

The Economics of Piracy

Pirate Ransoms & Livelihoods off the Coast of Somalia

May 2011

Specialists in Economic Intelligence

geopolicity.



HEADLINES (Based on Available Data):

Low/High Pirate income (2010): Using 1,500 Pirates ~ US\$33,000 – US\$79,000/ year

Potential Lifetime Earnings (2010 Data): Using 1,500 Pirates ~ US\$168,000 US\$394,000

Next Best Alternative: ~ US\$500 / year

Pirate Incomes Compared to Average Income ~ 67-157 higher

No. Pirates Could Double by: ~ 2016

Total Cost of Piracy 2010: ~ US\$4.9- 8.3 billion

Projected Increase by 2014: ~ US\$13-15 billion

Major Stakeholders: Financiers, Sponsors, Officials, Pirates, Maritime Insurers, Security Companies, Navies, Merchant Marine.

The conclusions drawn in this paper are considered appropriate at the time of publication, and relate purely to the analytical and diagnostic work being undertaken as part of the Geopolicy 'Tracking Pirate Finance' research; an independent and ongoing research program. Given the paucity of either aggregate or country level data, further 'action-research' will increase the confidence level of results, and firm up suggested policy responses. The results presented here are indicative.

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Pirates would appear to be the very essence of rational profit maximizing entrepreneurs described in neo-classical economics. Expected profits determine decisions based on the information available. The supply of pirates, therefore, is closely related to the expected benefits of being a pirate and the associated risk adjusted costs.

Based on the work conducted here, incidents of piracy are set to expand substantially beyond Somali waters - given the rising income disparity between pirates and non-pirates - requiring a Global Contact Group to be formed, and new approaches to asymmetric law and enforcement to be developed.

As part of the overall international community engagement, understanding the Costs and Benefits of piracy, as well as tracking what we call the Pirate Value Chain, to include the tracking of financial flows, will be an essential component of a Global Maritime Security Sector Development (GM-SSD) approach. Geopolicity, employing its already established Global Economic Piracy Model, is well placed to provide both strategic and ground level analytical and diagnostic support.

FOREWORD

Piracy off the Coast of Somalia has increased unabated in recent years. Already, in the first quarter of 2011, we have seen an alarming escalation in human and financial costs associated with the crime. Somali pirates have attacked over 117 ships and held over 338 hostages for ransom, killing seven crew members.

In order to adequately address this problem, we desperately need to better understand it. Geopolicity's *'The Economics of Piracy'* is a valuable contribution to analyses of the economic and business models of piracy. The report includes an important, practical assessment of the growing market for piracy. It also accurately points to the importance of tracking the piracy value chain, financial investments into piracy, as well as the profits earned through piracy.

Its forward-looking assessment of the predicted expansion of piracy and its associated impact, is a disheartening reminder of the pressing need to deal with this problem. The report states that the number of Somali pirates could double by 2016, while the economic cost of piracy could more than double in the next three years.

Analyses of this nature are never an easy task. This issue is incredibly difficult to analyze, both methodologically, and in terms of access to data. When *One Earth Future* (OEF) launched "*The Economic Cost of Maritime Piracy*" study at the beginning of 2011, we did so because there was little economic analyses done on piracy. We felt that good policy requires good data, and made the call for more analyses in this field. OEF's *Oceans Beyond Piracy* project therefore welcomes Geopolicity's contribution to this field.

Anna Bowden

One Earth Future Foundation

Anna Bowden is author of One Earth Future's study, "The Economic Cost of Maritime Piracy"¹



¹ See <http://oceansbeyondpiracy.org/obp/cost-of-piracy-home>

EXECUTIVE SUMMARY

In 2011, Geopolicity established a global economic model for assessing the costs and benefits of international piracy; adding significantly to the debate on the causes and consequences of piracy. This model provides a comprehensive, independent framework of trend analysis, whilst also highlighting across the 'Pirate Value Chain' (PVC) where the greatest rates of return on international counter pirate investment and policy are to be found. The model includes (i) cost-benefit analysis at the individual pirate level, based on existing socioeconomic and market data (ii) the aggregate costs and benefits at the international systems level and (iii) comprehensive data on the resurgence of piracy by functional classification and sovereign jurisdiction; to include trend, comparator and predictive analysis. Further research, based on aggregating all existing secondary data into a common analytical and diagnostic platform, as well as on the ground research in coastal communities is urgently needed, and would provide, for the first time, a strong understanding of the economics of piracy. Early findings from this research, aimed to benefit policy, institutional and investment decisions taken by the Contact Group on Piracy off the Coast of Somalia (CGPCS) are outlined below:

