's most exclusive resorts.<sup>3</sup> Beatrice Kiraso, the East African Community (EAC) Deputy Secretary General in charge of political integration, referred to the increase of piracy as posing a threat to East African peace and security and having a negative impact on tourism growth (Tairo 2011).

Although the cruise industry is thought to have suffered particularly, that is not obvious. However, anecdotal evidence does suggest that pirate attacks have suppressed tourism in countries like Kenya and Seychelles, popular cruise-ship destinations (Oceans Beyond Piracy 2010; Mbekeani and Ncube 2011). While those on cruises are not a large fraction of total visitors, they tend to spend substantially more than other tourists (Sunderland 2010). However, among countries for which mode-of-transport information is available, since 2006 only the Seychelles has experienced a drop in the number (both absolute and relative) of tourists arriving by water (Figures 3.4 and 3.5).

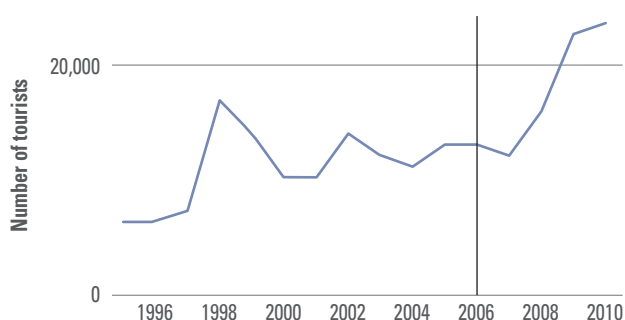
Since the global economic crisis, tourist spending in affected SSA countries is not catching up as fast as in other SSA countries. Piracy attacks may have discouraged high-income tourists from visiting East Africa, and service providers may also have had to lower their prices to stimulate demand. Figure 3.6 compares annual tourist expenditures between non-piracy- and piracy-affected SSA countries: while in 1999 tourist spending in the two groups was comparable, a gap that opened up in 2002 has been widening ever since. The 2008–09 economic crisis suppressed tourism expenditures in both groups, but by 2010 non-piracy-affected countries seemed to be recovering faster. In MENA, however, tourist spending in piracy- and non-piracy-affected countries did not change significantly (see Figure 3.7).

**FIGURE 3.4:** TOURISTS ARRIVING IN SUB-SAHARAN COASTAL COUNTRIES BY WATER

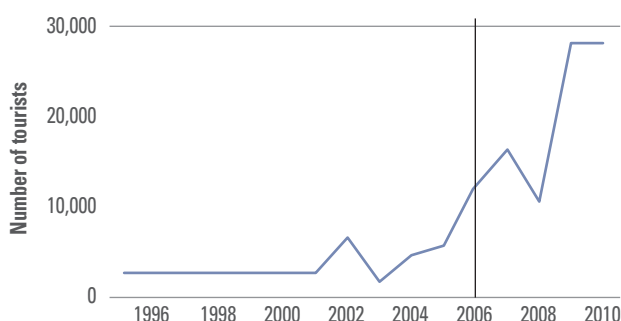
**a. Tourists Arriving by Water to Seychelles**



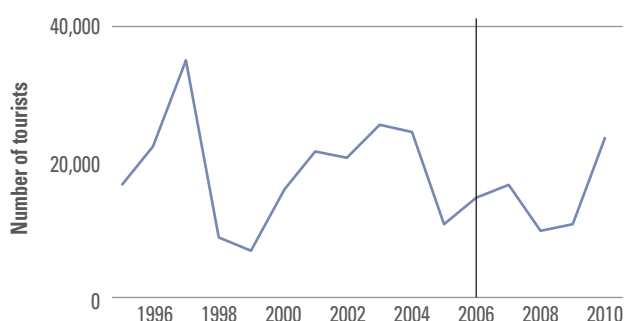
**b. Tourists Arriving by Water to Mauritius**



**c. Tourists Arriving by Water to Kenya**



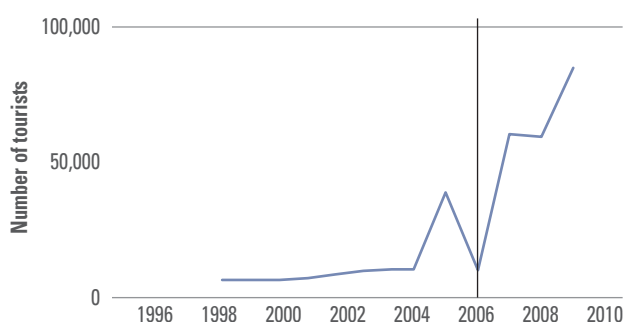
**d. Tourists Arriving by Water to Tanzania**



**e. Tourists Arriving by Water to Eritrea**



**f. Tourists Arriving by Water to Sudan**



Source: UNWTO 2012.

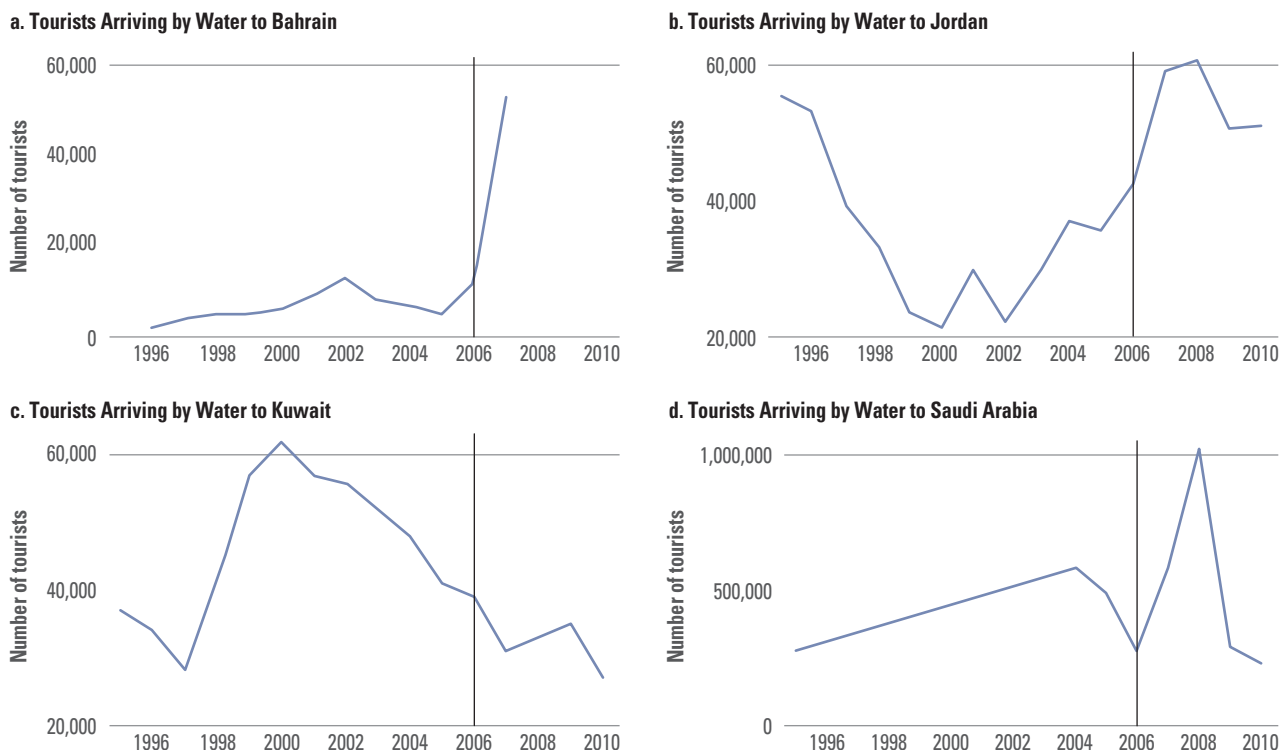
Note: Information on SSA water arrivals available only for these countries.

## Beyond Anecdotes: Quantifying the Impact

### Data Description

Tourism indicators examined in this chapter come from the UNWTO *Compendium of Tourism Statistics* and the *Yearbook of Tourism Statistics*, henceforth UNWTO (2012). They cover annual indicators worldwide from 1995 to 2010, allowing for comparisons between coun-

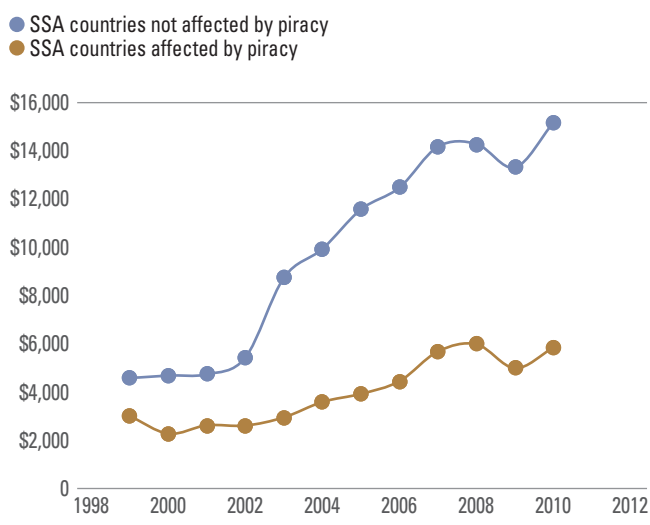
**FIGURE 3.5: TOURISTS ARRIVING BY WATER TO MENA COASTAL COUNTRIES**



Source: UNWTO 2012.

Note: Information on SSA water arrivals available only for these countries.

**FIGURE 3.6: ANNUAL TOURIST EXPENDITURES, SSA COUNTRIES (US\$ MILLIONS)**



Source: UNWTO 2012.

tries and over time. The *Compendium* covers inbound data on total arrivals of visitors, their total expenditures, and whether they travelled by air, land, or water for the 203 countries that provide information to the UNWTO annually. The *Yearbook* complements this information by breaking down visitor arrivals by country of origin.

While the final dataset has worldwide coverage, information for some countries is incomplete. The analysis is thus restricted to countries with consistent information for 1995–2010.

## Methodology

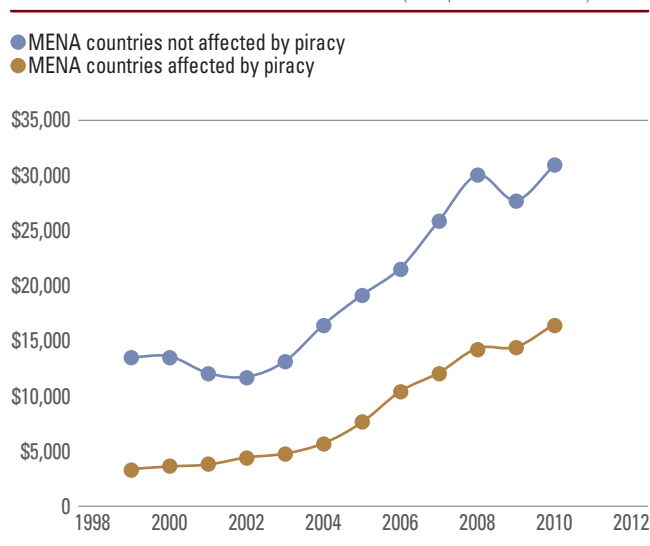
To measure the impact of piracy on tourism, outcomes before and after piracy and between

affected countries (the treatment group) and those not affected (the control group) were compared.<sup>4</sup> The function of the control group was to make it possible to net out other factors that may also have affected tourism, such as the global economic crisis or health epidemics, so that when comparing tourism outcomes in affected and unaffected groups, only the specific impact of piracy remains. That impact was computed by calculating the difference in tourism outcomes before and after piracy began, and between piracy- and non-piracy-affected countries (the methodology is defined in Annex 3.B). The group of not-affected countries consists of all countries outside 22 countries listed in Table 3.1. Other control groups were tested, such as SSA countries, but they had quite different trends in tourism indicators before piracy surged, which would bias the results.

The methodology helps isolate the effect of piracy on the Horn of Africa from:

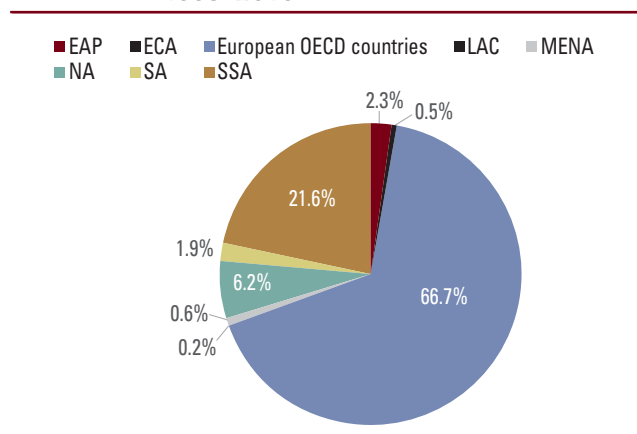
- *Time-specific factors affecting global tourism.* The 2009–10 global economic crisis, volatile oil prices, and the 2009 avian flu epidemic are example of incidents that substantially slowed tourism worldwide. Using the group of countries not exposed to piracy but subject to the same events allows us to cancel out the effect of these events and capture only events that are particular to affected countries, on the assumption that the global events affected tourism by the same magnitude in piracy-affected and unaffected groups.
- *Country-pair factors.* Tourism from country to country is also influenced by time-invariant factors like geographical proximity, cultural ties, or a common language. For instance, the historical link makes tourism between Kenya and Britain clearly different from that between Kenya and Colombia or Kenya and China. Several checks were used to ensure that the results are robust to these relationships.
- *Time-specific factors affecting tourism to regions of interest.* Somali piracy attacks coincided with other major events in the region that might have altered tourism, such as the

**FIGURE 3.7:** ANNUAL TOURIST EXPENDITURES, MENA COUNTRIES (US\$ MILLIONS)



Source: UNWTO 2012.

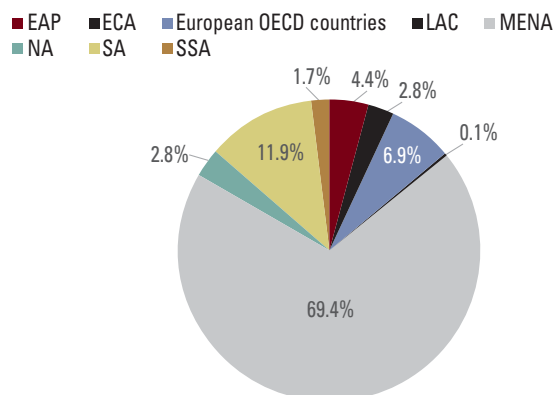
**FIGURE 3.8:** ORIGIN OF VISITORS TO SSA COUNTRIES AFFECTED BY SOMALI PIRACY, 1995–2010



Source: UNWTO 2012.



**FIGURE 3.9:** ORIGIN OF VISITORS TO MENA COUNTRIES AFFECTED BY SOMALI PIRACY, 1995–2010



Source: UNWTO 2012.

tourists in MENA countries affected by Somali piracy is different (Figure 3.9); most of the visitors come from elsewhere in the region (69.4 percent), followed by South Asia (11.9 percent).

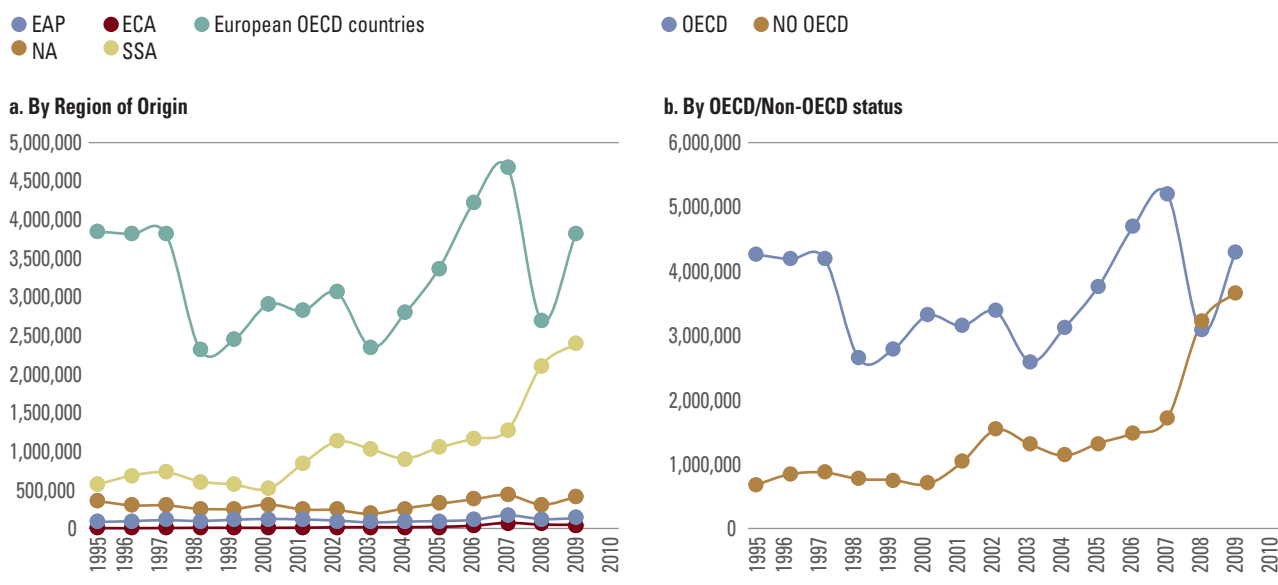
The composition of tourists visiting affected countries has changed over the years. For SSA countries affected by Somali piracy, while European tourists still take the lion's share (Figure 3.10.a), since 2000 tourists from elsewhere have been increasing in both numbers

Kenyan post-election crisis of 2007–08 and the 2009 political conflict in Madagascar. These were dealt with by examining how robust the results are if Kenya and Madagascar are excluded from the sample.

## Quantitative Analysis

Tourists to affected countries in SSA and MENA mostly come from one of two regions. Tourists to SSA countries are mostly from OECD countries (Figure 3.8): from 1995 to 2010, they made up 71.9 percent of all visitors to the region. Of total tourists, 66.7 percent came from European OECD countries, followed by tourists from other SSA countries (21.6 percent) and North America (6.2 percent). The composition of

**FIGURE 3.10:** ORIGIN OF VISITORS TO SSA COUNTRIES AFFECTED BY SOMALI PIRACY

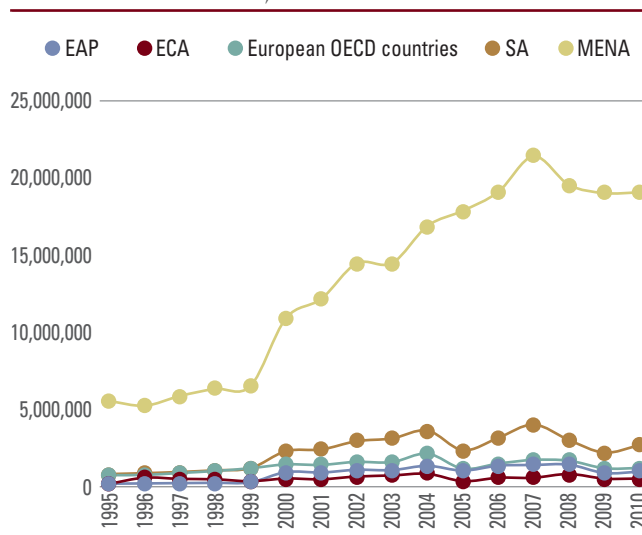


Source: UNWTO 2012.

and share. This pattern can also be seen in Figure 3.10.b, which compares visitors to SSA piracy-affected countries from OECD and non-OECD countries. Over the years, visitors from non-OECD countries (headed by SSA) have gained importance. Also, from 2003 to 2007 there was a steep increase in visitors from OECD countries, although by 2008 that had faded back to 2004 levels. The 2008 drop was partly buffered by the increase in visits from non-OECD countries. Since 1999, growth in tourism to MENA countries affected by piracy has been mainly from other MENA countries (Figure 3.11). Although in recent years visits from other regions have been stable or even slowed, the decrease had no effect due to the increasing importance of intra-MENA tourism.

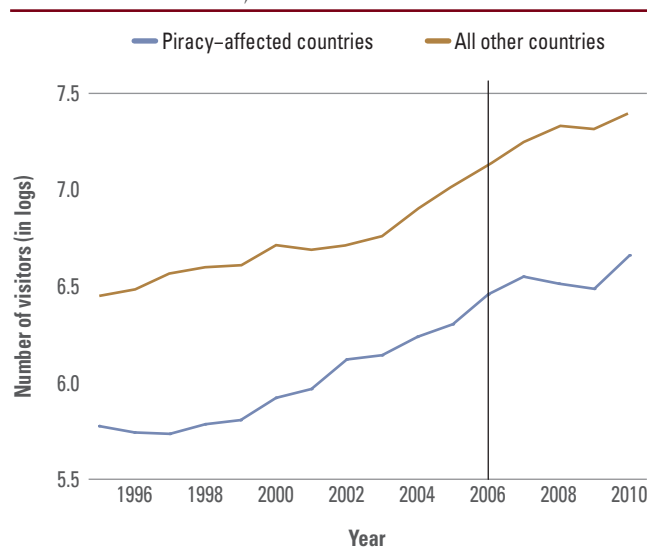
Tourist arrivals in the Affected Region have been below potential since piracy took off. To identify whether the piracy surge is related to changes in tourism volume and composition, how much change there was in tourism outcomes over time in piracy- and non-piracy-affected countries once piracy off the Horn became a threat to the region was quantified. There is evidence that piracy resulted in a 2 percent drop in visits from other countries to all piracy-affected countries and a 6.5 percent drop in visits to SSA piracy-affected countries (see Table 3.B.1 in Annex 3.B). Since both Kenya and Madagascar had political crises in years that overlap with piracy incidents (2007–09), the analysis checked whether the results for piracy-affected SSA countries are robust if those countries are excluded from the treated group. Indeed, even after excluding Kenya and Madagascar from the analysis, tourism to the coastal countries of East Africa fell dramatically after piracy surged, which suggests that the decrease in visitors was not driven by national political instability. Finally, another check was run by excluding from the sample visits of SSA tourists, because many years before piracy became an issue such tourists had been travelling increasingly to countries outside Africa—much faster than their travel on the continent rose. Even after excluding visits from SSA tourists, it was found that tourism dropped after the

**FIGURE 3.11: ORIGIN OF VISITORS TO MENA COUNTRIES AFFECTED BY SOMALI PIRACY, 1995–2010**



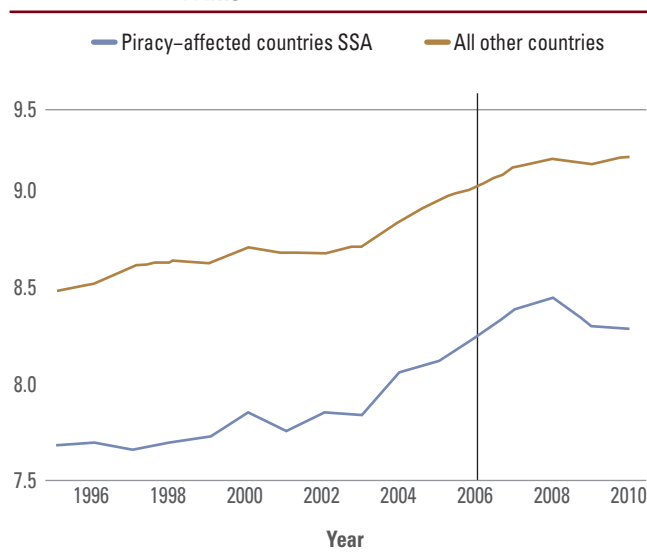
Source: UNWTO 2012.

**FIGURE 3.12: AVERAGE NUMBER OF VISITORS (LOG) TO PIRACY-AFFECTED COUNTRIES, 1995–2010**



Source: UNWTO 2012.

**FIGURE 3.13:** AVERAGE NUMBER OF VISITORS (LOG) TO SSA PIRACY-AFFECTED COUNTRIES FROM OECD COUNTRIES



Source: UNWTO 2012.

onset of piracy. Figure 3.12 shows the average number of visitors over time in piracy-affected countries and all other countries, with a slight expansion of the gap in number of visitors between these two groups post-piracy.

OECD tourists seem to have become particularly cautious about holidaying in East African coastal countries. To identify tourist reactions to piracy-affected SSA countries by region of origin, the sample was restricted to visits from regions that contribute more to tourism. Table 3.B.2 in Annex 3.B presents the results. Visits to piracy-affected countries in SSA dropped from almost all sending countries, but because OECD countries, especially those in Europe and North America, contribute most to tourism in the region, their response to piracy is more noticeable, and these tourists decreased their visits by 18.6 percent (see Figure 3.13): there were 34.5 percent fewer North American tourists and 9.7 percent fewer Europeans (Figure 3.14). Evidence was also found that,

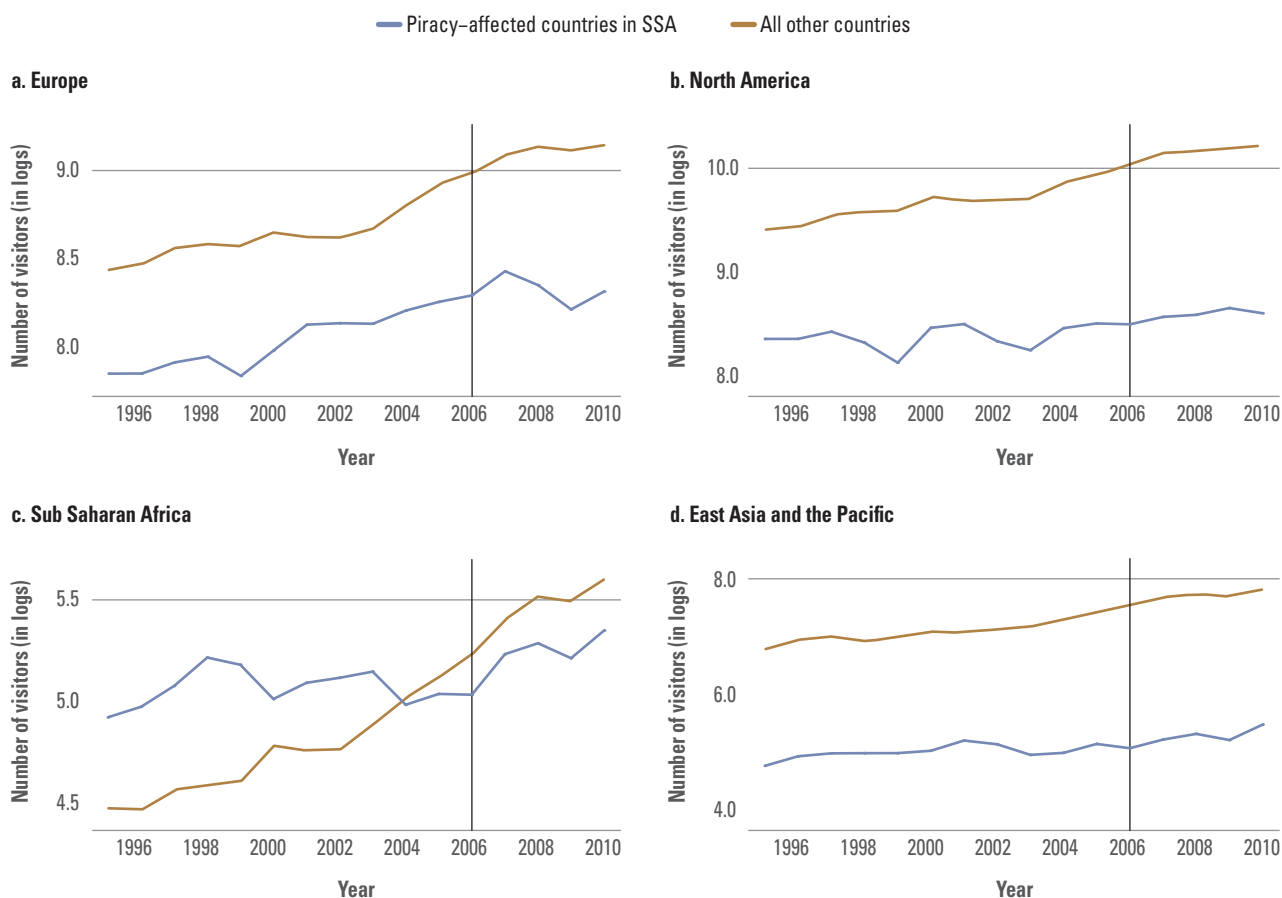
compared to visits to other countries, after 2006 tourists from East Asia and the Pacific reduced their visits to piracy-affected areas by 39.1 percent, though visitors from those countries represent only 2.3 percent of total visitors. As for tourists from elsewhere in SSA visiting piracy-affected countries, although the “difference in differences” effect indicates that SSA visitors reduced their visits by 51.7 percent, SSA tourists had increasingly been travelling to countries outside the region long before piracy became an issue in the region (Figure 3.14).

Below-potential tourism flows to East African coastal countries coincided with higher flows in West and Southern Africa. Using UNWTO data, the question next explored was whether tourism to other regions in Africa benefited from the drop in visitors to the East African coast. In fact (Figure 3.15), after 2006 tourists from all countries in general, and OECD countries in particular, not only slowed their visits to piracy-affected SSA countries but were also more likely to visit African countries outside the east of the continent.

## Seychelles: Trouble in Paradise?

While tourism continued to flourish in the island states, results could have been better still if there were no piracy. Tourism to Seychelles is heavily dependent on European visitors. Tourists from France, Italy, Germany, and the United Kingdom alone represented 49

**FIGURE 3.14: AVERAGE NUMBER OF VISITORS (LOG) TO SSA PIRACY-AFFECTED COUNTRIES FROM EUROPE, NORTH AMERICA, SSA, AND EAST ASIA AND THE PACIFIC**



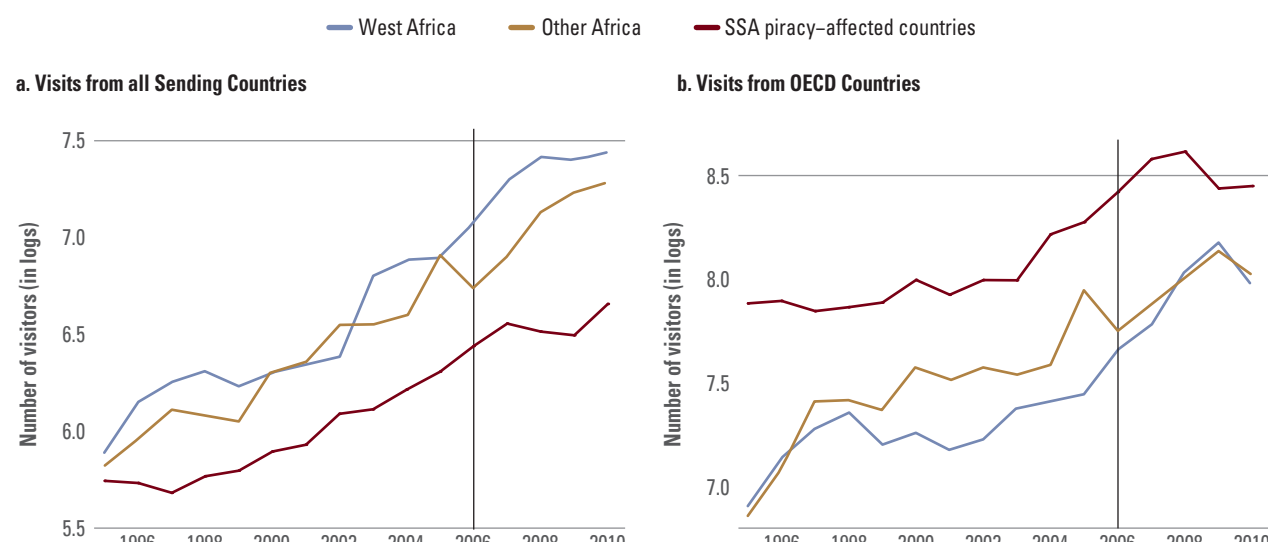
Source: UNWTO 2012.

Note: Information on SSA water arrivals available only for these countries.

percent of total arrivals in 2010. Yet since 2006, although the number of visitors to the Seychelles has continued to increase, the share of Europeans has declined (Figure 3.16).

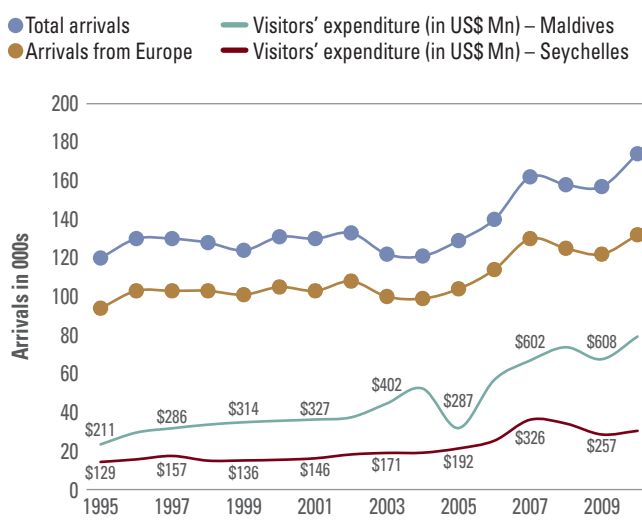
Though tourists have remained abundant, on average they are spending less. Visitors from other countries in Africa and the Middle East have allowed the Seychelles to sustain steady growth in tourism since the surge of piracy (Figure 3.17). However, the data suggest that this switch in sources may have had a negative effect on how much tourists spend (see the expenditures pattern in Figure 3.16). In 2007, when the number of European visitors was at a peak, tourists reportedly spent some \$326 million. In 2009, while the total number of visitors increased, spending fell 21 percent, to \$257 million, and plateaued there in 2010. To understand whether the global economic crisis explains the decline of how much Seychelles visitors spent in 2009–10, Figure 3.16 also shows data on tourist spending in the Maldives.<sup>5</sup> Maldives is an island economy in the Indian Ocean that like Seychelles is heavily dependent on tourism, so the global crisis should have had a similar effect

**FIGURE 3.15:** AVERAGE NUMBER OF VISITORS (LOG) TO SSA PIRACY-AFFECTED COUNTRIES, WEST AFRICAN COUNTRIES, AND ELSEWHERE IN AFRICA



Source: UNWTO 2012.

**FIGURE 3.16:** ARRIVALS AND VISITOR SPENDING, SEYCHELLES AND THE MALDIVES



Source: UNWTO 2012.

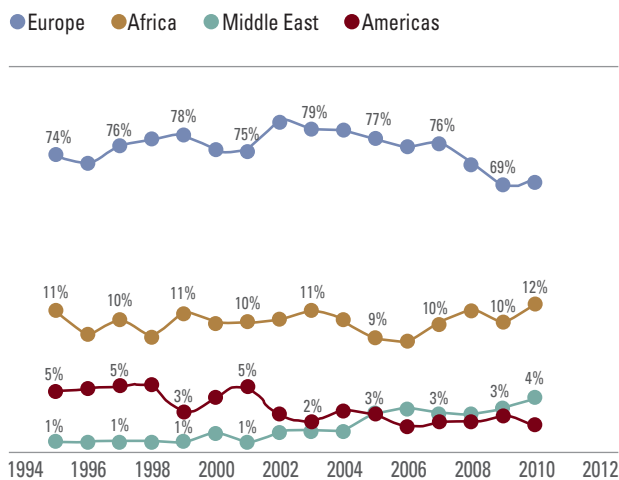
on tourism in both. However, by 2010 spending by Maldives tourists was already on the rise. While this is only indicative, it suggests that the drop in tourist spending in Seychelles is not all explained by the economic crisis.

Arrivals by sea have also plunged (Figure 3.18). Since 2007, more and more tourists prefer to travel by air, causing heavy losses for the Seychelles cruise and yachting industry.

## Conclusion

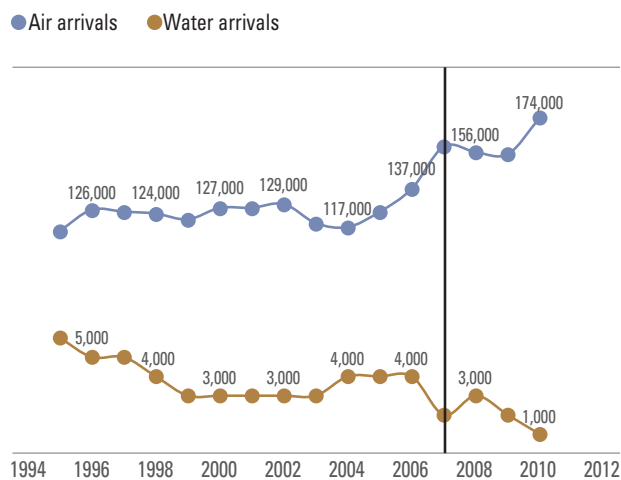
The influence of piracy on tourism in affected countries is clear. Visits to affected East African coastal countries have dropped by almost 6.5 percent relative to visits to other countries. For the entire group of piracy-affected countries, there has been a smaller but significant drop of 2 percent. For piracy-affected SSA countries, the decline can be attributed to tourists from OECD countries, who since 2006 have been less likely to travel to the East African coast than to other countries.

**FIGURE 3.17: PERCENTAGE OF VISITORS TO SEYCHELLES BY REGION OF RESIDENCE**



Source: UNWTO 2012.

**FIGURE 3.18: ARRIVALS OF VISITORS BY MODE OF TRANSPORT**



Source: UNWTO 2012.

Not only have tourist arrivals been below potential, visitors have also been spending less. In the piracy years, growth in tourist spending in affected countries has been lower than in all other SSA countries. This might be explained by the compositional change in tourists visiting piracy-affected countries, but it may also be that services in those countries have lowered their prices to keep attracting tourists.

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## Datasets

UNWTO 2012: United Nations World Tourism Organization Database

## Annex 3.A: Countries Included in Each Region

**TABLE 3.A.1: COUNTRIES BY REGION**

EAP	Cambodia, China, Cook Islands, Fiji, French Polynesia, Hong Kong, China, Indonesia, Japan, Kiribati, Lao People Democratic Republic, Macao, China, Malaysia, Marshall Islands, Mongolia, Myanmar, New Caledonia, New Zealand, Niue, Philippines, Samoa, Singapore, Taiwan, Province Of China, Thailand, Tonga, Tuvalu, Vanuatu
ECA	Albania, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Italy, Kyrgyzstan, Latvia, Lithuania, Malta, Monaco, Netherlands, Norway, Poland, Republic of Moldova, Russian Federation, Slovenia, Spain, Sweden, TFYR of Macedonia, Turkey, Ukraine, United Kingdom, Uzbekistan
LAC	Anguilla, Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, British Virgin Islands, Cayman Islands, Chile, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Guyana, Honduras, Jamaica, Martinique, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and The Grenadines, Suriname, United States Virgin Islands, Uruguay
MENA	Egypt, Israel, Jordan, Kuwait, Lebanon, Morocco, Qatar, Syrian Arab Republic, Tunisia, Yemen
NA	Canada, United States of America
SA	Bhutan, India, Maldives, Nepal, Sri Lanka
SSA	Angola, Benin, Botswana, Burkina Faso, Cape Verde, Eritrea, Gambia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Namibia, Nigeria, Reunion, São Tomé and Príncipe, Seychelles, Sierra Leone, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia



## Annex 3.B: Methodology and Quantitative Results

The approach used to measure the impact of tourism on piracy-affected countries is the difference-in-differences (DID) methodology.

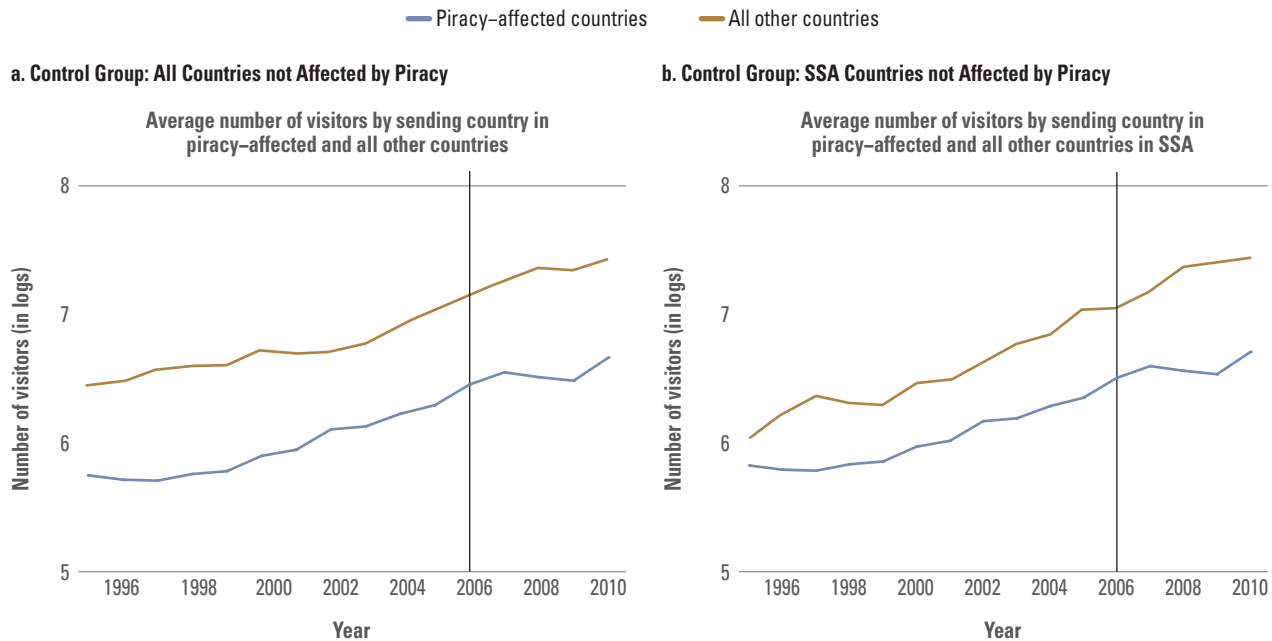
Formally, the DID specification used in this chapter is computed in the following way:

$$(3.B.1) \quad \log visits_{ijt} = \alpha_0 + \alpha_1 piracy_j + \alpha_2 T + \alpha_3 piracy_j \cdot T + \alpha_4 \log exchange_{ijt} + \alpha_{5t} + \alpha_{6ij} + \varepsilon_{ijt},$$

where  $visits_{ijt}$  refers to visits from country  $i$  to country  $j$  every year  $t$ ;  $piracy_j$  is an indicator variable that takes the value of 1 if country  $j$  is affected and 0 otherwise;  $T$  is an indicator variable that equals 1 from 2006 through 2010, and 0 otherwise;  $exchange_{ijt}$  is the annual relative exchange rate between countries  $i$  and  $j$ , obtained from the World Bank Data Catalog (using the relative exchange rates makes it possible to cancel out changes in tourism related to changes in the relative cost of travelling from country  $i$  to country  $j$ );  $\alpha_{5t}$  are fixed effects that control for all aggregate observed and unobserved factors happening in a particular year; and  $\alpha_{6ij}$  are country-pair fixed effects that control for time-invariant characteristics shared by countries  $i$  and  $j$ , such as location, distance, cultural background, and language.

The control group consists of all countries not affected by piracy. As seen from Figure 3.B.1.a, trends in the number of tourists visiting these countries over time are

**FIGURE 3.B.1: TOURISM TRENDS OF TREATMENT AND CONTROL GROUPS**



Source: UNWTO 2012.

Note: Number of visitors correspond to fitted values cleaned from seasonal and country-pair-time-unvariant changes.

similar to the trends in piracy-affected countries. Other control groups were tested, such as other SSA countries, but their pre-piracy trends and those of the treatment group were substantially different (see Figure 3.B.1.b), which would violate the assumption of the DID methodology.<sup>6</sup>

Table 3.B.1 presents the results of the DID specification. The outcome of interest is  $\alpha_3$ , the coefficient of the interaction between  $piracy_j$  and  $T$ , which measures the percentage change in annual visits to affected countries during the piracy years (2006–10) relative to annual visits to countries from the control group.  $\alpha_3$  already isolates the effect of piracy from such factors as relative exchange rates; time-invariant country-pair characteristics, such as location or language; and time-varying factors that affect tourism to treatment and control countries equally, such as global economic crises or health epidemics.<sup>7</sup>

The treatment group in column 1 consists of all countries affected by Somali piracy; in columns 2 to 6 it consists of the subset of SSA countries affected by Somali piracy. In all columns, the control group consists of all countries not affected by piracy.

The results shown in column 1 suggest that, on average, tourist arrivals in affected countries dropped 2.02 percent and the percentage was substantially higher for African countries affected (column 2). The DID effect suggests that the surge of piracy decreased visits from other countries to piracy-affected SSA countries by 17.6 percent. Since both Kenya and Madagascar had economic and political crises during the height of pirate attacks (2008–09), in order to ascertain whether their political and economic problems are driving the effect found, it was tested whether the results are robust to excluding the two countries from the treatment group. The next three columns exclude Kenya and Madagascar from the group of piracy-affected countries. As seen from the DID effect, excluding these two

**TABLE 3.B.1: ANNUAL TOURIST ARRIVALS TO PIRACY-AFFECTED COUNTRIES: DID ESTIMATES**

	(1)	(2)	(3)	(4)	(5)	(6)
$\alpha_3$	–0.0202* (0.012)	–0.1760*** (0.017)	–0.1725*** (0.017)	–0.1765*** (0.017)	–0.1729*** (0.018)	–0.0645*** (0.020)
$\alpha_4$	0.002 (0.002)	0.0044*** (0.002)	0.0044*** (0.002)	0.0044*** (0.002)	0.0045*** (0.002)	0.0037** (0.002)
$\alpha_0$	6.3680*** (0.009)	6.3732*** (0.009)	6.3661*** (0.009)	6.3714*** (0.009)	6.3643*** (0.009)	6.7142*** (0.009)
<i>All affected countries</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
<i>SSA-affected countries only</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
<i>Excluding KEN</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
<i>Excluding MDG</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
<i>Excluding visits from SSA</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>
Observations	148,288	139,549	139,380	139,401	139,232	117,470
R-squared	0.962	0.963	0.963	0.963	0.963	0.964

Source: UNWTO 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 3.B.2: ANNUAL TOURIST ARRIVALS BY SENDING REGION: DID ESTIMATES**

Visitors from:	EAP Countries	NA Countries	SSA Countries	European OECD Countries	All OECD Countries
$\alpha_3$	−0.3912*** (0.049)	−0.3453*** (0.076)	−0.5177*** (0.041)	−0.0972*** (0.033)	−0.1863*** (0.028)
$\alpha_4$	0.0186** (0.009)	0.0702*** (0.010)	0.0257*** (0.007)	0.0151*** (0.002)	0.0170*** (0.002)
$\alpha_0$	6.6850*** (0.024)	9.3391*** (0.035)	4.5008*** (0.029)	8.3925*** (0.012)	8.4657*** (0.010)
Share (%)	2.3	6.2	21.6	66.7	71.9
Observations	18,774	4,113	21,762	28,887	37,907
R-squared	0.965	0.974	0.933	0.971	0.972

Source: UNWTO 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels. Share corresponds to the share of tourism to SSA piracy-affected countries from each region from 1995 through 2010.

countries has almost no effect on the coefficient, suggesting that the drop in their visitors was not driven by their national crises. Finally, column 6 also excludes from the sample visits of tourists from SSA, since they had been increasingly visiting countries outside Africa many years before piracy became an issue. Excluding visitors from SSA, there is still a negative (though smaller) effect of piracy on the annual number of visitors to piracy-affected African countries of 6.45 percent.

Finally, Table 3.B.2 presents the DID estimates of annual tourist arrivals for the subset of African countries affected by Somali piracy, disaggregated by sending region—OECD countries from both Europe and North America, SSA countries, and East Asia and the Pacific countries (EAP)—since together these groups represent more than 95 percent of all visits to affected countries. After Somali piracy began, visits of tourists from EAP dropped by 39 percent, from North America by 34 percent (columns 1 and 2), and from European OECD members by 9.7 percent (column 4). Visitors from SSA countries not affected by piracy dropped their visits to affected countries in Africa by 52 percent (column 3), but as explained before, this effect should not be attributed to Somali piracy.

## Annex 3.C: Tourism Patterns of South Asian Countries within Range of Somali Piracy Attacks

While most pirate attacks occur near the shores of East African and MENA countries, there have also been some near the Maldives and the coasts of India and Pakistan (see Figure 2 in the Executive Summary). This annex compares the tourism patterns of these three countries with other South Asian countries to examine whether the surge of Somali piracy has altered tourism to India, the Maldives, or Pakistan.<sup>8</sup> No evidence of this was found.

India, Pakistan, and the Maldives have very different tourism experiences. Tourism in South Asia is dominated by visits to India (Figure 3.C.1). In numbers of tourists and dollars spent by them, India's tourism sector has grown in importance over the years (in 2010, India received more than 70 percent of visitors to the region and 85 percent of their spending).

While tourism in the Maldives has been growing more modestly than in India, it is the island economy's most important industry. For the past 20 years, tourism there has been steadily increasing in terms of both number of visitors and their spending (see Figures 3.C.2.b and 3.C.3.b). It fell only with the tsunami of December 26, 2004 and the global economic crisis of 2008–09.

In contrast, the tourism sector of Pakistan has struggled with such challenges as military disruptions, such as the 9/11 attacks and the subsequent Taliban conflict, and natural disasters, such as a devastating earthquake in 2005 and the 2010 floods.

Comparing tourist arrivals to these three countries with those to other South Asian countries over time, the surge of piracy does not seem to have had a negative impact on any of them (Figures 3.C.2.a and 3.C.2.b). On the contrary, relative to the rest of South Asia, India's tourist arrivals had been growing continuously from 2002 until the global economic crisis, and by 2010 visitors to India and the Maldives were again on the rise.

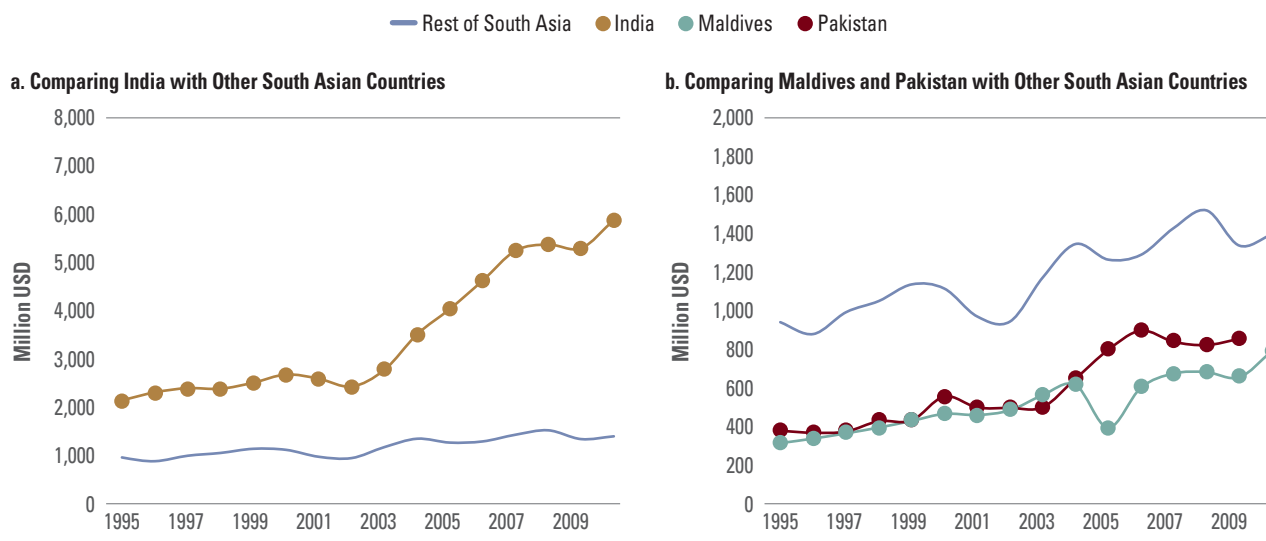
Another indicator is tourist spending in South Asian countries over time (Figures 3.C.3.a and 3.C.3.b). As with arrivals, India has since 2002 experienced constant growth in tourist spending. While the economic crisis suppressed tourist expenditures in 2009, by 2010 they were again on the rise. The Maldives was also experiencing a modest increase in tourist expenditures by 2010.

**FIGURE 3.C.1:** INDIA'S SHARE OF SOUTH ASIA  
TOURIST EXPENDITURE AND  
ARRIVALS



Source: UNWTO 2012.

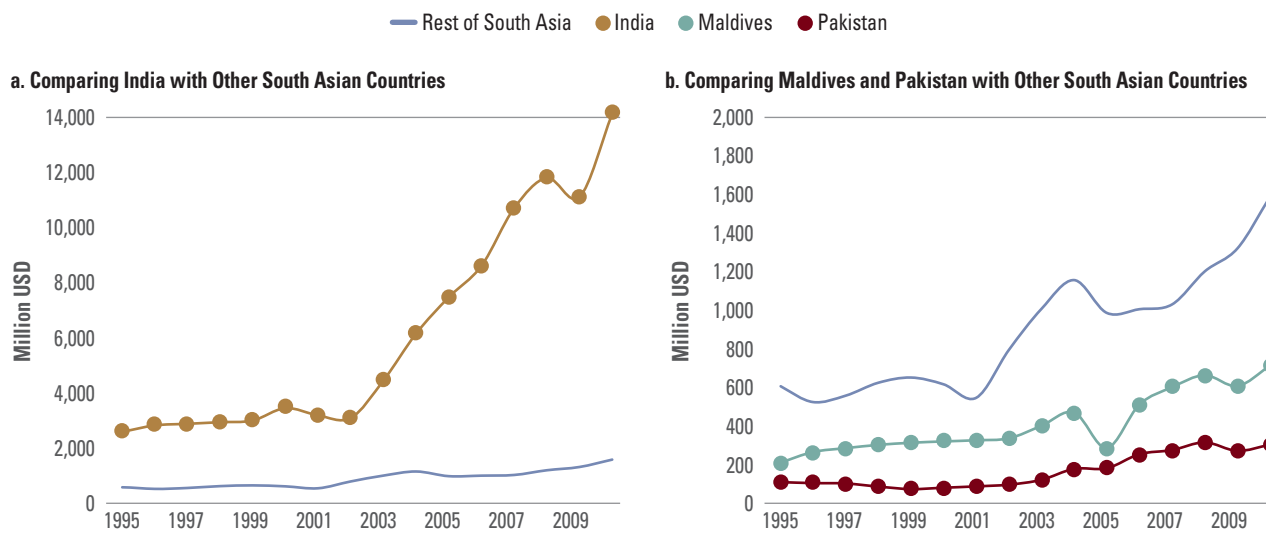
**FIGURE 3.C.2: ANNUAL VISITORS TO SOUTH ASIAN COUNTRIES**



Source: UNWTO 2012.

Note: The other South Asian countries are Bangladesh, Bhutan, Nepal, and Sri Lanka.

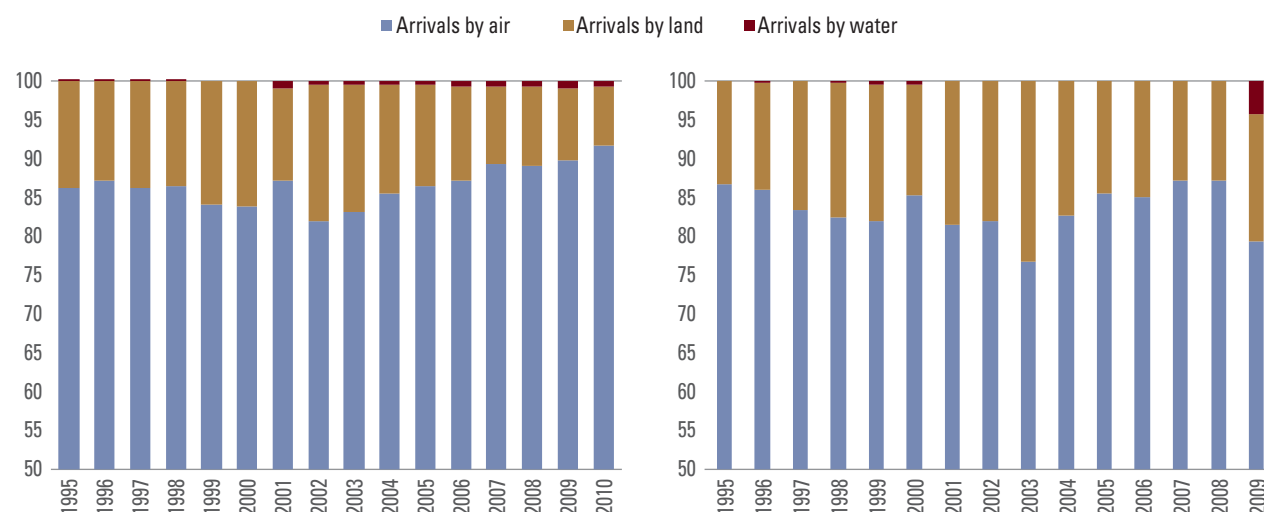
**FIGURE 3.C.3: TOURIST EXPENDITURE IN SOUTH ASIAN COUNTRIES**



Source: UNWTO 2012.

Note: The other South Asian countries are Bangladesh, Bhutan, Nepal, and Sri Lanka.

**FIGURE 3.C.4: TOURIST ARRIVALS BY MODE OF TRANSPORT, INDIA AND PAKISTAN (PERCENT)**



Source: UNWTO 2012.

Unlike coastal countries in East Asia or the Middle East, South Asian countries with coasts on or near the West Indian Ocean have few if any tourist arrivals by water. All tourists reach the Maldives by air, and India and Pakistan report that most of their visitors arrive either by air or by land. Less than 1 percent of visitors arrive in India or Pakistan by water (Figure 3.C.4).

## Notes

1. While India, the Maldives, and Pakistan are also in close proximity to areas where pirate attacks have occurred, Annex 3.C presents evidence suggesting that the surge in Somali piracy has not affected their tourism.
2. Annex 3.A lists the countries in each region.
3. “The [pirate] attacks are a blow to Kenya’s economy, which earns over \$800 million a year from tourism.... In the meantime, the growing operational range of the pirates and their ties to jihadists mean that tourists may be at risk of capture even farther down the coast” (*Economist* 2011).
4. For purposes of this report, 2006 is considered to be when piracy off the Horn of Africa began.
5. Visitor spending in the Maldives dropped substantially in 2005 after the tsunami on December 26, 2004.
6. The fundamental assumption of the DID approach is that the trend for the control group is identical to the trend that the treated group would have without treatment. While this assumption is not testable, its validity can be measured by ensuring that before piracy, trends in tourism for treated and control groups were similar.

7. If an aggregate factor (the economic crisis) had different effects on East African tourism and tourism to other countries, the DID estimate might be confounding the impact of piracy with the aggregate factor.
8. The eight South Asian countries are Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Because it lacks tourism indicators, Afghanistan is not covered by the analysis.

# IMPACT ON FISHERIES: WHERE IT ALL STARTED

# 4

## Introduction

This chapter examines the impact of piracy on the fishing industry in East African countries. This is both a concrete economic issue and a deeply symbolic one. Somalis often argue that piracy started off as self-defense by impoverished fishermen against international fleets fishing illegally in their waters. Over time, even as piracy evolved into a much broader business and despite the fact that fisheries were never a leading economic activity in Somalia, this “Robin Hook” (Shortland 2011) interpretation has by now become a powerful legitimizing narrative.

In contrast to Somalia, the fishing industry is an economic pillar for many other East African countries. It has accounted for over 90 percent of Seychelles total exports of goods for the past two decades and is responsible for about 20 percent of Madagascar’s. Since 2005 more than 100 hijackings have occurred in places where the fishing industry traditionally operates. At least 44 fishing vessels have been hijacked, and some are still captive. The question is the extent to which these attacks have undermined the fishing industry in the region.

Using econometric tools to isolate the effect of piracy, the fishing exports and production of countries affected by piracy are compared with those of countries that are piracy-free. The comparison spans a period from before until after the surge of Somalia pirates. This makes it possible to quantify changes in exports and production that can be attributed solely to Somali piracy. As will be discussed in detail, the methodology requires assumptions to make piracy-free countries an appropriate comparison for piracy-affected countries.

Somali piracy has indeed had a significant negative impact on the fishing industry in the region. The tuna catch alone has dropped by 26.8 percent annually in areas affected by pirates. It also appears that after 2006 the fishing fleets relocated to the eastern part of the Indian Ocean. The analysis also provides evidence that the change of fishing venue is not caused by resource depletion. In terms of trade, exports of fishing products have dropped by 23.8 percent in East African countries, and those countries are trying to avoid pirates by switching to trading partners the routes to which are safer.



Moreover, the analysis finds no evidence of overfishing. While illegal fishing has often been associated with overfishing and the depletion of stocks available to Somali fishermen, the data do not reflect that. It was found that high total tuna production in a given year does not presage low production the next year either for an individual fleet or in the aggregate. In fact, at the aggregate level there is solid evidence that high tuna catches in one year predict high catches the next year. If stock depletion were a major problem, the productivity of the fleets remaining in piracy-affected waters should be higher after the piracy surge because so many fleets moved to safer water. However, no productivity boost can be seen in the data. Note, however, that since the data used relate to catches of tuna in the Indian Ocean, they might not apply for either the type of fish or the location relevant for Somalia. The analysis for this chapter is further limited by the fact that illegal fishing is, almost by definition, not reported. However, the absence of any surge in the productivity of fleets operating in piracy-affected areas after 2005 is consistent with the absence of evidence of overfishing. The results are consistent with findings that both historical and current output of the fishing sector is far below potential output. For example, World Bank (2006) states that Somalia has “potential annual sustainable catch of 300,000 metric tons of fish and 10,000 tons of crustaceans. However, the annual commercial catch was estimated in 1989 at its historical peak at 21,000 tons of fish and 4,700 tons of crustaceans.” The huge gap between realized and potential production suggests that underutilization, rather than overfishing, is likely to explain the current state of the fishing industry in the region.

## Piracy and Fisheries in Sub-Saharan Africa

Fishing is a strategic economic sector in most East African countries. For example, for the past two decades fishing has been the single most important exporting sector for Seychelles, and while less dominant in other East African countries, it is nevertheless a nontrivial part of their trade: in 2005, fishing accounted for 19 percent of total exports for Madagascar, 11 percent for Tanzania, 10 percent for Mauritius, 4 percent for Mozambique, and about 2 percent for Yemen and Kenya.<sup>1</sup>

Unfortunately, the fishing industry is particularly vulnerable to pirates because they highly value fishing vessels. Between 2005 and 2011, Somali pirates took 44 fishing vessels—one-fifth of all hijacks. Fishing vessels are of particular interest to pirates because they can be used as mother-ships, floating bases from which to launch further attacks (see Chapter 6 for a thorough discussion). Of all the types of boats that have been hijacked, fishing vessels are the least likely to be ransomed and the most likely to be held captive indefinitely. This poses particular risks for the fishermen on board; once their ship becomes a pirate vessel, their fates are at best uncertain. At least 234 fishermen were on fishing vessels that were either sunk or taken captive as of May 2012.

Attacks on fishing vessels are very likely to be underreported because the International Maritime Bureau database (IMB 2012) captures only attacks self-reported by the ship owners. Attacks are most reliably reported when the ship is owned by a large shipping company. Small fishing dhows hijacked in the middle of the Indian Ocean do not typically show up in the IMB database, primarily because the owner is likely to have been on board with the hijacked crew.

Given its vulnerability to piracy, it is to be expected that the fishing industry will have been affected. This chapter investigates the question quantitatively, examining whether piracy has affected production (tuna catch) and exports.

## Data and Methodology

### *Production and Trade Data*

The 2012 Indian Ocean Tuna Commission Catch and Effort Database (IOTC 2012) was used to estimate the impact of piracy on fishing production. The database covers the annual catch of tuna from 1950 to the present. It provides annual catches in the entire Indian Ocean, broken down by species, fleets, region of operation, and the gear employed. For example, it can reveal that in 1995, a fishing fleet from India caught 2.21 tons of yellow fin tuna using long-line. Because catches in the western and the eastern parts of the Indian Ocean can be compared, it is possible to see if pirate activities off the Horn of Africa have changed tuna-fishing patterns.

Trade data are from the UN Commodity Trade Statistics Database (COMTRADE 2012). COMTRADE has comprehensive coverage of most bilateral imports and exports since 1962. It covers all products using the 6-digit Harmonized Commodity Description and Coding System (HS-6). Fishery products are grouped under headings 03, 15, and 16. Heading 03 covers all live, frozen, and preliminarily processed maritime products. Headings 15 and 16 cover all processed maritime products. Table 4.A.1 in Annex 4.A details the products covered in the analysis.

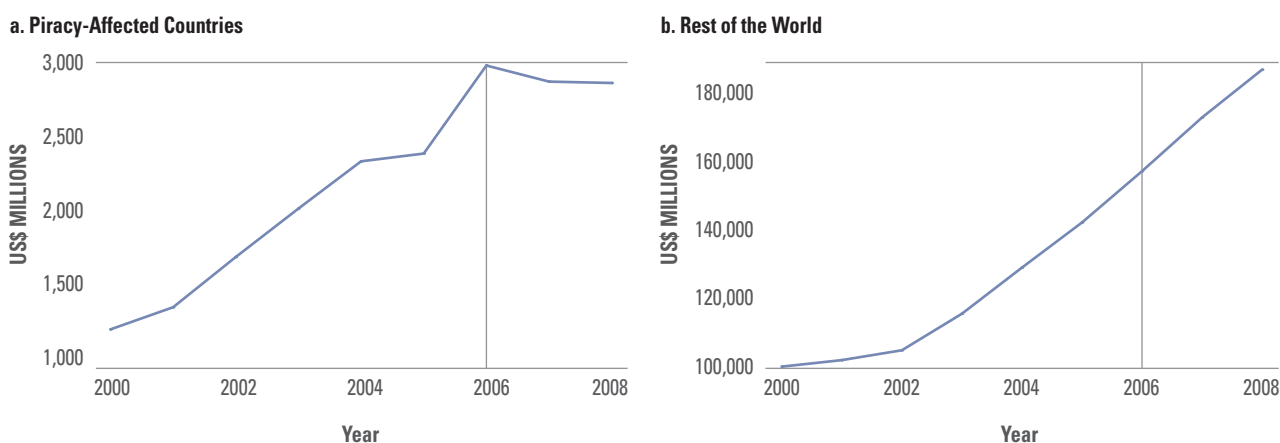
Data coverage is incomplete for some countries. For instance there is no information on Somali trade flows, and information for Seychelles is available only up to 2008. Table 4.A.2 presents data coverage details for countries affected by piracy.

### *Methodology*

Outcomes in affected and in unaffected countries were compared, both before and after the surge of piracy.<sup>2</sup> That makes it possible to isolate effects driven solely by pirate activities. For example, during the global economic crisis and the collapse of trade that followed in 2008, export of fishing products plunged in both piracy-affected and piracy-free countries. Without comparing the results for countries not affected by piracy, this drop would be wrongly attributed to Somali pirates. The comparison between country groups can help net out these effects. Similarly, if a country affected by piracy also suffered from political and economic turmoil long before the surge of piracy, later fishing exports and production might have been affected. Without comparing the results both before and after the piracy surge, one would inaccurately attribute the entire drop in production and exports to piracy. Again, the study methods help to isolate the effect of piracy from possible alternative disruptions.

The econometric method used was as follows: For the analysis of production, total catches in the western and in the eastern Indian Ocean were compared both before and

**FIGURE 4.1: EXPORTS OF FISHING PRODUCTS, PIRACY-AFFECTED AND NON-AFFECTED COUNTRIES**  
(US\$ MILLIONS)



Source: COMTRADE 2012.

after the piracy surge, as were exports of fishing products between countries exposed to piracy and those that are not. Countries potentially affected by piracy are listed in Table 3.A.1 in Annex 4.A.<sup>3</sup> The starting year for Somali piracy was defined as 2006. The technical details of the econometric approach are summarized in Annex 4.B.

## Quantitative Results: A Significant Impact

### *Decline in Exports after the Onset of Piracy*

When piracy began, exports of affected countries began to trend down. Figure 4.1 compares trends in total annual exports of the fishing industry between 2000 and 2010 for piracy-affected countries and the rest of the world. In both there is a steep upward trajectory until 2006. After that the trends diverge as exports in the Affected Region decline.

Quantitative analysis confirms this: Countries affected by piracy experienced much slower growth in exports of fishing products relative to the rest of the world. On average, piracy has brought about a 23.8 percent annual reduction in aggregate exports of fishing products by affected countries. Since both Kenya and Madagascar experienced political and economic turmoil during the period when piracy took off, the analysis was repeated excluding these countries. The results do not change significantly (see Annex 4.B for details).<sup>4</sup>

Not surprisingly, exports to MENA especially have declined. Destination countries are grouped into seven regions: North America, Latin America, Europe, MENA, SSA, South Asia, and East Asia/Pacific (see Table 3.A.1 in Annex 3.A). When the econometric analysis for each region was repeated, as expected the decline is most pronounced in exports to MENA countries; declines to other regions are minimal (see results in Table 4.B.2 in

Annex 4.B). This is consistent with the piracy explanation, since the main trade route between East Africa and MENA is through the Gulf of Aden and along the coasts of Somalia.

### *Decline in Production: A Tale of Two Oceans*

The main reason for lower exports of fish products has been a fall in production, exacerbated by a fall in trade. In piracy-affected countries exports of fishery products declined much faster than aggregate or food and beverage exports (see Table 4.B.5 in Annex 4.B). This suggests that piracy affected fishing production, and there is in fact direct evidence that the tuna catch collapsed in the western Indian Ocean relative to the eastern when Somali pirates were active.

After 2006 trends in tuna catches across the western and the eastern Indian Ocean clearly diverge. Before the onset of piracy, total annual catch had been rising steadily in the western Indian Ocean while remaining more or less stable in the eastern (see Figure 4.2). There was then a break and an obvious reversal of fortunes. After 2006 the total annual catch in the western Indian Ocean plunged, and it has continued downward ever since. By contrast, in the eastern Indian Ocean production quickly picked up and has been rising ever since. Regression analysis confirms this: since Somali pirates became active the annual tuna catch has dropped by 26.8 percent in the western part of the Indian Ocean relative to the eastern part (see Annex 4.C for details).

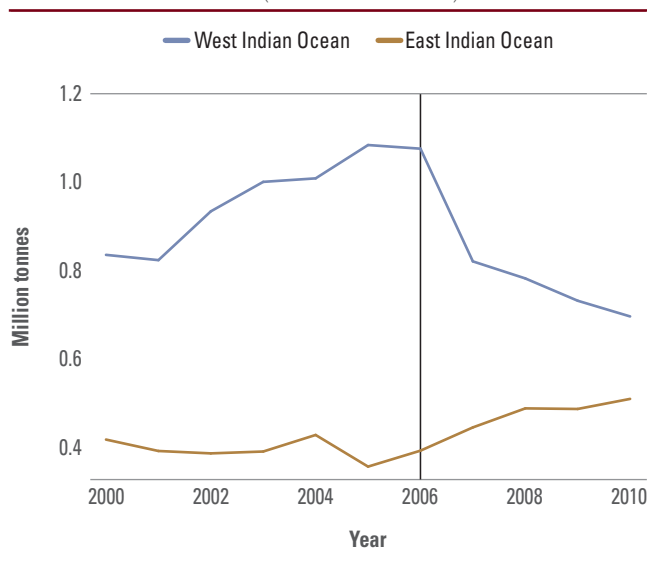
The decline in tuna catch is due mainly to the repositioning of the fishing fleets from west to east as operators sought pirate-free waters. Regression analysis found that on average the number of fleets operating in the western Indian Ocean has dropped by 16.1 percent since Somali pirates became active. Notably, during the same period no differences can be seen between the two parts in average catches per fleet.

### *Was Stock Depletion Real?*

And did piracy allow stocks to replenish? Given the importance of illegal fishing as a cause of piracy, at least in popular narratives, what do the data say? Is there quantitative information that supplies evidence of overfishing?

A simple first step is to see whether total catches in a given year negatively predict catches in the next year. A more refined approach is to look at specific fleets: do high total

**FIGURE 4.2:** TOTAL ANNUAL TUNA CATCH, WESTERN AND EASTERN INDIAN OCEAN (MILLION TONS)

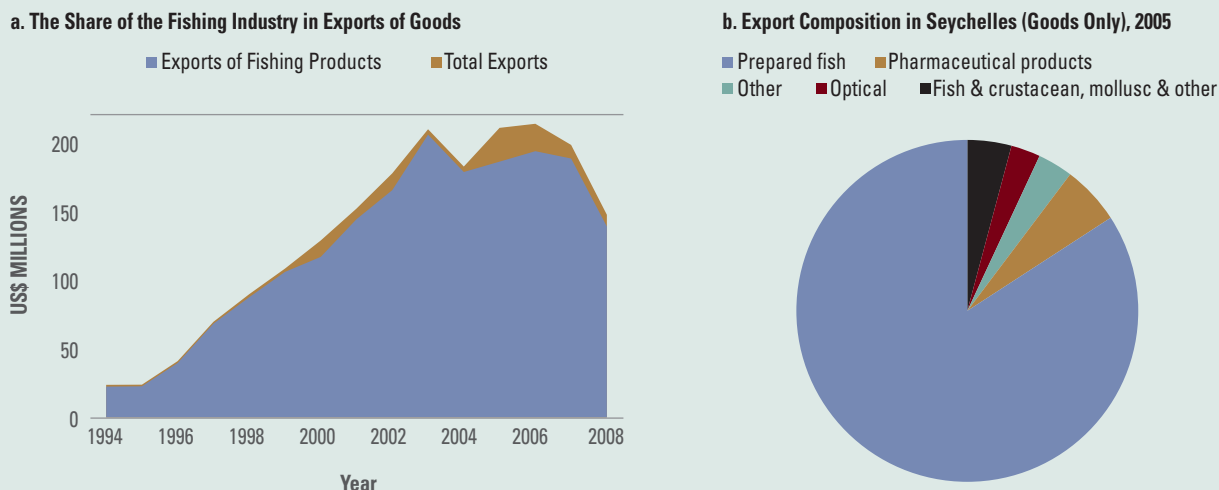


Source: IOTC 2012.

## Box 4.1 Seychelles Case Study: Piracy a Serious Threat to Output and Jobs

The fishing industry is strategic for Seychelles, and it is under major threat. Fishing products contribute over 90 percent of the country's total merchandise exports by value (see Figure B4.1.1); they accounted for a dramatic rise in total exports between 1994 and 2005. Both total and fishing exports then stagnated before collapsing in 2007. The collapse is unlikely to have been caused by the great recession, which it predates by almost a year, or by the global trade collapse, which it predates by two.

**FIGURE B4.1.1: SEYCHELLES EXPORTS: FISH AND LITTLE ELSE**



Source: COMTRADE 2012.

Seychelles exports of fishing products fell by over 29.7 percent. This is far greater than the already large drop (23.8 percent) measured for all piracy-affected countries (Table 4.B.1). By destination, exports to European countries dropped by 41.0 percent and exports to Middle Eastern and North African countries virtually disappeared, plunging by a whopping 98.6 percent. By contrast, exports to countries in South Asia, such as India and Pakistan, skyrocketed, increasing by over 100 times (Table 4.B.3). Seychelles is located in the western Indian Ocean; its trade routes to Europe and the Middle East pass through the Gulf of Aden. Its trade routes to South Asia, which cross the Indian Ocean to the east, are much safer. In short, the Seychelles fishing industry seems to have responded to piracy risks by switching to safer trading partners (see Annex 4.B for details).

catches decrease fleet productivity in the next year? The next step is to use piracy as an outside shock to tuna fishing in the southwestern Indian Ocean. If stock depletion were a major concern, the decrease in fishing operations in the piracy-affected zone should be associated with increased stocks and hence higher productivity for the fleets still operating there. The data make it possible to look into these issues empirically.

The results presented here have several methodological shortcomings; additional evidence would be needed to properly address the question of stock depletion: First, the data used measure catches of tuna only and do not account for other fish that might be subject to overexploitation. Second, since data on illegal fishing are naturally not available, it is necessary to use only reported catches and then make unverifiable assumptions about patterns of illegal fishing.

In fact, in both parts of the Indian Ocean, a year when the tuna catch is high is likely to be followed by another high-catch year (see Annex 4.C). In the aggregate, there is no detectable evidence of stock depletion. At the fleet level, high total catches in a given year do not predict decreased fleet productivity in the following year in either part of the Indian Ocean. This confirms the previous simple test that high tuna catches one year do not presage a low catch the next year (see Annex 4.C).

Finally, fleets operating in the western Indian Ocean after the piracy surge do not have higher productivity. If stock depletion were a major problem, after most fleets moved to safer waters, those still operating in the western Indian Ocean should enjoy a productivity boost. The absence of such a boost suggests that low fish stocks were not a serious concern before the onset of piracy (see Annex 4.C).

This result is consistent with evidence from many other studies demonstrating that actual catches are far below potential sustainable production in Somalia. This implies that underutilization, rather than overfishing, is the main concern of the fishing industry. The World Bank estimated that only about 5 percent of the sustainable catch was being realized before the Somali civil war, and the rate was even lower after the war (World Bank 2006). The FAO estimates that potential fishery production in Somalia is about 15 times higher than the historical peak. Many factors may explain the shortfall. Traditionally, in Somalia fishing has only constituted 1 percent of agricultural value-added (World Bank 2006). The lack of investment in industrial fishing equipment is another factor (World Bank 2006), as is illegal fishing by foreign-owned vessels. According to the FAO (2005), about 700 foreign-owned vessels operate illegally in Somali waters, causing problems for legitimate Somali fishermen. It is impossible to estimate the total catch of unlicensed vessels; however, given the huge gap between the actual and the potential catch, it is very unlikely that illegal fishing can lead to overfishing in Somali waters.

## Conclusion

Somali piracy has affected the fishing industry negatively in terms of both output and trade. The total tuna catch in affected areas has dropped by 26.8 percent annually, and annual fisheries exports fell by 23.8 percent.

Paradoxically the impact on fisheries was probably higher for its neighbors than for Somalia itself. Fishing was never an important economic activity in Somalia, except perhaps in some coastal villages, and its fish stock was underexploited to begin with. Moreover, many of the foreign trawlers that operated in Somali waters did in fact pay for licenses—although often not to official representatives of the state. This does not mean that the power of the self-defense narrative should be underestimated; it helped to legitimize piracy in the early days and still resonates today with Somali audiences. However, the potential of fishing to be an alternative engine of growth and source of income in a piracy-free Somalia should also not be overstated.

## References

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- Shortland, A. 2011. “Robin Hook: The Developmental Effects of Somali Piracy.” DIW Berlin. <http://ideas.repec.org/p/diw/diwwpp/dp1155.html>.
- World Bank. 2006. *From Resilience Towards Recovery and Development: A Country Economic Memorandum for Somalia* (No. 34356-SO). Washington, DC: World Bank.

## Datasets

- COMTRADE 2012: United Nations Commodity Trade Statistics Database
- IMB 2012: International Maritime Bureau Database on Piracy Incidents
- IOTC 2012: Indian Ocean Tuna Commission Catch and Effort Database

## Annex 4.A: Miscellaneous Tables

**TABLE 4.A.1:** OUTPUTS OF THE FISHING INDUSTRY

HS Code	Description	HS Code	Description
30110	Live ornamental fish	30490	Frozen fish meat (excl. fillets)
30191	Live trout	30510	Flours, meals and pellets of fish,
30192	Live eels	30520	Livers and roes, dried, smoked, salted or in brine
30193	Live carp	30530	Fish fillets, dried, salted or in brine
30199	Other live fish	30541	Smoked Pacific, Atlantic and Danube
30211	Fresh or chilled trout	30542	Smoked herrings (incl. fillets)
30212	Fresh or chilled Pacific, Atlantic salmon	30549	Smoked fish (excl. salmon and herring)
30219	Fresh or chilled salmonidae	30551	Dried cod, not smoked
30221	Fresh or chilled halibut	30559	Dried fish, not smoked (excl. cod)
30222	Fresh or chilled plaice	30561	Herrings salted or in brine but not dried or smoked
30223	Fresh or chilled sole	30562	Cod salted or in brine but not dried or smoked
30229	Fresh or chilled flat fish	30563	Anchovies salted or in brine but not dried or smoked
30231	Fresh or chilled albacore or longfinned tunas	30569	Other fish salted or in brine but not dried or smoked
30232	Fresh or chilled yellowfin tunas	30611	Frozen rock lobster and other sea crawfish
30233	Fresh or chilled skipjack or stripe	30612	Frozen lobsters
30239	Fresh or chilled tunas, nes	30613	Frozen shrimps and prawns
30240	Fresh or chilled herrings	30614	Frozen crabs
30250	Fresh or chilled cod (excl. livers)	30619	Frozen crustaceans, nes
30261	Fresh or chilled sardines, brisling	30621	Rock lobster and other sea crawfish
30262	Fresh or chilled haddock	30622	Lobsters (excl. frozen)
30263	Fresh or chilled coalfish	30623	Shrimps and prawns (excl. frozen)
30264	Fresh or chilled mackerel	30624	Crabs (excl. frozen)
30265	Fresh or chilled dogfish and other	30629	Crustaceans not frozen, nes
30266	Fresh or chilled eels	30710	Oysters
30269	Fresh or chilled fish, nes	30721	Scallops, live, fresh or chilled
30270	Fresh or chilled fish livers and roes	30729	Scallops (excl. live, fresh or chilled)
30310	Frozen Pacific salmon	30731	Mussels, live, fresh or chilled
30321	Frozen trout	30739	Mussels (excl. live, fresh or chilled)
30322	Frozen Atlantic and Danube salmon	30741	Cuttle fish and squid, live, fresh
30329	Frozen salmonidae	30749	Cuttle fish and squid (excl. live, fresh or chilled)
30331	Frozen halibut	30751	Octopus live, fresh or chilled
30332	Frozen plaice	30759	Octopus (excl. live, fresh or chilled)
30333	Frozen sole	30760	Snails other than sea snails

(continued on next page)



**TABLE 4.A.1: OUTPUTS OF THE FISHING INDUSTRY** *(continued)*

HS Code	Description	HS Code	Description
30339	Frozen flat fish	30791	Aquatic invertebrates, nes, live, fresh or chilled
30341	Frozen albacore or longfinned tunas	30799	Aquatic invertebrates, nes, other
30342	Frozen yellowfin tunas	150410	Fish-liver oils and their fractions
30343	Frozen skipjack	150420	Fish fats, oils and fractions
30349	Frozen tunas, nes	150430	Marine mammal fats, oils and their
30350	Frozen herrings	160411	Prepared or preserved salmon
30360	Frozen cod (excl. livers and roes)	160412	Prepared or preserved herrings
30371	Frozen sardines, brisling or sprats	160413	Prepared or preserved sardines
30372	Frozen haddock	160414	Prepared or preserved tuna
30373	Frozen coalfish	160415	Prepared or preserved mackerel
30374	Frozen mackerel	160416	Prepared or preserved anchovies
30375	Frozen dogfish and sharks	160419	Prepared or preserved fish
30376	Frozen eels	160420	Other prepared or preserved fish
30377	Frozen sea-bass	160430	Caviar and caviar substitutes
30378	Frozen hake	160510	Crab, prepared or preserved
30379	Frozen fish, nes	160520	Shrimps and prawns, prepared or preserved
30380	Frozen fish livers and roes	160530	Lobster, prepared or preserved
30410	Fresh or chilled fish fillets	160540	Crustaceans, nes, prepared or preserved
30420	Frozen fish fillets	160590	Molluscs and other aquatic invertebrates, prepared

Source: COMTRADE 2012.

**TABLE 4.A.2: TRADE DATA COVERAGE FOR COUNTRIES EXPOSED TO PIRACY**

Country	Starting Year	Ending Year
Iran	1997	2010
Jordan	1994	2008
Kenya	1992	2010
Kuwait	2006	2009
Madagascar	1990	2010
Mauritius	1993	2011
Mozambique	2001	2009
Oman	1989	2010
Pakistan	2003	2011
Saudi Arabia	1991	2010
Seychelles	1994	2008
Tanzania	1997	2011
Yemen	2004	2009

Source: COMTRADE 2012.