- We estimate the cost of piracy to the international community was between **US\$4.9-8.3 billion** in 2010 based on upper and lower bound assumptions, and is likely to increase to more than **US\$13-15 billion** by 2015, given the rebound on maritime trade volume, the geographical expansion of piracy incidents and use of more sophisticated tactics;
- Total income to pirates and from piracy off the Coast of Somalia in 2010 was between **US\$75-238 million** based on upper and lower bound assumptions and could rise to US\$200-400 million by 2015 based on projections. Given the supply and demand for piracy services, and income disparity between pirates and non-pirates, there is plenty of room for expansion;
- Assuming only 1,500 active pirates off the coasts of Somalia, a pirate can expect to earn between US\$168,630 and US\$394,200 over a theoretical five-year career. If pirates engage in the next best alternative they would earn US\$14,500 over their entire working life, highlighting the income disparity between these choices. The report also runs scenarios based on 3,000 pirates;
- Based on opportunity–cost analysis, we forecast an annual increase in the number of pirates of between 200-400, based on present demand assumptions. Our analysis of the spread of piracy suggests that if this occurs, piracy risks becoming a significant problem across all major African, Middle Eastern and Pacific Rim maritime systems;
- The expansion of global piracy incidents (see Map 1), which increased from 276 in 2005 to 445 in 2010 (219 of which were off the Coast of Somalia), is already at 150 by April 2011. This could increase to more than 600 incidents by 2015, based on the application of supply/demand and opportunity cost theory;
- The Pirate Value Chain highlights the linkage between pirates, financiers and sponsors. Pirates are visible and known, financiers are harder to tack, and sponsors remain invisible. Moreover, whilst the majority of ransoms are delivered by Air-drop, evidence suggests a significant proportion of proceeds (~40-50%) are transferred out of Somalia using informal money transfer systems, presenting a vulnerability to the AML/CFT system;
- We propose a three-phased independent economic research program focused on (i) strengthening our existing economic model, overcoming data paucity constraints, and producing quarterly updates for the international community (ii) undertaking country level financial tracking and sponsorship research, to strengthen understanding of the entire value chain and (iii) developing a framework of corrective measures that focus on policy, institutional, security sector reform, law enforcement, prevention and systems monitoring.

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ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practices
CGPCS	Contact Group for Piracy Off the Coast of Somalia
CMF	Combined Maritime Forces
DWT	Dead Weight Tonnage
EU NAVFOR	European Union Naval Force
EUROPOL	European Police Office
FCC	Fully Cellular Containership
FCO	Foreign and Commonwealth Office
FIU	Financial Intelligence Unit
IGAD	Intergovernmental Authority for Development
IMB	International Maritime Bureau
IMO	International Maritime Organization
INTERPOL	International Criminal Police Organization
IRTC	Gulf of Aden Internationally Recognized Transit Corridor
ISM	International Safety Management Code
IVTS	Informal Value Transfer Systems
KFR	Kidnap for Ransom
LOS	Law of the Sea
LRIT	Long Range Identification and Tracking
MARLO	Maritime Liaison Office
MDA	Maritime Domain Awareness
MIS	Management Information System
MSA	Maritime Situation Awareness
MSC-HOA	Maritime Security Centre - Horn of Africa
MSSR	Maritime Security Sector Reform
MTO	Money Transfer Operators
MTS	Maritime Transport System
OEF	One Earth Future
PFR	Piracy For Ransom
PRC	Piracy Reporting Centre
PVC	Pirate Value Chain
SHADE	Shared Awareness and De-confliction Process
SOLAS	International Convention for the Safety of Life at Sea
SSAS	Shipboard Security Alert System
UKMTO	United Kingdom Maritime Trade Operations
ULBC	Ultra Large Bulk Carrier
ULCC	Ultra Large Crude Carrier
UNCLOS	United Nations Convention on the Law of the Sea
UNODC	United Nations Office on Drugs and Crime
UNPOS	United Nations Political Office for Somalia
UNSCR	United Nations Security Council Resolution
USAID	United States Agency for International Development
VLCC	Very Large Crude Carrier

1. INTRODUCTION

Remarkably little work has been conducted on the economics of piracy. Current efforts – including the pioneering work of One Earth Future (OEF) – focuses on calculating direct and indirect costs, but does not assess the benefits accruing to pirates, financiers, sponsors, and other major stakeholders, who reap more revenue from piracy than pirates themselves. Piracy has emerged as a market in its own right, valued at between US\$4.9-8.3 billion in 2010 alone, based on the results of this research.

The past decade has seen an unprecedented increase in piracy, between the Red Sea and Indian Ocean (despite Best Management Practices), off the Somali Coast (a 15 fold increase in recent years), and in the Strait of Malacca and Singapore. The geographic trajectory of pirate activity is also worrying (see **Map 1** below), with a reduction off the coast of Bangladesh being offset by substantial increases off the coast of Somalia. With the benefits accruing to individual pirates, at over 100 times the next best option, there will be no shortage of willing labor unless the costs begin to outweigh the benefits.

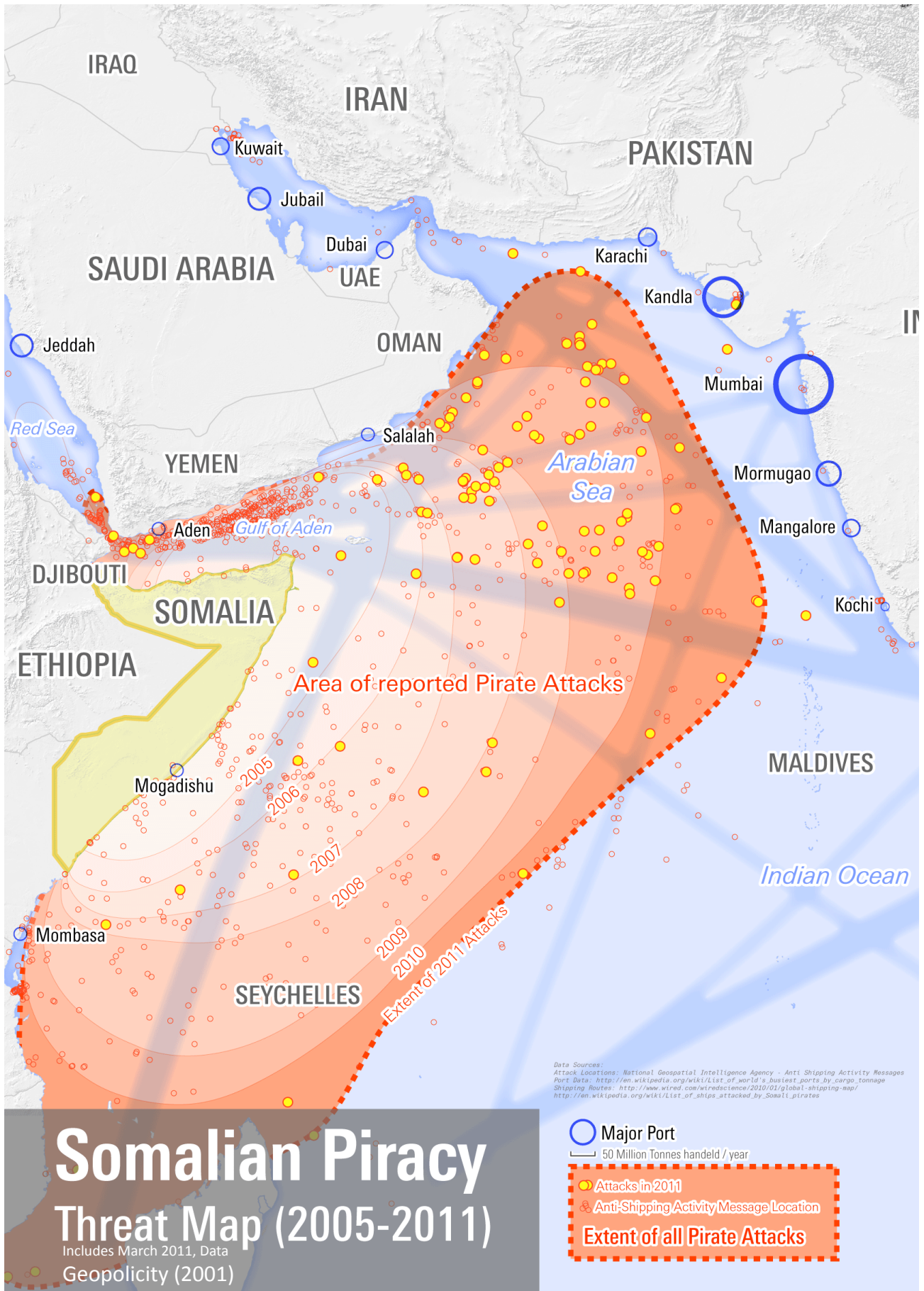
Whilst combating piracy in a period of improved global integration would appear to be a simple task, in reality the international community will struggle to deal with this scourge unless global asymmetric law enforcement and information sharing capacities are substantially improved. Strengthening regional security sector governance will be an early stepping-stone towards this end, and conducting a full review of the '**pirate value-chain**' will provide significant insights into what is driving expansion.