## Annex 4.B: Export Analysis and Seychelles Case Study

The following equation was estimated using the Ordinary Least Squares (OLS) method for the export data:

$$(4.B.1) \quad \log Export_{it} = \alpha_0 + \alpha_1 piracy_i + \alpha_2 T_t + \alpha_3 piracy_i \cdot T_t + \alpha_{4t} + \alpha_{5i} + \varepsilon_{it}$$

where  $Export_{it}$  is the export of all fishing products of country  $i$  in year  $t$  (not including re-exports);  $piracy_i$  is an indicator variable that takes the value of 1 if the country is exposed to piracy and 0 otherwise (see Table 4.A.2 for the list of countries exposed to piracy);  $T_t$  is an indicator variable to highlight the years in which Somali pirates were active—it takes the value of 1 between year 2006 and 2011 and 0 otherwise;  $\alpha_{4t}$  is year fixed effect; and  $\alpha_{5i}$  is country fixed effect.

The main result is presented in the first column of Table 4.B.1. The row named “Piracy” is the interaction term ( $piracy_i \cdot T_t$ ) in equation 4.B.1, and measures the impact of piracy on fisheries exports. Columns 2–4 present robustness checks with Kenya and Madagascar excluded from the piracy-affected group. It is clear that across the four specifications, the effect of piracy varies very little. The magnitude of the effect is about 23.8 percent. In Column 5 Seychelles is defined as the only piracy-affected country.

The estimation of equation 4.B.1 was repeated but the exporting destination was restricted to the country groups outlined in Table 3.A.1; the results are presented in Table 4.B.2. Again, “Piracy” is the interaction term. Exports to the Middle East and North Africa have dropped significantly, by about 35.7 percent. Table 4.B.3 is the same exercise done for the Seychelles case study in Box 4.1, where Seychelles is the only piracy-affected country.

As a robustness check the starting position of  $T_t$  in equation 4.B.1 was varied with 2004 and 2008. The rationale was that Somali pirates started to be active in about 2005–06.

**TABLE 4.B.1:** DIFFERENCE-IN-DIFFERENCE EFFECTS, MAIN TABLE

Specification	(1) Main	(2) Kenya Excluded	(3) Madagascar Excluded	(4) Kenya and Madagascar Excluded	(5) Seychelles Only
Piracy	–0.272** (0.137)	–0.281* (0.147)	–0.266* (0.147)	–0.276* (0.158)	–0.353* (0.188)
Constant	1.271*** (0.350)	1.271*** (0.350)	1.272*** (0.350)	1.273*** (0.350)	1.281*** (0.351)
Observations	1,796	1,796	1,796	1,796	1,796
R-squared	0.912	0.912	0.912	0.912	0.912

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 4.B.2: EXPORTS BY DESTINATION**

Destinations	(1) EAP	(2) ECA	(3) LACA	(4) MENA	(5) NA	(6) SA	(7) SSA
Piracy	-0.275 (0.275)	-0.343 (0.280)	-0.526 (0.397)	-0.442* (0.254)	-0.406 (0.326)	-0.104 (0.413)	-0.0570 (0.232)
Constant	-11.07*** (0.800)	-7.420*** (0.749)	-16.49*** (2.055)	-14.04*** -0.203	-8.125*** (0.133)	-12.48*** (0.405)	-7.628*** (0.221)
Observations	1,360	1,576	1,055	1,100	1,412	650	1,112
R-squared	0.905	0.915	0.877	0.871	0.891	0.792	0.856

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 4.B.3: EXPORT BY DESTINATION, SEYCHELLES**

Destinations	(1) EAP	(2) ECA	(3) MENA	(4) NA	(5) SA	(6) SSA
Piracy	0.026 (0.158)	-0.527*** (0.113)	-4.236*** (1.157)	0.000 (2.319)	5.072*** (0.308)	0.385 (0.398)
Constant	-11.06*** (0.803)	-7.410*** (0.749)	-14.04*** (0.198)	-8.094*** (0.132)	-12.46*** (0.414)	-7.624*** (0.221)
Observations	1,360	1,576	1,100	1,412	650	1,112
R-squared	0.905	0.915	0.874	0.891	0.795	0.856

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 4.B.4: ROBUSTNESS CHECK, STARTING YEAR**

Starting Year	(1) 2004	(2) 2005	(3) 2006	(4) 2007	(5) 2008
Piracy	-0.256 (0.182)	-0.374** (0.168)	-0.272** (0.137)	-0.235* (0.125)	-0.232* (0.127)
Constant	1.267*** (0.351)	1.263*** (0.351)	1.271*** (0.350)	1.275*** (0.351)	1.276*** (0.352)
Observations	1,796	1,796	1,796	1,796	1,796
R-squared	0.912	0.912	0.912	0.912	0.912

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

If the starting position is moved away from this interval, the estimated effects should be smaller. That is exactly what can be seen in Table 4.B.4. Before the piracy surge, no

significant differences can be found between piracy-affected and piracy-free countries. Long after the surge, piracy has only a dampened effect.

To test whether fishing exports differ systematically from aggregate exports in piracy-affected countries, the following equation was estimated:

$$(4.B.2) \quad \log Export_{jt} = \alpha_0 + \alpha_1 Fishing_j + \alpha_2 T_t + \alpha_3 Fishing_i \cdot T_t + \alpha_{4t} + \alpha_{5i} + \epsilon_{it}$$

where  $Export_{jt}$  is the export in industry  $i$ , year  $t$  in a piracy-affected country (the industry is classified using the 6-digit HS code, 1988 version);  $Fishing_j$  is an indicator variable taking the value of 1 if an industry is part of the fishing industry and 0 otherwise;  $T_t$  is taking the value of 1 when the time period under consideration is between 2006 and 2010;  $\alpha_{4t}$  is a time fixed effect and  $\alpha_{5i}$  is an industry fixed effect.

The results are presented in Table 4.B.5. The first column—“Aggregate,”—is where the sample includes all merchandise exports of piracy-affected countries. For “Food Only,” the sample includes only the food and beverage industries broadly defined—the definition covers all the categories under headings 01 to 24 in the 2-digit HS code, 1988 version (Table 4.A.1). The variable “Fishing industry” corresponds to  $\alpha_3$  in equation 4.B.2; the negative coefficient means that the fishing industry was hit particularly hard by piracy compared to aggregate goods or food and beverage exports. These results suggest that in addition to trade, fishing industry production might also be affected.

**TABLE 4.B.5:** EXPORTS OF FISHERY PRODUCTS VS. OTHER EXPORTS

	(1) Aggregate	(2) Food Only
Fishing industry	−7.907** (3.352)	−0.755* (0.450)
Constant	−13.71** (6.590)	1.549** (0.760)
Observations	410,452	62,990
R-squared	0.018	0.011

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

## Annex 4.C: Tuna Catch Analysis

The following equation was estimated using OLS for tuna catch data:

$$(4.C.1) \quad \log Catch_{jt} = \beta_0 + \beta_1 west_j + \beta_2 T_t + \beta_3 west_j \cdot T_t + \beta_4 + u_{jt}$$

where  $Catch_{jt}$  is the annual catch of tuna in region  $j$  and year  $t$ ;  $west_j$  is an indicator variable that takes the value of 1 if the region is in the western Indian Ocean and 0 otherwise; and  $T_t$ , another indicator variable, takes the value of 1 if the year is between 2006 and 2011 and 0 otherwise.<sup>5</sup> The parameter of interest here is  $\beta_3$ . If  $\beta_3$  is negative, relative to the eastern Indian Ocean pirate activities reduced the annual catch in the western Indian Ocean during the years when pirates were active.  $\beta_4$  is time fixed effect.

The result of this estimation is reported in the first column of Table 4.C.1. The variable “Western Indian Ocean” corresponds to  $\beta_3$ . Thus, during piracy-active years the tuna catch in the western Indian Ocean dropped relative to the eastern Indian Ocean by about 26.8 percent.

Columns 2 and 3 of Table 4.C.1 present the results of two auxiliary tests. Instead of using total annual catch on the left-hand side of equation 4.C.1, number of fleets and average catches per fleet were used. The intention was to separate the extensive from the intensive margin of tuna catches. If the extensive margin (number of fleets) is mainly driving the decline of fishing in the western Indian Ocean, the reason might be the repositioning of the fleets from west to east. On the other hand, if it is mainly the intensive margin (average catches per fleet), the reason might be the relative depletion of fishing resources in the western Indian Ocean. It was found that changes in the number of fleets operating in the western Indian Ocean are mainly responsible for the drop in the total tuna catch.

To further test the hypothesis of relative fishing resource depletion in the western Indian Ocean, total annual catch data were tested using an auto-regression model in the following equation:

$$(4.C.2) \quad Catch_t = \beta_0 + \beta_1 Catch_{t-1} + \varepsilon_t$$

**TABLE 4.C.1: TUNA CATCH, MAIN TABLE**

	(1) Total Tuna Catch	(2) Number of Fleets	(3) Catches Per Fleet
Western Indian Ocean	-0.313** (0.137)	-0.176*** (0.0461)	-0.137 (0.154)
Constant	5.933*** (0.104)	2.963*** (0.0423)	2.970*** (0.0775)
Observations	22	22	22
R-squared	0.939	0.986	0.438

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

where  $Catch_t$  is the detrended total tuna catch in year  $t$ . The data were detrended with a quadratic time filter:

$$(4.C.3) \quad Catch_t^* = \gamma_0 + \gamma_1 t + \gamma_2 t^2 + u_t$$

where  $Catch_t^*$  is the original catch data and  $Catch_t$  is the estimated residual of equation 4.C.3.

The idea behind these tests was that, if fishing resources have been significantly depleted, there should be wild fluctuations in the data, with good fishing years likely to be followed by bad ones. In that case,  $\beta_1$  would be close to zero or negative.

The results are presented in Table 4.C.2, where “Lagged tuna catch” is estimated. The samples in the first column are from the western Indian Ocean and in the second from the eastern. Neither part shows a persistently low catch.

To check robustness equation 4.C.2 was also estimated with the original catch data and the data detrended with a linear filter (equation 4.C.3 without the  $\gamma_2$  term). The results are very similar to those in Table 4.C.2.

A refined test of equation 4.C.2 is to replace the left-hand side with catches by fleet:

$$Catch_{it} = \beta_0 + \beta_1 Catch_{t-1} + \beta_{2t} + \varepsilon_{it}$$

where  $Catch_{it}$  is the catch of fleet  $i$  in year  $t$ ;  $Catch_{t-1}$  is the total catch of all fleets in year  $t-1$ ; and  $\beta_{2t}$  is year fixed-effects. This test is more precise because there are far more observations available to estimate basically the same number of parameters. The parameter of interest is  $\beta_1$ —if overfishing were a real problem, it should be negative.

The results are presented in the first two columns in Table 4.C.3. Clearly,  $\beta_1$  is not significantly different from zero in both parts of the Indian Ocean. In fact, in both parts it is slightly positive, though not significant.

The last test carried out for overfishing used the following equation:

$$Catch_{it} = \beta_0 + \beta_1 west_i + \beta_2 T_t + \beta_3 west_i \cdot T_t + \beta_{4t} + \varepsilon_{it}$$

where  $Catch_{it}$  is the catch of fleet  $i$  in year  $t$ ;  $west_i$  is a dummy variable that takes the value of 1 if the fleet is operating in the western Indian Ocean and 0 otherwise;  $T_t$  is another dummy that takes the value of 1 if and 0 otherwise; and  $\beta_{4t}$  is year fixed effect. The parameter of interest is  $\beta_3$ .

The results are presented in the last column of Table 4.C.3. If overfishing were a major concern, the coefficient on the interaction “Post-piracy and West” would be positive

**TABLE 4.C.2: TUNA CATCHES BY YEAR**

	Regions	
	(1) Western Indian Ocean, Detrended	(2) Eastern Indian Ocean, Detrended
Lagged tuna catch	0.839** (0.274)	0.811** (0.317)
Constant	0.0421 (0.112)	-0.0562 (0.129)
Observations	10	10
R-squared	0.540	0.450

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 4.C.3: OVERFISHING TESTS**

Models	(1) Western Indian Ocean	(2) Eastern Indian Ocean	(3) Second Test
Lagged aggregate tuna catch	0.0150 (0.0305)	0.0180 (0.0502)	
Post piracy & West			–2,215 (2,025)
Constant	–3,890 (23,811)	–398.5 (22,047)	6,785*** (816.2)
Observations	1,003	606	1,750
R-squared	0.002	0.002	0.003

Source: COMTRADE 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

because after 2006 many fleets were switching to safer waters, which would allow the fishing stocks in the western Indian Ocean to replenish themselves—which in turn should boost the productivity of the fleets that stayed there. However, the parameter is not positive. If anything, the fleets still there suffered a mild productivity loss, though not a significant one.

## Notes

1. In the rest of this chapter, unless specified otherwise “exports” refers to exports of goods only, not services like tourism.
2. This methodology is known in the economics literature as difference-in-differences (DID).
3. Due to data availability problems, Bahrain, Djibouti, Eritrea, Iraq, Somalia, and Sudan, which were labeled as piracy-affected in Chapters 2 and 3, are not covered in this chapter.
4. The analyses were also repeated with different years for the start of Somali piracy. Before 2005 no significant effect of piracy was found. After 2006 the effect of piracy is fanned out. These analyses provide support for the theory that piracy caused the drop in exports (see Table 4.B.4 in Annex B).
5. The ending date is 2011 for the tuna catch estimations but 2010 for the export estimations because of data availability problems for the latter.

# PIRACY, INSURGENCY, AND TERRORISM

# 5

## Introduction

The spate of land-based kidnappings of foreign tourists and aid workers in East Africa between 2011 and 2012 rekindled speculation that pirates might be moving toward cooperation with al-Shabaab. The evidence suggests that since the insurgency began, individual pirate groups and members of al-Shabaab have sometimes fought each other over property disputes and sometimes, since perhaps as early as 2008, cooperated on an ad hoc basis through facilitators sharing subclan ties. Recent pressures have forced elements of each group closer together, with some al-Shabaab members being pushed north into Central Somalia and Puntland, which raises the possibility of collaboration between some insurgents and pirate groups and more conflict between others.

However, actual cooperation between individuals from both groups appears to be lower than the theoretical scope for such an alliance would suggest. There are two possible scenarios that would provide gains for both groups: complementarities in settling money laundering balances inside and outside Somalia, and al-Shabaab acting as a secondary market for pirate hostages with high political value to insurgents.

This report considers an unlikely scenario in which al-Shabaab could use pirates to facilitate incidents of “maritime terrorism,” using hijacked ships to carry out political violence. Such a scenario, however, is not in the interests of either pirates or Islamists. It is also inconsistent with the pirates’ strategic advantage, which is the ability to safely anchor hijacked boats along the Somali coastline (see Part II of this report).

## Current Cooperation

The relationship between pirates, insurgents, and terrorists has long been a subject of debate among Somalia watchers. Some analysts suggest that in Somalia pirates and al-Shabaab



are closely linked—an “unholy high seas alliance” (*Jane’s* 2008); it is alleged that al-Shabaab trained pirates, pirates have used al-Shabaab-controlled ports, and portions of ransoms have been funneled to the insurgent organization (Assyrian International News Agency 2011; BBC 2008; Radio Netherlands Worldwide 2011; Reuters 2008, 2011; UPI 2011). Conversely, others recall the crackdown by al-Shabaab’s predecessors, the Islamic Courts Union (ICU) and Hizbul Islam, which enforced Islamic laws forbidding piracy in an effort to maintain popular legitimacy (Bahadur 2011). In this line of reasoning, the criminal motivations of pirates and the religious and political motivations of the Islamists are thought to be fundamentally too different for meaningful cooperation (Islamic law considers the proceeds of piracy to be *haram*, “forbidden”).

### *From Conflict to Coordination*

There is evidence that interactions between individual pirate groups and al-Shabaab have ranged from violent conflict to direct coordination. There has been armed conflict particularly when pirates have hijacked ships heading into or out of insurgent-controlled ports in southern Somalia or have captured vessels owned by al-Shabaab suppliers and financiers (Voice of America 2010). Violent clashes have also occurred in coastal Central Somalia, where various pirate groups, al-Shabaab, and previously Hizbul Islam and the ICU have long competed for control of the areas around Harardheere and Hobyo (Jamestown Foundation 2006; *Time* 2008).

Thanks to its control over swaths of territory in Central Somalia and regional centers of economic activity, al-Shabaab has been able to benefit financially from piracy; its share of ransom proceeds appears to have fluctuated with the group’s relative strength. According to interviews with local sources, the man widely considered to be the father of piracy in Central Somalia, Mohamed Abdi Hassan Afweyne, and his commander, Mohamed Garfanji, were the first pirate leaders to negotiate an agreement with the post-ICU al-Shabaab, sometime between 2008 and 2010 (interviews with Darod Majerteen analyst 2010, 2011). The pirates initially agreed to pay US\$100,000 per successfully ransomed vessel in exchange for noninterference in the Harardheere area.<sup>1</sup> However, the militants were able to increase the cost of this protection to US\$200,000 per vessel in early 2011, shortly after the group gained more influence by subsuming Hizbul Islam (interview with Darod Majerteen analyst 2011).

When al-Shabaab fighters initially arrived in Harardheere in May 2010, most analysts expected them to follow through on their anti-piracy rhetoric, attack moored ships, and liberate hostages (*New York Times* 2010; Associated Press, 2010). However, several ships anchored off the coast near Harardheere remained secure even as al-Shabaab became the dominant power holder in the city. For example, Automatic Identification System (AIS) vessel-tracking histories show that the MV Albedo arrived at the anchorage at Harardheere shortly after its hijacking on 26 November 2010 and never moved a significant distance from its original mooring position throughout the lengthy ransom negotiation. (Shortland and Varese 2012; see Figure 5.1). This suggests that local al-Shabaab leaders and the pirates had reached an agreement around that time.

**FIGURE 5.1:** AIS TRACKING OF MV ALBEDO NOVEMBER 2010–MARCH 2013



Source: Bloomberg Finance L.P. 2013.

## The Role of Subclan Affiliations

Al-Shabaab and pirates mainly interact in Harardheere and the surrounding areas because of local subclan ties (SEMG 2011). Al-Shabaab has long had a presence in Harardheere and in 2012 moved steadily into the surrounding regions (*Somalia Report* 2012c). Local sources state that there is a representative of the group (perhaps a former Hizbul Islam official) in Harardheere who is delegated to accept its cut of ransom payments (interviews with Darod Majerteen analyst 2011, Hawiye Habar Gidir Cayr analyst 2012, Hawiye Habar Gidir Saleeban NGO director 2012, and Hawiye Shiikhaal political analyst, 2012). Others named this representative as a Saleeban al-Shabaab commander named Hassan Afrax (Hansen 2011; SEMG 2011; *Suna Times* 2011).

The importance of individual subclan facilitators cannot be overstated: to date, cooperation between the pirates and militants has been brokered at the individual and group rather than the organizational or institutional level (SEMG 2011). Although pirates can generally be classified according to the two regions in which they operate, Puntland and Central Somalia, operations and decision-making are done by smaller groups, usually led by a single powerful individual supported by two to five investors, often though not always from the same clan or subclan (interviews with Hawiye Habar Gidir Cayr analyst 2012 and Hawiye Habar Gidir Saleeban NGO director 2012). In Central Somalia, the most prominent pirate groups are from the Sacad and Saleeban subclans of the Hawiye Habar Gidir clan. Although there are many clans in Harardheere, among them Dir, Abgaal, Shiikhaal, and other Habar Gidir, the Saleeban groups dominate the piracy industry and thus have the closest ties to al-Shabaab (SEMG 2011).

## Box 5.1 Subclan Dynamics: The Case of the Saleeban

In the pastoral areas of Central Somalia, because resources are scarce and territorial boundaries poorly defined, there is persistent conflict, particularly between the three subclans of Habar Gidir, the dominant clan in this area (see Chapter 8). Although all three subclans—Cayr, Sacad, and Saleeban—are subject to similar resource constraints and environmental conditions, Saleeban has emerged as the dominant group in the piracy industry, and ties between pirates and insurgents operate through Saleeban channels (SEMG 2011). According to a focus group discussion with local journalists in Mogadishu (multiclan focus group 2012), the contentious relationship between the Saleeban and each of its neighbors is a major reason why both pirates and insurgents persist in their territory, and why the most frequent collaboration between pirates and al-Shabaab to date has taken place through Saleeban facilitators like Afweyne, the first pirate leader to cooperate with the insurgents. These subclan dynamics are mainly influenced by geographic and demographic factors, all of which both al-Shabaab and the local pirates exploit.

Saleeban territory is wedged between that of the rival Habar Gidir subclans Cayr to the southwest and Sacad to the northeast (see map in UNHCR 2009). Because all three are traditionally nomadic pastoralists with porous territorial boundaries, conflicts over pasturing rights are common (*Somalia Report* 2011a). The co-location of the Saleeban with both of its rivals means that the frequency of conflict between the Saleeban and the other subclans is greater than between the Cayr and Sacad, who share much less disputed territory. For pirates, territory is crucial for anchoring hijacked vessels during protracted ransom negotiations, which is central to their business model (see Chapter 7 and 8). Al-Shabaab relies on territorial control to extract rents and recruit foot soldiers. Therefore to some extent both groups rely on control of physical territory to generate revenue and sustain operations. Although these attempts to secure private property rights in a rural communitarian society can cause tension, both groups have been able to build ties to the Saleeban because local authorities are preoccupied with territorial defense (see Chapter 8).

Further complicating the picture for the Saleeban leadership is the strength of the local Sufi militia, Ahlu Sunna Waljama'a (ASWJ), which although it has some Saleeban members is predominantly drawn from the Cayr in the central regions although other elements include the Darod Marehan clan from the areas around Abudwak and Dir Qubeys from Herale District (*Somalia Report* 2011b). ASWJ represents a serious potential threat to the Saleeban, and although instances of actual conflict are less frequent than in the Sacad-Saleeban rivalry, the tension does occasionally boil over, further destabilizing the region (RBC Radio 2012a, 2012b). Beyond this subclan rivalry, ASWJ is ostensibly allied with the federal government, is an enemy of al-Shabaab, and has also arrested and prosecuted pirates (*Somalia Report* 2012a). This means that insurgents, pirates, and the Saleeban subclan have an antagonist in common. All these geographic and demographic factors illuminate the precarious position of the Saleeban compared with the other subclans, which may make its members either more receptive to insurgent or pirate inducements, or more vulnerable to the threat of physical violence.

Sources: SEMG 2011; multiclan focus group 2012; *Somalia Report* 2011a, 2011b, 2012a; and RBC Radio 2012a, 2012b.

These subclan ties cement the coordination between pirate and militant individuals. Afweyne, the first pirate leader to coordinate with the local insurgents, is himself a member of the Hawiye Habar Gidir Saleeban subclan (Bahadur 2011), but the early agreements he brokered with militant kinsmen were almost certainly a risk-mitigation strategy rather than an expression of ideological support.

## Potential for Increased Cooperation

From a theoretical standpoint pirates and al-Shabaab could mutually benefit from closer cooperation in two areas. The first concerns financial flows. As national and international law enforcement agencies get better at monitoring illicit flows in and out of Somalia, there is natural scope for cooperation between pirates and members of al-Shabaab. The former have allegedly found ways to transfer part of the ransom proceeds outside of Somalia for investment and saving purposes (see Chapter 6), while the latter have been trying to bring in funds from outside benefactors for al-Shabaab's logistical and operational needs (Ali

2008). Since transfers via financial service providers, formal or informal, have costs—not only transaction costs but also risk of detection—cooperation between beneficiaries of ransom proceeds and al-Shabaab officials might present an appealing alternative: ransom money would be transferred directly to the insurgent group and the sponsors of al-Shabaab would in return transfer an equivalent amount to a recipient designated by the pirates. Box 5.2 gives a simplified description of the principles of *hawala*, the informal remittance system allegedly used by financiers and facilitators for both pirates and al-Shabaab (interviews with Darod Majerteen analysts 2011, 2012 and Hawiye Habar Gidir Cayr analyst 2012; *Suna Times* 2012; UNSC Committee on Somalia and Eritrea 2012), and shows how

### Box 5.2 *Hawala Companies and Pirate-Insurgent Cooperation*

Most people in Somalia and the large Somali diaspora rely on hawala companies for making long-distance payments. Hawala networks constitute a remittance system based on trust. They consist of a large number of money brokers (hawaladars) spread across the Somali diaspora communities, the Horn of Africa, and the Arabian Peninsula. Although it is based on trust and traditional networks, the sector is increasingly embracing regulations, including those pertaining to anti-money-laundering and counter-threat financing (International Monetary Fund 2005). “Since 2001, there has been a plethora of new laws, regulations, recommendations and best practice statements on the regulation and supervision of informal remittance systems” (Maimbo 2004).

The principle of informal remittances works as follows: A person in location A wishing to pay money to someone in location B approaches the local hawaladar in A, who instructs the hawaladar in B to make the payment. People in location B will be making similar transfers to A or to other locations within the network. An informal running tally of all transfers is kept, inflows and outflows largely offset each other, and only net flows are eventually settled in cash, goods, or services. In this way funds can be transferred without moving cash. However, if aggregate flows from A to B exceed those from B to A, the local hawaladar in A will run a deficit vis-à-vis the hawaladar in B by accumulating cash reserves while the hawaladar in B sees his slowly depleted. This would be the case when Somalis receive diaspora remittances. A rebalancing of books or settlement consisting of actual cash moving from A to B is then required. In reality, though, actual cash transfer is rare, and settlement would take the form of transfers of goods or services via several intermediaries.

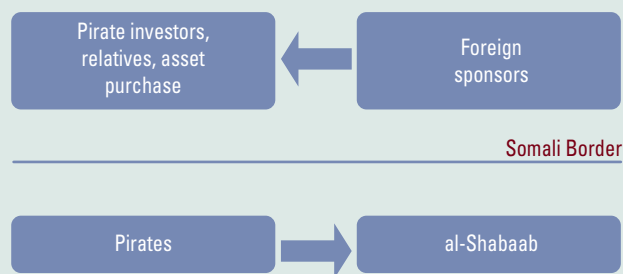
As both formal and informal hawala companies will continue to be subject to heavier regulation as a counter-piracy measure, both pirates and al-Shabaab members are expected to seek alternative means, such as mobile banking and cash couriers (see Chapter 6). One alternative is direct cooperation between two parties that minimizes financial flows in and out of Somalia and the use of financial services. Figure B5.2.1 illustrates how such cooperation could take place. In B5.2.1.a, operating independently, al-Shabaab and its foreign sponsors and pirates and their investors and other foreign beneficiaries move funds in and out of Somalia. In Figure B5.2.1b, however, cooperation between pirates and al-Shabaab allows money to change hands without any cross-border movement or involvement with Somali financial service providers.

**FIGURE B5.2.1: PIRATES, AL-SHABAAB AND FINANCIAL FLOWS**

#### a. Independent Operation



#### b. Cooperation



cooperation between individual pirates and al-Shabaab officers could lower both transaction costs and risk of detection.

Secondly, given the differing objectives of pirates and al-Shabaab, the creation of an informal “market” for hostages could benefit both parties. Lehr (2010) argued that if the next iteration of Somali piracy were to develop a political component, the leading indicators would be increased pirate demands for prisoner exchanges and the sale of hostages to al-Shabaab if ransom demands were not met. Some hostages have a higher political value than others, and al-Shabaab could use Western pirate hostages to pursue specific political goals. Similarly, because of UN sanctions on making financial transfers to terrorist organizations, al-Shabaab could have difficulties in realizing the financial value of hostages that have little political value. Allegedly, hostage transactions between al-Shabaab and pirates have gone in both directions at least once (3news 2012; Global Post 2012). Pirates have also threatened to sell at least one other hostage to al-Shabaab if their ransom demands are not met (*Somalia Report* 2012d).

## Piracy and Maritime Terrorism

Despite known links between certain pirates and al-Shabaab insurgents and anecdotal evidence of pirates threatening to sell hostages to al-Shabaab, Somali piracy is unlikely to evolve into maritime terrorism. So far relationships between elements of the insurgent leadership and certain pirate groups have been ad hoc and pragmatic, taking place at the individual rather than the organizational level (SEMG 2011). Commonalities between al-Shabaab insurgents and pirates have been described as primarily operational.

Traditionally, Somali piracy is undertaken for profit only and is devoid of political, religious, or ideological motives. Pirates do not necessarily avoid attacking on Islamic holidays or during Ramadan (unless these fall in the monsoon season) and regularly hijack ships owned and operated by Muslims (Shortland and Vothknecht 2011). So far none of the ransom demands has had a political dimension. Although occasionally ransom negotiations have included demands for the release of fellow pirates held in foreign countries, in practice ship-owners have avoided cross-issue bargaining, and negotiations over ship releases have concluded with payment of ransom only. In a small minority of recent cases, however, some crewmembers have been held back to put pressure on governments to release captured pirates (*New York Times* 2012; *Somalia Report* 2012b).

To the extent that al-Shabaab derives its legitimacy from Islam, an explicit link with piracy is problematic. Piracy is fundamentally un-Islamic: *Sharia* forbids abduction, violence against hostages, and extortion, and piracy is specifically singled out as a crime that demands the death penalty. Indeed, during the brief rule of the ICU in 2006, which threatened pirates with severe penalties, their attacks totally ceased (Hansen 2009; Middleton 2008; *Telegraph* 2006).

Similarly, assimilation of piracy with insurgent groups entails risks to the pirate business model. In April 2010, U.S. President Barack Obama signed an executive order outlawing payments to named individuals within al-Shabaab (Executive Office of the President 2010). While the wording of the order was vague enough to leave doubt as to whether it

would apply to ransom payments, it is clear that formal cooperation with al-Shabaab or more violent or destructive tactics in piracy would make it considerably harder for ship-owners to legally raise and pay ransoms, and for pirates to receive them.

Finally, as Part II argues, the piracy business model is built on the ability of pirates to anchor hijacked ships along the coast of Somalia. The pirates of Somalia, therefore, do not have a comparative advantage over any other organization in launching maritime terrorism expeditions. Access to potential crew and provision of boats and weapons are not unique to Somali pirates, and their unique ability to mobilize political forces in order to anchor hijacked vessels along the Somali shore is of limited value for conducting maritime terrorist attacks. This, however, does not preclude independent pirates from using their accumulated wealth to sponsor or instigate politically motivated acts of violence.

## Conclusion: Looking Ahead

Both pirates and al-Shabaab insurgents take advantage of a weak central government, but their ultimate aims are not aligned—though their operations are complementary. Al-Shabaab-controlled territory can be “rented out” to pirates as an anchorage for hijacked vessels, and cooperation between insurgents and pirates to move money in and out of Somalia could minimize the use of financial services and therefore the risk of detection. Finally, a profit-driven pirate and an ideologically oriented Islamist insurgent might find it beneficial to trade hostages.

However, Somali piracy is unlikely to turn into maritime terrorism. The analysis in Part II highlights the unique ability of Somali pirates to secure access to the coastline in order to hold hijacked vessels while ransom is negotiated. This would have less value in support of maritime terrorism. Similarly, any motivations of piracy that could be construed as political have so far been limited to alleged attempts to negotiate for incarcerated kin. However, individual terrorism initiatives by wealthy pirates pursuing a political agenda cannot be ruled out.



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## Notes

1. In reality, this was probably based on a percentage, as the SEMG (2011) suggested, rather than a flat fee.

PART II:  
UNDERSTANDING  
SOMALI PIRACY



# CHARACTERIZING SOMALI PIRACY: FACTS AND ANALYSIS

# 6

## Introduction

Piracy emerged at the same time as seaborne traffic. Since then, most of the coasts and busy sea routes of the globe have had to deal with pirate attacks (Elleman, Forbes, and Rosenberg 2010). Though forms, purposes, and modus operandi of piracy have evolved over time, the fundamentals stay the same: Piracy relies on a crew, a boat, a base on land, and access to busy shipping routes, harbors, and anchorages.

Piracy is not a well-defined concept. Because the variety of attack locations, motives, identities of perpetrators and victims, and modus operandi make a clear-cut definition of piracy difficult, it has given rise to many typologies. This report is restricted to attacks reported to have emanated from Somalia since 2005.

This chapter analyzes information from the 2012 International Maritime Bureau database (IMB 2012), scholarly research, policy reports, and news articles to provide a comprehensive dataset on Somali piracy. The IMB (2012) publishes detailed information on attacks carried out by Somali pirates and, for a subset of cases, the outcome of ransom negotiations. That information is augmented here with open source information to create a comprehensive dataset on ransom payments and anchorage locations: the joint United Nations Office of Drugs and Crime–World Bank dataset (UNODC–WB 2012). It appears from these data that the average ransom amount paid for a hijacked ship so far is US\$3.06 million, and total payments to pirates since 2005 are estimated at US\$315 million to US\$385 million.

## Piracy and Armed Robbery against Ships

Definitions of piracy appear in a number of international and national laws, domestic regulations, and shipping and insurance industry agreements. As Bento (2011) notes, the main issue is that the same act may or may not qualify as piracy depending on where it is carried out. Piracy as a specific crime is, however, defined in identical terms in the two international instruments regulating the high seas, the 1958 Geneva Convention on the High Seas (Geneva Convention) and the 1982 United Nations Convention on the Law of the Sea (UNCLOS, or the Montego Bay Convention). The latter states in article 101 that maritime 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 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 an aircraft with knowledge of facts making it a pirate ship or aircraft;
- c. Any act of inciting or intentionally facilitating an act described in subparagraph (a) or (b).

Therefore, if pirates attack a tourist resort or attack a vessel moored in a port or close to shore, the crime will not qualify as piracy because the attack does not involve two ships.

The restrictive UNCLOS characterization of piracy created a potential legal vacuum or conflict of jurisdictions. Consequently, the definition was expanded by the 1988 Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (henceforth SUA) to cover acts taking place in territorial waters and politically motivated attacks. To partly remedy the enforcement deficiency, SUA also obliges state parties to the convention to extradite or prosecute any offender they apprehend. In the current definition, piracy refers to any unlawful act as defined by UNCLOS that takes place more than 12 nautical miles from the coast (Kraska 2011).

When a maritime crime does not comply with the UNCLOS and SUA definitions, usually because the attack has taken place within 12 nautical miles of the coast, rather than being piracy it is considered armed robbery against ships. This type of armed robbery is defined in the Code of Practice for the Investigation of the Crimes of Piracy and Armed Robbery Against Ships (Resolution A.1025 (26), as “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 a ship, *within a State’s internal waters, archipelagic waters and territorial sea* [emphasis added] and any act of inciting or of intentionally facilitating an act described above.”

The scholarly and policy communities have produced numerous typologies, each looking at the phenomenon from a different angle. Box 6.1 reviews some of these. For its statistical and reporting system the IMB follows the definitions of piracy set

## Box 6.1 Piracy Typologies

A number of typologies have been proposed to make sense of the different types of piracy, facilitate analyses, enhance international cooperation, and improve enforcement. Two that are central are those of the International Maritime Organization (IMO) and the Information Sharing Centre of the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP). Piracy experts have put forward many other typologies to match their own analyses.

In the early 1990s the IMO stressed the importance of improving counter-piracy programs by gathering accurate statistics on incidents by type of attack, location, and modus operandi (Murphy 2009). It characterized acts of piracy along a scale of violence with related features (i.e., organization, skills, and equipment): “Low level armed robbery (LLAR)” refers to opportunistic attacks carried out in ports or close to the shore by petty thieves armed with sticks or knives. “Medium level armed assault and robbery” (MLAAR) refers to attacks farther from shore carried out by better-organized groups and with a higher likelihood of violence. Finally, “major criminal hijack” (MCH) categorizes attacks carried out by skilled and well-resourced pirates during well-planned operations that commonly entail considerable violence (IMO Maritime Safety Committee 1993, as quoted in Murphy 2009).

The ReCAAP later came up with a different categorization. According to its website, incidents are classified by four levels depending on the degree of violence and economic loss (e.g., the type of item stolen). Category 1 is “very significant,” with kidnapping, hijacking, and crew dead or missing; category 2 is “moderately significant”: pirates were armed, crew was threatened or assaulted, and cash or goods were taken; category 3 is “less significant”: pirates were armed with knives and did not harm the crew; and category 4 is petty theft. In 2011, of 38 incidents reported to the ReCAAP, 1 was classified as category 1, 13 as 2, 9 as 3, and 15 as 4. In sum, most of the attacks caused little economic damage or human suffering.

Some authors who created their own typologies classify attacks according to where the attack took place (harbor, territorial waters, or high seas); others by the geographical area of the attacks, since at any given time a specific region may host specific forms of piracy; and others by the methodology the pirates used, the economic role of piracy, or its political legitimacy (see, for example, Murphy 2009, Ke 2007, and Lehr 2006).

*Sources:* IMO 2012, ReCAAP 2012, Murphy 2009, Ke 2007, and Lehr 2006.

out in UNCLOS article 101 and of armed robbery set out in resolution A.1025 (26). For each incident, IMB (2012) indicates if the vessel was boarded, fired on, or hijacked or if the attack failed, together with numerous other boat, crew, and location characteristics (see Appendix for detailed description of incidents of Somali piracy reported by the IMB).

## The Fundamentals of Somali Pirate Operations

Although the business of hijacking for ransom started in 2005, there has always been small-scale piracy along the Somali coast. In the 1950s occasional attacks and ransoming were reported in the Gulf of Aden (Murphy 2011). Between 1989 and 1991, the Somali National Movement (SNM) routinely financed the war against Siad Barre’s dictatorial regime by hijacking vessels off the coast of Somaliland and reselling the cargo or holding the crew for ransom (Mukhtar 2011). Around 1995, a new kind of attack emerged against vessels illegally fishing or dumping toxic waste in Somali national waters, where there were no federal enforcement capacities after the fall of Siad Barre (Murphy 2011). The romantic “Robin Hood” icon of the Somali pirate defending his waters from foreign predation had its roots there (Shortland 2011). However, if fishermen genuinely defending their waters performed some attacks, most had from the

outset characteristics of a protection racket, targeting any vessel transiting by or near Somali waters (Foreign Affairs Committee 2012; Hansen 2009; Murphy 2011). Some attacks between 1995 and 2004 had the same features of piracy for ransom as the most recent surge in piracy explored in this report, notably kidnapping and the use of mother ships (Murphy 2011).

The first reported vessel hijacked for ransom off Somalia listed in UNODC–WB (2012) is the MV Feisty Gas. The vessel, a liquefied petroleum gas tanker, was seized near Mogadishu on April 10, 2005, and released 17 days later after payment of a US\$315,000 ransom. Thereafter in 2005, 13 more successful hijackings took place off the Horn of Africa. The number dropped to 5 in 2006 after the Islamic Courts Union (ICU) proclaimed that piracy was against Islam and attacked pirate ports in a move to end it (Hansen 2009). After the fall of the ICU in late 2006, the number of successful hijackings shot up to 13 in 2007 and 42 in 2008. Despite mobilization of international navies off Somalia starting in 2008, the number of hijackings hit a peak of 50 in 2010. The number then dropped by 40 percent to 31 in 2011, and the decline continued in the first three quarters of 2012, during which time there were only 15 (see Figure 1.1.B). The decrease coincides with heightened international navy operations and the growing application of best management practices by the shipping industry, such as deploying armed guards on ships (SEMG 2012).

Somali pirates operate over some 4 million square kilometers extending far beyond Somali national waters into the high seas and the national waters of coastal countries around the Arabian Sea and the West Indian Ocean. The main areas are the Red Sea, the Gulf of Aden, the Arabian Sea with the Gulf of Oman, the Somali basin, and the West Indian Ocean (see Figure 1.2). Attacks have happened as far away as the Iranian coast to the north of the pirate area, Ilha Magaruque in the Mozambique Channel to the south, and Minicoy Island, off India, to the east (SEMG 2011). In 2007, the pirate attack furthest from Eyl—the original pirate hub on the Somali coast—took place 800 km away; in 2008, the distance increased to 1,410km, 2,030km in 2009, and 3,655km in 2010, falling to 2,200km in 2011.

### *Preparing for Pirate Operations*

The home bases of Somali pirates are mainly situated on the coast of Puntland and the northern coast of Central Somalia. The Somalia and Eritrea Monitoring Group (SEMG 2008, 2010), from which most of the information in this section is drawn, and Murphy (2011) have noted that the coastal bases of pirates, whether major or secondary, have evolved over time. Bases in the Bari region in Northern Puntland and at Eyl, once the Somali pirate capital, are increasingly neglected, except for the Bandarbeyla area; pirate activity is now concentrated between Garacad and Harardheere on the South Puntland and North Central Somalia coast (see map of Somalia on p. xx). The UNODC–WB (2012) data show that in late 2011, the northeast of the Bari region, mainly the Bargaal and Caluula areas, began to host pirate operations again (see Figure 8.3 and analyses in Chapter 8). Somaliland has remained mostly free of pirates (SEMG 2008, 2011; Murphy 2011), though

some pirates have operated from the port of Laasqoray in the Somaliland/Puntland disputed region of Sanaag. Murphy (2011) pointed out that in South Central Somalia the port of Kismayo was used as a launching base for attacks before 2007 and then in 2011 and 2012. He added that the Kismayo area is no longer identified as hosting a pirate base, but that pirates still routinely use the oceanic current passing off the port to swiftly access the Indian Ocean. The Mogadishu area is also a launching site for mother ships (Murphy 2011).

At the outset of an operation, an instigator provides or gathers from investors the funds needed to launch the operation and identifies a pirate commander to organize the attack. At least 10 instigators are known to be active in Puntland (Lang 2011). Some attacks, however, are launched opportunistically without being prefunded, in which case investors are solicited as necessary to fund ransom negotiation costs (SEMG 2008). The pirate commander gathers a team and conducts the mission. The instigator and the financiers may be pirates, ex-pirates, businessmen, members of the Somali diaspora, or criminals already engaged in illegal activities (Foreign Affairs Committee 2012; Murphy 2011; SEMG 2008). Regarding the possible collusion of pirates and other criminal actors, the SEMG (2008) found that in some cases pirates overlapped with arms smugglers in Central Somalia and human traffickers in Northern Puntland.