With the CGPCS currently focused on improving (i) military and operational coordination, information sharing, and capacity building (ii) judicial governance and strengthening (iii) shipping self-awareness, and other capabilities, and (iv) public information, we believe the absence of a dedicated Working Group on Economics and Financial Tracking (across the entire value chain) remains the Achilles heel of the current approach. Analytic and diagnostic work – across the piracy value chain will deepen understanding of how piracy is financed and conducted by whom, where and how.

The discussion paper outlines a new approach – building on existing work - by differentiating between pirates and privateers, and financiers and sponsors; across the entire value-chain. In addition to identifying the costs to global maritime shipping it also identifies the many interest groups that benefit (directly and indirectly) from piracy – with the majority of benefits accruing to non-pirates.

This research charts largely unknown territory, and although the initial paper may provide a significant contribution given the paucity of relevant work in this area, we are aware that only dedicated ground level action research, **mapping and quantifying the pirate value-chain** and '**tracking-finances**' will provide the evidence required to reverse the current trend. This initial subject-scoping exercise aims to overcome the problem that much information is classified and not open to public domain discussion. We propose a framework of corrective measures that could be financed by CGPCS.

MAP 1 GEOGRAPHICAL EXPANSION OF PIRACY (2005-2011)



2. METHODOLOGICAL OBSERVATIONS

Establishing how costs and benefits are distributed across the entire pirate value-chain (see Section 3 below) will require substantial research to be conducted. That a value chain approach has not so far been adopted underlines the relatively weak application of economics to the problem of piracy. Current cost estimates lack both confidence and means of verification (as acknowledged by the authors) for one or more of the following reasons:

- Estimates have not been established scientifically or based on an accepted economic model;
- Analysis is often founded on inadequate or missing data, at the international, country and market level (See **Box 1** below);
- Many cost calculations (including re-routing and macroeconomic impact) are based on untested or un-testable assumptions;
- Most calculations are based on cost, not costs and benefits as provided here;
- Research has not followed a value-chain approach as advocated here, undermining important causal linkages and opportunities for targeting CGPCS trust fund intervention;
- Multiple agencies are responsible for the collection of discrete data, yet no single entity aggregates these sources into a singular source of common reference;
- Western rational-legal systems are confronted by informal systems, where disclosure of financial flows and transfers are concealed between agents; and,
- Country based field assessments have not been conducted, in spite of the insights this would provide.

BOX 1 OBSERVATIONS ON PRIMARY AND SECONDARY DATA SOURCES

Understanding the economics of piracy, across the value (cost and profit) chain, is heavily hampered by the lack of relevant, timely and accurate primary and secondary data. There is no single source or unified data point for analysis and diagnosis, despite the low costs of such a service. Figures on piracy, on incentives, and on economic opportunity costs and benefits are not currently captured. The total number of pirates and support crew are not known, nor the casualty/death rate, undermining risk based opportunity cost calculations and messaging to potential recruits about the costs of engagement. Profits accruing to the insurance industry are poorly reported, as are the final value of ransoms. Financial flows are not tracked, due to the use of IVTS: 'we only use cash' (Somalia Pirate). Further examples include:

- **Pirates:** Estimates of the number of pirates off the coast of Somalia varies from 1,500 to 3,000;
- **Ransoms:** Exact ransom payments are not accurately reported;
- **Hijacking:** Total number of global hijackings that lead to ransom payments varies from 44 to 53 over the same period, and there are different reports on ransoms values, which are also poorly disclosed;
- **Insurance Costs:** Whilst insurance industry premiums and surcharges can be calculated, profit margins are unknown as are payouts, for the industry as a whole;
- **Re-Routing:** Some estimates indicate that up to 10% of ships are forced to re-route as a consequence of the threat of piracy, though this figure is difficult to substantiate and economic value of such decisions difficult to quantify (See **Section 4** in relation to costs); and,
- **Macroeconomic Costs:** The macroeconomic impact of piracy on coastal states is virtually impossible to calculate, given GDP volatility, exchange rate fluctuations and increasing primary and secondary commodity prices as a result of financial crisis and global political unrest.

3. THE PIRATE 'VALUE CHAIN'

Value Chain Analysis provides a systematic approach for examining the sources of competitive advantage; in this case for the pirates off the coast of Somalia, their financiers and sponsors and counter piracy bodies. Piracy is a long and complex supply chain, involving literally hundreds of land based support staff and increasingly large and sophisticated maritime-based operations. As participants in the piracy value chain upgrade their functions, the more capable and effective piracy becomes.

This research has established a detailed Pirate Value Chain model, which identifies each stage of the value chain, from *sponsors/officials* and *financiers* to pirates and *support crew*, from *laborers* to *accountants* and *cooks* to *Khat dealers*, from *engineers* and *logistical support operators* to *skiff/mother ship* and *arms suppliers*, from *ransom negotiators* and *Money Transfer Operators/Informal Value Transfer System* back to *sponsors, financiers* and *government officials*. This is the value-chain at the pirate level and we have established broad order

costs and benefits across this framework, identifying the greatest areas of value addition. Each year, higher value addition naturally leads to greater profits. (See Section 5 below)

Beyond the immediate pirate value-chain, substantial (undisclosed) value added accrues to other significant agents such as maritime insurers (See Box 2), private security firms, Hawala (IVTS) dealers and producers of deterrent technologies. An indicative (and purely descriptive) pirate value-chain is provided in **Figure 1** below, highlighting that land-based support activities are more profitable than sea-based activities, and far less risky also. **Figure 2** identifies the main agents across the value chain. Being a pirate is a very risky business, yet in a fragile state with an ineffective Government, financing piracy is relatively risk free over the longer term. The worst scenario for a financier is that he loses his boat and equipment. The worst scenario for a pirate is death. There is no worst scenario for insurance companies, as they merely pass on risks as premiums.