The initial investment can be provided in seed money or goods, such as an engine, skiffs, or weapons. In exchange, the financiers are entitled to a share of the ransom if the operation is successful. Reuters (2009) and Kraska (2010) mentioned a stock exchange in Harardheere, where anyone could invest in pirate operations. To launch a mission the pirate group needs at minimum a boat to scout the sea, a fast skiff with a ladder to attack and board the target, engines, fuel, and food to sustain several weeks at sea. Pirates themselves are believed to provide the light weapons, such as AK-47 automatic assault rifles or M76 semi-automatic rifles. Meanwhile, the investors provide heavier weapons, such as rocket-propelled grenades (RPG) or anti-tank rocket launchers (interview with former pirates 2012).

Pirates tend to use their arms: the number of vessels fired upon tripled between 2008 and 2010 (IMB 2012), and Somali pirates fired weapons in 92 percent of all attacks in 2009 and 2010 (SEMG 2012). More sophisticated equipment, such as communication devices, radar, and global positioning systems (GPS) are ever more common. Lastly, although there is no substantial proof, the SEMG (2008) suspects that some pirate groups benefit from intelligence on potential target movement. They may access the Automated Information System (AIS) to get the positioning of vessels in real time so that they can track targets (Lang 2011). A best management practice of the shipping industry recommends that the shipmaster, although free to switch it off, keep the AIS on even in high-risk areas (BMP 2011).

The team assembled by the pirate commander is usually homogenous from mission to mission until successful (interview with former pirates 2012). The commanders are usually former successful pirates (Murphy 2011). The turnover of pirates is rapid—most retire after their first successful attack (Anderson 2010). When a team member is killed or captured, a member of his family is said to have priority to take the vacant slot (interview with former pirates 2012).



The SEMG (2008, 2012) identified two main networks of pirates operating off Somalia, the Puntland Piracy Network (PPN), mostly operating from around Garacad and Bandarbeyla, and the Hobyo–Harardheere Piracy Network (HHPN). The two are loosely organized and to some extent overlap and cooperate (SEMG 2008). They host a large number of operationally autonomous pirate groups of varying sizes, from a few to several hundred (Chalk 2010). At any given time an estimated 1,500 to 3,000 pirates are operating off the coast of Somalia (Foreign Affairs Committee 2012).

## Attack Execution

Pirate attacks are now routinely launched from a mother ship (Oceans Beyond Piracy 2011; SEMG 2011; UNSC 2012). Mother ships offer three advantages: pirates can stay at sea longer, their areas of operation are extended, and they blend better into the sea traffic. At first, small trawlers or fishing dhows, mostly hijacked off Yemen (Hansen 2009), were used as mother ships, but since the use of the MV *Izumi* in late 2010, larger commercial ships have also been employed (*Somalia Report* 2011a). The SEMG (2011) points out that the new type of mother ship offers better cover, less dependence on weather conditions, and a larger reach. The North Atlantic Treaty Organization (NATO) has identified several ports along the Somali and Yemeni coasts, Bossasso and Mogadishu for example, where mother ships routinely resupply before going back to sea (SEMG 2008). Whenever possible skiffs that will be used for the attack itself are hidden onboard the mother ship to avoid early detection by the potential target or a patrolling navy (SEMG 2008).

While attacks are mostly opportunistic, this does not necessarily imply that all vessels are equally attractive as targets. Boarding a vessel steaming in the open sea from a small skiff is difficult. Slow ships with a low freeboard (the distance between the waterline and the deck) and not much maneuverability are easier to hijack (Lang 2011); even in Asia they tend to be the main pirate targets (Mejia, Cariou, and Wolff 2008). Vessels moving faster than 15 knots are less susceptible to attack (Ploch et al. 2010), and there is no known case of a successful attack on a vessel travelling at or above 18 knots (BMP 2011; UNITAR 2010). The height of the freeboard is a relative protection. The BMP (2011) has indicated that with more than 8 meters of freeboard, a vessel has a better chance to escape, although the SEMG (2010) pointed out the successful hijack in 2010 of a vehicle carrier with a 23-meter freeboard.

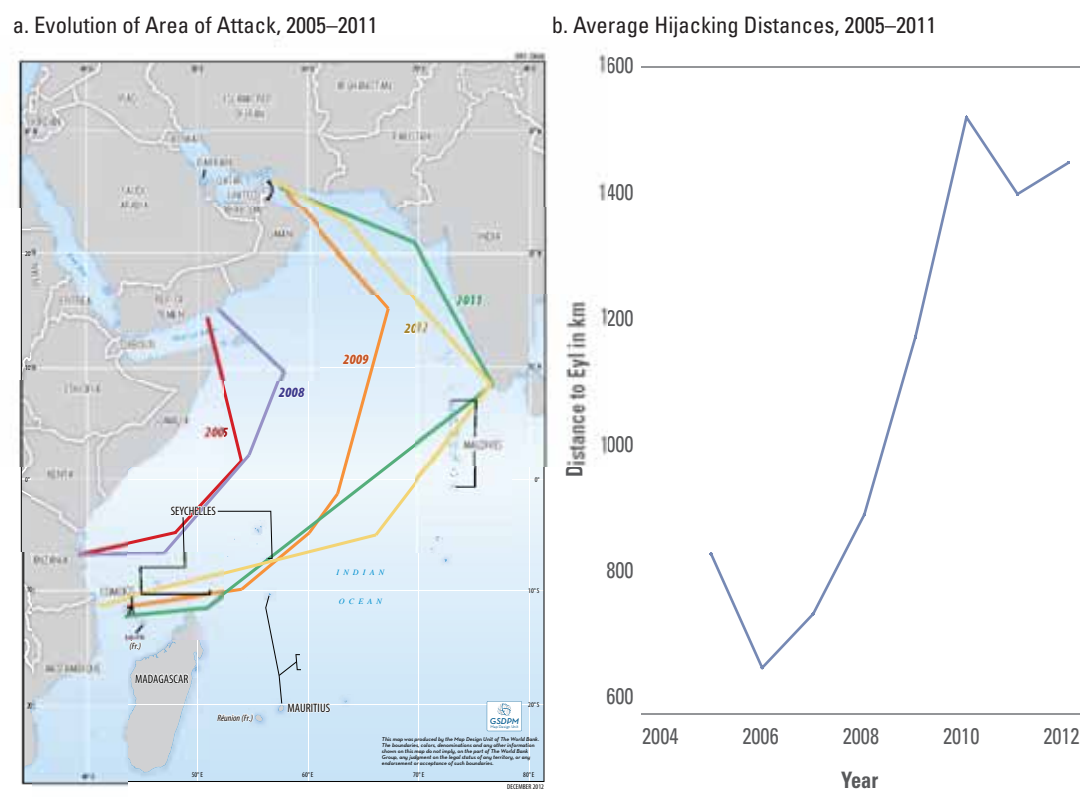
Analysis of IMB (2012) data reveals that ship characteristics and the location of the attack strongly predict its result. Larger ships and ships with a larger crew can be particularly hard to hijack, and the success rate drops significantly when the attack takes place far from the Somali coast. The marginal effects of the boat's characteristics are sizable; every 1,000-ton increment in deadweight tonnage decreases the probability of being hijacked by 1.31 percent (0.237 percentage points). Similarly, on average, having one more crewmember on board decreases the probability of being hijacked by 6.05 percent, or 1.09 percentage points, given a baseline probability of 18.01 percent. The success rate drops quickly as pirates hunt deep into the Indian Ocean. Every 100 km they sail away from the port of Eyl

decreases their probability of success by 6.44 percent, or 1.16 percentage points (see details of the analysis in Annex 6.A).

Over time the pirate area of operation has expanded, the hijack zone has shifted away from the Somali shore, and the average distance pirates travel has increased (see Figure 6.1). The growing presence of military vessels patrolling the Gulf of Aden since 2008 is believed to be the main driver behind the geographical change (Foreign Affairs Committee 2012). Concurrent with the drop in the number of attacks in the Gulf of Aden, the SEMG (2011) noted that the number of attacks and hijacks increased significantly in the Red Sea and the Indian Ocean generally, where the navies have little to no capacity to interfere. The use of larger mother ships is another driver of the geographic expansion, because they give pirates the ability to operate farther out even in severe weather (SEMG 2012).

Analysis of IMB (2012) data reveals a correlation between success rate and distance traveled from the port of Eyl for an attack (see Annex 6.C). When pirates have been successful with one hijacking, they will not travel as far for their next attack. Numerically this effect is very significant: increasing their success rate by 10 percent prompts pirates to revise their “hunting” strategy; they tend to travel 192 km less to their next target. Since the pirates travel 1,231 km on average for each hunt, the change shortens the distance by 15.6 percent. This finding is consistent with pirates extending their search until they can

**FIGURE 6.1: THE GEOGRAPHY OF SOMALI PIRACY**



Source: IMB 2012.

successfully hijack a ship. The increase in distance over time can therefore be attributed to the lower probability of success closer to shore, lending support to the effectiveness of counter-piracy strategies that consist of avoidance of routes at risk, escort by navy ships, and use of best management practices.

Weather conditions also have a major impact on pirate activity. Piracy off the coast of Somalia is heavily affected by the monsoon periods. The Industry BMP (2011) found that pirate skiffs are increasingly difficult to operate when there are 3-foot (1.6–4.1) waves and 14 knot or higher winds. A recent study of the impact of weather conditions on piracy off the Horn of Africa in 2010–11 (Cook, Garrett, and Rutherford 2011) concluded that attacks were rare when the wind reached 21 knots and nearly impossible when wave height exceeded 2.5 meters (8.2 feet). The analysis of IMB data for this report confirms these findings (see Box 6.2).

During the southwest monsoon season, between May and September, and the northwest monsoon, from December to February, pirate activity drops. The number of attacks falls by about 34 percent (see Figure 6.2) and a spatial change of pirate activity is noticeable (UNITAR 2010). During monsoon seasons, the pirates sail less far and target areas less affected by the weather. During the southwest monsoon they scout mostly the southern Red Sea/Bab el-Mamdeb area and the Gulf of Aden (UN Secretary-General 2011), and during the northwest monsoon the south of the pirate zone, such as the Mozambique Channel or the Seychelles (Foreign Affairs Committee 2012).

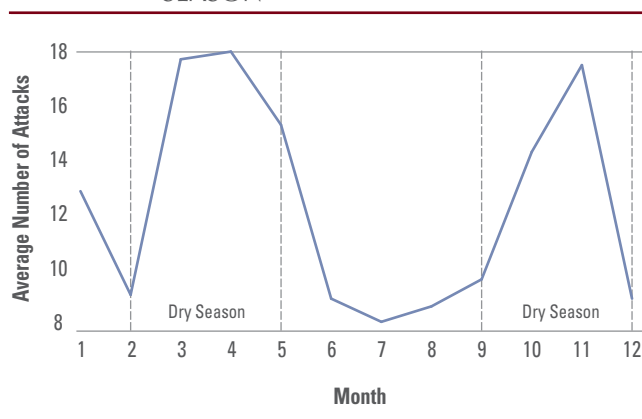
## Hijacking and Ransoms

Once in control of the vessel, the pirates are not interested in stealing the cargo. The single goal is to hijack the vessel, with crew and cargo, to negotiate a ransom or for use as a mother ship. If it is for a ransom negotiation, the vessel is anchored off the Somali coast (Figure 6.3). Every hijacked vessel will be anchored off Puntland or Central Somalia for

the duration of the ransom negotiation. There are a limited number of anchoring points: 26 have been identified, of which 6 are most active (see Figure 6.3). The SEMG (2008, 2010, 2012) noted that routinely several vessels are anchored in the same area; a hostage described the sea off Eyl as a parking lot for hijacked vessels. The anchorage marks the beginning of the last phase of the operation, the ransom negotiation.

Once the vessel is anchored off the shore of Central Somalia or Puntland, a ground team usually takes over. First, a team of typically 50 guards is hired to secure the vessel against rescue missions or rival gangs. It is placed under the authority of a ground commander. Protection

**FIGURE 6.2:** ATTACK PATTERN BY MONSOON SEASON



Sources: IMB 2012; ICOAD 2012.

## Box 6.2 Weather Conditions and the Probability of Attacks

When piracy data from IMB were combined with atmospheric data from the International Comprehensive Ocean-Atmosphere Dataset (ICOAD 2012) of the U.S. National Oceanic and Atmospheric Administration (NOAA), it was found that both wind speed and wave height significantly predict whether an attack will take place on a given day (see Annex 6.A).

A binary choice model used at daily frequency shows that atmospheric conditions are relevant to a pirate group's decision to attack. The dependent variable is a binary variable that indicates whether there is at least one attack on a certain day. For the independent variables, mean wind speed and wave height on the Indian Ocean were used as proxies for weather conditions.

When the wind speed is high at the 90th percentile in a given year, the probability of an attack decreases by 12.25 percent compared to when the wind speed is at the 10th percentile. Similarly, if wave height increases from the 10th percentile to the 90th, the probability of attack will decrease by 11.74 percent. Yet there is no statistical association between weather conditions and the number of hijacks or the hijack rates, probably because the weather primarily determines whether or not an attack takes place at all, not the probability of its success.

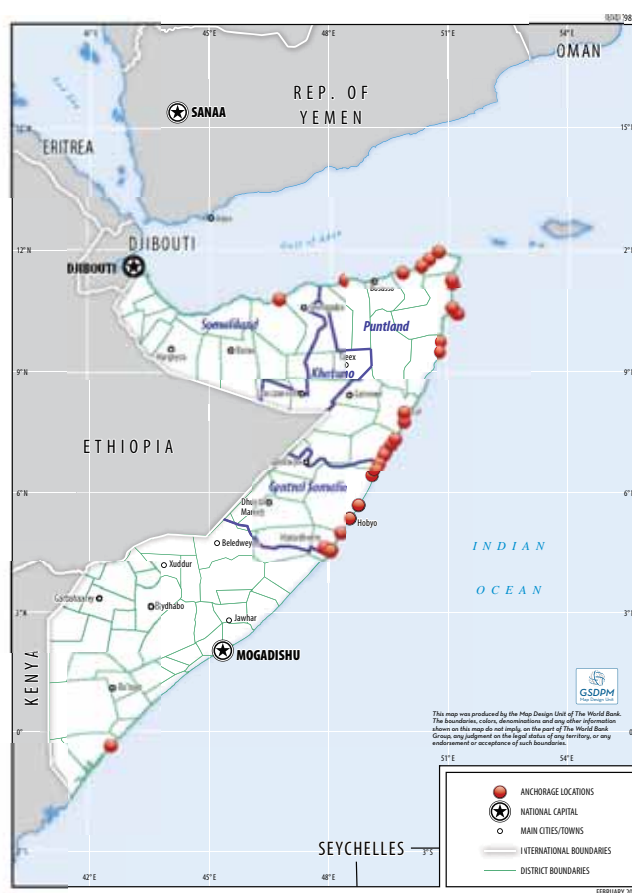
Sources: IMB 2012; ICOAD 2012.

of the vessel may also be outsourced to another pirate group (Hansen 2009). Until it is released, support networks and coastal communities keep the hostages supplied with food, prepared by a dedicated cook, and water (Atallah 2011). Through the same networks, the pirates are supplied with a wide array of goods or services, notably khat, alcohol, fresh clothes, and airtime.

According to interviews with former pirates (2012; SEMG 2011), a committee usually composed of five members (the instigator, two main investors, and the sea and ground commanders) oversees the ransom negotiation process. The committee relies on a negotiator, who usually also acts as translator, who will open the negotiation with the shipping company, which in turn will typically involve its insurance company, a specialized law firm (Panjabi 2010), and a private security company. The pirate negotiators are usually involved in several negotiations at once. The SEMG (2011) noted that in 2011, 14 pirates were negotiating ransoms for the release of 25 ships. Finally, an accountant takes care of the financial records and distributes ransom proceeds among shareholders (Bahadur 2011).

London is at the epicenter of pirate ransom negotiations. London has been the world center

FIGURE 6.3: ANCHORAGE POINTS



Sources: IMB 2012; UNODC-WB 2012.

of the maritime underwriting market since the late 17th century (Jones 2009), and English law rules most maritime and admiralty (maritime incident resolution) matters (Foreign Affairs Committee 2012). London is thus commonly the favored jurisdiction for international maritime issues. The Foreign Affairs Committee (2012) stated that in negotiations the lawyers' roles consist of "[working with the] owner's crisis management team in giving support and advice on the legal and practical consequences of a maritime hijacking from the immediate aftermath of the hijacking through to the release of the vessel and its recovery to a port of refuge."

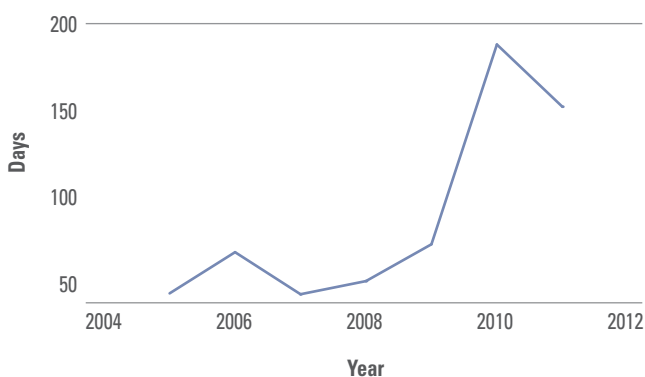
The negotiation between the pirates and the ship owner is usually lengthy. The SEMG (2011) noted that although the pirate negotiators follow the bargaining instructions of the committee, they are selected based on their negotiation skills. The pirates routinely open the negotiation with the ship owner or charterer (Oceans Beyond Piracy 2010). The bargaining process consists of alternating offers; initially the demand is large (SEMG 2011). For example, for the MV Victoria, which was held for seven months in 2009, the initial demand was US\$8 million and the negotiators finally agreed on US\$1.8 million, just a little lower than the US\$2 million target the pirate negotiator had suggested to the captain of the hijacked ship (SEMG 2011). The pirates usually negotiate from the hijacked vessel (SEMG 2011) via satellite phone (Foreign Affairs Committee 2012).

During the negotiation, the hostages are usually kept in the anchored vessel. The median length of negotiation went from 46 days in 2005 to 188 days in 2010 (Figure 6.4); between 2009 and 2010, the length of negotiation increased by 154 percent. The longest detention was 1,178 days for the 29 crewmembers of the FV NN Iran, an Iranian fishing vessel seized in March 2009 (UNODC-WB 2012).

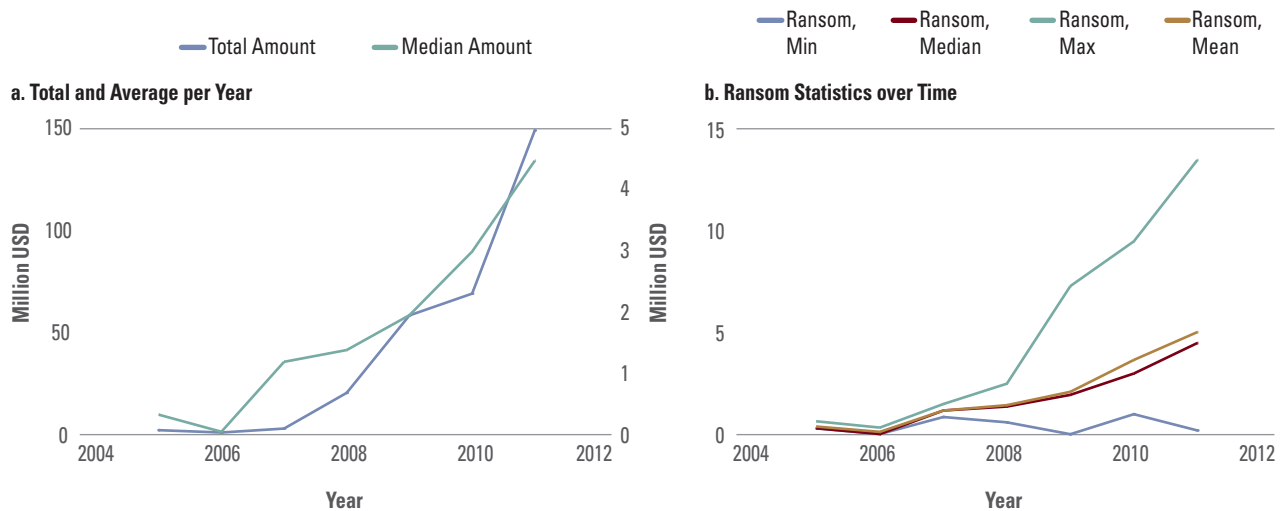
On average, ship owners pay US\$3.06 million to recover ship, cargo, and crew. However, the ransom amount can vary widely (Figure 6.5). On the lower end, ship owners pay a few hundred thousand dollars. On the higher end, several ransoms have exceeded US\$10 million. In 2011, the average ransom was US\$5.04 million, a 37 percent increase from 2010 and a 140 percent increase from 2009. The nationalities of the hostages, the size and type of vessel, and the number of hijacked ships held by the pirates are three variables that heavily affect the ransom amount finally paid (see Box 6.3).

Analysis of the determinants of ransom amounts makes it possible to estimate more precisely the total payments made to Somali pirates since 2005 (Box 6.3). With information on ship characteristics and a custom ransom determination model, it is possible to impute many of the unknown values in the ransom dataset. For example, to predict a ransom payment using the model for this report, it is only necessary to know the size and type of ship, the composition of crew nationalities, and the number of ships currently held by Somali pirates at a given

**FIGURE 6.4:** NEGOTIATION TIME (MEDIAN)



Source: UNODC-WB 2012.

**FIGURE 6.5: RANSOM AMOUNTS**

Source: UNODC-WB 2012.

anchoring point (the independent variables listed in Box 6.3). In some cases where information on ship characteristics was only partial, sample averages were used to impute unknown values. With this method it was possible to impute 50 cases of ransom payments, about one-third of the entire sample. Without any imputation it was estimated that, based on 103 payments, total ransom payments between 2005 and 2012 add up to US\$315 million. With imputation, based on 153 payments, the estimated total payment would be about US\$385 million.

Ransoms are usually paid in US dollars and delivered directly to the pirates by a private security firm, which may also have participated in the negotiation (FATF 2011). Payment is usually airdropped near the hijacked vessel by a small plane originating in Kenya or Djibouti (*Somalia Report* 2011b). In a few cases, the ransom was reportedly paid outside Somalia, in either Mombasa or Dubai (FATF 2011). The accountant confirms the amount and divides it among the pirates according to the share structure—the precise distribution is the theme of the next chapter. Once the ransom is accounted for, the vessel, cargo, and crew are released. The SEMG (2012) noted that on two occasions in 2011, after the ransom payment the pirates retained a few hostages to negotiate the release of pirates imprisoned in the country of origin of the hostages. The SEMG (2008) stated that the hijacked vessel may benefit from the protection of the pirates until it has left the area—there is no account of a vessel being hijacked a second time by a competing pirate group.

How and where the ransom proceeds are moved and laundered is largely unproved, but it is known that pirates transfer ransom money through three alternative channels: cash couriers, mobile banking, and *hawala* dealers. It is possible that cash couriers could move ransom money by road and then further by sea or air (UNODC 2011). UNODC (2011) suggests that mobile banking, used by a third of Somali adults (*Economist* 2012) is



## Box 6.3 What Predicts the Ransom Amount

Ransom payments depend on the characteristics of the ship and of the pirates holding the ship. On the ship side, there are data on the nationality of the owner; the flag state; the type, size and tonnage of the vessel; and the number of people on board and their nationalities. On the pirate side, information is scarce—only the dates of the attack, the hijack, and the vessel release. From these it was possible to compute the number of ships the pirates were holding and a measure of their “success rate” at each time point. These variables are used as proxies for how successful the pirates were at the time of the ransom negotiations and to investigate whether this affects the negotiation results.

It was found that three variables can potentially predict the negotiated ransom amount: the nationalities of the crewmembers, the size of the boat, and the number of hijacked ships the pirates were holding at the same time (see Annex 6.B).

**Crew Nationality.** There is detailed information on the nationalities of each crewmember on the hijacked ships. For example, for the MV Rak Afrikana, of the 26 crewmembers on board, 11 were Indian, 10 Tanzanian, and the other 5 Pakistani. Hypothetically, if some of the crewmembers come from higher-income countries, the pirates might be able to extract a higher ransom because their relatives and friends, and sometimes their governments, might be able to raise more money for ransom.

To test this hypothesis, a dummy variable was constructed indicating whether the crew contains at least one member from a high-income country, defined as one where per capita nominal GDP was higher than US\$11,000 on average for 2005–11 (roughly the World Bank definition of “high-income country” for the same period).

On average, having a crewmember from a high-income country increases the ransom payment by 31–38 percent. This sizable result is robust across different specifications in models without time fixed effects. In the model with time fixed effects, the estimation predicts that the ransom payment would increase by 20 percent—still sizable, although not always statistically robust to all econometric specifications (notably when time fixed effects are used). Nevertheless, it seems clear that pirates indeed use crew nationality information to extract higher ransoms.

**Size of the Ship.** On average, the pirates extract a larger ransom on larger ships. Depending on specifications, every 1,000-ton increment in deadweight tonnage increases the ransom payments by 0.7 percent. Similarly, larger crew size also predicts higher ransom payments.

**Number of Ships Held.** Pirates who are holding many ships at the anchoring points are likely to suffer congestion problems because the supply of food, water, and guards is limited. Therefore, if they have more ships on their hands, they might ask for a lower price on each to reduce negotiation time.

There is evidence for this effect. On average, having one more ship at the anchoring point will lower the ransom by 1.5 percent.

Source: UNODC–WB 2012.

probably widely used to move money. Even though such services are regulated (US\$2,000 limit per transaction and mandatory identification), mobile transfers of up to US\$100,000 by unidentified users are reported as not unusual. Finally, the pirates probably use hawala companies, a remittance system whereby money is transferred through a network of brokers, to launder the proceeds. Local sources (interviews with Darod Majerteen analyst 2011 and Hawiye Habar Gidir Cayr analyst 2012) and UNODC (2011) identified close connections, through clan ties and investment activities, between pirates and registered or informal hawala dealers. FATF (2011) and SEMG (2012) reported cases of ransom money moved by hawalas. Regarding the destination of the ransom money, UNODC (2011) suggested that most of the proceeds are spent inside Somalia, the rest being either moved to countries vulnerable to money laundering or sent to accomplices or relatives in the Somali diaspora. FATF (2011) noted that a significant amount of proceeds probably enter the international

financial system, and SEMG (2012) obtained evidence of transfer of ransom money between pirates and individuals in the Somali diaspora. A continuing UNODC–WB study on illicit flows stemming from Somali piracy is working to verify these allegations and better understand how and where ransom money is channeled.

## Conclusion

Quantitative analysis of the data on piracy incidents from the IMB (2012) database and on ransom payments from the new UNODC–WB (2012) dataset offers evidence of the Somali pirate modus operandi. Somali piracy has recently been responsible for 50 percent of pirate attacks worldwide, is exclusively a piracy for ransom, and covers a remarkably large geographical area. The characteristics of the target and the location of the attacks predict their outcome, and the size of the ship, the nationalities of crewmembers, and the number of ships held concomitantly predicts the ransom amount. Last, the data confirm that the operational model of the Somali pirates has evolved. They have, for instance, changed their catchment area, partly in response to the growing military presence in the original area and shipping industry preparedness.

However, if Somali piracy is singular for its scale, geographic scope, modus operandi, and the consistency of its objective of hijacking vessels, with crew and cargo, for ransom, its main operational characteristic is found on land. A singular feature of Somali piracy is its ability to securely negotiate ransoms from a few known coastal bases along the Somali shore. That feature has been defining Somali piracy since 2006, the period of interest for this report.



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## Datasets

- FSNAU 2012: Food Security and Nutrition Analysis Unit Database
- ICOAD 2012: International Comprehensive Ocean-Atmosphere Database
- IMB 2012: International Maritime Bureau Database on Piracy Incidents
- UNODC–WB 2012: Joint UNODC–WB Database on Anchorage Information and Ransom Payments Made to Somali Pirates

## Annex 6.A: Determinants of a Pirate Hijacking Attempt and its Success

Using a logit model of event frequency to investigate the determinants of a successful attack, the following equation was estimated using a maximum likelihood estimator:

$$Success_i = L(\beta_0 + \beta_1 Wind + \beta_2 Wave + \beta_3 Ship\ Size + \beta_4 Distance + \beta_5 Crew\ Size + t + \varepsilon_i)$$

where  $Success_i$  is a binary variable taking the value of 1 if the attack is successful and 0 otherwise, and  $L(x)$  is the standard logistic cumulative density function (CDF) function:

$$L(x) = \frac{1}{1 + e^{-x}}$$

Looking at daily wind and wave condition data at square-degree level, to avoid the problem of outliers for each attack the mean or median is taken across all the observations in the 10-day window before the attack on a 2-degree rectangle. This makes it possible to interpret weather variables as capturing the general conditions in the area just before the attack, which in turn should make it possible to characterize the difficulties the pirates faced at about the time of the attack.

The ship size variable is the deadweight tonnage. The distance variable is the distance between the point of attack and the port of Eyl. All the other variables are self-explanatory. The results are detailed in Table 6.A.1.

Similarly, another logit model was estimated at daily frequency to study the relationship between weather conditions and the decision to attack:

$$Attack_t = L(\alpha_0 + \alpha_1 Wind + \alpha_2 Wage + \alpha_3 t + u_t)$$

The dependent variable  $Attack_t$  indicates whether there is at least one attack on day  $t$ . The independent variables are mean wind speed and wave height on the Indian Ocean, as proxies for atmospheric conditions. The wind speed and wave height variable is defined as the average across all the observations in the entire Indian Ocean for each day. The results are presented in Table 6.A.2.

**TABLE 6.A.1: DETERMINANTS OF SUCCESSFUL ATTACK**

Specification:	(1)	(2)	Time FE	Time FE
Wind (mean)	–0.0189 (0.0910)		0.00794 (0.0969)	
Wave (mean)	–0.253 (0.214)		–0.251 (0.225)	
Ship Size	–1.52e–05** (6.20e–06)	–1.56e–05** (6.26e–06)	–1.74e–05** (6.90e–06)	–1.79e–05*** (6.93e–06)
Distance	–0.000798*** (0.000253)	–0.000764*** (0.000253)	–0.000601** (0.000273)	–0.000565** (0.000273)
Crew Size	–0.0705*** (0.0174)	–0.0719*** (0.0175)	–0.0832*** (0.0182)	–0.0848*** (0.0183)
Time Trend	–0.000550** (0.000244)	–0.000576** (0.000243)		
Wind (median)		–0.106 (0.0813)		–0.0845 (0.0849)
Wave (median)		0.0583 (0.195)		0.0950 (0.202)
Constant	11.96*** (4.407)	12.38*** (4.373)	2.110 (1.438)	2.115 (1.414)
Observations	526	526	526	526

Sources: IMB 2012; ICOAD 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

**TABLE 6.A.2: DETERMINANTS OF ATTACK**

Specification:	(1)	(2)	(3)	(4)	(5)
Wind Speed	–3.204*** (0.749)	–2.176*** (0.353)		–1.655** (0.788)	–2.577*** (0.773)
Wave Height	0.941* (0.484)		–1.348*** (0.230)	–0.380 (0.514)	0.496 (0.500)
Time Trend		0.000663*** (5.21e–05)	0.000686*** (5.25e–05)	0.000670*** (5.31e–05)	
Constant	4.142*** (1.091)	–8.819*** (1.104)	–12.29*** (0.929)	–9.632*** (1.561)	3.445*** (1.123)
Observations	3,134	3,134	3,134	3,134	2,768

Sources: IMB 2012; ICOAD 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

## Annex 6.B: Determinants of Ransom Payments

Multivariate ordinary least squares was used to estimate the determinants for ransoms, with the following specification:

$$\begin{aligned} \text{Log}(Ransom) = & \beta_0 + \beta_1 RichCrew + \beta_2 ShipsHeld + \beta_3 BoatSize + \beta_4 TotalCrew \\ & + \beta_5 PriorSuccessRate + \beta_6 PosteriorSuccessRate + \beta_7 NegotiationTime \\ & + \beta_8 BoatFlag + \beta_9 TimeTrend + \varepsilon_i \end{aligned}$$

where  $\text{Log}(Ransom)$  is the logarithm of the ransom payment in US\$ million and the other variables are defined as follows:

1. *Rich Crew*: A dummy variable to indicate whether the crew contains at least one member from a rich country. A rich country is defined as one where the average nominal real GDP between 2005 and 2012 is more than US\$11,000 in constant dollars.
2. *Ships Held*: The total number of ships hijacked and not released by all Somali pirates.
3. *Boat Size*: The size of the boat measured in deadweight tonnage.
4. *Total Crew*: Total number of people on board, including passengers and armed guards as well as crew.
5. *Prior Success Rate*: The cumulative success rate of Somali pirates between January 2000 and a given date. Success is defined to be a hijack. The rate is the number of total hijacks divided by the number of total attacks.
6. *Posterior Success Rate*: The success rate of Somali pirates between a given date and May 2012.
7. *Negotiation Time*: The difference between the date of attack and the date of release, measured in days.
8. *Boat Flag*: The average per capita real GDP between 2005 and 2011 of the flag country.

The results of the estimations are shown in Table 6.B.1.

**TABLE 6.B.1: DETERMINANTS OF RANSOM**

Specification:	(1)	(2)	(3)	(4)	(5)	(6)	Time FE
Rich Crew	0.308* (0.169)	0.307* (0.166)	0.268* (0.145)	0.272* (0.143)	0.276* (0.159)	0.231 (0.142)	0.234 (0.165)
Ships Held		-0.00182 (0.00142)	-0.00226** (0.00111)	-0.00231** (0.00107)	-0.00277 (0.00226)	-0.00254 (0.00234)	0.00364* (0.00191)
Boat Size			8.31e-06** (3.71e-06)	6.40e-06* (3.28e-06)	5.42e-06* (2.90e-06)	5.82e-06* (3.01e-06)	3.65e-06 (3.13e-06)
Total Crew				0.0180** (0.00824)	0.0148* (0.00849)	0.0173** (0.00850)	0.0194** (0.00817)
Prior.Suc.Rate					-4.357 (5.116)	-3.263 (4.987)	4.808 (5.890)
Post.Suc.Rate					5.375 (5.498)	5.944 (6.093)	13.50 (12.30)
Negotiation Time					0.00146 (0.00155)	0.00145 (0.00157)	-0.00198 (0.00133)
Boat Flag					-5.21e-06 (6.29e-06)		-3.78e-06 (6.15e-06)
Time Trend	0.00166*** (0.000258)	0.00253*** (0.000840)	0.00282*** (0.000713)	0.00279*** (0.000698)	0.00330*** (0.000963)	0.00323*** (0.000981)	
Constant	-29.45*** (4.722)	-44.39*** (14.61)	-49.44*** (12.49)	-49.20*** (12.22)	-58.21*** (16.14)	-57.59*** (16.36)	-5.475 (3.316)
Observations	96	96	95	95	93	95	93
R-squared	0.439	0.455	0.598	0.617	0.648	0.646	0.688

Sources: IMB 2012; UNODC-WB 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.

## Annex 6.C: Attack Distance and Prior Success Rate

The following equation was estimated to test the relationship between the distance travelled for each attack and the prior success rate:

$$Distance_i = \beta_0 + \beta_1 SuccessRate_i + X\beta + \varepsilon_i$$

where  $Distance_i$  is the distance between an attack and the port of Eyl, and  $SuccessRate_i$  is the cumulative success rate between January 1, 2005, and 150 days before the attack. The latter variable captures the success rate up to five months before the attack. Vector  $X$  contains several different sets of variables to control for the time trend. The control for time trends includes linear, quadratic, and cubic terms of year variable and monthly or yearly fixed effects.

The distance covered is shown to be significantly correlated with the success rate five months before the attack. The five-month lag is unique; no significant lag can be found in the data for any other lags between one and eight months. It is likely that the five-month lag is determined by the monsoon pattern in the Indian Ocean: though pirates indeed learn from experience about the location of potential hunting grounds, their knowledge will only affect their choice of the next trip five months later, because they need to wait on land for the three-month monsoon to pass and they need time to prepare before they can set sail again. (See Table 6.C.1.)

**TABLE 6.C.1: DISTANCE AND PRIOR SUCCESS RATE**

Distance Specification:	No Fixed Effects	No Fixed Effects	No Fixed Effects	Year Fixed Effects
Lagged Success Rate	–1,922*** (636.10)	–1,911*** (636.80)	–4,479*** (682.40)	–2,341*** (729.70)
Year	–35,708 (28997.00)			
Year Squared	8.928 (7.22)	–9.114 (7.22)		
Year Cubic		0.003 (0.00)		
Constant	3.57E+7 (2.912E+07)	1.22E+7 (9.17E+06)	2,513*** (189.10)	1,293*** (215.30)
Observations	649	649	649	649
R-squared	0.207	0.207	0.112	0.295

Sources: IMB 2012; ICOAD 2012.

Note: Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent levels.





# SPLITTING THE PIE: THE DISTRIBUTION OF RANSOM PROCEEDS

## 7

### Introduction

The common thread of Somali piracy operations is the ultimate objective of obtaining a ransom in exchange for the release of crew and cargo. Given the importance of secure access to coastal areas for that purpose, a pirate operation needs more than just manpower and financial resources: it needs political capital. Pirates have to build long-term alliances with local stakeholders to ensure that nobody contests possession of the hijacked ship or disrupts supply chains during the negotiation. Because local residents often have moral and religious objections to piracy, pirates need to ensure that decision-makers and veto-holders support their use of an anchorage. The mixture of political, clan, and militia connections that allows a pirate or pirate advocate to influence political leaders to condone piracy is political capital.

The analysis in this chapter looks at how ransom proceeds are distributed across the three components of a pirate operation: manpower, financial resources, and political capital. Unlike earlier attempts, the accounting framework does not look at payments to individuals per se (SEMG 2010, 2011) but at returns on the inputs individuals make. Focusing on political capital as a separate input into the piracy business makes it clear that the direct and indirect beneficiaries of piracy go well beyond the actual perpetrators.

This alternative breakdown is designed to isolate marketable inputs, where the rewards are directly responsive to market conditions, from those where the rewards are nonmarketable. Both financial capital and pirate labor can be obtained in competitive markets. The rewards to labor and financial investments will therefore depend on market conditions, which include alternative options and the probabilities of piracy success or failure. Political capital, on the other hand, makes it possible to create an environment in which pirates are protected from outside interference while they extract ransoms. Political capital therefore collects a

fee for protection, which could take the form of (potentially large) payments to locally and regionally important figures, inflated prices for inputs, charitable donations, “hospitality,” and overt protection payments.

The ultimate goal of the proposed trichotomy is a framework that can be used to gauge the effectiveness of current and proposed policies for curbing piracy. Current counter-piracy policies change the required market wages for pirates and market returns to investors by changing the risks involved in piracy and the rewards for alternative employment or investment. It is therefore possible to analyze the cut-offs (for example, in death and success rates) that make piracy unsustainable in that it no longer covers capital and labor costs. Chapter 9 evaluates current anti-piracy policies using the proposed analytical framework.

## A New Look at the Business Model of Somali Piracy

### *A Historical Detour*

For most of history, pirates were either the de facto masters of an ungoverned land or the beneficiaries of the protection of the state ruling the land.

Sometimes the pirates were the “rulers” in that no authority was governing the areas from which they operated (see Annex 7.A for a brief historical review of piracy). This was the case of the Cilician pirates in the 2nd and 1st century B.C. (De Souza 2002; Konstam 2008) and the early 20th century pirates of the South China coast (Antony 2010; Ke 2007). Antony (2010) pointed out that in China, the combination of the state’s weakness and civil war led to the creation of “no-man’s lands,” strongholds from which pirates were able to attack with little fear of law enforcement authorities because domestic authorities were “too weak and too corrupt” to act against pirates, and the international community was unable or unwilling to intervene in Chinese waters or on shore. From secure coastal land, pirates engaged in piracy for ransom and cargo theft, ransacked coastal cities, and ran protection rackets to guarantee safe passage.

Pirates often benefited from the protection or even sponsorship of sovereign states. Two of the most emblematic examples are the privateering and the Barbary corsairs. Elleman, Forbes, and Rosenberg (2010) noted that the first privateers appeared around 1300; privateering burgeoned with the expansion of commercial and military navies to reach a peak in the early 17th century, and then slowly declined until the mid-19th century. Nadelmann (1990) described privateering as “an officially sanctioned version of piracy directed toward a state’s enemies and anyone engaged in trading with these enemies.” When they operated as privateers the pirates were in theory granted legal protection and could not be prosecuted and punished as pirates (Kontorovich 2004). Beyond the legal protection, they also benefited from access to safe havens on coasts ruled by the sponsor, as well as financial support to rearm ships. In return, the sponsor-state received a percentage of the gains and was able to use the privateer fleet both to protect its commercial vessels and for political ends, including naval warfare (Elleman, Forbes, and Rosenberg 2010; Nadelmann 1990). State-sponsored piracy off the Barbary Coast was primarily an economic rather than an ideological or political venture (Turner 2010). The corsairs operated from well-guarded sea-

ports that offered protection after attacks. The European powers had to pay tribute to buy safe conduct for their merchant fleets. Corsairs monitored the sea traffic by attacking vessels without safe conducts and benefited from the protection of the coastal authorities (Tinniswood 2011) and, in the words of Boot (2009), the “blessing of the Ottoman emperor.” From the early 19th century on, however, the international community “eliminated, one by one, the vacuums of the de jure and the de facto sovereignty on which ... pirates had depended” (Nadelmann 1990). Most of the safe havens had been closed by the late 19th century, though they did not totally disappear until the early 20th century (Nadelmann 1990).

### *The Importance of Coastal Areas*

The lynchpin of the Somali pirate business model is the safe use of anchorages at a short distance from the Somali coast. Somali pirates do not have access to either maritime infrastructure to unload cargo or a market for selling stolen goods. Instead, hijack-for-ransom pirates need a secure place to anchor the vessels that will assure supplies of the necessary goods and services during ransom and release negotiations.

The anchorage points have to provide safe access to land for small vessels, security for the hijacked ship, and a reliable supply of goods and services. Pirates first need anchorages with a beach from which to launch and land the smaller vessels that supply hijacked ships and transport personnel back and forth. Secure anchorages can only be provided by local authorities who are not challenged about control of the territory, either by law enforcement officers associated with regional or central government or by militias associated with rival clans or religious groups. Pirates also need a basic infrastructure. The average ransom negotiation in 2011 and 2012 took six months, but many ships have been held for more than a year and one for close to three years. During this period, the hostages have to be fed and kept in good health because their welfare is critical to the bargaining process. The pirates also have to be provided with ammunition, food, water, alcohol, khat, and telecommunications. Finally, pirates require financial services to transfer funds from and make payments to investors and stakeholders further afield.