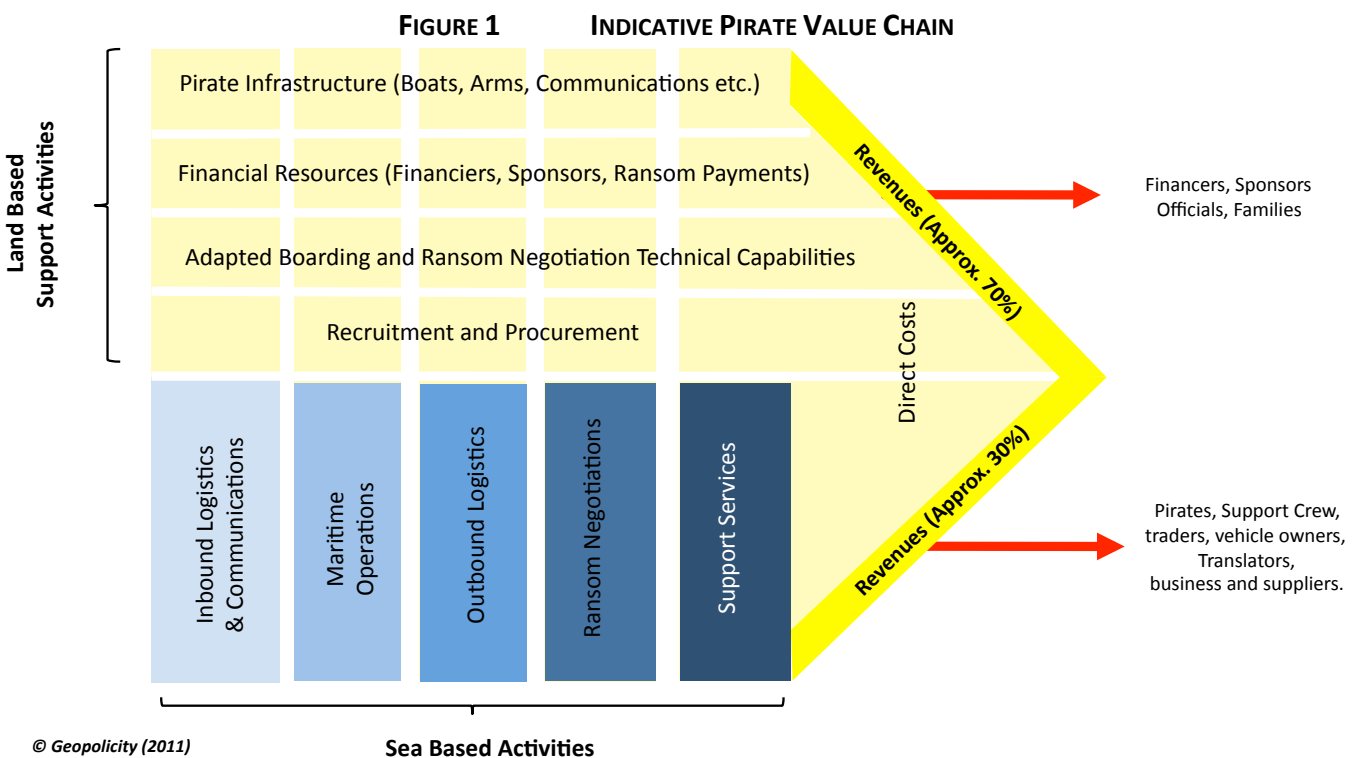
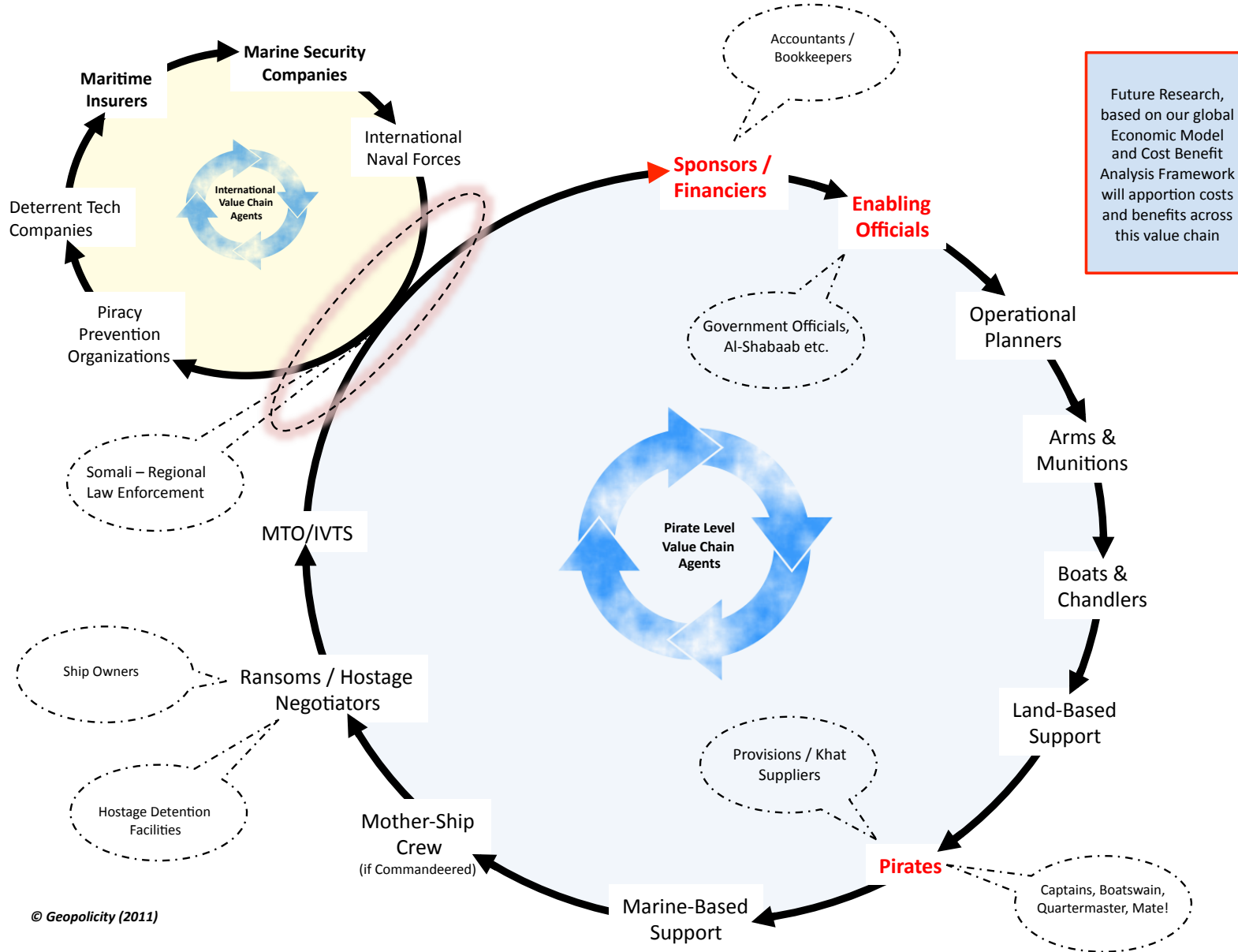