As with any other land use issue, unfettered access to coastal land for as long as three uninterrupted years is subject to local rules driven by local politics. Chapter 8 analyzes these power dynamics. Whether or not pirates can be offered a secure anchorage point for hijacked boats depends on whether they can obtain explicit or implicit endorsement from local stakeholders with whom decisions over land use issues, among other things, ultimately rest. Endorsement of piracy by local governing authorities makes Somali pirates more like the 17th century privateers, their historical state-sponsored predecessors, than to contemporaries in South-East Asia or West Africa.

### *Beyond Pirates, Boats, and Guns*

The visible part of Somali piracy—armed pirates on their boats—is thus not the entire story. The need to access the shore is central to a hijacking-for-ransom enterprise, and to find

a suitable location political capital is necessary. It allows pirate management to “buy” local support from stakeholders for the right to use coastal areas as needed to keep ransom negotiations going.

The three factors of production of the Somali piracy business—manpower, financial resources, and political capital—split the ransom proceeds. This report focuses on rewards to the factors of production. Individuals can contribute many different input factors and be rewarded accordingly. For example, pirate commanders who invest their own cash, organize crews and missions, and sway politicians and local leaders to condone piracy are contributing financial resources, manpower, and political capital all at once. Similarly, pirate crew members, guards, and militias are rewarded for manpower, but because they are often drawn from a particular clan or location, they bring political support (capital) from their clan or immediate family, who hope to benefit financially from the association.

The motivation underlying the trichotomy is to separate the marketable factors of production (manpower and financial resources) from the nonmarketable (political capital). When would-be pirate crewmembers consider whether to join a mission, they compare the potential payment they would get and the associated risk to the earnings they would receive were they to dedicate their time to an alternative occupation, such as fishing or herding. Thus, returns on manpower will be directly affected by the prevailing market wage and the perceived risk of a pirate expedition. Similarly, when investors decide whether to respond to the solicitations of instigators, they compare the risk-adjusted return of investing in piracy with the return on alternatives. Thus, rewards to investors will respond to both market interest rates and the risk of a failed expedition.

The ultimate objective is to use the proposed analytical framework to evaluate policies. Chapter 9 reviews both current and proposed policies for curbing Somali piracy. Most policies can be seen as either affecting the opportunity cost of becoming a pirate by, for example, providing alternative means of livelihood or increasing the inherent risk of the piracy business by stepping up offshore anti-piracy measures. These “market interventions” will directly impact the returns on labor and finance in a way that the proposed model can quantify. Chapter 9 will thus gauge the resilience of Somali piracy to application of certain policies.

## Estimating the Distribution of Ransom Proceeds

The quantitative exercise consists in estimating how the ransom proceeds are distributed among the three factors of production. The critical assumption is that the supply of labor and finance is abundant. Thus, once adjusted for risk, piracy’s rewards to manpower or finance should not exceed what Somali labor and capital markets would otherwise offer in terms of wages and interest rates.

### *Manpower and Market Wages*

The piracy industry in Somalia employs 1,500 to 3,000 people (Foreign Affairs Committee, 2012). While the job profiles are diverse, two occupations capture the bulk of the

workforce: pirate crew members and guards (alternatively “attack teams” and “holding teams”; Hansen 2009).

### *Pirate Crew Members*

To estimate the share of ransom proceeds going to reward the work of pirate crew members, it is assumed that there is an abundant supply of candidates. Even with the higher estimate of 3,000 or so, pirates constitute a small fraction of the Somali labor force of males aged 15–30, and anecdotal evidence suggests that many young men actively seek to be recruited (BBC 2008). It is therefore reasonable to believe that the labor market for pirates is likely to be more constrained by job openings than by a lack of candidates.

An abundant (in economic terms elastic) supply of prospective pirates implies that the payments offered to pirate crew members for their labor will not exceed by much the market wage for unskilled or low-skilled labor once risk and other factors are taken into account. The industry will need to promise payment that compensates for the risk of dying at sea, being shot, or being caught and imprisoned. Physical hardship and possible moral or social stigma are also features associated with joining a pirate crew that should be rewarded. Beyond these considerations, the wage will look very much like that of other low-skilled occupations.

The payment promised to pirate crew members for being part of an attack mission is estimated based on an occupational choice model (see Annex 7.B), where prospective pirates are faced with the alternatives of joining a crew and receiving a wage premium or staying onshore and earning the market low-skilled wage of, say, a herder or fisherman. The model reduces their decision to the following factors: (i) the prevailing market wage, (ii) the risk of never returning due to death or lengthy imprisonment, and (iii) the probability of success, i.e. of obtaining payment of a ransom after having successfully brought a captured ship to anchorage.

- i. In the estimation, the *prevailing wage rate* is set to US\$859, which corresponds to the local low-skilled wage rate as reported by the Food Security and Nutrition Analysis Unit (FSNAU 2012).
- ii. A 5 percent *probability of never returning* is assumed. Pirates may die at sea from being caught in storms, shot, or drowned in encounters with naval ships or on-board security guards; they may not have enough fuel and food to sail back to shore; or they may be killed during an assault. Those caught by naval forces are rarely tried, and long prison sentences are given to the few who end up being convicted (Bruxelles2 2011a, 2011b).
- iii. Finally, IMB data (2012) suggest that Somali pirates had a 15 percent *probability of success* every time they attacked in recent years, which the estimation assumes. The assumption implies that on every mission pirate crews are able to eventually find a ship and attack.<sup>1</sup>

The residual 80 percent is the probability of coming back safely but empty-handed. Other modeling assumptions are discussed in detail in Annex 7.B.

The parameters adopted predict that an average payment of US\$10,478 is offered to each member of a successful attack team. Since the contract generally offered by piracy enterprises is one in which pirates and guards are paid after successful conclusion of the ransom negotiation (Hansen 2009; SEMG 2010), the apparently large number reflects the low probability of payment. The estimate is of the same order of magnitude as the US\$10,000–US\$15,000 rewards suggested by Kraska (2010) or Bahadur (2011). Furthermore, the first pirate to board a vessel is entitled to a larger share of the ransom or a bonus, usually in the form of a sports utility vehicle (SUV; SEMG 2008). This arrangement is consistent with the proposed model because the first man climbing the ladder faces disproportionate risks if the crew decides to defend the ship. A bonus of US\$45,000 (the cost of an SUV) corresponds to a premium associated with an increased risk of death of 37 percent (see Annex 7.B).

The discrepancy, if any, between the model prediction of US\$10,478 and the actual reports of US\$10,000 to US\$15,000 might be driven by several factors: (1) The estimates capture the rewards to manpower only and therefore do not estimate the actual payments pirate crew members receive, since compensation might be higher if they help to get endorsement of piracy from their own communities and social networks. That type of compensation is considered, for purposes of this report, as a reward for their contribution of political capital. (2) The model accounts only for economic conditions (prevailing wage rate and risk) and does not incorporate noneconomic dimensions, such as the emotional toll on the community if one of its members were to die at sea or the social stigma associated with piracy. (3) The prediction delivered by the model is inherently approximate (as are the estimates used as benchmarks) and indicates an order of magnitude rather than being a precise value.

### *Pirate Militia and Armed Guards*

The risk profile faced by pirate guards and militias differs significantly from that for crew members. Once a ship is brought into an anchorage, there is a very low probability that ransom negotiations will break down entirely. Even when the ship owner is uninsured and unable to raise a ransom, family members and other supporters try to negotiate a deal to cover pirate “costs” in exchange for the hostages (*Gulf News* 2012; *Telegraph* 2012a). Therefore, it is highly unlikely that guards will not be paid, and they are also supplied with food and khat throughout their stay on board. Furthermore, while the guards are on board there is a very low probability that possession of the ship will be contested, although recently the Puntland Maritime Police Force attacked the Isse Yulux group (*Somalia Report* 2012e) and freed the MV Iceberg 1 (*Telegraph* 2012b). After ransom drops there are occasional reports of inter- and intra-gang conflicts over the distribution of money (*Somalia Report* 2012f, 2012g), but these are relatively rare. In general, guards do not seem to face risks that are disproportionate to militia duties on land.

Payment to guards is therefore unlikely to be higher than the prevailing unskilled or low-skilled wage of US\$859 a year. That estimated payment is much lower than what guards actually take home, since it captures the reward only for their labor inputs. There is little direct evidence of how much pirates pay their subcontractors, but there are indications that they pay casual laborers in line with market conditions. In a recent court case



one of the accused stated that he earned US\$2–3 a day piloting a supply ship for the pirates. This is very close to the low-skilled wage reported in FSNAU (2012) and assumed here, but it was a steady income at more than twice the rate the accused had previously earned in casual jobs on fishing boats (Spiegel Online 2011).

## Financial Resources and Market Interest Rates

Somali piracy requires both high-risk start-up capital to equip attack crews and low-risk capital to finance ransom negotiations. Start-up capital finances equipment for the attack crew. It is generally provided by a few lead investors and a range of smaller investors; in Harardheere, for instance, members of the local community were invited to invest in piracy (Reuters 2009; Kraska 2010). Injections of working capital take place after a successful hijacking and throughout the ransom negotiations.

### Start-up Capital

Chapter 6 describes the typical pirate operation, which involves from one to as many as eight pirate vessels, often operating from a mother ship. The IMB (2012) dataset reports that the Vogebulker (March 8, 2010) and the Diplomat (June 23, 2010) were attacked by five skiffs and the YM Taichung (June 24, 2010) and the OOCL Kaohsiung (September 11, 2010) by four. Three skiff groups were reported in the attacks on the Sakoba (March 3, 2010), the Suez (August 2, 2010), the Songa Sapphire (August 3, 2010), the Pelicanas (August 5, 2010), and the United Emblem (September 10, 2011). While the most sophisticated pirate teams use modern fiberglass hulls, pirates have also been successful with old wooden fishing boats. Table 7.1 shows the market cost of acquiring the necessary equipment in Somalia for an operation requiring three skiffs. The cost of double-engine skiffs as reported by a news agency (*Somalia Report* 2012b) was corroborated by primary sources. Given the abundance of weapons in Somalia, the analysis used the standard price of second-hand rocket-propelled grenades (RPG) in conflict environments like Afghanistan and Syria. The average cost of AK47s was observed in Mogadishu's main market in February 2012. Grenades for RPGs cost about US\$285 each and bullets for AK47s US\$0.42 each (SEMG 2011; *Somalia Report* 2012b). The analysis assumed five armed men per skiff, each carrying three 30-round clips and 5

**TABLE 7.1: PIRACY START-UP CAPITAL COST (US\$)**

	Unit Cost (US\$)	Quantity	Total
Double-engine fiberglass skiff	35,000	1	35000
Wooden Hull with high-powered engine	10,000	2	20000
Global positioning system (GPS)	450	2	900
Satellite phone	1,350	1	1350
Rocket-propelled grenade (RPG)	1,500	1	1500
RPG grenades	285	6	1710
AK-47s	750	15	11250
Ammunition (grenades, bullets)	63	15	945
Intelligence/informants	1,000	1	1000
Gasoline (1.5\$/L, 500l tank)	750	3	2250
Food/water/other supplies	200	15	3000
Khat (50\$/kg)	20	15	300
Ladder	200	2	400
Total			79605

Sources: SEMG 2011; *Somalia Report* 2012b.



grenades for each RPG. For engines, global positioning systems (GPS), and phones, a mark-up of 50 percent over prices charged in Dubai was assumed. The analysis assumes that an average attack team consists of one high-powered modern fiberglass skiff and two single-engine wooden skiffs equipped with only one RPG, two GPS, and one satellite phone and requiring services from one intelligence source. This brings start-up costs to about US\$80,000. Admittedly, a wide range of possible mission configurations is possible and estimations will need to be adjusted accordingly.

The occupational choice model that is used to look at the returns on manpower can easily be modified into a portfolio choice model to look at the returns on finance. Because given the relatively low success rate potential pirate financiers face a high risk, they need to be offered a high enough rate of return to be willing to invest. Using the parameters adopted earlier, the analysis assumes that all capital is lost when the entire crew is lost at sea, for which there is a 5 percent probability; there is a 15 percent probability the pirates will bring back a ship and the financiers earn a return; and there is thus an 80 percent probability the pirates will return empty-handed. In the last case, it is assumed that investors on average lose half their capital. During expeditions, pirates use up fuel and ammunition, and in encounters with the naval forces they often jettison weaponry and ladders. The impossibility of achieving conviction on the basis of circumstantial evidence induces most of the naval contingent to adopt a “catch and release” policy toward suspected pirates, who throw all incriminating equipment overboard (Roach 2010; *Sunday Times* 2009): captured pirates are released with hull and motors intact and enough food and fuel to get them home, but they will have lost weapons and piracy-relevant communications and GPS equipment. If the pirates are arrested and charged, however, the boats are also lost to the investors. The analysis assumes, then, that on average half the original equipment would be usable for the next attack group. The precise shared loss will be shown to matter little in determining the rate of return (see Annex 7.C and Chapter 9).

The annualized return on start-up capital should be at least the equivalent of 427 percent if an attack is successful. On the assumptions given, a risk-averse financier will be willing to invest a small proportion of his total assets into equipping a piracy mission for a return of this magnitude (see Annex 7.C). Accounts of actual returns to investors vary widely because they are not paid a fixed return but a proportion of the ransom. SEMG (2011) reports that investors get 30 percent of the ransom after all costs have been covered and that generally the majority of the ransom is taken up by costs (including bribes, provisions, wages of cooks and accountants, and logistics support). *Somalia Report* (2011) gives 15 percent of the final ransom as going to investors, which is consistent with SEMG (2011) if half the total ransom is taken up by costs. In Table 7.2 the total capital cost of a pirate operation is shown to be about US\$400,000; with a 15 percent share investors would get the market return if the total ransom is US\$2.6 million. Since 15 percent of the 2011/2012 average ransom of US\$4.9 million would be US\$735,000, on average investors would get more than the market return on their capital. However, the contributions of lead investors go beyond the financial resources they provide; their social and political connections will help make an operation feasible, and this political capital will be rewarded appropriately, possibly showing up in higher rates of returns on their financial contributions.

**TABLE 7.2:** TOTAL COST OF CAPITAL

	Cost (US\$)	Per Annum Return (%)	Effective Return (%)	Total (US\$)
Start-up capital	80,000	427	427	341,600
Working capital	64,875	4	1.87	66,088
Total				407,688

Sources: BBC 2004, Garowe Urban 2012, Sabahi 2012, and *Somaliland Sun* 2010.

### *Working Capital*

Further funding is needed during the ransom negotiation, much of which is provided by local suppliers in the form of goods and services. When a ship is brought into anchorage and ransom is being negotiated, a second round of fund-raising takes place to cover the cost of maintaining the ship and its crew, which includes food for guards and crews, khat for guards, and diesel for generators for lighting and desalination. The business model of piracy described in SEMG (2011) and evidence from specific hijacking cases (e.g., *New York Times* 2011) suggest that many goods and services are effectively financed by a form of trade credit: those who provide inputs during the ransom negotiation are paid a fixed sum out of the ransom paid. In other cases the investors finance the inputs and are rewarded accordingly after the ransom drop.

The reward to working capital is the same as the prevailing annual market interest rate of 4 percent. Since the complete breakdown of ransom negotiations once a ship has reached an anchorage is highly unlikely, those providing working capital or material inputs are likely to be paid eventually (though perhaps with a delay if a negotiation is particularly long). For this analysis, the average length of ransoming indicates the term of the loan based on which to calculate the return to capital.

### *Political Capital and Residual Rents*

The third input factor in the Somali piracy business model is political capital. Pirates need a stable alliance of stakeholders who are willing, able, or forced to provide piracy-relevant infrastructure and implicit or explicit protection against law enforcement and rival gangs to make a given anchorage suitable for ransom negotiations. Ransom proceeds therefore need to be used in part to build such an alliance.

Political capital is an attribute that goes beyond the closed circle of the perpetrators of piracy. Pirates and investors might be contributing more than just manpower and financial resources to the piracy business and might therefore receive compensation above market rates. Some individuals that have no direct role in the piracy business lend their social and political connections to the pirate cause by condoning it—politicians who do not interfere, clan elders or religious leaders who condone it, or local residents who do not oppose anchorages off their stretch of coastline. These individuals are not perpetrators but enablers of piracy.

The extent to which manpower and financial resources are being rewarded by the piracy industry will depend on supply and demand. Because political capital enables piracy

in the first place, it will capture whatever is left once manpower and financial resources have been paid their market returns. With an estimated average ransom payment in the neighborhood of US\$4.9 million, it is possible to calculate the residual amount once payments to other factor inputs have been made.

It is estimated that the total wage bill is in the region of US\$265,000. Successful crews are paid the pirate wage. An average skiff has five people on board, so the analysis assumes an average group of 15 men in the attack team. The first man on board earns an SUV (priced at about US\$45,000) as an additional premium. With an average of 50 guards to provide round-the-clock protection for a ship during the ransom negotiation, each earning an annualized US\$859 for six months (the average duration of ransom negotiations on ships released between January 2011 and March 2012 was 173 days), the associated wage bill would be US\$21,425. Finally, the negotiator and the accountant are central to the ransom negotiation process. Their reported wages are twice the ones paid to pirate crew members, possibly because the skills required are scarce (SEMG 2011) or they have political and social connections that allow them to earn the trust of other key personnel, such as the instigator or the commanders. To make a conservative estimate of the rents paid to political capital, the former explanation is assumed and payments are counted as pure labor costs. The total wage bill is calculated in Table 7.3.

Return on startup and working capital for an average successful operation is about US\$407,000 (Table 7.2). Startup capital amounts to US\$80,000 for boats, weapons, and supplies (Table 7.1). It is assumed that investors are paid an annualized return of 427 percent, as predicted by the portfolio choice model. The average length of a mission from preparation until ransom drop is assumed to be about a year, with three months spent on preparations, three months at sea, and negotiations averaging six months. Piracy is a seasonal business. Pirates are considerably less likely to attempt hijacks in the rough seas associated with the two monsoon seasons. Those seasons would be the preparation time as motors, boats, and weapons are assembled and crews trained. There are two stretches of three months in which the attack teams can operate on the high sea, and attacks occur throughout these “pirate seasons,” but initially pirates tend to attack dhows for use as mother ships from which to launch attacks on merchant ships. It is therefore assumed that average time at sea is three months. Working capital finances supplies for 75 people (crew and guards) for an average of 173 days at a rate of US\$5 per person per day, earning the annualized market rate of return of 4 percent, i.e., 1.87 percent for the duration of the ransom negotiation.

**TABLE 7.3:** LABOR COST PER SUCCESSFUL PIRATE OPERATION (US\$)

	Cost per Unit	Number	Total
Pirates	10,478	15	157,170
Negotiator, accountant	20,956	2	41,912
First-man premium	45,000	1	45,000
Guards	429.5	50	21,475
Total			265,557

Sources: BBC 2004, Garowe Urban 2012, Sabahi 2012, and *Somaliland Sun* 2010.

The rough accounting exercise produces payment of about US\$670,000 for manpower and financial resources at market rates. The average ransom in 2011 and 2012, however, was US\$4.9 million, leaving US\$4.2 million, or 86 percent, for rents to the possessors of political capital who enable Somali piracy. If the analysis is expanded to include the entire sample from 2005 to 2012, about 81 percent of the total ransom is distributed as rents to the owners of political capital.<sup>2</sup>

The conclusion that the vast majority of the ransom goes to the “rent” of political capital is very robust to alternative, yet reasonable, assumptions about parameters of the model. If extremely conservative assumptions and parameter values are used in the economics models behind the calculations, the conclusion is that at least 70 percent of the average ransom goes to the providers of political capital.<sup>3</sup> Annex 7.B details how the calculations vary with different model parameters. Chapter 9 also provides detailed analysis on how three main parameters—the probability of success, the probability of death or detention, and the wage for unskilled labor—affect distribution of a ransom.

The distribution of ransom proceeds calculated here is aligned with earlier accounts. Previous accounts (e.g., Hansen 2009; SEMG 2008, 2010) look at percentages going to different contributors to a successful pirate venture, including maritime pirates, organizers, financiers, militia members and commanders, and local dignitaries paid off with “hospitality,” local “tax,” and outright bribes. Usually the pay-offs to individual contributors are considerably higher than those calculated here. This is not a contradiction, however, because actual payments to individuals may reflect both returns to their productive assets (finance, labor) and the rents for their political capital.

## How Political Capital Collects its Rents

Admittedly, who receives what and how much will vary by location and over time. Chapter 8 delves into the political economy of resource-sharing. This section simply gives a few examples of rents distributed to stakeholders, some involved directly in the piracy business, others more remotely.

Rents may be collected in a range of ways, from outright fees to mark-ups on supplies and labor. When pirates bring a ship to the location from which they wish to conduct the ransom negotiation, they pay an anchorage fee. Some sources mention a per vessel fee payable at entry that reportedly ranges from US\$100,000 to US\$300,000, others a 10, 20, or even 30 percent share of the final ransom (interviews with Darod Majerteen analysts 2010 and 2011 and a Hawiye Habar Gidir Saleeban analyst 2012; SEMG 2011; *Somalia Report* 2012a). Chapter 5 reported on specific arrangements al-Shabaab made to collect these “noninterference” fees. Similarly, local dignitaries are entitled to a share of the profit—a “development fee.” A significant portion of the ransom is needed for local hospitality (Hansen 2009; SEMG 2011). Pirates are also obliged by custom to share incomes with their families, occasionally engage in direct acts of charity, or pay a fixed proportion of their income to the mosque for charitable purposes. Administration officials are also reported to have benefitted from compensation for noninterference in the piracy business. Regional politicians in Puntland have at times received considerable sums to turn a blind eye (Hansen 2009; SEMG 2011).

Furthermore, it is expected that pirates will hire guards locally. Pirates are charged for guards at a monthly rate of US\$400 per guard (interview with ransom negotiator 2012) or even US\$12,000 for the duration (Bahadur 2011)—a substantial markup on market wages. After successful conclusion of the ransom negotiation the guards are paid only a small fraction of this money, most of which goes to those who arranged the contract and those who supplied the guards with khat. Thus, whoever arranges protection of the ship takes a very large cut of the profit. Control over land creates oligopoly power for businesses that deliver supplies to the ships; the price markup is reportedly up to 300 percent (SEMG 2011). *La Nouvelle Gazette* (2012) cites the case of a 26-year-old woman who earns up to US\$400 over a few days for preparing meals for hostages. The *New York Times* (2011) reported a monthly cost of US\$20,000 to guard the Chandlers—a couple kidnapped off their yacht near the Seychelles—largely for inflated prices for food and khat. Finally, financial services are said to be provided by a small number of intermediaries who are able to charge above-market fees for financial transactions (FATF 2011; interviews with Darod Majerteen analyst 2011 and Hawiye Habar Gidir Cayr analyst 2012; (FATF 2011; interviews with Darod Majerteen analyst 2011 and Hawiye Habar Gidir Cayr analyst 2012; UNODC 2011).

Finally, individuals with extensive political and social connections have “key personnel” status in the piracy business that earns them a large share of the ransom proceeds. Despite the potentially significant costs of building stakeholder support for piracy, several prominent people in the business have made substantial profits. Pirate bosses leverage extensive social networks created through local business interests or employment in the civil service (Hansen 2009) or marriage into the families of local government officials (Somalia Report 2012c). Some successful organizers became businessmen by investing piracy profits in trade ventures; for example, Afweyne allegedly dominates khat supplies in some areas along the Puntland/Galmudug coast (SEMG 2011). As local stakeholders and people with influence, they can mobilize public opinion in favor of providing safe anchorage. Some pirate bosses (e.g., Garfanji and Isse Yulux) invested in their own militias to reduce the cost of land-side security and—if necessary—suppress opposition to pirate activities in their territory (New York Times 2011; Somalia Report 2012d). Close links to local militia leaders are evident in the case of Garfanji, who was asked to bolster the local militia with his pirate militia when Hobyo faced an insurgent attack (New York Times 2011).

## Conclusion

The largest share—by far—of ransom payments is captured by the enablers of piracy. The model used in this chapter calculated the risk-adjusted market wage and return on financial capital and was calibrated using data on pirate attacks and local market conditions. The calculations showed that 70 to 86 percent of ransoms go to enablers. These are figures or groups whose tacit or active support is necessary for the piracy enterprise to obtain the long-term security guarantees and stable supply lines that make it possible to conduct ransom negotiations.

The results suggest that perpetrators of piracy themselves are capturing only a small fraction of the ransom proceeds; policies targeting pirate crewmembers and investors might therefore not reach the main stakeholders of Somali piracy. Part III is dedicated to discussion of current and proposed anti-piracy policies. However, the findings in this chapter already suggest that policies targeting perpetrators of piracy are targeting only minority stakeholders in the enterprise.

Who these enablers of piracy are and when they are in a position to allow anchorage of hijacked boats are investigated in Chapter 8.

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## Datasets

IMB 2012: International Maritime Bureau Database on Piracy Incidents

FNSAU 2012: Food Security and Nutrition Analysis Unit Database

WDI 2012: World Development Indicators Database

## Notes

1. Arguably IMB (2012) underreports piracy incidents not followed by a hijacking. No data are available, however, on the actual probability of success conditional on a mission. Several scenarios will be looked at to test the robustness of the results to parameter choice (see Annex 7.B and Chapter 9).
2. If the analysis is extended to include years before 2011, the average ransom paid will be US\$3.15 million and the average pirate success rate will be 18 percent.
3. For example, the extremely conservative calculations assume that individuals are more risk-averse than most economics studies have suggested, and the dependency ratio used is higher than for any country in the past 10 years. These conservative assumptions all lead to higher payments to labor and financial capital, thus lower returns to political capital.

## Annex 7.A: A Brief History of Piracy

The historical account provided here is an opportunity to revisit various forms of piracy, particularly in terms of the relationships pirates have had or currently have with the institutions governing the harbors from which they operate. Is the Somali piracy business model unique in that pirates can keep hijacked boats in broad daylight apparently unfettered?

### *Before the Transoceanic Era*

Until the development in the early 16th century of transoceanic trade between Europe and the Americas, then Africa, India, and the Far East, most piracy was close to shore. According to Konstam (2008), during the 2nd and 1st centuries BC, Cilicia, in what is now Turkey, provided well-known pirate havens. The uncontrolled coastline, which presented numerous places to conceal pirate bases, adjoined the busy Greece–Syrian Kingdom trade line. First occupied by small pirate communities, the area later hosted most of the pirates ousted from the Aegean Sea. Cilicia offered places to hide between attacks and keep hostages during ransom negotiations. The pirates initially preyed opportunistically on vessels transiting close to the shore but over time became strong enough to finance large pirate communities that could endanger sea traffic in most of the eastern Mediterranean, preying on both large vessels and coastal cities (Konstam 2008). Cilician pirates ruled the seas for 35 years (De Souza 2002). Konstam (2008) pointed out that the Romans had to mobilize 500 vessels, 120,000 troops, and a considerable budget to wipe out piracy and secure the sea (Konstam 2008).<sup>1</sup>

During the 9th and 10th centuries, the Vikings developed a different model. They operated from a friendly kingdom, such as Denmark, Norway, and Sweden, which offered both safe use of its land and financial support. Vikings thus enjoyed safe havens between missions and financial resources to arm the large fleets they needed for their attacks. The pirate objectives were to either ransack coastal cities or extract protection payments. In a second phase, their goal was to conquer new land for settlement (Konstam 2008). Because fertile lands were in short supply in the Scandinavian countries, the governments supported the aspiration of the Vikings to colonize the countries they were raiding (Ritchie 2011). When most of the Vikings had found a place to inhabit, Viking piracy ended (Konstam 2008).

### *The Glory Days of Piracy on the High Seas*

The emblematic high-seas piracy emerged in the 16th century as traffic between Europe and its new colonies took off. The early targets were Spanish vessels bringing precious metals and stones from the New World to Europe (Konstam 2008), but the targets were quickly extended to all European naval powers and goods traveling between the Old and the New World. At the outset, pirates were sponsored by European states interested in Spanish wealth and willing to undermine Spain's political influence. Then the model

spread, each naval nation sponsoring piracy to accumulate wealth, protect its own fleet, or affirm its political influence (Nadelmann 1990). The piracy model then was based on larger vessels arranged to facilitate attack on the high seas. Pirate crews were large, 80–100 members on average and often up to 200, and composed almost exclusively of expert seamen (Leeson 2009). The area of operation extended along all the trade routes, with pirate ships sometimes teaming up to form squadrons (Leeson 2009). The capital needed to equip a privateer was considerable. Moreover, pirates needed safe havens to maintain ships between voyages and sell stolen cargo and ships.

By the end of the 17th century, the political and economic paradigm had changed. Nadelmann (1990) noted that “the advantage to be derived from stealing from one another [had given] way to the greater advantage of stable commercial relations.” The European powers stopped endorsing privateers and shut down safe havens. By the mid-19th century it had become hard for pirates to resupply, find friendly black markets, and securely scout the seas (Daxecker and Prins 2011; Konstam 2008). However, after losing the support of the European powers a number of ex-privateers found new sponsors in Barbary (Tinniswood 2011). The Barbary model was mainly based on payment of tribute or ransom to the Barbary regencies (Turner 2010). The European powers paid an annual tribute to each Barbary Coast potentate to ensure free passage for their commercial fleets. If the tribute was not paid, the vessels were hijacked and ransom negotiated for the crew after lengthy imprisonment and hard labor, or they were sold as slaves (Tinniswood 2011). Nadelmann (1990) argued that a lack of capital precipitated the end of high-seas piracy because pirates were unable to handle the turn to modern steamboats in the mid-19th century. Pirates did not have funds to access such technology and steam commercial vessels were for a time beyond their reach. Piracy on the Barbary Coast ceased completely with the French conquest of Algiers in 1830 (Chisholm 1911) and the decision by then U.S. president Thomas Jefferson’s to destroy the Barbary pirates’ fleet (Turner 2010). However, the end of state-sponsored privateering did not completely eradicate piracy. Except for some areas where state weakness and civil war created ungoverned coastal territories where pirates could create strongholds, as for example on the Chinese coast in the early 20th century (Antony 2010; Ke 2007), the close-to-shore “armed robbery” type of piracy, which had historically been responsible for many more attacks than piracy on the high seas, re-emerged (Murphy 2009).

## *Contemporary Piracy*

During the cold war, most lands and seas were under strict control. The cold war navies deterred pirates, and piracy disappeared almost completely. To endure, pirates had to lower the time spent at sea and to hide carefully on land, which restricted them to opportunistic attacks close to shore. Then in the late 1980s the end of the cold war and growing seaborne trade stimulated a resurgence (Lehr 2006). Post-cold-war piracy is again mostly close to shore. Being less sophisticated than piracy on the high seas, it is perpetrated by both organized groups and opportunistic individuals. With regard to the groups, Murphy (2009) has observed that piracy is usually a minor source of revenue for criminal groups that gain most of their wealth through other maritime crimes, such as smuggling, illegal fishing, or toxic dumping.

The Caribbean waters, once the epicenter of piracy, are today almost piracy-free, according to the IMB (2012). Murphy (2009) has pointed out that most attacks here target anchored yachts and are carried out by opportunistic thieves or drug smugglers. Hijacked yachts may be used for smuggling drugs before being sunk or sold. In the 2000s, the crowded and narrow waters of the Malacca Strait witnessed a large number of attacks: petty robbery on anchored boats; attacks on ships to steal the cargo, the ship itself, or both; and kidnapping (Frecon 2009; Raymond 2010). More sophisticated cargo and ship thefts there, too, required access to coastal territory, which in this case was found in the Aceh region, where an insurgency was underway and the Indonesian navy was unable to patrol the coast (Bateman 2010). Since the peace settlement in Aceh in 2005, the number of incidents has dropped (see Chapter 1, Figure 1.1.a) and the Regional Cooperation Agreement on Combating Piracy and Armed Robbery Against Ships in Asia (ReCAAP) in its 2006 to 2012 reports has classified most of them as at most only moderately significant (ReCAAP 2012). The Gulf of Guinea, and more broadly West Africa, is now seeing an upward trend in piracy. Nodland (2010) has pointed out that minor robbers living off petty thievery perpetrate attacks in port, mainly in Lagos, or close to shore; farther at sea more organized groups attack vessels, tug boats, or oil rigs. These groups are usually quite violent and in a significant number of cases are motivated by political as much as financial reasons (Nodland 2010). Even though cargo theft is still the main objective, a growing number of attacks have led to the kidnapping of crewmembers for ransom (United Nations Press 2012).

The Somali coast always supported petty piracy close to shore, even before the fall of the Siad Barre regime (Murphy 2011), but gradually between 1991 and 2005 pirates became more audacious, targeting the dhows in regional trade and commercial fishing. Fishermen and coast guards held vessels for ransom that did not have a license to operate in Somali waters (Hansen 2009; Murphy 2011).<sup>2</sup> One of the defining characteristics of Somali piracy compared to what is currently happening in West Africa and Malacca is that it is almost exclusively piracy for ransom, in which not only the crew but the entire ship is being held.

## Annex 7.B: An Occupational Choice Model of Pirate Labor Supply

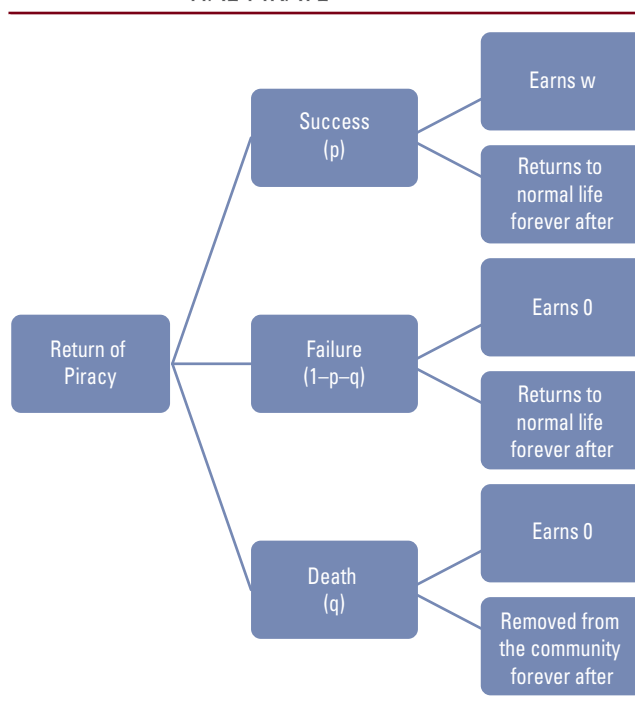
### The Occupational Choice Model

An infinite time horizon model is used to estimate the real wage for Somali pirates. The model consists of two periods: At the beginning of period 1, an individual determines whether he wants to be a pirate. The return for being a pirate is stochastic: (1) with probability  $p$  he succeeds and earns  $w$ ; (2) with probability  $q$  he dies at sea or gets arrested and never returns; or (3) with probability  $1 - p - q$  his attack fails and he returns home empty-handed. If he stays away from the piracy industry, he can engage in normal economic activity that earns a constant wage of  $w_0$ . At the end of period 1, the surviving pirate learns the result of an attack and decides how much to consume. For simplicity's sake it is assumed that the surviving pirate will return to his former life starting in period 2 and will earn  $w_0$  forever after. Figure 7.B.1 summarizes the flow of returns for a potential pirate.

It is further assumed that this individual lives in a community of  $n$  members that share all their income, e.g., an extended family. The large literature on remittances to Somalia documents the strength of social obligations to support family members, compelling wage-earners to share their incomes with the wider family even when settled abroad. In this community  $1 - x$  fraction of its members engages in normal economic activity that yields a return  $w_0$ . The remaining fraction  $x$  consists of dependents who earn zero income. The potential pirate is one of the working members of this community. The income-sharing assumption implies that all members of the community enjoy the same flow of consumption, independent of their occupation.

When making the piracy decision, it is assumed that the potential pirate internalizes all the externalities of his decision—that he will evaluate the cost of death as the utility generated from the reduced consumption flow of his community, with himself permanently excluded. In other words, the penalty of death is a permanently higher dependency ratio for his community, and he perfectly internalizes this in his decision. Alternatively, one can think of a model of communities deciding whether or not a member should become a pirate and therefore trading gains from a successful hijack against the permanent loss of revenues if the member died at sea.

**FIGURE 7.B.1:** FLOW OF RETURNS FOR A POTENTIAL PIRATE



Individuals can save and borrow at a risk-free rate of  $R$  that equals  $1/\delta$ , where  $\delta$  is the rate at which they discount future income. This assumption implies that their consumption flow will always be a fraction  $(1-\delta)$  of their lifetime wealth. This simplifies the problem so that the solution can be expressed entirely in terms of consumption flows rather than income flows or lifetime wealth.

It is assumed that there are infinitely many potential pirates making this decision in a competitive labor market. This implies that the solution of this problem must be that, in expectation, each individual is indifferent about being a pirate or not:

$$(7.B.1) \quad p \cdot u(c_s) + q \cdot u(c_f) + (1-p-q) \cdot u(c_n) = u(c_n),$$

where  $c_s$  is consumption if the pirate succeeds,  $c_f$  is consumption if he fails,  $c_d$  is consumption if he dies, and  $c_n$  is consumption if he decides not to participate in piracy.  $u(c)$  is the standard constant relative risk aversion (CRRA) utility function with parameter  $\gamma$ :

$$(7.B.2) \quad u(c) = \frac{c^{1-\gamma} - 1}{1-\gamma}$$

The strategy is to first back out  $c_s$  and then solve for  $w$ . The rest of this section discusses the consumption flow in each case.

If the individual decides not to be a pirate, his lifetime earnings flow will always be  $w_0$  and his consumption in each period always  $c_n = (1-x) \cdot w_0$ , where  $x$  is the dependency ratio in his community.

If he becomes a pirate and succeeds, the community income in period 1 will be  $[(1-x) \cdot n - 1] \cdot w_0 + w$  and in period 2 and forever after will be  $(1-x) \cdot n \cdot w_0$ . In this case, the lifetime wealth of this community is

$$(7.B.3) \quad W_s = \left\{ [(1-x) \cdot n - 1] \cdot w_0 + \frac{(1-x)nw_0\delta}{1-\delta} \right\}$$

Consumption is simply a constant fraction of lifetime wealth:

$$(7.B.4) \quad c_s = \frac{1-\delta}{n} W_s = (1-x) \cdot w_0 + (w - w_0) \frac{1-\delta}{n}$$

This is a very intuitive result: if the attack is successful, the lifetime wealth of the community is increased by  $w - w_0$ . The community will spread this windfall evenly over each period and across each member. In the end each member consumes of this increment  $(1-\delta)/n$  every period.

If the pirate returns empty-handed, the community income in period 1 will be  $[(1-x) \cdot n - 1] \cdot w_0$  and in period 2 and after will be  $(1-x) \cdot n \cdot w_0$ . In this case the lifetime wealth and consumption of this community is

$$(7.B.5) \quad W_f = [(1-x)n - 1]w_0 + \frac{(1-x)nw_0\delta}{1-\delta}$$

$$(7.B.6) \quad c_f = (1-x) \cdot w_0 - w_0 \cdot \frac{1-\delta}{n}$$



Here the cost of failure is the loss of one labor in one period, which equals  $w_0$ . Again, the community will spread this loss evenly over each period. In the end each member will consume  $(1-\delta)w_0/n$  less in each period.

If the pirate dies at sea and never returns, the income of the community will be permanently reduced by  $w_0$  in each period. Therefore from period 1 onward its consumption will always be

$$(7.B.7) \quad c_d = \frac{[(1-x)n-1]w_0}{n-1}$$

## Main Result and Calibration

In the benchmark model  $p = 0.15$ ,  $q = 0.05$ ,  $\gamma = 0.96$ ,  $w_0 = 859$ ,  $n = 20$ , and  $x = 0.475$ . Solving the model numerically, the result is  $w = 10,478$ . This is very close to the empirical finding that the wage for a typical pirate ranges from US\$10,000 to US\$15,000.

The success rate is set as  $p = 0.15$ . There are not enough data to precisely calibrate this parameter because it is almost impossible to estimate the pirate success rate. IMB (2012) data suggest that in 2011 and 2012 about 15 percent of all reported attacks were successful.

The probability of death,  $q = 0.05$ , is another parameter for which the data are not particularly reliable. The estimate is based on statistics compiled on the number of pirates killed in encounters with international naval forces (Bruxelles2 2011b). From March 25, 2010, through April 26, 2011, naval forces encountered 2,124 pirates, of whom 105—4.9 percent—were reported killed (Bruxelles2 2011a). While not all pirates necessarily encounter a naval force, the number of deaths is very likely to be under-reported because private security companies, wishing to avoid litigation, generally do not report detailed casualty statistics, and deaths of pirates who perished in storms are not recorded anywhere. Levitt and Venkatesh (2000) reported that a street gang dealing drugs in New York experienced an annual death rate of 7 percent over the four years of observation—criminal businesses have relatively high fatality rates.

The degree of risk aversion,  $\gamma$ , measures subjective attitude toward risk. Higher  $\gamma$  means the individual dislikes risk more. For this parameter there is a vast economics literature to rely on for calibration. The value chosen,  $\gamma = 5$ , is toward the higher end of the admissible range. For example, individuals with  $\gamma = 5$  will be marginally willing to participate in a 50–50 gamble, which would either double their income or reduce it by about 15 percent. The next section demonstrates that the prediction of the model does not depend critically on the choice of this parameter.

The measure of patience is set at  $\delta = 0.96$ , which means that the annualized risk-free interest rate is about 4 percent. Another way to interpret this parameter is that an average Somali values US\$100 of income in the next year as equal to US\$96 of income this year. This is smaller than the general choice of  $\delta$  in the economics literature, which lies in the 0.97–0.99 range, on the theory that potential pirates in Somalia should discount their future utility much faster than people living in a developed country because they have significantly shorter life expectancy.



$w_0$  is the unskilled wage in Somalia, based on FSNAU (2012): all unskilled wage observations between 2005 and 2011 were averaged across all regional markets with  $w_0 = \text{US\$859}$  the result.

The next parameter,  $n$ , the size of a hypothetical Somali community, is set at 20—the community as extended family.

The last parameter,  $x = 0.475$ , the dependence ratio, is calculated from the average employment-to-population ratio between 2001 and 2011 for Somalis aged 15 and up. The ratio is from the World Development Indicators (WDI) database.

## *Comparative Statics and Robustness*

Several sets of comparative statics exercises were carried out to investigate how changes in the parameters affect the return on piracy. The results are summarized in Figure 7.B.2.

If there is a higher probability of success or a lower probability of death, the return to piracy should be lower because the risk associated with the attacks is lower. The model predicts that if the probability of success is lowered to 5 percent, the return on piracy will be as high as US\$40,000; if the probability of death is increased to 20 percent, the return on piracy will be about US\$35,000. On the other hand, the piracy business is easier when the probability of success is increased to 25 percent or the probability of death is lowered to 1 percent. In these cases, the return to piracy will drop below US\$10,000. Comparative statics for these parameters are presented in the first row of Figure 7.B.2.

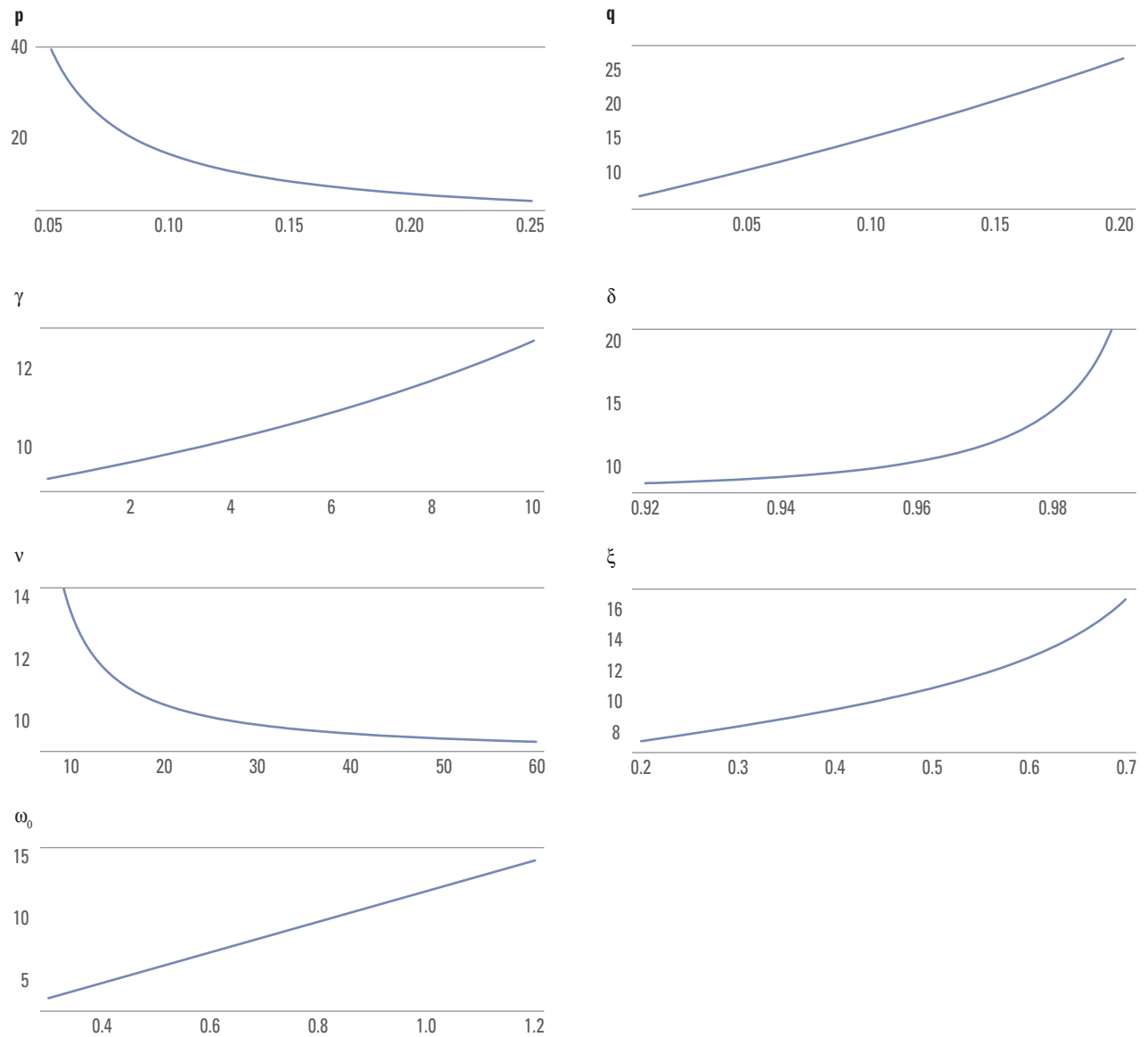
The model prediction does not depend critically on  $\gamma$  or  $\delta$ . For the range of  $\gamma \in [0.5, 10]$ , the predicted wage only varies between US\$8,000 and US\$13,000. If  $\delta$  is between 0.92 and 0.99, the predicted wage moves between US\$8,000 and US\$21,000. For details please check the two panels in the second row of Figure 7.B.2.

If the hypothetical community is larger or the dependency ratio is lower, the predicted wage will be lower because in these cases each individual potential pirate represents a smaller fraction of income for the community. The model predicts that if the hypothetical community size is as large as 60 or the dependency ratio as low as 0.3, the wage for pirates will be lowered to about US\$7,500. The details are presented in the third row of Figure 7.B.2.

The model prediction is proportional to the unskilled wage,  $w_0$ . If the average payoff of an ordinary Somali worker or fisherman doubles, the payment to pirates will also double to attract people into piracy. For example, if the unskilled annual wage increases to US\$1,200, the payoff to pirates will increase to about US\$15,000. See the last panel in Figure 7.B.2 for details.

To test the robustness of the conclusion that the majority of ransom income goes to political capital, very conservative parameter inputs were used to estimate the upper bound of wage payment. In this case risk aversion,  $\gamma$ , was set at 10, the discount factor  $\delta$  at 0.98, the dependency ratio at 0.6, and the size of the community at 15. The wage of the pirates will then rise to US\$44,275 and total payment for manpower will go up to US\$907,700. In this upper bound estimate, the total payment to labor is about 18.5 percent of the entire US\$4.9 million average payment.

**FIGURE 7.B.2: COMPARATIVE STATICS**



To calculate the risk to the pirate who is first on board, the model is reversed to ask what would be the probability of death and detention if the return to this pirate is the base wage plus an SUV worth about US\$45,000. At the end the probability of death and detention will be 37 percent.

## Annex 7.C: A Model of Portfolio Choice

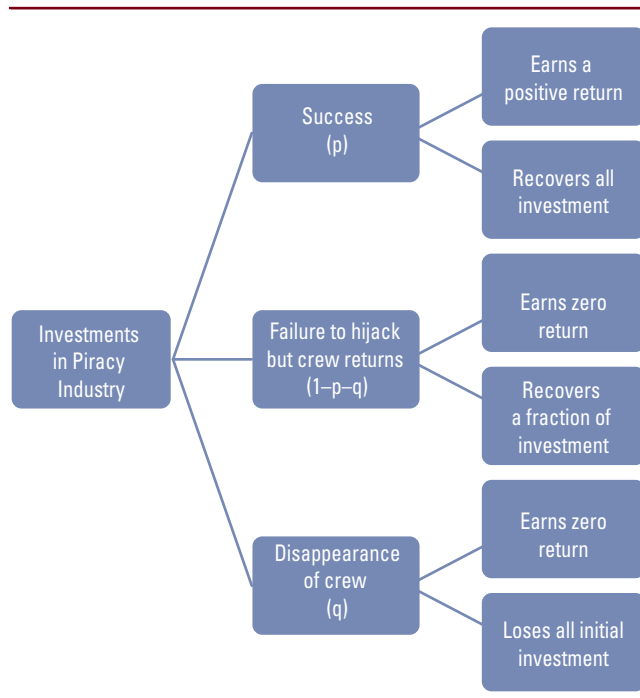
### Modeling Investor Returns

A model similar to the one in Annex 7.B is used to estimate the returns investors require. An investor invests  $\alpha$  fraction of his wealth into an attack crew. He invests the rest,  $1 - \alpha$ , into a riskless bond that earns  $R = 1/\delta$ , where  $\delta = 0.96$  is the rate at which he discounts his future utility. The return on the piracy investment is stochastic: (1) with probability  $p = 0.15$ , the attack crew succeeds and the investor earns a return of  $R_s$ ; (2) with probability  $q = 0.05$ , the attack crew is lost at sea and the investor loses his entire investment; (3) with probability,  $1 - p - q = 0.80$ , the pirates fail at sea but return home, and the investor can keep  $\eta$  fraction of his investment. In the benchmark case  $\eta = 0.5$ , Figure 7.C.1 summarizes the flow of returns to the investor. The potential investor values his consumption using the same CRRA utility function as with risk aversion,  $\gamma = 5$ .

The main parameters that overlap with the wage model are set the same as in the labor model. Annex 7.B explains in detail how these parameters were calibrated. The only new parameters in this model are  $\alpha$ , the share invested in piracy, and  $\eta$ , the proportion of

capital lost in unsuccessful attacks. In the benchmark case,  $\alpha = 0$  captures the behavior of small investors who are on the margin of stepping into the piracy industry. The proportion of capital lost in unsuccessful attacks is set at  $\eta = 0.5$ , reflecting the depreciation of capital in journeys where no contact is made and the loss of weapons and occasionally of entire boats in encounters with the navies of private security teams. The result is that  $R_s = 4.27$ . This means that if the investor puts US\$1,000 into an attack crew, the expected gross return conditional on success should be at least US\$4,270 or the investor will be better off not investing.

**FIGURE 7.C.1:** FLOW OF INVESTMENT IN PIRACY INDUSTRY



### Comparative Statics and Robustness

A series of comparative statics was carried out by varying the parameters of the model to study how they affect the predicted return. The results are summarized in Figure 7.C.2. If the probability of success is higher or the probability of death lower, the risk associated with piracy investment will be much lower, as will be the re-

quired return on investment. The model predicts that with a 30 percent success rate, the required return would be lowered to about 300 percent. On the other hand if the success rate is only 5 percent, the required return will rocket up to more than 1,000 percent. The results for the full range can be found in the top two panels of Figure 7.C.2.

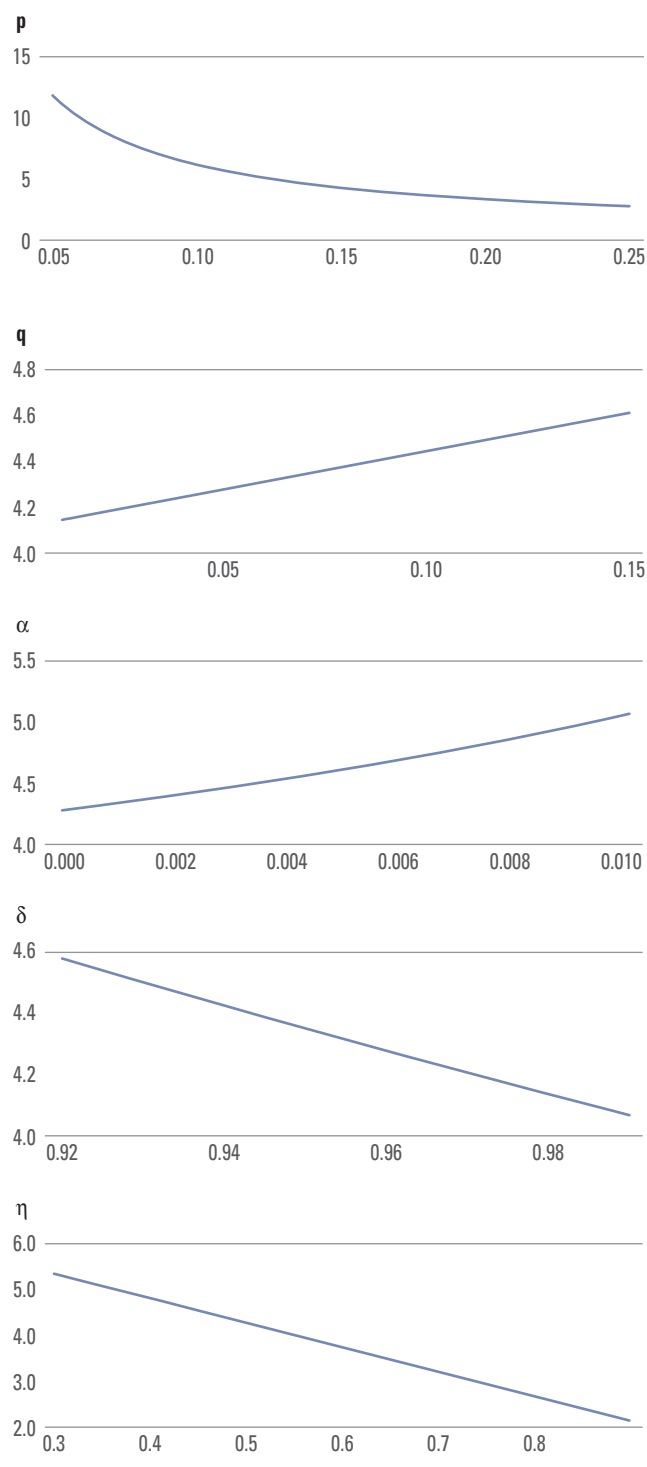
An investor who puts a larger fraction of his wealth into the piracy industry will ask for a higher return because his entire portfolio has become riskier. This is captured by varying  $\alpha$ . If  $\alpha$  is as high as 1 percent, the investor needs to be compensated by about 500 percent of gross return (see Panel  $\alpha$  in Figure 7.C.2 for details).

In this model changes in  $\delta$  affect the result through changes in the riskless interest rate,  $R_0$ . If  $\delta$  is higher,  $R_0$  will be lower, which means the opportunity cost of investing in piracy is lower. This translates into a lower return. The model is again very robust to changes in this parameter. If  $\delta$  is varied between 0.92 and 0.99, the predicted return will move between 410 and 460 percentage points (see Panel  $\delta$  in Figure 7.C.2 for details).

The benchmark model assumes that the investor only keeps half of his initial investment if the attack crew fails at sea. If this fraction,  $\eta$ , is higher, the piracy business becomes less risky and thus risk compensation will be lower. If the investor can keep 90 percent of his initial investment upon failure, the return of piracy only needs to be about 200 percent for him to participate (see panel  $\eta$  in Figure 7.C.2 for details).

As with the conservative robustness check carried out for the labor model, the parameter inputs to extremes are pushed to estimate the upper bound of required return. In this case  $\delta$  is set at 0.92 and it is assumed that the investors can recover only 20 percent of their investment in case of failure. With these changes it is estimated that the required rate of return would be 617 percent, making the total payment to

**FIGURE 7.C.2: COMPARATIVE STATICS**



financial capital US\$559,688—approximately 11.4 percent of the entire ransom income of US\$4.9 million.

If, as in Annex 7.B, in the most conservative estimates the provider of manpower will be rewarded by 18.5 percent of the total income, using the most conservative estimates the providers of political capital can still garner at least 70.1 percent of the entire income flow.

## Notes

1. According to Konstam the scale of the Roman intervention would be equivalent to the mobilization of over half of the U.S. armed forces and half of the U.S. budget should it have taken place today.
2. With the state collapse few valid licenses were issued, but Somali officials, warlords, and businessmen illegally sold foreign vessels fishing or dumping rights (Hansen 2009; Murphy 2011).

# THE POLITICAL ECONOMY OF SOMALI PIRACY

# 8

## Introduction

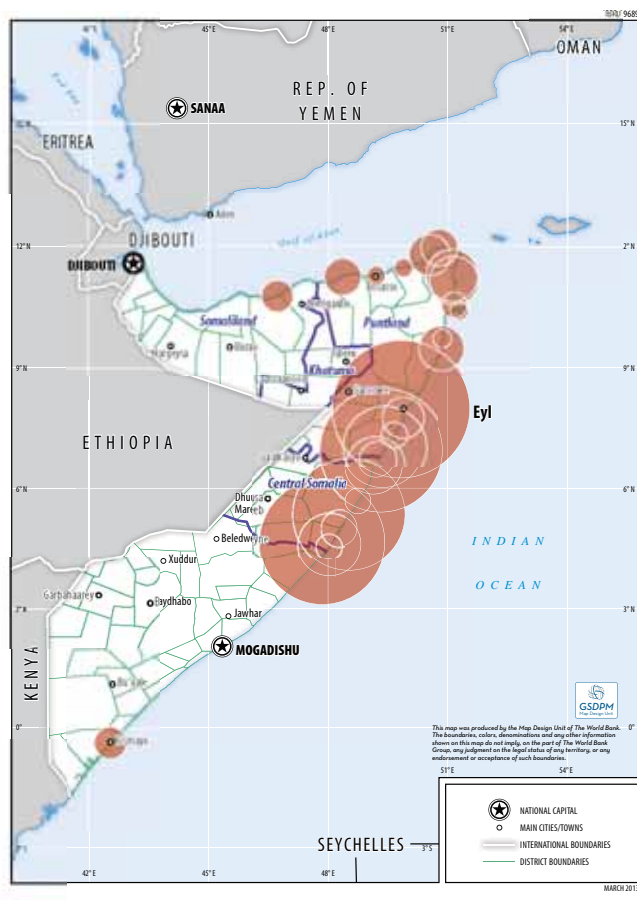
The main strategic advantage of Somali pirates is their ability to securely detain hijacked vessels and crews during extended ransom negotiations, which is crucial to their business model. In order to compel ship owners to pay ransom pirates must be able to protect the hijacked property for months or years at a time. Because the Somali pirate business model is critically dependent on the availability of secure anchorage, a significant percentage of ransom proceeds is therefore dedicated to facilitating long-term vessel storage (see Chapter 7).

Piracy at sea responds to certain conditions on land, but identifying those specific conditions requires plausibly explaining patterns of anchorage utilization both across space and over time. Only when these patterns are understood can credible counter-piracy strategies be devised.

## Understanding Anchorage Choices

The uneven distribution of pirate anchorages suggests that some areas of the Somali coastline may be more appropriate than others for storing hijacked vessels. Figure 8.1 reproduces Figure 6.3 but now shows the distribution of anchorage points from 2005 to 2012, scaled by the total percentage of vessels that passed through each location over the entire period. Known anchorages are heavily concentrated in Puntland and Central Somalia, with just one or two in Somaliland and Southern Somalia. Yet known pirate operations have been planned and launched from all along the coast, including Southern Somalia and Somaliland. Several hypotheses may explain the asymmetry between attacks and anchorage.

**FIGURE 8.1: NUMBER OF VESSELS HELD PER ANCHORAGE 2005–12**



Source: UNODC-WB 2012.

Physical geography of an individual anchorage must allow for oceangoing vessels and it must be located near pirate hunting grounds. Although Somalia has over 3,000 kilometers of coastline, access to the sea is interrupted in many areas by long stretches of cliffs, and numerous inshore coral reefs in many areas prevent significant coastal traffic (Hadden 2007). Northeast Somalia is near the busy shipping lanes of the Red Sea and Gulf of Aden, so that pirates in Puntland, for example, have a comparatively shorter distance to travel to hijack a vessel and return to shore than if they operated from farther south. However, the geography is relatively consistent along the entire Somali coastline, and Somaliland is as close to these high-traffic areas as Puntland, yet hijacked vessels have rarely been anchored there (SEMG 2010). Conversely, Central Somalia is relatively far from the prime pirate hunting grounds yet hosts far more anchorages than Somaliland. Clearly, though appropriate physical geography and relative proximity to hunting grounds may be necessary for anchorage, neither is sufficient to fully explain the choices of locations for storing the vessels.

Because anchorage also requires at least minimal onshore infrastructure to facilitate resupply of hijacked vessels and crews, some level of development is therefore necessary. Outside of the major urban centers and some moderate-

sized ports, the Somali coastline is sparsely populated and generally underdeveloped; the lack of development could explain why some areas might appear more suitable for anchorage than others. However, coastal settlement patterns are generally consistent in all four regions of Somalia (Somaliland, Puntland, Central Somalia, and Southern Somalia). Like geography, development alone is not sufficient as an explanatory variable.

There is also asymmetry between the sites from which pirate operations are launched and the locations where captured vessels are anchored. Pirate operations and attacks have been planned and executed all along the coast from Kismayo to Somaliland. Although the majority of pirate groups have always operated out of Puntland and Central Somalia, the UN Somalia and Eritrea Monitoring Group (SEMG) identified at least one group operating from Somaliland pre-2008 (SEMG 2010), and pirate attack groups and motherships have similarly been launched from Kismayo and other southern areas (Murphy 2011). Thus the presence of active pirate groups all along the Somali coast means that pirate activity in a region does not necessarily beget anchorage.

The only condition that varies significantly between the four regions of Somalia and correlates with anchorage distribution patterns is the degree of centralization versus fragmentation of power—in other words, the local political economy. Uneven historical patterns of conflict and competition over economic and political resources have induced heterogeneity in local political economic conditions in each of the four regions. Each region started from a slightly different baseline of ethnic composition, power distribution, and allocation of economic resources; however, more important than the differing baselines are the divergent historical trajectories of stakeholders interacting with and influencing the evolution of these conditions.

### *The Gradual Erosion of Clan Authority*

The notion of a common Somali identity based on shared language, culture, and religion began to coalesce in the 15th century (Lewis 2004). Despite the relative ethnic and religious homogeneity from which this identity is constructed, the Somali social environment is fragmented by competition between kinship groups. The social structure is based on a lineage system in which an individual's identity and status are derived primarily from patrilineal descent and primogeniture (Battera 2005). This system divides Somalis into four to six major clan families—Darod, Hawiye, Dir, Digil, and sometimes Issaq and Mirifle—and some minorities.<sup>1</sup> The clan families are further subdivided into clans and subclans, each with independent social and leadership hierarchies. Subclans tend to be highly localized and defined by territory as well as lineage. As a result, each group's traditional notion of governance is rooted in regulation of its own territory (Osman 2005). However, after decades of colonial influence, predatory dictatorship, and conflict-driven displacement, in addition to prevalent nomadic traditions, most clan groups and even many subclans are too geographically dispersed and fragmented to organize socially, economically, or politically. Affiliation with a local “sub-sub-clan” social institution therefore tends to be a more stable and salient organizing factor (Lewis 2002; Pham 2011).

Below the subclans, Somalis further divide into even more highly localized social units. These “blood money” paying units are known as *diya* (Arabic) or *mag* (Somali) groups. Mag groups themselves are composed of several *jiffo* groups and finally the *jilib* (“knee”) groups, each of which is a confederation of extended families named for the mechanism by which the group connects its members to the larger subclan (Gundel 2006). The *diya* or *mag* groups generally total a few hundred to a few thousand men, large enough to pay the specific blood debts defined by Sharia, the concept of *diya* being derived from Islamic law, when one of its members commits murder or manslaughter, but not so large as to obligate the group to pay such debts on behalf of too many disparate or competing actors (Gundel 2006). Where social identity at all levels is generally based on patrilineal descent, actual membership in a *diya* or *mag* group is determined more pragmatically: members are obligated to share in the group's liabilities and compensation through explicit social and political contracts known as *xeer* (Pham 2011). The authority to negotiate and enforce these contracts on behalf of the community is conferred upon traditional elders.



Each Somali social unit (clan family, clan, subclan, primary lineage group, extended family) has a number of traditional leaders, its chiefs and elders. There is significant regional heterogeneity in the actual number and authority of these nominal leaders. In certain areas, decision-making authority traditionally flowed from a king-of-kings, the *boqor*, at the head of a clan family through titled subclan leaders, known as either *suldaan* or *garaad*, and finally through the elders of the confederations of extended families, known as *ugaas*, *issim*, or *duub*, or more generally *ooday* or *nabadoon*.<sup>2</sup> In recent years, these titles have become somewhat interchangeable, and clan families apply them differently. Whereas in the precolonial era of the sultanates the boqor or suldaan exercised autonomy and lower-level elders were expected to implement top-down decisions, today the process is somewhat reversed, with the nominal head of the clan family expected to approve decisions taken by the council of elders (Osman 2005).

Decision-making is the outcome of a deliberative process. A modern council of elders meets on an ad hoc basis with representation from all social units affected by the proceedings; the scope of the engagement may range from questions of resource management to full mobilization of the clan or subclan militia in territorial defense to enforcement of a xeer contract. This deliberative process is known as *shir*. Despite the somewhat hierarchical structure of the subdivided lineage segments, each male member has an opportunity to speak and decisions are made based on consensus. The outcome of the deliberation is binding upon all members of each social unit represented; however, the outcome is administered territorially, and while the same fundamental principles of xeer are recognized by clans across the entire country, negotiation and enforcement of specific bilateral xeer contracts tend to be conducted between adjacent local groups, which reinforces the localized nature of subclan governance (Le Sage 2005).

Although xeer-bound subclan groups have traditionally regulated resource use in Somalia, resource competition is neither limited by the territorial borders of any given subclan nor confined to the subclans as the only interested stakeholders. In the last 100 years, Somalia has witnessed a proliferation of external actors competing for political and economic power in the country, beginning with Europeans, whose colonial administrations were followed by the rise and dramatic fall of the dictatorship of Mohamed Siad Barre. More recently, warlords, powerful businessmen, and religious leaders established courts and militias to protect their own interests (Le Sage 2005). All these actors challenged the equilibrium tension within and between clans. The resultant chaos led to multiple international interventions that attempted to mitigate the resulting humanitarian crises (Menkhaus 2007). Each of these interventions offered its own prescription for governance, and many elevated or empowered external stakeholders, such as warlords, at the expense of traditional systems (Hansen 2003).

## *Conflict and Power in Somalia's Recent History*

Somalia's complex history explains the divergence observed today across Somaliland, Puntland, Central Somalia, and Southern Somalia. While in the north a modicum of political and administrative centralization could be achieved peacefully, the south is still characterized by fragmentation and violent competition for power. Between these

extremes central Somalia has retained an essentially informal clan-based governance structure.

Precolonial Somalia was a patchwork of native nomadic pastoralist communities, coastal settlements, and tribal territories. The arrival of Muslims from the Arabian Peninsula in the 12th and 13th centuries, and later from Inquisition Spain and Mughal India, paved the way for Islamic statelets, with new immigrants intermarrying and contributing to the steady expansion of the Somalis south and west over the course of several centuries (Lewis 2002). This expansion was at times interrupted by fighting against Oromo and other Cushitic peoples along the western edge of what is now the Ogaden region of Ethiopia, which was finally halted by Bantu resistance in the riverine areas of Southern Somalia. Fighting between loosely organized Islamic states and clan-based sultanates, in addition to the expansionist Christian Abyssinian Empire, persisted throughout the 17th and 18th centuries. Inevitably the powerful Ottoman Turk and Portuguese empires attempted to establish footholds in the region, with the Ottomans building relationships with Muslim Somalis and the Portuguese supporting Christian Ethiopia. Thus the precolonial history of Somalia was one of cyclical occupation, expansion, and conflict, with relatively more ethnic fragmentation at the southern and southwestern limits of Somali expansion. This fragmentation persists today in what is now Southern Somalia. However, in the pastoral central and northern regions of what is now Central Somalia, Puntland, and Somaliland, the traditional system of governance ultimately prevailed, having absorbed other ethnic groups and cultures into political and economic institutions centered on the clan.

Differing experiences with colonization gave rise to highly heterogeneous models of government and administration across Somali regions. By the time British and Italian colonizers turned their attention to Somalia in the late 19<sup>th</sup> century, the region was divided into numerous competing clan-based sultanates and the emergent Dervish state of Mohamed Abdullahi Hassan, each governing significant swaths of territory.<sup>3</sup> The British and Italians, who had differing colonial goals, took distinctly different approaches to dealing with the entrenched clans.

The British in northern Somalia were primarily concerned with safe passage through the Gulf of Aden and secure supply lines for their garrisons in Yemen (Collier 2003; Lewis 2002). Their colonial administration left a light footprint; it managed its interests by empowering clan governance structures in a hybridized system of traditional and formal leadership known as *aqiil* (Gundel 2006). While this system acknowledged the primacy of the clan, it also set a precedent for today's pluralistic institution-based governance. In modern Somaliland, there is a distinction between traditional leaders, the *suldaan*, who together form the House of Elders (*Goolaha Guurti*) and have a mandate solely for conflict resolution, and the *aqiil*, who oversee a decentralized system of government-registered *diya*-paying groups and village leaders that mostly deal with local traditional elders on behalf of the Somaliland government (Gundel 2006). Thus, clan elders retain their traditional roles of conflict and dispute resolution, but the institutions of the state have a monopoly on policy, taxation, and law enforcement. Stakeholders in Puntland and Central Somalia have also made attempts to formalize traditional institutions, but these regional administrations have largely failed to achieve pluralistic political centralization and those areas are effectively divided along clan lines, often with overlapping territorial claims.

In contrast to the British model, the Italian colonial administration generally sought to suppress and undermine traditional institutions by promoting predatory patronage. This was especially true in the riverine south, where the social environment was already far more ethnically fragmented and unstable than in the north (Gundel 2006). The fragmentation was due in large part to dominant traditions that were agricultural rather than pastoral (for security purposes minority agriculturalists tended to be more flexible in their absorption of other lineage groups) and in part to population migration to major urban centers. In the south, the Italians were primarily concerned with extending territorial control from the ports into the Somali hinterland in order to facilitate agricultural development along the Juba and Shabelle rivers (Lewis 2002). To do this, they coopted certain clan leaders and elevated others to *Capo-Qabilah* status, awarding colonial decorations and medals to those who were loyal (Lewis 2011). By circumventing traditional legitimization processes, the Italians created a nominally loyal and manipulable cohort of local leaders to help with their efforts to extract economic resources from the region (Gundel 2006). This legacy of manipulation and favoritism persisted through the postcolonial period and contributed to the proliferation of exploitive leaders at the hands of both Mohamed Siad Barre and the warlords who succeeded him.

The Italian model provided a blueprint for the modern Somali state under Mohamed Siad Barre, characterized by predatory engagement with traditional structures. In the 1980s he began to intensify his divide-and-rule campaign against competing clans, consolidating power among the Marehan, Ogaden, and Dhulbahante in the urban economic centers of Southern Somalia (Gebrewold 2005; Shultz 1995). When the Siad Barre regime fell, the clans quickly sought to reassert territorial authority, but the system of traditional leadership had become confused and corrupted, allowing factional warlords to themselves employ similar models of patronage and favoritism under the pretense of providing security for clan interests. Even though the warlords drew their militias from their own subclans, with few exceptions they gained power independent of and exogenous to the traditional clan institutions (Hansen 2003). Ultimately, where the Italians had pursued agricultural resource extraction at the expense of traditional institutions, Siad Barre and the warlords who succeeded him used similar tactics of patronage to compete for aid from international donors and protection money from businesses in urban economic centers, mainly in and around Mogadishu (Menkhaus 2007). Thus, these areas bore the brunt of the violent clan-based resource competition that stoked the Somali civil war throughout the 1990s, reinforcing the ethnic fragmentation and causing a near-complete breakdown of property rights.

To a large extent, the experience of the Sharia courts in the late 1990s and early 2000s can be seen as an attempt by businessmen and religious leaders to reintroduce a modicum of order and local administration (Le Sage 2005). Although these institutions evolved exogenous to the clan system, they were largely clan-based and drew their legitimacy from close cooperation with local elders and religious leaders: *xeer* matters (particularly conflict resolution) were generally left to the elders, and authority for religious jurisprudence was vested in sheikhs (*wadaad*) drawn from local clans (Le Sage 2005). Even the Joint Courts administration that formed in Mogadishu during the Islamic Courts Union (ICU) in 2004–05 still relied on elders to sit on oversight *shura* bodies to settle disputes in matters of religious interpretation (Le Sage 2005). The Sharia courts thus did not in themselves

represent a challenge to any one clan or the traditional system of political institutions in general; by this time, Islamic law and jurisprudence had been part of Somali society for hundreds of years, and these courts drew their legitimacy from clan power structures.

In Southern Somalia, the militant extremist wing of the ICU, which evolved into al-Shabaab, has made halting attempts since its rise to power in 2005–06 to use Sharia as a tool to directly challenge the traditional clan-based institutions. Al-Shabaab's supra-clan narrative stems from the transnational character of salafi jihadism and leverages the common refrain that factional clan behavior is responsible for the persistent conflict in Southern Somalia (Schaefer and Black 2011). With its legitimacy theoretically provided by a strict interpretation of Sharia rather than clan dominance, al-Shabaab has provided a path to power for otherwise disenfranchised minorities (and less politically powerful groups like the Digil and Mirifle), who have been marginalized in the various iterations of national government (Meleagrou-Hitchens and Solomon 2012). The militant group has sought to downplay the importance of the clans by appointing commanders and governors from non-local subclans in Southern Somalia (Le Sage 2010). However, the case of Kismayo suggests that even when al-Shabaab represented the most powerful stakeholder in Southern Somalia, it could not completely eliminate clan-based political and economic competition in this most resource-rich region: as the group ceded Kismayo to international and Somali forces in 2012, specific clan militias supported by external actors gained effective control of the diverse city; although these militias are nominally committed to forming an inclusive all-clan administration, there is significant fear on the part of both local residents and international actors that violent clan competition for resources will be renewed (Associated Press 2012; Freear 2012).

Experiences with secular governance in Southern Somalia have not managed to overcome clan-based political competition and fragmentation. The various internationally sponsored post-civil war transitional administrations have in fact formalized these conditions. As the legislative body of the Transitional Federal Government (TFG), the Transitional Federal Parliament was designed on the basis of the "4.5 system," in which each of the majority clan families (Darod, Hawiye, Dir, and Digil iyo Mirifle) was awarded an equal number of seats, with half as many seats reserved for minority clans, including descendants of Arab and Bantu peoples. The 4.5 structure was intended to ensure fair representation of clan interests, but in practice it encouraged the subversion of issue-based policy by clan politics; in 2011 the International Crisis Group (ICG) went so far as to say that the "arbiters of the [4.5] system tend to be a non-transparent cabal of clan elders." It is worth noting, however, that just over one year later, the elders' conference in Mogadishu provided a far more transparent and inclusive example of the interaction of formal and informal institutions at the federal level. In May of 2012, 135 elders of the first subclan level from across Somalia convened in Mogadishu to begin selecting delegates to send to the National Constituent Assembly, which would be tasked with approving the new federal constitution and appointing the new permanent federal parliament. Although this role in effect removed the elders from direct participation in the political process, it may have been necessary to preserve their legitimacy as impartial authorities within their own communities, according to the standards proposed by Gundel in 2006. According to Augustine Mahiga (2012), the UN Special Representative of the Secretary General (SRSG) for

Somalia, “in the absence of direct elections or a referendum, the most legitimate representatives of the people are these elders.”

Thus the uneven history of conflict and competition for power and resources has created differing levels of political fragmentation and centralization across the four regions of Somalia. In Somaliland, the underlying relative ethnic homogeneity, benign colonial experience, and insulation from ongoing conflict have all contributed to a centralization of effective political power and the development of pluralistic institutions. At the other end of the spectrum, the underlying social heterogeneity, experience with extractive colonial and post-colonial administrations, and conflict over economic and political resources in Southern Somalia has reinforced and translated existing ethnic fragmentation into a zero-sum competition for power. In Puntland and Central Somalia, the political and economic institutions remain informal and centered on the clan, leading to intermediate levels of fragmentation, but the relative insulation from the civil war and continuing conflict in the south have prevented development of the feedback loop of violent resource competition and extreme ethnic retrenchment seen in Southern Somalia. The general evolution of local political economic conditions across the different regions of Somalia therefore provides a plausible framework in which to explain the spatial heterogeneity of pirate anchorage: too much centralization or all-out fragmentation of political power equally preclude pirate anchorage but intermediate degrees of political fragmentation provide the right conditions for it.

### *A Political Economy Model of Somali Piracy*

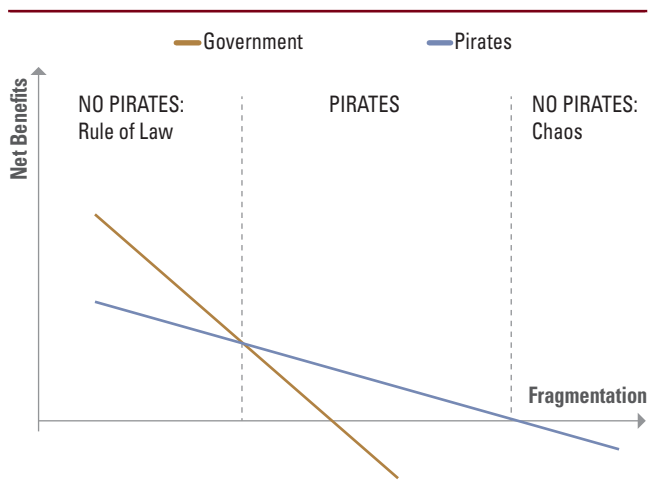
The overlap between regional differences in political centralization and the spatial distribution of anchorages provides a solid rationale for a political economy model of Somali piracy. Pirates compete for stakeholder support against other interest groups, such as the central government, the international community, or any other business interest incompatible with piracy (e.g., fisheries, onshore or offshore oil and mineral exploitation, maritime trade). For simplicity, the competition is reduced to two groups in the proposed model: pirates versus the central government. The model is further built on three assumptions:

1. Obtaining local support for either pirate activity or government engagement in a given region becomes more costly as the number of stakeholders increases.
2. Pirates have an edge over the central government in their ability to leverage social capital to obtain stakeholder support more cheaply.
3. The benefits of a piracy-free Somalia to the central government exceed the revenues earned by pirates.

The outcome of the political economy model is illustrated in Figure 8.2 and confirms that piracy should emerge in environments with intermediate levels of political fragmentation. In Figure 8.2, the pirates’ net-benefit curve slopes downward as it is costlier to operate in a more fragmented environment (assumption 1). When the curve cuts the horizontal axis, piracy ceases to be profitable. Similarly, the central government’s net-benefit curve is downward sloping and indicates that government presence eventually be-

comes unsustainable. Assumption 2 implies that as political fragmentation increases, formal arrangements with the central government break down while informal dealings with pirates still remain feasible. The two net-benefit curves delineate three distinct regimes. At low levels of political fragmentation (left domain), formal agreements between local power brokers and the central government are feasible and dominate the alternative offered by pirates (assumption 3). The central government can therefore operate and enforce the *rule of law*, hence preventing the emergence of piracy. At the other end, when fragmentation is high (right domain), neither formal nor informal agreements with the multitude of power holders are feasible so that neither the government nor pirates can operate in an environment characterized by chaos. Finally, at intermediate levels of political fragmentation (central domain), piracy can flourish because pirates can leverage their local political and social connections to secure protection from power holders who are however too fragmented for the central government to be able to establish a meaningful presence.

**FIGURE 8.2: POLITICAL ECONOMY MODEL OF SOMALI PIRACY**



### How Pirates Secure Stakeholder Support

To influence the balance of power in their favor, pirates use a mix of financial incentives and physical threats to form a coalition of stakeholders that has the power to provide the necessary endorsement, implicit or explicit, and make a long-run commitment to the industry. In Puntland, where the established regional administration is the main political actor, this is primarily obtained through corrupting government officials. In Central Somalia there are more reported cases of clan leaders, businessmen, and al-Shabaab militants being complicit in piracy, commensurate with the relatively higher degree of political fragmentation in that area. For example, interviews with local sources in Central Somalia suggest that an anchorage fee is paid directly or at least obligated as soon as a vessel is brought to the coastal waters of a given district (interviews with Darod Majerteen analyst 2011 and Hawiye Habar Gidir Saleeban former pirate financier 2012). City administrators, businessmen, regional government officials, militia leaders, and al-Shabaab have allegedly received such fees, alternatively described as a flat per-vessel or per-month fee of US\$100,000–US\$300,000 or as a 10, 20, or even 30 percent share of ransoms (interviews with Darod Majerteen analyst 2010, Darod Majerteen analyst 2011, and Hawiye Habar Gidir Saleeban analyst 2012; SEMG 2011).

When inter- and intra-group conflict does occur between pirates, or between pirate groups and other local stakeholders, the warring sides tend to divide along kinship lines



(*Somalia Report* 2012b, 2012d, 2012e). Local militias often side with pirates of their own subclan, turning against non-native groups; conversely, pirates have been known to support kinship groups in conflict with outsiders, acting as militia reserves (interview with Hawiye Shiikhaal political analyst 2012). Securing and maintaining kinship support thus takes on additional importance for pirates, and simple coercion is insufficient. This ability to leverage social and political capital through clan connections gives the pirates a comparative advantage over outsiders, namely the international community, in this simplified setting.

This section highlighted the divergent patterns of conflict and competition among internal and external stakeholders that led to the heterogeneity of contemporary political economic conditions in the different regions of Somalia. Intermediate degrees of political fragmentation generally correspond with the presence of pirate anchorages, which are rarely present in either highly fragmented or highly centralized environments. Pirates are able to leverage social and political capital in these areas of intermediate fragmentation so as to favorably influence the balance of power toward stakeholders who can be convinced, through positive or negative incentives, to tolerate the industry. The rest of this chapter argues that, consistent with the proposed model, changes in the degree of local political fragmentation also explain to a large extent the variations over time of pirate anchorage activation and deactivation.

## Explaining Variations over Time

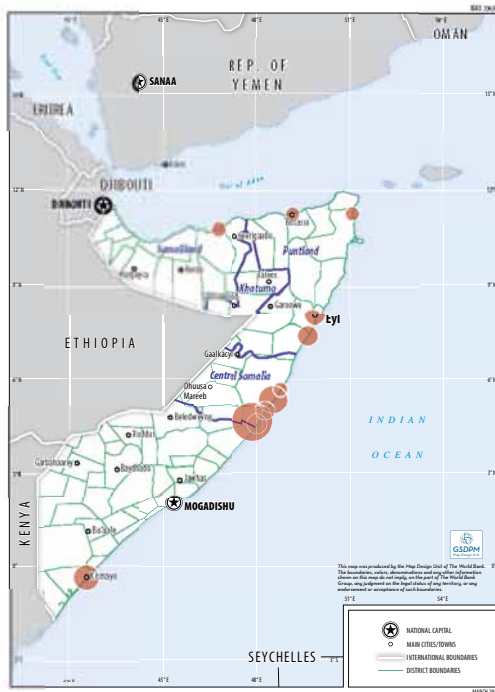
Activation and deactivation of pirate anchorages within each region of Somalia has varied over time. Figure 8.3 shows the number of detained vessels per year passing through each of the 26 identified anchorages, across all four regions of Somalia. While the model developed earlier suggests that Puntland and Central Somalia are more hospitable to pirate anchorage, it can also be used to explain the apparent outliers: vessels detained in Kismayo in 2005 and in the Sanaag region between 2007 and 2009.