FIGURE 2 AGENCY & INSTITUTIONAL ACTORS ACROSS THE 'PIRACY VALUE CHAIN'



BOX 2 PIRACY & PROFITEERS

Defining Piracy

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) defines Piracy as: (a) any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed: (i) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft; (ii) against a ship, aircraft, persons or property in a place outside the jurisdiction of any State; (b) any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft; (c) any act inciting or of intentionally facilitating an act described in sub-paragraph (a) or (b).

Origins

The origins of piracy off the coast of Somalia can be traced back to the political, economic and social unrest that characterized the country in the mid-1990s. In the absence of a functioning central government, some Somali fishermen assumed the role of protecting Somali waters from illegal dumping of waste by foreigners and over-fishing. Such vigilante activities led to piracy to supplement livelihoods. Though risky, for some impoverished Somalis there are few *legal* alternatives.²

Participants and Profiteers

- Catalyzed by the absence of effective government or law enforcement, piracy has been transformed into a lucrative and highly organized illicit business.
- In many respects, the organization of piracy operations is guided more by the principles of private enterprise than military strategy and planning.³
- There are multiple actors associated with any given operation ranging from international actors, senior government officials who provide political protection and money launderers who facilitate ransom transfer, to ground teams composed of locals.
- Financiers and other prominent business and political figures with assets in the fishing industry, provide 'seed money' for the pirate groups to function, as well as resources and equipment.
- Financiers & sponsors are believed to retain approximately 50% of the ransom money, compared with the pirates themselves who take 30%.⁴
- An international network mostly of Somali expatriates reaching as far as North America and Europe reportedly backs the spike in piracy in African waters and beyond. With help from the network, Somali pirates brought in more than \$30 million in ransom in 2008.⁵
- Resolving piracy is not solely a Somali problem, with financial backers and profiteers found in countries across the world including Lebanon and the United Arab Emirates, as well as criminal gangs in Yemen, and global insurance companies in the West.⁶ Other value chain agents are displayed in Figure 2.

Main (Known) Somali Piracy Groups

As of 2008 the International Maritime Bureau (IMB) identified four main piracy gangs operating in the trade route linking the Red Sea with the Mediterranean Sea via the Suez Canal: (i) *The National Volunteer Coast Guard (NVCG)*, commanded by Garaad Mohamed, believed to specialize in intercepting small boats and fishing vessels around Kismayu on the southern coast (ii) *The Marka group*, commanded by Sheikh Yusuf Mohamed Siad (iii) *traditional Somali fishermen* operating around Puntland, known as the Puntland Group (iv) *The Somali Marines* - the most powerful and sophisticated of the pirate groups with a military structure and led by warlord Abdi Mohamed Afweyne.⁷ Jack Lang, Special Adviser to the Secretary-General on Legal Issues Related to Piracy off the Coast of Somalia, states that there are around 1,500 pirates and 12 major sponsors. Our analysis indicated uncertainty with regards actual numbers of active pirates, which we assume to be higher than often quoted. The Gulf of Aden Internationally Recognized Transit Corridor (IRTC) has improved security of passage but piracy incidents have now increased substantially outside of this transit area.