### *Southern Somalia: The Early Days of Piracy in Kismayo*

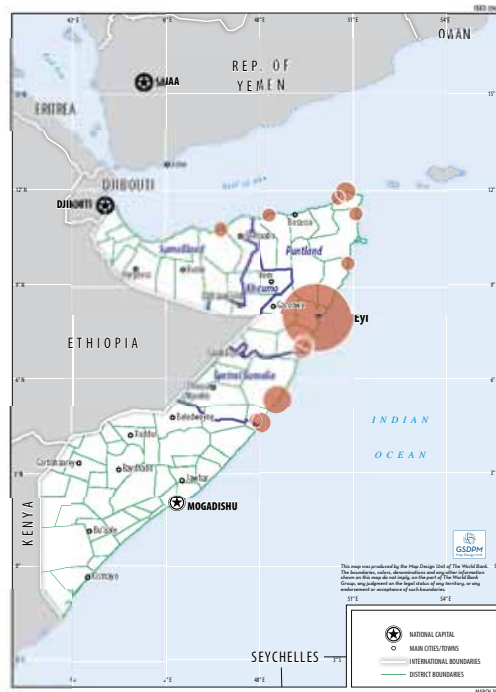
In 2005, when three Thai fishing vessels were detained in Kismayo harbor, Somali piracy had only just begun to resemble today's sophisticated hijack-for-ransom enterprise. Except for the small-scale maritime banditry perpetrated by former fishermen in the 1980s and 1990s, modern piracy first emerged during the era of the warlords, who hijacked aid delivery ships, sold fishing rights to foreign companies, and set up "coastguards" in their fiefdoms to extort and enforce their protection racket against rivals (SEMG 2003). When the local "coastguard" detained the three Thai vessels in Kismayo for allegedly fishing illegally, crewmembers claimed to have been granted a license by a local warlord (Mwangura 2005). As stated earlier, these warlords competed for the economic centers all throughout Southern Somalia, but some areas, such as Mogadishu, were subject to disproportionately violent conflict and persistent instability.

**FIGURE 8.3: NUMBER OF VESSELS HELD PER ANCHORAGE 2005–12, YEARLY BREAKDOWN**

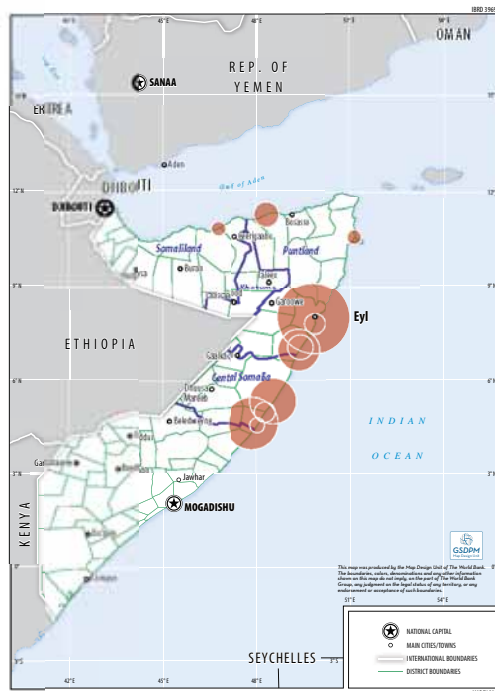
a. Pre-2008



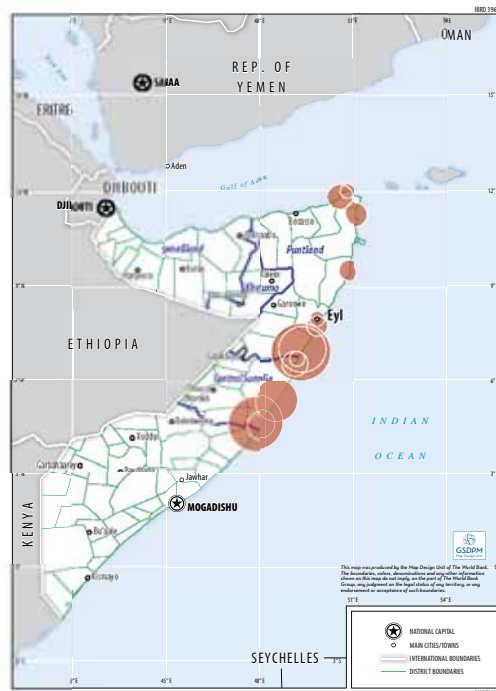
b. 2008



c. 2009



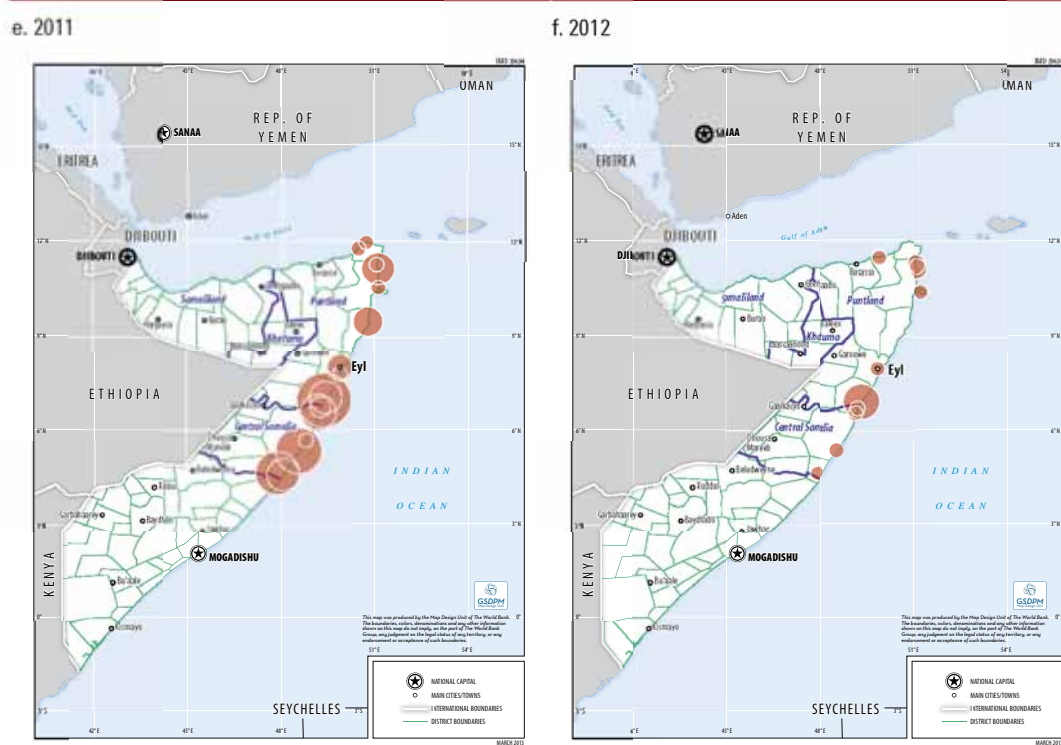
d. 2010



(continued on next page)



**FIGURE 8.3:** NUMBER OF VESSELS HELD PER ANCHORAGE 2005–12, YEARLY  
BREAKDOWN (*continued*)



Source: UNODC-WB 2012.

Compared to Mogadishu, Kismayo was largely spared the devastation of the civil war and the continuing conflict, despite underlying ethnic fragmentation and valuable economic resources. Consistent with the model analyzed previously, the city would therefore have presented a more appropriate political economic environment than Mogadishu for a warlord active in Southern Somalia to safely anchor detained vessels while experimenting with the emerging business of piracy as both a political tool and a source of revenue.

## *Somaliland: The Overarching Goal of Recognition*

Unlike Southern Somalia, the self-proclaimed Republic of Somaliland has relatively inclusive political institutions, such as universal suffrage, in addition to centralization of effective power. Social conditions play some role in promoting stability: the largest clan, Issaq, comprises more than half the population (Clapham et al. 2011), although there are significant numbers of other Dir (Gadabuursi and Ciise) and Harti Darod from the Warsangeli and Dhulbahante clans (Bradbury, Abokor, and Yusuf 2003). However, more important than the underlying conditions is Somaliland's approach to accommodating these demographic factors. This is what distinguishes it from the rest of Somalia and helps explain the trajectory it has followed since proclaiming independence in 1991.

Somaliland's relatively good antipiracy record has often been attributed to the stability achieved by the regime (Anderson 2012; Langfitt 2011). Somaliland navigated a successful transition from conflict to postwar clan-based power-sharing agreements in the late 1990s and is now approaching a system that resembles representative democracy and inclusive governance. However, during this transition, Somaliland suffered many of the same afflictions that the many transitional governments in Mogadishu faced, starting with clan politics and corruption. The *beel* system of government, established at the 1993 Borama Conference, was an attempt to reconcile traditional and contemporary governance by accommodating the existing political conditions: elders were incorporated into central government through a council, the *guurti*, which formed the upper house of Somaliland's parliament. However, the system was widely criticized for lack of transparency, nepotism, and corruption, which allowed majority clans to dominate minorities. Further, the composition of the parliament favored clan balance over merit, meaning that clan concerns trumped issue-based politics (Bradbury, Abokor, and Yusuf 2003). Somaliland successfully achieved stasis over the chaotic next several years only after some sovereignty, namely taxation and enforcement powers, was transferred from the informal clan institutions to the state through the reinvigorated colonial *aqil* system. Since the clan power-sharing period of the late 1990s began, most of Somaliland has been free of the cycle of ethnic retrenchment and violent resource competition plaguing other parts of Somalia, and militias and clans have been largely disarmed (Hansen and Bradbury 2007), which suggests that the state has a monopoly on the use of force. Formal (though underfunded) military, police, and coast guard units have been established, with the last having antipiracy authority (Dua 2011). A coastline of only several hundred kilometers makes Somaliland fairly manageable for a relatively small force (Dua 2011).

The Somaliland administration's goals of international recognition, increased foreign direct investment (FDI), and protection of the revenue stream from Berbera Port also likely encourage sustained commitment to antipiracy. In contrast to other historical examples of state interaction with piracy, such as that of the Barbary States, Somaliland seems to have made a cost-benefit calculation that favors attempts at international recognition, increased FDI, and port revenue over piracy proceeds.<sup>4</sup> Dua (2011) has highlighted the link between counter-piracy and the narrative of international recognition in Somaliland, while Clapham et al. (2011) found that revenue from Berbera Port is critical to sustaining the administration.

However, between 2007 and 2009 the disputed coastal region of Sanaag harbored hijacked vessels and hostages. In this period, data in UNODC-WB (2012) confirm five instances of piracy in which up to three anchorages in Somaliland were used to hold vessels and hostages: Ras Shula at the western end of Sanaag region, and Ras Gacan and Laasqooray at the eastern end, deep inside territory disputed by Puntland. Consistent with the model, the level of political fragmentation in Sanaag region was far greater than that of the rest of Somaliland during the years 2007–09, so that the pirates could have exploited the lack of strong local governance to their benefit.

During this period, parts of Sanaag region, especially ports on the coast and major cities, were contested between Somaliland, Puntland, Khatumo State (Sool, Sanaag, and Cayn, or SSC), secessionist and unionist parties, smugglers, clan militias, and local administrations, such as Laasqooray. In 2007–09, when the area surrounding Laasqooray was used to hold

pirated vessels and hostages, Sanaag region was part of Maakhir State, a Warsangeli clan enclave formed in 2007. Until he was caught by Yemeni authorities, Fu'aad Hanaano had his piracy operations there, securing protection through close ties to local officials from his Warsangeli clan, allegedly including members of the current Puntland administration (SEMG 2010). As of 2012, this territorial dispute had achieved an equilibrium tension, with Laasqooray and Ras Gacan in the east coming under the effective control of Puntland, the Ras Shula area in the west under control of Somaliland, and Khatumo State nominally claiming a strip of the coast between the two areas (Figures 6.3, 8.1, 8.3).

### *Puntland: Piracy Responding to Local Politics*

The neighboring semi-autonomous Puntland State of Somalia has a more mixed record than Somaliland of dealing with piracy. If geography and demographics work to Somaliland's advantage in fostering relative stability and countering piracy, the exact opposite is true in Puntland. The coastline of Puntland is 1,300 to 1,600 kilometers long, depending on whether disputed territories are included, but in either case it would constitute nearly half of Somalia's total shoreline. The administration has difficulty in accessing the remotest areas of its claimed territory; much of coastal Puntland is separated from Garoowe, the inland capital, and urban centers like Bosaso by mountainous terrain, with very little transportation infrastructure to connect the different territories and their native clans. Though dominated by one clan, the Darod Majerteen, and relatively ethnically homogeneous by the numbers, Puntland's experience with minority clans is significantly different from that of Somaliland. For example, Puntland currently bears the brunt of the insurgency by the minority Warsangeli (and to a lesser extent the Dhulbahante) clan that is being waged in the Galgala Hills and throughout parts of western Bari, even though these areas are also being contested by Somaliland and several nonstate actors (see Chapter 5). This is a consequence of Puntland's political economic environment.

Piracy off the coast of Puntland appears to respond to changes in the region's political landscape. Historically, different Majerteen subclans, none of which has been strong enough to impose its authority and enforce the rule of its law across the territory of the others, have dominated Puntland's political, administrative, and economic institutions. Recently power has been alternating between the Isse Mohamud, Osman Mohamud, and Omar Mohamud subclans, and piracy activities have adapted in response. There appears to have been a surge in pirate activity in Isse Mohamud areas like Eyl in 2005–09 when the rival Osman Mohamud subclan held the presidency (Bahadur 2011). When Isse Mohamud regained the presidency with the election of President Farole in 2009, anchorage utilization responded by moving to the far northeast (Osman Mohamud territory) and the far south (Omar Mohamud territory). Anchorage utilization has declined significantly in central Puntland, which is Isse Mohamud territory; President Farole has been compelled to take action against pirates where he is able to leverage social and political capital through his clan, particularly in his birthplace of Eyl. Figure 8.3 shows the surge of piracy in Isse Mohamud territory (Eyl) through 2008 and subsequent displacement of pirates to the north and south away from Eyl beginning in 2009.

Since its very inception allegations of corruption, including collusion with or protection of pirates, have hung over all levels of the Puntland administration, local through regional. In other words, pirates seem to have been able to effectively identify and contract with key stakeholders in the region. The first president of Puntland and the TFG, Abdullahi Yusuf Ahmed, has often been accused of accepting financial inducements from pirates, though not of participating directly in organizing or sponsoring piracy (Middleton 2008). Pirate leader Boyah, speaking in 2008, went even farther, saying that Puntland authorities (under the Mo-hamud Muse Hersi “Adde” administration) provided weapons and financing to pirates, taking a 30 percent cut of the ransoms (CNN 2008).<sup>5</sup> In 2010 the Puntland Development Research Center and Interpeace stated that the public perceives local councils there to be “inefficient, non-transparent, not accountable and rife with corruption.” The SEMG (2008, 2010, 2011) went further, identifying members of the Puntland administration suspected to be currently or previously involved in protecting pirates. In late 2012, the Farole administration indicated tentative willingness to move toward more accountability and inclusiveness by allowing political parties to be registered for the first time (*Garowe Online* 2012); however, the president has since extended his term of office for one year (Shabelle Media Network 2013), even in the face of stiff resistance and protests from local communities (Farah 2012).

### *Central Somalia: Piracy Responding to Conflict Dynamics*

Central Somalia is comparatively more fragmented than Puntland or Somaliland but more stable than Southern Somalia. The self-declared semi-autonomous federal states of Galmudug and Ximan iyo Xeeb are both located in Central Somalia and often have competing territorial claims.<sup>6</sup> Each of these administrations is effectively a clan enclave based loosely on traditional territory, with Habar Gidir Sacad making up the Galmudug administration and its rival Habar Gidir Saleeban dominant in Ximan iyo Xeeb.<sup>7</sup> The coastal city of Hobyo and the inland economic center of Galkacyo are contested between these administrations (*New York Times* 2010; United Nations Office for the Coordinator of Humanitarian Affairs [UNOCHA] 2011), which emerged in 2006 in Galmudug and 2008 in Ximan iyo Xeeb. The states saw generally escalating tension, likely due to competition over scarce water and pasture resources exacerbated by the cyclical drought from about 2009 through 2011 (UNOCHA 2011), until environmental conditions in the central regions eased in the 2011–12 *deyr* (roughly fall to late winter) rainy season (Food Security and Nutrition Analysis Unit [FSNAU] 2011). The rise of a new generation of pirate bosses based in and around Hobyo, such as Mohamed Garfanji (Saleeban subclan) and Ahmed Fatxi (Sacad subclan), occurred throughout the period of escalating conflict. Figure 8.3 shows how the activation of Hobyo as an anchorage, beginning in 2008, peaking in 2011, and dropping off abruptly in 2012, roughly corresponds to this period of drought, escalating conflict and fragmentation of power, and the rise of new bosses like Garfanji and Fatxi. South of Hobyo and the disputed Galmudug–Ximan iyo Xeeb border areas lies Harardheere, firmly in Ximan iyo Xeeb territory yet under effective control of al-Shabaab since late 2010; this suggests that the balance of power between al-Shabaab and the regional administrations, particularly when the latter are fighting each other, favors the militants.

The rise of Islamist militant groups like Hizbul Islam in the early days of modern piracy and later of al-Shabaab has created a powerful new set of stakeholders in Central Somalia with whom pirates must also negotiate. Despite a series of confrontations in 2010, certain pirate groups and Islamists in Harardheere settled into a tense equilibrium perhaps as early as 2008, with pirates opting to deliver a cut of ransoms to the militants in exchange for noninterference (see Chapter 5). Harardheere was used as an anchorage for the highest percentage of anchored vessels pre-2008, even as volume likely increased through 2010 with more hijackings. Its importance as an anchorage seemed to decline beginning in 2011 with the decline in successful Saleeban hijackings (as a percentage of the 2011 total) and increase in alleged land-based kidnappings perpetrated by these groups. However, the increasing movement of al-Shabaab into Central Somalia and southern Puntland (BBC 2012; *Somalia Report* 2012c) and the arrests of pirates by al-Shabaab rivals Ahlu Sunna Waljama'a (ASWJ) and the Galmudug administration (*Somalia Report* 2012a, 2012e) could change the risk calculation for pirates in that area.

## Conclusion

The Somali pirate business model is critically dependent on long-term secure anchorage. However, the patterns illustrated in Figures 8.1 and 8.3 cannot be sufficiently explained by the presence or absence of certain necessary conditions for anchorage, such as appropriate geography or infrastructure. Asymmetry between attacks launched and vessels anchored further indicates that the mere presence of pirate activity does not necessarily beget anchorage.

The patterns of anchorage locations do, however, suggest a close relationship between local politics and piracy, consistent with the model proposed in Figure 8.2. Anchorage can be obtained where there is an intermediate degree of political fragmentation. Differing patterns of conflict and competition for resources throughout the four regions of Somalia have created appropriate long-term conditions for anchorage in Puntland and Central Somalia; however, anchorage can also be obtained elsewhere in the short term when changes in the political economic environment temporarily provide the appropriate degree of political fragmentation. The common pattern throughout Somalia is that piracy moves in when a central or regional authority is weak, corrupt, or undermined by infighting, often along clan lines, so that pirates can hope to affect the balance of power to favor their interests. But when changes in the local political landscape are too frequent or the political equilibrium is too fragile, the stability necessary for piracy operations is no longer present. The need to anchor hijacked boats or protect hostages for as long as three years precludes pirates from operating in regions that are too volatile.

Pirates employ a diverse mix of financial inducements and physical coercion to obtain stakeholder support. Ultimately, just as pirates employ different positive and negative incentive structures to accommodate heterogeneity across space and over time, so too must the international community design incentive-compatible policies sensitive to the local distribution of power and flexible enough to accommodate shifting stakeholder dynamics within each coastal area affected by piracy.



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## Datasets

IMB 2012: International Maritime Bureau Database on Piracy Incidents



## Notes

1. There are two basic disagreements that affect how Somali clan families are counted. Mirifle, also known as Rahanweyn, is often grouped with Digil (World Bank 2005), presumably due to common descent, shared language and dialects, an agrarian rather than pastoral tradition (as in the rest of Somalia), and political considerations, such as the grouping of elders from ‘Digil iyo Mirifle’ for the Transitional Federal Government (TFG)–sponsored conference to select the National Constituent Assembly in 2012. Issaq is often referred to as part of Dir, although many Issaq dispute this association; their ancestor Sheikh Issaq married into the lineage through the daughter of one of Dir’s descendants in the 12th or 13th century (Lewis 1998, 2002).
2. A term introduced by Mohamed Siad Barre, literally translated as “peacemaker,” in an effort to de-emphasize the clan-based origins of their role (Gundel 2006).
3. The French controlled the far northwest extent of ethnic Somali territory, in what is now Djibouti.
4. There is some evidence that Puntland may also be moving in this direction. Although the administration’s most significant anti-piracy success occurred in the territory of President Farole’s subclan around Eyl, operations against pirates by the Puntland Maritime Police Force (PMPF) in the second quarter of 2012 farther north in Iskushuban and Hafun roughly correspond to attempts by the government and international partners beginning in late 2011 to exploit the Dharoor oil block, which incorporates these towns (Patersons 2011). Since 2011 the Dharoor effort has taken priority over development of the Nugaal oil block near Garoowe due to the border dispute with Somaliland in that region (Patersons 2011). The prospect of significant revenues from oil development is predicated on sustained FDI, and the corresponding provision of law and order to secure property rights. This would presumably alter the Puntland government’s cost-benefit calculation with regard to tolerating piracy.
5. According to Bahadur (2011), Boyah has since retracted this claim several times.
6. Other self-declared regional administrations in Central Somalia, such as Hiiraanland, are inland and thus largely irrelevant to this study.
7. Other minority groups live in the central regions, such as Hawiye Abgaal and Shiikhaal in the south and Dir Marehan inland. North and South Galkacyo separate Majerteen Omar Mohamud from Hawiye Habar Gidir Sacad (UNOCHA 2011).

PART III:  
RESHAPING THE POLICY  
DIALOGUE



# REVIEW AND EVALUATION OF CURRENT POLICIES

# 9

## Introduction

At least 60 countries and 20 established and ad hoc international organizations are engaged in the fight against piracy off the coast of Somalia. Once declared a “threat to international peace and security” pursuant to Chapter VII of the Charter of the UN, it has prompted rapid engagement of the United Nations Security Council (UNSC), which since 2008 has adopted 13 resolutions in support of antipiracy efforts (UNSC 2012d). Initial policy responses were directed exclusively to combating piracy using military and law enforcement capacities. While the recent drop in reported instances of Somali piracy attacks has often been attributed to such efforts, the international community has agreed that a comprehensive approach is needed that also addresses the political and socioeconomic root causes of piracy in Somalia (UNSC 2011a).

This chapter reviews counter-piracy initiatives to date and attempts to draw lessons for designing a new incentive-compatible path out of piracy. Both national onshore initiatives and international offshore operations are analyzed in terms of the business model set out in Part II. In particular, the analysis uses the framework developed in Chapter 7 to assess how a given intervention affects the profitability of Somali piracy by either decreasing the probability of a successful hijacking or increasing the opportunity cost of becoming a pirate rather than opting for an alternative occupation. In doing so it highlights their limits, taken individually in terms of efficiency and sustainability.

## Curbing Piracy off the Coast of Somalia

### *Antipiracy at Sea*

#### *Stepping up Naval Military Operations*

The United Nations (UN) and the European Union (EU) have both endorsed the use of force off Somalia “as may be necessary to maintain or restore international peace and security” (UN Charter, Chapter VII, Art. 42) and substantial forces have been deployed. Three multinational maritime coalitions—the EU Operation Atalanta of the European Naval Force Somalia (EUNAVFOR), Operation Ocean Shield from the North Atlantic Treaty Organization (NATO), and the Combined Maritime Task Forces 151 (CMT-151)—are present to protect ships transiting off the Horn of Africa. At least seven countries acting individually have also deployed ships or aircraft in the area, both to protect vessels in transit and to rescue vessels under attack (UNSC 2011a). At any given time, the three coalitions alone have about 20 vessels deployed there. In 2011, military assets off the Horn of Africa comprised 32 vessels, 4 aircraft, and 1,800 personnel (UNSC 2011a). The international forces have been authorized to act on Somalia’s coastal territory and territorial waters to disrupt pirate supplies (UN Security Council resolution 1851 [2008], 16 December 2008; EU Council decision 2012/174/CFSP, 23 March 2012). Such operations are also known as Disruption of Pirate Logistics Dumps (DPLD) and have since been conducted at least once and by EUNAVFOR in May 2012 (EUNAVFOR Public Affairs Office 2012).

International military operations in 2011 are estimated to have cost at least US\$1.27 billion (Oceans Beyond Piracy 2011). Estimating the specific cost of these operations is difficult because the vessel alone would still need maintenance and would be in training operations or in other active service even if deployed elsewhere and costs would also be incurred for personnel and other military infrastructure. But though approximate, the estimates arguably provide a first order of magnitude of the costs involved.

#### *Raising Awareness of the Shipping Industry*

With the support of the International Maritime Organization (IMO) and counter-piracy authorities, the shipping industry has formulated best management practices (BMPs). The fourth version published in 2011 (BMP 2011) gives recommendations to avoid or deter pirate attacks; gives information about high-risk areas and the typical modus operandi of a pirate attack, and suggests the appropriate course of action in response; and sets out procedures for reporting counter-piracy forces. There are also practical recommendations for pre-travel risk assessment and ship protection measures, including specific steps to be taken in case of attack, successful hijack, and military intervention. According to the UN, ships conforming to the BMPs face a lower risk of being hijacked (UNSC 2010), and indeed no ship with onboard armed guards has yet been hijacked (Ince LLP 2012; Oceans Beyond Piracy 2011).

More and more vessels are using armed guards, who furthermore seem to be the main BMP used to effectively deter pirates. Armed guards are usually private personnel armed with lethal weapons, who board commercial ships for the transit through dangerous waters.

Sometimes they are military personnel provided by the state and acting as vessel protection detachments (Foreign Affairs Committee 2012). The use of armed guards has increased significantly in recent years. Currently, an estimated 40 to 50 percent of the 40,000 vessels crossing the area have them (Oceans Beyond Piracy 2011). The quick increase in the use of armed guards has been spurred by the active support of some governments and counter-piracy authorities after a major change in attitude (Ince LLP 2012) and a push from the insurance companies that factored armed guards into their premiums (Chalk 2012). Because of legal, practical, and ethical issues related to arming merchant ships, until recently most governments and the IMO strongly discouraged armed guards (Foreign Affairs Committee 2012; Liss 2012). Then in 2011, the IMO endorsed their deployment on board ships and published an interim guidance for their use (IMO 2011c).

Yearly cost estimates for having armed guards on board range from US\$170 million all the way to US\$530.6 million. Oceans Beyond Piracy (2011) estimated the cost at US\$530.6 million for 2011, on the assumption that 25 percent of the 42,450 transiting vessels used armed guards at an average cost of US\$50,000 per trip. The Foreign Affairs Committee (2012) suggested a more conservative US\$34,000 for the average cost and 20,000 for the number of commercial vessels transiting the area (see also Lang 2011), while Operation Atalanta puts the number of vessels at 45,000 (MSC HOA, 2012). Again assuming 25 percent compliance with BMPs related to armed guards, the total cost would be between US\$170 million and US\$306 million.

Oceans Beyond Piracy (2012b) estimated the combined premiums in 2011 for kidnap and ransom (K&R) and war risk insurance at US\$635 million, assuming that K&R insurance would cost from US\$5,000 to US\$20,000 depending on the speed and freeboard height of the vessel. The war risk premium is usually about 0.1 percent of the vessel's hull value.

## *Law Enforcement Initiatives*

### *Holding Pirates Accountable*

According to the 2011 "Report of the Special Adviser to the UN Secretary-General on Legal Issues Related to Piracy off the Coast of Somalia" (Lang 2011), more than 90 percent of the pirates apprehended off the coast of Somalia were released without being prosecuted. Under the leadership of the UN Political Office for Somalia (UNPOS), the UN Office of Drugs and Crime (UNODC), the UN Development Programme (UNDP), and the IMO, several actions to end pirate impunity have been initiated: tightening domestic laws in several countries, improving prosecution systems, and stepping-up detention capacity. Respect for human rights throughout the chain from apprehension through conviction is a guiding principle of the programs (UNSC 2011b).

Most countries affected by piracy have committed to review their national laws to ensure that piracy is criminalized (Belle 2012). The legal review is usually done under the guidance of the UN Office of Legal Affairs, IMO, and UNODC to ensure that national legislation meets international legal norms (UNSC 2011a). According to the UNODC (2012), 21 regional or international states currently hold or prosecute pirates operating off

Somalia (UNODC 2012). As of July 2012, only 582 Somali pirates in 12 countries had been convicted (UNODC 2012). Regional prosecution centers have been opened in Seychelles, Kenya, and Mauritius (UNSC 2012a), and the UN agencies are considering setting up specialized anti-piracy courts in Somalia, Seychelles, Kenya, Mauritius, and Tanzania (UNSC 2012b). Finally, UNPOS, UNODC, and UNDP are helping states in the region to renovate prisons, build new ones, and train prison officers—ensuring that prison facilities comply with the minimum standards (UNSC 2012b). UNODC has undertaken the rehabilitation or construction program in Seychelles, Mauritius, and Kenya, but most prisons there are already overcrowded with domestic prisoners and the current programs would not be enough to accommodate all the prisoners (UNSC 2012b). UNODC is planning to create or refurbish prisons in order to open up 1,000 new places in Somalia and has begun a training program for prison staff (Foreign Affairs Committee 2012). However, as noted by SEMG (2012), “while hundreds of junior pirates serve sentences in Puntland’s prisons, top pirate leaders/organizers/investors and negotiators ... have remained undisturbed, and have continued to organize and manage piracy operations. One notable exception is the notorious pirate leader Boya, who was arrested in May 2010 after international pressure was applied to the Puntland authorities. Since, by his own account, Boyah headed a militia of approximately 500 pirates and was responsible for between 25 and 60 hijackings, his sentence of only 5 years contrasts sharply with penalties of up to 20 years awarded to junior pirate figures and foot soldiers” (SEMG 2012, p. 203).

### *Disrupting Illicit Financial Flows*

Another initiative is to disrupt or dismantle the illicit financial flows that underpin the piracy business model. Working Group 5 of the Contact Group on Piracy off the Coast of Somalia (CGPCS) has been established to “coordinate international community efforts to identify and disrupt the financial networks of pirate leaders” onshore (CGPCS 2011). The UNODC has identified what needs to be done: build the capacity of domestic and regional law enforcement, build up anti-money laundering regulation, and draw up a comprehensive regional program to disrupt financial flows (UNODC 2011). Activities so far are mainly training and mentoring by the UNODC or the International Criminal Police Organization (INTERPOL) in Ethiopia, Kenya, and Seychelles. The UNSC (2012b) has identified the capacity of Somali enforcement authorities to investigate and prosecute sponsors and financiers of piracy as a long-term challenge. The continuing joint UNODC–World Bank (WB) study on illicit financial flows stemming from Somali piracy should provide insight into this issue.

### *Somalia’s Central and Regional Administrations and the Fight against Piracy*

Piracy-eradication policies were implemented in the past during the rule of the Islamic Courts Union (ICU). In 2006 the ICU briefly cracked down on piracy in Central Somalia by overtaking key anchorages, such as Harardheere, Hobyo, and Ceel Dheer (Jamestown Foundation 2006). This law enforcement approach was in keeping with a strict interpretation of Sharia (Hansen 2009). The approach was successful in part because the ICU drew

its popular support from its ability to impose law and order, rather than taking the extortion and expropriation approach of the warlords (Shariff 2006).

More recently, however, the central administration of Somalia has had limited involvement in antipiracy efforts. The UN through its agencies has initiated a program to build its capacity in the areas of justice, security, and human rights (UNSC 2011a). The Mogadishu Road Map, which organized the end of the transitional period, integrated a maritime security and national counter-piracy strategy as a key element to stabilize Somalia, but no initiatives were taken before the transition (UNSC 2011a). By August 2012, the end of the transition period, the TFG had never been able to extend its influence beyond a few districts in Mogadishu (Menkhaus 2012). The transitional authorities were supported by armed and police forces, operating under the authority either of the TFG or of militia groups (UK Border Agency 2012); the TFG mostly relied on the African Union Mission in Somalia (AMISOM) and international community forces (International Crisis Group 2011). The lack of security in South-Central Somalia has, however, impaired the formulation of any counter-piracy program in that area beyond participation of the TFG in the Kampala process coordinating system (UNSC 2012b).<sup>1</sup>

Upon taking power in September 2012, Hassan Sheikh Mohamud, president of the first post-transitional administration, called for an end to piracy (Euronews 2012). Since then a number of hostages have been released without payment of ransom: 22 hostages from the MV Iceberg in December 2012 (BBC 2012) and 3 from the MV Orna in January 2013 (Reuters 2013). Furthermore, one of the “fathers” of piracy, Mohamed Afweyne, publicly renounced piracy in January 2013, recalling his crews and urging other pirates to follow him into retirement (CNN 2013). These are first signs of success of the new administration in addressing piracy.

Somalia’s regional administrations have also been involved in international efforts to curb piracy, to varying effect. The Puntland administration in 2009 initiated a counter-piracy campaign and set up an anti-piracy task force, though again there are concerns about corruption of officials. With the support of UNDP and UNODC Puntland has built prisons, reinforced its legal system, prosecuted 290 pirates (UNODC 2012), and created a Puntland Maritime Police Force (PMPF) dedicated to fighting piracy (SEMG 2012), which carried out the successful release of the Iceberg hostages in December 2012 (Puntland Government Press Release 2012). The SEMG (2010) stated, however, that officials in the Puntland administration benefited from piracy proceeds—allegations that prompted vocal protests from the Puntland authorities (Ploch et al 2010). The State of Galmudug—the combination of the two central regions of Mudug and Galguduud—not only hosts the main pirate ports of Harardheere, Hobyo, and Dhinoodha but is also alleged to have no effective control over its own territory (*Somalia Report* 2012). The regional authority there is challenged by clans competing for political and territorial control (e.g., Ximan iyo Xeeb, which claims its sovereignty notably of Harardheere and part of Hobyo); its regional neighbor, Puntland; al-Shabaab, which controls part of the Galmudug territory; and powerful pirate groups. The Galmudug administration nevertheless plans to set up a maritime police unit to fight piracy on and off its shores (UNSC 2011a) and in December 2011 opened one of the largest prisons in the region (UNSC 2012c).



Finally, Somaliland has been a key partner with the international community in the fight against piracy. Somaliland in March 2012 adopted a new anti-piracy law (*Somaliland Law* 2012). UNDP has initiated a three-year program to enable the Somaliland authorities to conduct piracy trials in accordance with international standards. UNDP has also trained its police officers on investigations, operational procedures, and basic forensic skills for investigating piracy crime (UNSC 2012b). UNODC has initiated a prison construction and rehabilitation program and is training and mentoring prison officials (UNSC 2012b). Somaliland adopted a law on Transfer of Prisoners that allows for relocation of pirates convicted in another country to serve their terms in Somaliland (*Somaliland Law* 2012). In late March 2012 the first group of 17 pirates, convicted in Seychelles, was transferred to a Somaliland prison (UNODC 2012).

### *Socioeconomic Interventions*

The International Contact Group officially recognizes that eradication of piracy requires “a comprehensive approach that would address the political, security, and socioeconomic root causes in Somalia.” It has called for land-based employment and income-generation projects (UNSC 2011a). The CGPCS (2011) notes that the TFG has initiated a program, funded by the CGPCS trust fund, to inform Somalis, particularly young males, about the risks involved in piracy and alternative livelihood options available. The UNODC will engage in a sustainable livelihood program to inform local communities about viable alternative economic opportunities and provide business training and seed money to start up economic activities (UNODC 2012). World G18 Somalia, a diaspora network, is with the support of UNDP initiating a program similar to the Millennium Villages Project (MVP) that targets six coastal villages affected by piracy: Eyl, Garacad, Hiis, Lasquoray, Luqhaya, and Hobyo (Foreign Affairs Committee 2012).<sup>2</sup> The aim is to assemble for each village a “benefits package” of education, health, agriculture, and employment services in exchange for the commitment by the village community and elders to remove “pirate teams and their planners from the village” (Foreign Affairs Committee 2012). Meanwhile, local nongovernmental organizations (NGOs) have also engaged in the fight: for instance, the Puntland-based Youth Organization Against Piracy (YOAP) was established in 2011 with the unique mission of “eradicating piracy by providing sensitization and creating social and economic programs for the Somali youth” (interview with YOAP members 2012).

Year after year, international partners have delivered substantial aid to Somalia, although not enough and often inefficiently. Total development and humanitarian assistance is believed to be in the range of US\$750 million a year. Most of these resources have gone to emergency food assistance, but longer-term development assistance spans a broad range of interventions from state- and capacity-building to livelihoods and community infrastructure. While the amount is substantial, questions have been raised as to whether the funds have been used effectively and efficiently; there is considerable concern about corruption and manipulation of aid. Moreover, the amounts pale in comparison to the vast sums spent on “defensive” and security measures. Somali analysts often interpret the discrepancy as a policy of containment, rather than development, driven by fear of pirates and terrorists.

## Assessing Policy Effectiveness

This section assesses the effectiveness of current and proposed antipiracy policies using the framework set out in Chapter 7, where inputs into the piracy business were separated into three categories: manpower, financial resources, and political capital. The first two earn returns determined by market conditions. In other words, individuals involved in an operation and investors providing financial resources must be offered at least the risk-adjusted market rate of return on labor or on capital. By default, political capital captures whatever is left once those returns are paid.

Current and proposed policies alter key parameters of the Somali piracy business model and the economic environment in which it is evolving, but how decisively is an open question. Some parameters are specific to piracy, such as the probabilities of a successful hijack and of death and detention. Others characterize the general economic environment: The opportunity cost of piracy captures the loss incurred by would-be pirates when they decide to join the business. It consists of foregone revenues from an alternative livelihood and even the social stigma of participating in a criminal enterprise. The first step in assessing policy effectiveness is to determine the most plausible impact of a given policy on the profitability of Somali piracy. For example, alternative livelihood programs, by offering occupation with lower risk, will have a direct effect on the opportunity cost of joining pirate crews. Naval forces and BMPs both lower the chances of a successful hijack and increase the risk of pirate death or capture. Finally, systematic prosecutions and detentions of convicted pirates increase the penalty for captured pirates. Table 9.1 summarizes the main anti-piracy policies considered in this chapter and how likely they are to affect the piracy business model.

Piracy will remain a sustainable business as long as the proceeds from ransom payments are large enough to compensate providers of manpower or financial resources for the opportunity cost of their time or their funds and the risk incurred by being in the piracy

**TABLE 9.1: IMPACT OF POLICIES ON THE PIRACY BUSINESS MODEL**

	Channel of Impact						
	Market Wage	Social Stigma	Probability of Success	Benefits in Case of Success	Probability of Capture	Cost in Case of Capture	Probability of Death
<b>Proposed policies</b>							
Naval operations			–		+		+
BMPs			–				+
Prosecution imprisonment						+	
Monitoring of illicit flows				–			
Alternative livelihoods	+						
Sensitization programs		+					

business. Since manpower and financial resources should be offered rewards equivalent to the risk-adjusted market wage or the interest rate, any policy-induced change in the risk profile or market conditions should translate into adjusted payments to these two factors of production. If these market-driven rewards to providers of manpower and financial resources absorb the entire ransom amount, no rents are left to the providers of political capital—the enablers of piracy. At that point piracy ceases to be sustainable.

The impact assessment relies on several assumptions:

1. Piracy is deemed sustainable if political capital still has rents to capture.
2. Ransom amounts do not change in response to policy interventions. While ransom amounts tended to be the higher the lower the number of ships currently anchored along the Somali coast (see Chapter 6), it is unclear whether and how that pattern will be affected once a new policy is put in place or an old one is scaled up.
3. Using the assumed parameter values outlined in Chapter 7, the model predicts that the wage payment to one pirate in the attack crew should be about US\$10,478 and the rate of return for investors about 427 percent. These numbers imply that providers of manpower and financial resources capture only 14 percent of an average ransom payment.

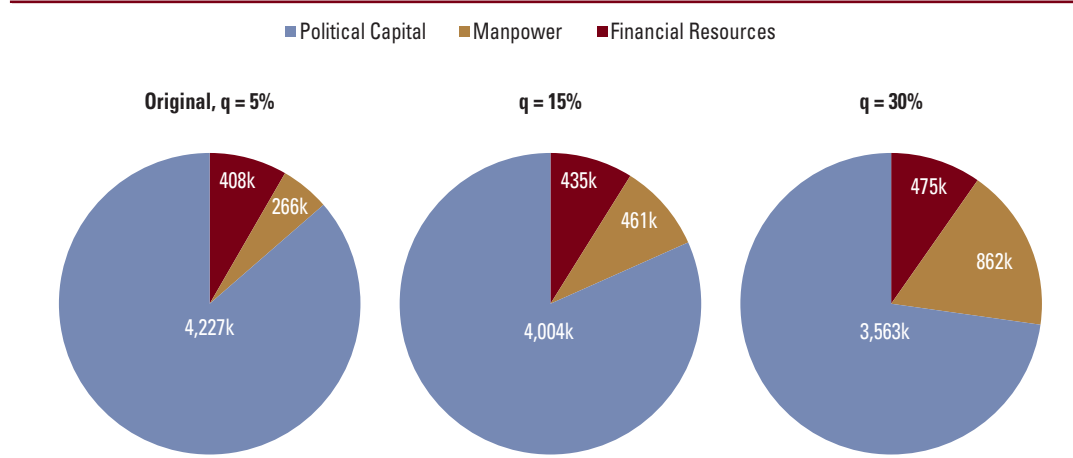
This is the benchmark scenario against which several counterfactual cases are compared to check for robustness to alternative parameters.

### *Increasing the Risk of Death and Detention*

Increased military deployment and judicial responses have increased the risks to pirates of death, capture, and detention. To separate the effect of increased risk of death/detention and increased risk of outright failure (in which a pirate crew could return safe and sound but empty-handed), the model assumes an increase in the risk of death/detention while keeping the success rate constant. This assumption might not correspond to what BMPs actually imply (see Table 9.1) but it does make it possible to disentangle the mechanisms at work. For the sake of simplicity, it is further assumed that detention and death have similar economic costs for pirates in terms of foregone income. Since the framework does not quantify the emotional toll of either death or detention (see Chapter 7), the predictions in this section are lower-bound estimates of wage adjustments, since a larger emotional cost will need more compensation, which is not factored in. Arguably, the necessary premium would be higher for a higher risk of death than for a higher risk of detention.

Two possible results of policy intervention are compared against the benchmark case. The left panel of Figure 9.1 shows the benchmark case, where the probability of death and detention is 5 percent. About 5.4 percent of the total ransom goes to pay pirates for their manpower and 8.3 percent goes to providers of financial resources. The residual is distributed in the form of rents to various holders of political capital. The middle panel simulates a situation where the probability of death and detention goes up to 15 percent and in the right panel the probability is 30 percent.<sup>3</sup> In these two cases, payments to both

**FIGURE 9.1: PAYMENT DISTRIBUTION BY DEATH/DETENTION RATE**



Sources: IMB 2012; FSNAU 2012.

Note: q is the probability of pirate death/capture.

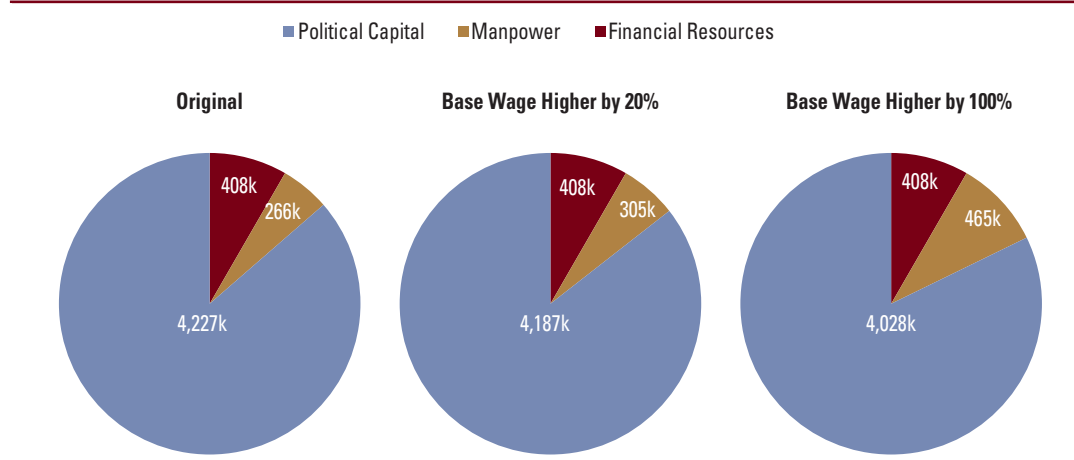
providers of manpower and financiers go up; however, the change is not significant enough to affect residual earnings. The death and detention probability does not matter much for investors, since return on a failed attack is nearly the same as return on a crew lost at sea. The main reason for such lack of sensitivity to external conditions is the low prevailing market wage given how pervasive poverty is in the communities pirates are typically drawn from. In other words, the required rate of return is much more sensitive to the probability of success than to the probability of death. To the pirates themselves and their communities, however, death and detention present a significant loss. However, as the payoffs of being a pirate are already important compared to the alternative of earning the standard unskilled wage, pirates are generally willing to take the additional risk without much additional compensation.

The efforts of the government and the international community to hold pirate crewmembers accountable, therefore, have little impact on the piracy business model. The deterrence effect of increased accountability for pirate crews is relatively weak. The potential supply of prospective pirates is abundant (see Chapter 7), and an imprisoned pirate is likely to be quickly replaced if a sufficiently attractive pay package is offered. The increased premium for the risk of imprisonment would be too low to significantly affect piracy profitability. However, this assessment ignores the “expressive” aspect of such policies; a commitment to holding perpetrators of crime accountable for their actions might have broader implications in terms of the rule of law and the legitimacy of the government—implications that largely go beyond what this framework can capture.

### *Increasing the Opportunity Cost of Becoming a Pirate*

Some onshore policies aim to change the economic environment of coastal Somalia by offering alternative livelihood options. Their main effect is an increased market wage. If the

**FIGURE 9.2:** PAYMENT DISTRIBUTION BY WAGE



Sources: IMB 2012; FSNAU 2012.

average income is higher, it will be harder to recruit pirates because the opportunity cost of being a pirate is higher. On average the Somali wage increased at 5 percent annually between 1996 and 2012 (FSNAU 2012). The average wage for unskilled labor was US\$738 in 2005 and US\$1,287 in 2012. Other initiatives focus on sensitization of youth. Although there is no immediate way to monetize the social stigma of being a pirate, effective campaigns will increase the wages that must be offered to would-be pirates.

Simulations of how wage increases might affect the piracy business model suggest they have marginal impact (see Figure 9.2). Two different scenarios were simulated. In one the unskilled wage was increased by 20 percent and in the other by 100 percent. It is clear that increasing wages will not change the distribution of ransom significantly. Even when wages are doubled, payment for manpower will only increase to 9.5 percent, shrinking the residual payment to 82.2 percent. Wages are insignificant because manpower constitutes only a very small proportion of all piracy costs. Even if the entire payment to manpower were to double overnight (doubling wages at the current rate would take 14 years), it would shrink the residual profit only marginally.

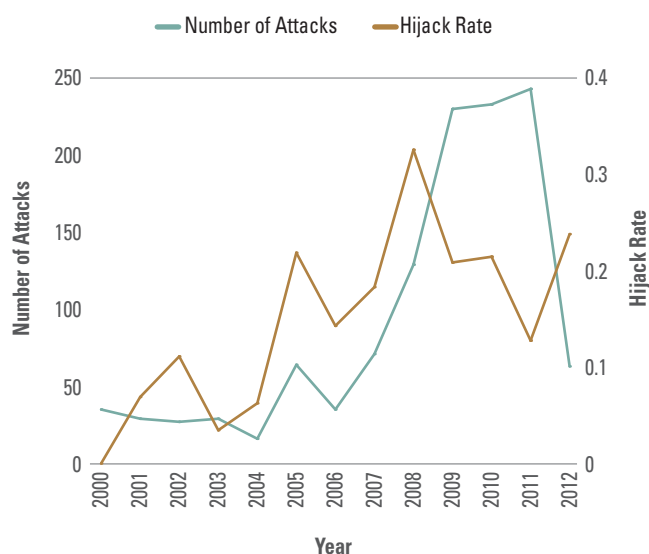
### *Lowering the Chances of Successful Hijackings*

Governments and shipping companies affected by Somali pirates have carried out several counter-piracy measures directly aimed at deterring hijacks and lowering their success rate if they occur. About 35 navies have patrolled the pirate area since the surge in Somali piracy (UNSC 2011a). Merchant fleets passing through piracy-affected waters increasingly follow BMPs (BMP 2011). It has been argued that these measures decrease the probability that Somali pirates will succeed, making their business model less profitable (IMB 2012; SEMG 2012), and there is indeed a noticeable decline of hijacking success rate starting in 2008 (Figure 9.3). The number of attacks also flattened out.

However, whether these measures are effective at disrupting piracy is an open question. It is possible to gauge the answer quantitatively. Figure 9.4 presents the distribution of payments to different parties as the success rate diminishes, keeping all other parameters constant, including those for death and detention.<sup>4</sup> The left panel presents the benchmark case, assuming a 15 percent success rate. About 5.4 percent of the total ransom goes for manpower and 8.3 percent goes for return on investments. If naval interventions could reduce the success rate to 5 percent, the possible income distribution would look like the pie chart in the middle panel in Figure 9.4. This drastically lower success rate would push the wage payment up from US\$10,478 to US\$42,516 and triple the required rate of return from 427 percent to 1,183 percent. Intuitively, the reason for such large effects is that since payments to providers of manpower and financial resources are made only in case of success, lowering that probability will increase those payments accordingly. These together will squeeze the residual payoff to about 61.5 percent. This is certainly a sizable shock to the piracy enterprise, but still not sufficient to drive it out of business.

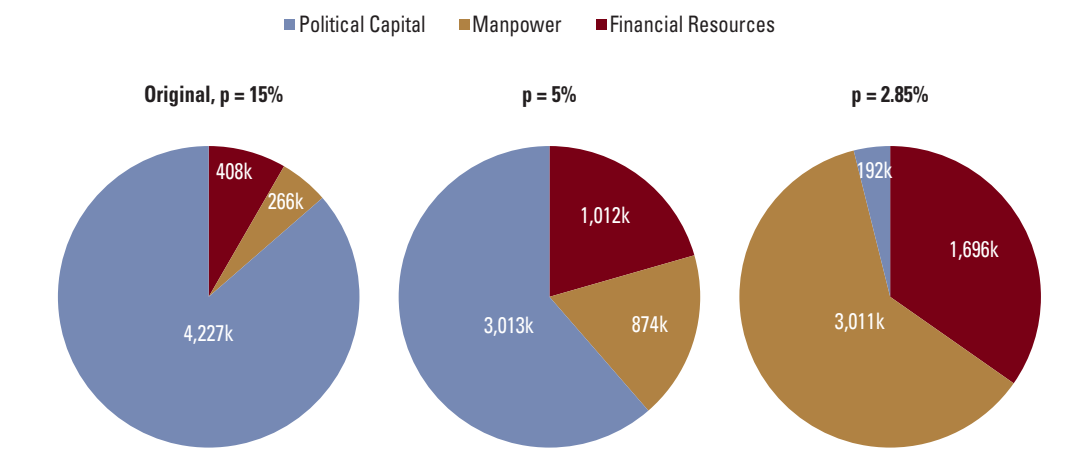
To make the current piracy business model unprofitable, the success rate would have to fall to as low as 2.85 percent. At that point (the right panel of Figure 9.4), the piracy

**FIGURE 9.3: PIRATE ACTIVITIES IN SOMALIA**



Source: IMB 2012.

**FIGURE 9.4: PAYMENT DISTRIBUTION BY SUCCESS RATE**



Sources: IMB 2012; FSNAU 2012.

Note: p is the probability of success, i.e. completed ransom payment.

business becomes so risky that each member of the attack crew needs to be paid US\$154,981 to get on board, and investors will be seeking a gross return of 2,038 percent in order to break even. Thus, more than 96 percent of the ransom would have to be distributed to the providers of manpower and finance, leaving essentially zero for the providers of political capital. However, the military effort to keep the success rate at 2.85 percent would have to be made permanent. More conservative assumptions on parameter values (risk aversion, dependency ratio, or discount rate) predict an 11.5 percent success rate to be the point where piracy is no longer sustainable (see Chapter 7).

While lowering the success rate of pirate operations might affect profitability, the cost of anti-piracy policies must also be considered. Preventive law enforcement measures are effective only to the extent they are enforced, *whether or not pirates are actually active*. Thus, to be sustainable, measures to prevent piracy have to be permanent. Earlier, the yearly cost of current naval operations was estimated at more than US\$1 billion, and provision of armed guards onboard would amount to US\$50,000 per vessel (Oceans Beyond Piracy 2011). How much more would these measures cost if they were scaled up to levels that would deter pirates from operating in the first place? To answer this question would imply evaluating how much preventive measures affect the pirate success rate, but that would require data (such as detailed information on vessel compliance with BMPs, itineraries, etc.) that are currently not available. Nonetheless, it is worth noting that the cost estimates in Chapter 2 do include the additional cost of equipping vessels with armed guards and any other privately provided preventive measures.

## Conclusion

*Somalia cannot buy its way out of piracy.* The modeled impact of current or proposed policies on the piracy business model suggests that “market interventions” are either unlikely to significantly affect the industry’s profitability or, in the case of navy deployments and BMPs, will need to be scaled up and made permanent, which may simply be unsustainable.

Targeting the perpetrators is ineffective. Given how pervasive poverty is, the share of returns that accrue to raw labor is simply too marginal to affect the profitability of piracy. Instead, Chapter 10 proposes a paradigm shift that consists of shifting attention away from the perpetrators and toward the enablers of Somali piracy.



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## Datasets

FSNAU 2012: Food Security and Nutrition Analysis Unit Database

IMB 2012: International Maritime Bureau Database on Piracy Incidents

## Notes

1. Set up in 2010 under the auspices of the UNPOS, the Somali Contact Group on Counter-piracy, otherwise known as the Kampala process, is a coordinating mechanism for the TFG, Puntland, Somaliland, and Galmudug administrations. The main objectives are information sourcing and exchange, coordination of counter-piracy offices, and development of joint initiatives to fight piracy, including the drafting of a Somali antipiracy law (Oceans Beyond Piracy 2012a; UNSC 2011a). According to Puntland officials, there was previously no effective coordination or information-sharing between Somali administrations (interviews with Puntland Ministry of Transportation and port and counter-piracy officials 2012). However, a law reform group had drafted two laws, one criminalizing piracy and the other regulating the transfer of prisoners (UNODC 2012).
2. The Millennium Villages Project is a multistakeholder project led by the Earth Institute of Columbia University. Its goal is to address the roots of extreme poverty and achieve the Millennium Development Goals through a low-cost, integrated, and community-led approach to rural development (MVP 2012).
3. Oceans Beyond Piracy (2011) estimates the number of pirates that have died in 2011 to be 7 percent, excluding those who died at sea without engaging in an attack. Lang (2011) estimates the number of pirates freed without being prosecuted at 90 percent.
4. In reality the probability of death and detention will hardly be independent of the probability of success. The exercise carried out here tries to separate their effects in order to understand the effect of different policies. The effect of simultaneously changing the two probabilities is discussed later in this chapter.

# A PARADIGM SHIFT TO ERADICATE SOMALI PIRACY

10

## Introduction

The analyses in Part I of this report looked at several dimensions of the threat to the global economy and global security that piracy off the Horn of Africa constitutes and found that countries in the region were disproportionately affected by both trade disruption and the flight of tourists and fishing vessels to safer places. Even for Somalia, piracy has been incompatible with the expansion of sectors such as trade, tourism, or fisheries, although the lack of data makes it impossible to precisely gauge the magnitude of the prejudice. The dramatic discrepancy between the revenues pirates enjoy and the costs to the global economy sets up a powerful rationale for the international community to support the administration of the Federal Republic of Somalia.

Any meaningful attempt to eradicate Somali piracy will require a paradigm shift away from the perpetrators and toward the enablers of piracy. Chapter 9 in reviewing current and proposed policies concluded that “Somalia cannot buy its way out of piracy.” The analysis in Part II showed that Somali piracy thrives because its proceeds are distributed in such a way that an enabling environment is created and the cost-benefit calculations of stakeholders onshore leads them to condone piracy. By contrast, the actual perpetrators (pirate crew, investors) capture a relatively small share of the profits their involvement generates. The crux of this chapter, therefore, is to discuss avenues through which the incentives of stakeholders can be altered so that piracy ceases to be appealing.

The proposed path to a piracy-free Somalia is in effect a political contract between stakeholders and the government of Somalia. It hinges on a mechanism for formal representation of the former so that they can be party to the political contract and be held accountable for meeting the terms of that contract. Therefore, long-term eradication of

piracy off the Horn of Africa cannot be dissociated from the construction of viable and accountable state structures, both central and decentralized. This report does not advocate any particular model of federalism or decentralization; it simply seeks to open the topic for further debate on the basis of the new evidence presented.

An incentive-compatible resolution to Somali piracy involves a mix of development and law enforcement initiatives to alter stakeholder cost-benefit calculations. It would require some compensation for the loss of revenues together with law enforcement initiatives to neutralize potential spoilers. While current policies are either ineffective or unsustainable if implemented in an ad hoc and uncoordinated fashion, they can have major impact if embedded in the proposed paradigm shift and effectively leveraged to affect stakeholder incentives. There is therefore a natural complementarity between development and law enforcement agencies when it comes to altering those incentives. Specifically, within the framework of a negotiated political solution led by the central government multilateral and bilateral partners could provide assistance in designing and implementing compensation packages to replace the foregone revenues from piracy, while law enforcement agencies could work on neutralizing individual spoilers.

Power dynamics among stakeholders vary greatly across Somalia and evolve over time. While the regional government is an important actor in Puntland, the Islamist insurgents of al-Shabaab have significant influence in Central Somalia. Moreover, the relative power of various stakeholders is volatile, as suggested in Chapter 8, and best illustrated by the changing patterns of active anchorage locations (see Figure 8.3). Understanding the idiosyncratic power dynamics that underpin local resource-sharing arrangements is thus a prerequisite to design of effective game-changing policies. Meaningfully mapping out stakeholder interactions requires both a high degree of granularity and the understanding that stakeholder interactions evolve over time and respond to changes in external conditions, including those induced by the policy initiatives discussed in this chapter.

The fight against piracy is only one of myriad challenges the Somali government must confront to move the country onto a path toward peace and prosperity. Whether this should be a priority is for the government of Somalia to determine with its partners. Nonetheless, the proposed framework is relevant for addressing many of the challenges facing Somalia that evolve around the critical issue of resource-sharing, whether or not the resources and revenues stem from piracy, fishing, charcoal, potential exploitation of oil fields, or even development assistance.

## A Political Contract for the Eradication of Piracy

Chapter 9 argued that interventions offering alternative livelihoods to would-be pirate crew members could not possibly be delivered on the scale needed to make the piracy business model unsustainable. While large-scale naval law enforcement interventions are believed to have been successful in curbing the number of attacks, they are only effective as long as they are deployed—a costly and perhaps unsustainable proposition in the long run.

This report calls for a paradigm shift: redirecting the policy focus away from the perpetrators toward the enablers of piracy. Given the centrality of coastal access to the Somali piracy business model and the limited availability of suitable anchorages, removing access to safe anchorage points or significantly increasing the effective price of access would affect the profitability of piracy. Doing so would involve altering the incentives of the stakeholders who collectively hold veto power over the decision to allow the anchoring of hijacked boats in a particular area.

This report calls for a negotiated political contract between local stakeholders and the central government. The contract would essentially consist of incentive packages from the government in exchange for a commitment from local stakeholders not to tolerate pirate activity in their areas of control. Livelihood projects are deemed ineffective because the pool of potential recruits far exceeds the numbers such projects can absorb: unless recruitment into piracy is blocked, there will always be volunteers. Similarly, if local development assistance is extended unconditionally, it will fail to dissuade stakeholders from condoning piracy, since piracy and development assistance would not be mutually exclusive. To be effective at curbing piracy, development assistance thus should be integrated into an umbrella political agreement where economic incentives are made conditional on verifiable progress toward termination of piracy.

The proposed political solution is similar to current policies targeting opium poppy production in Afghanistan and coca production in Colombia. Dissuading every single farmer from planting opium poppy or coca trees is prohibitively costly. Instead, the interventions involve devolving the monitoring of drug eradication to local communities; community leadership institutions are held accountable for meeting the terms of a negotiated agreement and rewarded accordingly. The lessons learned from the negotiation and implementation of antidrug programs in Afghanistan and Colombia should guide the design of a negotiated antipiracy solution in Somalia. Box 10.1 summarizes experience with poppy eradication in Afghanistan and draws lessons relevant to the Somali piracy case.

### *Political Representation and Accountability*

A contract between the central government and the enablers of piracy first and foremost requires that the latter have political representation so that (i) their interests can be properly defended, and (ii) they can be held accountable for progress toward eradicating piracy. The proposed institutional reforms will have implications, positive and negative, for stakeholders whose interests go beyond piracy. Thus there are large economies of scope in addressing piracy together with other local governance issues. A common theme is the distribution of resources and power among the population in general and power brokers in particular. The need to formalize local representation and build accountability systems implies, therefore, that eradicating piracy cannot be dissociated from efforts to (re)build a viable Somali state.

Recent evidence from Afghanistan that emphasizes the importance of carefully designing locally representative institutions should be useful for Somalia. Beath, Christia, and Enikolopov (2012) found that the creation of noncustomary institutions can result in



## Box 10.1 The Afghan Experience: Throwing Billions of Dollars at a Problem Does not Work

Counter-narcotics policies in Afghanistan have largely failed, despite the vast resources mobilized and a variety of course corrections.

The policy of eradication between 2004 and 2009 was not just ineffective it was in fact counter-productive. Afghan power brokers were able to manipulate the policy to eliminate rivals and consolidate their own influence and networks: “The result was a significant vertical integration of the drug industry in Afghanistan and intensified dependence of small traders on powerful patrons” (Felbab-Brown 2012). In the absence of alternative livelihood options, eradication left poor farmers worse off economically and helped to radicalize them.

The Obama administration shifted to a policy of selective interdiction, targeted mostly at traffickers with Taliban affiliations, coupled with massive investments in rural development. The United States alone mobilized US\$250 million a year for the latter. Yet its design has often been faulty and implementation difficulties have prevented achievement of tangible results. Because short-term “quick impact” interventions, such as cash-for-work schemes, were not clearly linked to long-term development programs, their sustainability has been minimal. Some cash transfer programs have been manipulated, undermining state-building objectives, and poor security conditions have greatly undermined the ability to deliver comprehensive economic development packages. In general alternative development programs “show little empirical evidence of reductions in illicit cultivation: projects stumble during implementation; in the instances where development is introduced it does not necessarily lead to reductions in illicit cultivation. Where there are reductions ... [they are] normally within a defined project area, but farmers have had ample time ... to relocate” (Farrell 1998).

Significant cuts in poppy cultivation have been achieved in the provinces of Helmand, Balkh and Nangarhar (Mansfield 2010). In all three, the drop was closely associated with the resolve of provincial governors to enforce production bans. These examples offer insights into what works, as well as into the fragility of such achievements. First, the bans involved intensely negotiated processes and fragile political settlements with local stakeholders: “Behind what could appear to be a province-wide ban enforced by a dominant governor lies a set of long and complex negotiations between former commanders and combatants, each seeking to maintain or strengthen their political and economic interests” (Mansfield, 2010). Second, they have generated substantial discontent and partly undermined the state building agenda, particularly where alternative livelihoods have not been available and where the bans have implied rapid pauperization of farmers. Lastly, they have benefited from exceptional circumstances, in particular favorable terms of trade between wheat and poppy. By 2007 however, poppy cultivation was back on the rise.

Lessons:

- Political settlements with local stakeholders are a necessary but not sufficient condition for sustainable poppy eradication.
- A comprehensive approach is necessary to avoid displacing the problem to other locations.
- Alternative livelihood works only as long as the cost-benefit calculation makes sense; it can have perverse outcomes where governance is weak.
- Poor security and governance dramatically affect the speed and scope at which development interventions can be rolled out, even with massive budgets.

Sources: Felbab-Brown 2012; Farrell 1998; and Mansfield 2010.

perverse outcomes by creating institutional ambiguity that opportunistic local actors then exploit. Determining the desired distribution of power between central, regional, and local administrations is beyond the scope of this report. Rather than advocating a particular model of federalism or decentralization, the report opens this topic for further debate on the basis of new evidence. In particular, it emphasizes the importance of stakeholder power and interest in explaining Somali piracy. It also highlights the remarkable geographical heterogeneity and the time variability of local power dynamics. As a consequence, altering the incentives of stakeholders requires a granular understanding of the local political economy.



## State-Building as a Prerequisite

The World Development Report for 2011 (WDR 2011) emphasizes the overarching importance of building confidence in central, regional, and local institutions. It stresses that “national reformers and their international partners need to build the legitimate institutions that can provide a sustained level of citizen security, justice and jobs—offering a stake in society to groups that may otherwise receive more respect and recognition from engaging in armed violence than in lawful activities, and punishing infractions capably and fairly” (WDR 2011 Overview). Replacing “armed violence” by “piracy” suggests a model for the long-term eradication of Somali piracy.

Ensuring security is a mandate of the central government, but it could involve local actors. In the long run, the provision of security rests with the state, whether central or decentralized. Pirate militias and guards will thus eventually need to be disarmed and integrated into civilian life or made part of a national, regional, or local police force or a Somali coast guard force.

The distribution of resources is a critical dimension of Somalia’s state-building. (The distribution of resources is also at the heart of the piracy business model.) For instance, the legitimacy and capacity of central, regional, and local administrations to raise taxes is central to a government’s ability to conduct economic policy. Another critical aspect of Somalia’s state-building is thus agreement on a fair split of national resources.

Guiding Somalia onto a path of economic development free from piracy requires investment in infrastructure and jobs and support for promising sectors. Using the terminology of the *World Development Report 2013* (WDR 2013), the emphasis could be on “good jobs for development”—or for this report, “good jobs for piracy eradication.” As argued earlier, some categories of jobs that can provide employment opportunities for the Somali population are incompatible with the pursuit of piracy, such as fishing, tourism, or some law enforcement activities, such as the coast guard. Investing in port and land-side infrastructure to promote sea trade might also increase the opportunity cost of piracy: pirate anchorages are notably absent around major port cities and areas benefiting from processing trade for the region, such as Kismayo and Somaliland.

## An Incentive-Compatible Political Resolution of Piracy

Incentive compatibility—the need to align stakeholder incentives with the objective of piracy eradication—is the guiding principle of the proposed policy path. A feasible resolution of the piracy problem needs to shift stakeholder incentives from condoning to condemning it. This will be achieved by changing the cost-benefit calculation of individual groups and empowering some categories of stakeholders at the expense of others, so that the new balance of power results in a new environment hostile to the pursuit of piracy. Box 10.2 discusses a current antipiracy initiative in Somalia built around a contract between a development agency and local communities that makes development assistance conditional on the eviction of pirates.

## Box 10.2 A Promising Solution?

The piracy working group of World G18 Somalia (WG18S), a UK-based nonprofit organization uniting the diaspora of Somalia's 18 regions to foster peace and development in Somalia, has initiated a community-led program to eradicate piracy.

The program proposes the following bargain to the targeted coastal communities: a comprehensive Development Benefits Package, bringing social and economic benefits, will be deployed if the community and community elders make a commitment that piracy will not be allowed and the pirates and enablers will be durably evicted from coastal areas. From discussion with community elders, WG18S is confident that the prospect of a “better quality of life” alternative will attract community support and pirates will be forced out.

The Development Benefits Package will be tailored to each area after a needs assessment. It will cover education, health, employment, and economic development (agriculture and fisheries), security, and gender. The project will be modeled after the Millennium Villages Project, a Columbia University-led initiative in Africa aimed at achieving the Millennium Development Goals.

The program will initially target six coastal villages—Eyl, Garacad, Hiis, Laasqoray, Luqhaya, and Hobyo—and will be led by the members of the diaspora who are uniquely equipped to “assess the needs, build trust, and generate commitment.” Members of the WG18S piracy working group have visited the region and presented the project to UNDP and other agencies.

### Can the Development Benefits Package program be scaled up?

The WG18S initiative is a promising first step and, unlike other proposed initiatives, is characterized by an implicit or explicit contract—aid in exchange for piracy eradication—between local communities and the development agency along the lines of the paradigm shift proposed in this chapter. An evaluation of the WG18S will certainly produce useful information, in particular:

- How is the conditionality enforced? In particular, how is progress toward piracy eradication being monitored?
- What is the appropriate representation? Are community elders always the appropriate institution to be held accountable for progress toward eradication of piracy?
- Who are the potential spoilers, and what is being done to contain them if necessary?
- How can it be ensured that eviction of pirates from one community will not simply result in their displacement to another?

Sources: Foreign Affairs Committee 2012; WG18S 2012.

The political economy implications should be carefully considered so as to do no harm. While piracy could be effectively eradicated, the implied political economy change could lead to a surge in violence between interest groups, which could undermine the state-building agenda. To properly identify interest groups and manage the risks stemming from changes in the distribution of power that is an aspect of antipiracy interventions, understanding local power dynamics at a granular level is crucial.

## *Compensating for Loss of Piracy Revenues*

Stakeholders will need to be compensated for lost revenues, but exactly how is yet to be determined. Again, the optimal design of compensation packages hinges on understanding local power dynamics and resource distribution arrangements. However, some general principles (which apply to most development assistance initiatives) can be laid out: interventions need to reach the intended beneficiaries and limit capture and corruption; and

they should be visible and transparent, since political support is in fact the main outcome sought.

The minimal capacity of the Somali administration in transition makes development assistance particularly vulnerable to capture and corruption. Compensating stakeholders for the loss of piracy revenues presupposes that interventions actually reach the targeted individuals or groups. Therefore, there need to be explicit strategies to ring-fence projects against political capture or administrative leakages (corruption).

When considering the policy mix, symbolic impact and payoff should also be factored in. The cost-benefit calculation of stakeholders is not only economic. To some extent piracy has been tolerated by some communities because it is not seen as fundamentally wrong or illegitimate. The rise of Somali piracy has often been explained as a response to large-scale illegal fishing by foreign fleets off the coast of Somalia. Impoverished fishing communities supplied the manpower for pirates, who paid themselves back for lost livelihoods (see Waldo 2009). Although still debated (see Chapter 4), this rationale continues to be a powerful narrative and moral argument in the battle for hearts and minds. Therefore, improving Somalia's fisheries sector and the state's capacity to monitor and regulate exploitation of marine resources could have symbolic impact well beyond the monetary and economic payoffs.

### *Containing Individual Spoilers*

Unlawful activities should be punished capably and fairly. Eradicating piracy will create losers, who will attempt to stall the process. Naval interventions at sea and security measures on board, which may explain in part the recent drop in attacks and hijackings, will still be relevant. They are important in reducing the opportunity cost for pirates of quitting. Moreover, prosecution and imprisonment of captured pirate crew members, which so far has been only marginally effective, could send a powerful signal that the government and its partners are committed to upholding the rule of law in general and to eradicating piracy in particular.

Some individuals are too vested to be credibly compensated. Whether the piracy business crucially relies on a few key individuals with unique networks and capabilities or whether they may be easily replaceable by other politically connected businessmen ready to seize a lucrative opportunity is an open question. In any case, they capture significant rents from piracy and will resist eradication efforts. Furthermore, since a viable Somali state is certainly incompatible with the pursuit of piracy activities, they may also constitute a threat to nation-building. Going after these individuals either physically or by identifying and tracking illicit flows and freezing assets ought to be part of the portfolio of inducements available to the government and its partners for curbing piracy off Somalia's coast.

Finally, the transition towards a viable state of Somalia might experience the emergence of piracy and other criminal activities in areas previously too unstable for illegal (as well as legal) economic activities to thrive. Assessing and managing such risks should be an integral part of the government's state-building agenda.

## The Role of the International Community

Good governance and public sector capacity-building are the foundation of a Somali strategy to eradicate piracy. International support to the government of the Federal Republic of Somalia could be implemented through three instruments: partnership, knowledge, and finance. That proposed role is consistent with the Africa regional strategy of the World Bank (World Bank 2011).

### *Partnerships*

The international community could set up mechanisms for coordinating development and law enforcement. Both groups need to coordinate their support to the Somali government. Law enforcement and development both have their own independent coordination mechanisms. International and domestic law enforcement actors cooperate and coordinate primarily through Shared Awareness and Deconfliction (SHADE), the Djibouti code of conduct, the Contact Group on Piracy off the Coast of Somalia (CGPCS), and the Regional Anti-Piracy Prosecutions Intelligence Coordination Centre (RAPICC). These mechanisms are mainly intended to enhance operational control of regional maritime zones and coordinate civil, military, and law enforcement initiatives; facilitate information-gathering and sharing; reinforce the piracy legal framework; promote shipping industry awareness; and ensure effective prosecution of pirate kingpins. Until December 2012 donors and development agencies coordinated their actions and goals through the Somali Reconstruction and Development Plan (RDP) and will probably continue their collaboration through the New Deal framework that the Somalia government has espoused. However, there are no mechanisms in place to facilitate partnerships between development and law enforcement initiatives. Since each type of intervention affects the other, if either is to be effective close collaboration is a necessary condition.

Coordination between development and law enforcement agencies should prioritize knowledge-generation and information-sharing. Understanding the political economy of Somali piracy would benefit from the combined expertise of development practitioners and law enforcement officials. While development agencies have a comparative advantage in collection and analysis of socioeconomic data, law enforcement agencies are uniquely equipped to identify actors in the piracy business and their networks. Fruitful cooperation requires the drafting of protocols for information-sharing. The World Bank, for example, has an open data policy, which implies among other things that nonproprietary data gathered during this study will be made publicly available for replication and continued analysis. On the other hand, due to their strict data-sharing rules the task team could not benefit from information gathered by some law enforcement agencies.

Partnerships with central, regional, and local governments; civil society organizations; and the Somali diaspora will be instrumental to strategies to eradicate piracy. The solution to Somali piracy is first and foremost political. A partnership between the international

policy community and relevant political authorities is therefore central to deliver both development and law enforcement policies efficiently, since these should be elaborated as part of a political solution rather than in isolation. Without fruitful partnerships with stakeholders, development projects and law enforcement initiatives might be unhelpful and even counter-productive.

## *Knowledge*

No meaningful solution to Somalia's piracy problem can be designed without understanding local power dynamics. An immediate follow-up to this report could be to launch an analysis of the local political economy of anchorage areas and communities. Piracy, like any other economic activity, generates economic rents that need to be shared not only among pirate crew members and financiers but also with clan leaders, government officials, local community members, and al-Shabaab insurgents, among others. Pirates have been shown to selectively use financial inducements and coercion to win support from local stakeholders. The political landscape they have had to navigate in Puntland and Central Somalia is the same landscape that central and regional governments and the international community will have to traverse. Whether the objective is to eradicate piracy or much more fundamentally to build the nation, the government of Somalia will need to confront the same realities as pirates and any other economic actors. Understanding local constraints is instrumental to the design of an appropriate mix of development assistance and law enforcement initiatives that ultimately will both eradicate the threat of piracy and rebuild the nation of Somalia.

Statistics should be an important component of the knowledge agenda. Measuring wealth and wealth distribution will provide valuable insight on the distribution of resources across space, time, and social units (e.g., clans and subclans). Building statistical capacity will have implications that go well beyond the realm of piracy eradication. For instance, poverty statistics will be instrumental for the design, targeting, monitoring, and evaluation of development assistance projects; statistics on catches of fish in Somalia's exclusive economic zone will inform sectoral policies and strengthen Somalia's position when negotiating over quotas within the framework of the Indian Ocean Tuna Commission (IOTC).

## *Finance (and Firepower)*

As argued earlier and demonstrated in Part I, financial assistance to the Federal Republic of Somalia makes economic sense for the international community as a whole. A coordinated financial assistance package could include budget support for specific development and law enforcement initiatives.

This report does not recommend particular projects or programs for official development assistance but reiterates that (i) initiatives should be tailored to local conditions and in particular the local political economy, and (ii) development projects and law enforcement interventions should be designed and implemented as part of a political contract.

## Conclusion

There is a window of opportunity for the government of Somalia and the international policy community together to tackle piracy. The political transition in Mogadishu has put state-building and legitimacy back on the agenda after a long hiatus. International marine mobilization, whether through naval forces or private on-board security measures, seems to have disrupted the piracy business model at least temporarily. Together, they open up space for the type of negotiated solution advocated here.

The proposed solution requires partnerships between development and law enforcement agencies to better assist the government of Somalia. Together their interventions can provide an appropriate mix of inducements to move Somalia out of piracy. To better assist the government in the design, negotiation, and realization of an incentive-compatible contract for eradication of piracy, development and law enforcement agencies need to be able to share knowledge and coordinate their actions. For that reason, interagency coordination needs to be institutionalized.

Understanding the local political economy and the redistributive implications of piracy are fundamental inputs into the design of an incentive-compatible strategy. A granular understanding of power and politics is necessary to better design instruments that will not only curb piracy but also manage the risks associated with the disruption of local power relations caused by antipiracy measures. The combination of information gathered by the intelligence community and socioeconomic data obtained from household surveys and focus groups will illuminate local power dynamics and guide the policy community to interventions that are better designed to alter the incentives of major stakeholders.

Given the substantial wedge between the global costs of Somali piracy and the revenues generated by its perpetrators, eradicating piracy makes economic sense for the entire international community. The economic logic by itself would justify its involvement. The global benefits of a piracy-free Somalia are likely to greatly exceed the costs even of interventions that would make Somalia's coastal regions significantly better off. At the national level, the persistence of piracy is incompatible with the expansion of sectors such as tourism, trade, and fisheries that are likely to lead to growth and prosperity for Somalia.

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# APPENDIX

## Data Sources

### *CEPII 2012: Centre d'Études Prospectives et d'Informations Internationales Database*

The database stores distance and common border variables between each pair of countries in the world. <http://www.cepii.fr/anglaisgraph/bdd/gravity.asp>.

### *CIA 2012: The World CIA Factbook*

The CIA World Factbook is a database compiled by the Central Intelligence Agency. It provides comprehensive description of features, including history, government, economy and military issues for 267 world entities. The CIA World Factbook database is used to estimate the aggregate import and export of Somalia between 2006 and 2010. <https://www.cia.gov/library/publications/the-world-factbook/>.

### *COMTRADE 2012: United Nations Commodity Trade Statistics Database*

COMTRADE systematically gathers and streamlines trade statistics from over 170 countries. This study uses the data on bilateral trade between each pair of countries in the world, 2000–10. <http://comtrade.un.org>.

### *EC DG Trade 2012: European Commission Directorate General for Trade Database*

The database provides import and export data at the aggregate level. The dataset complements the main trade dataset (UN COMTRADE) used in this report. Estimates of Somali trade statistics are partially based on this dataset. <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/statistics/>.

### *Factiva 2012: Dow Jones & Company Factiva Database on Newspapers, Journals, and Magazines*

Factiva's search tool is being used in the context of this report to count the number of newspapers, journals, and magazines that contain certain keywords. Searches can be narrowed by outlet types, time coverage, etc. <http://global.factiva.com/>.

### *FSNAU 2012: Food Security and Nutrition Analysis Unit Database*

FSNAU Somalia has since 1995 collected and analyzed weekly price data on 24 commodities (cereals, other foods, livestock, energy, and labor) and 2 exchange rates (Somaliland and Somali shillings) in 47 markets throughout Somalia. The data can be exported in MS Excel either by month/year or by month for a given range of years. [www.fsnau.org/ids](http://www.fsnau.org/ids).

### *ICOAD 2012: International Comprehensive Ocean-Atmosphere Database*

This provides detailed daily atmospheric information, such as wind speed, wind direction, and wave heights at daily level for 1-degree boxes. Compiled by the U.S. National Oceanic and Atmospheric Administration (NOAA), it contains surface marine data spanning the past three centuries, with detailed data starting in 1960. The tailored version used in this report covers data for 2004–12 for most of the Indian Ocean. Complete data are available at <http://icoads.noaa.gov/>.

### *IMB 2012: International Maritime Bureau Database on Piracy Incidents*

The dataset records all self-reported piracy attacks worldwide between January 1, 2000, and September 30, 2012; it describes 4,511 attacks in terms of the following variables: date, time, and location of the attack (latitude and longitude when possible); size, type, and flag of the ship attacked and its condition (anchored or steaming); result of the attack (hijacked, boarded, fired upon, or attempted); and a detailed note provided by the reporter. Extracting as much information from the notes as possible, variables such as crew size and nationality and number of pirates attacking were created. Data can be retrieved from IMB's annual "Piracy & Armed Robbery Reports," <http://icc-ccs.org/piracy-reporting-centre/request-piracy-report>.

### *IOTC 2012: Indian Ocean Tuna Commission Catch and Effort Database*

This dataset lists catch by weight of tuna and tuna-like species by year, species, and fleet in the Indian Ocean for 1950–2010. The original dataset provides spatial aggregation at 1°x1° grid area for purse seine and 5°x5° grid area for long-line; this analysis aggregates up to the western and eastern Indian Ocean. <http://www.iotc.org/English/data/databases.php#dl>.

### *ITC 2012: International Trade Center Trade Map Database*

The Trade Map database is compiled by the International Trade Center (ITC). It is based on the UN COMTRADE dataset and OECD dataset. It covers 247 world entities starting from 2001, providing information on export and import at 4-digit HS code level. Estimates of the aggregate trade statistics of Somalia are partially based on this dataset. <http://www.trademap.org/countrymap/Index.aspx>.

### *UNODC–WB 2012: Joint UNODC–WB Database on Anchorage Information and Ransom Payments Made to Somali Pirates*

The database on ransom payments is a combination of two sets separately compiled, one from the World Bank (WB) and the other from the UN Office on Drugs and Crime (UNODC). Both are compiled from open-source information, data from national and multilateral law enforcement agencies, and evidence provided by primary sources. The dataset covers the 234 ships hijacked by Somali pirates between April 2005 and May 2012. It states the most recent status of the ship (released, captive, sunk, or liberated); the ransom paid; length of the negotiation; negotiator; and ship characteristics, such as owner nation, flag nation, ship type, and crew information. It also provides anchorage information for each of the hijacked ships: ports at which the ship has been docked and, if possible, the last known location.

### *UNWTO 2012: United Nations World Tourism Organization Database*

The tourism indicators examined in Chapter 3 come from the UNWTO *Compendium of Tourism Statistics* and *Yearbook of Tourism Statistics*. The datasets have worldwide coverage and contain annual tourism indicators for 1995–2010, allowing for comparisons between countries and over time. The *Compendium* includes inbound data on total arrivals of visitors, total visitor spending, and visitor modes of transport (air, land, or water); 203 countries provided annual information. The *Yearbook* complements this information by providing a breakdown of visitor arrivals by country of origin, which makes it possible to identify visitors from particular countries and regions.

### *WDI 2012: World Development Indicators Database*

This is the primary World Bank collection of development indicators from officially recognized international organizations. It currently covers 214 economies at annual frequency starting in 1960. The indicators cover a wide range of topics, such as agriculture, education, employment, economic policy, health, and infrastructure. <http://data.world-bank.org/data-catalog/world-development-indicators>.