² US Department of State www.state.gov/t/pm/ppa/piracy/c32661.htm

³ 2008 UN Security Council report confirms the existence of financiers

⁴ *ibid*

⁵ 'Somali piracy backed by international network', MSNBC, www.msnbc.msn.com

⁶ 'Somalia's pirates: a long war of the waters', *The Economist*, Jan 7th 2010

⁷ www.globalsecurity.org/military/world/para/pirates.htm

4. ESTIMATING THE COSTS OF PIRACY

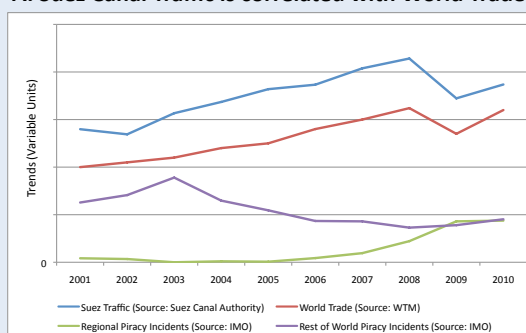
There are two major cost levels to piracy: (i) the costs of maritime piracy to the *international community* and (ii) costs of *running piracy operations* on land and sea. This section outlines cost calculations at the international level building on the work of OEF. Section 4 provides the preliminary results of detailed cost-benefit analysis based on existing figures.

Modeling the cost of piracy to the international community can only ever be an indicative exercise, for reasons outlined in **Section 2** above. If we are to assess general orders of magnitude, greater analysis and disclosure of information along the value-chain is required, as is an improved understanding of how costs and benefits accrue across multiple actors and sovereign domains. Piracy, as an illegal activity, relies on traditional/informal systems to hide value-transfers, making this task as complex as understanding the opium value chain.

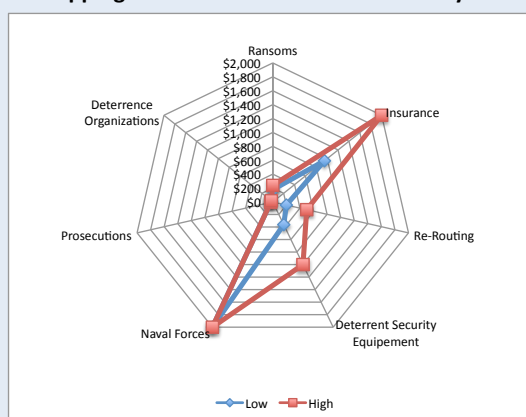
Nevertheless, building on the initial costing work conducted by OEF, we have established a **Global Economic Model (GEM)**, which (i) increases the confidence level of findings and (ii) isolates costs and benefits across the entire value-chain, whilst (iii) identifying potential leverage/turning points to strengthen the prioritization of international and national support. Direct Costs include (i) ransom payments (ii) insurance premiums and surcharges (iii) deterrent costs (iv) re-routing of vessels via Cape of Good Hope (v) Naval Presence (vi) prosecutions (vii) international organizational deterrents (viii) deaths to hostages and crews and (ix) indirect costs related to the growth performance of regional littoral economies.

Our calculations suggests that the direct costs of *piracy in 2010* range from **US\$3.7-6.6 billion** with indirect costs ranging from **US\$1.2-1.8 billion**. Total costs therefore equal between **US\$4.9-8.3 billion**. These calculations reflect, as shown below (See A), that the number of vessels transiting the Suez Canal is best correlated with World Trade Figures and not incident of piracy, implying that re-routing of ships has perhaps been over estimated. However, piracy has increased significantly despite lower trade volume. Of significance (See B) is that the costs of ransoms and revenues accruing at the level of the pirate value chain are dwarfed by costs for merchant shipping, whilst other stakeholders have found themselves with significant new market opportunities.

A. Suez Canal Traffic is correlated with World Trade



B. Shipping & Naval Costs Dwarf Ransom Payments



5. ESTIMATING THE BENEFITS OF PIRACY FOR PIRATES

Pirates who have not been press-ganged into being pirates would appear to be the very essence of rational profit maximizing entrepreneurs described in neo-classical economics. Expected profits determine decisions based on the information available.

The supply of pirates, therefore, is closely related to the expected benefits of being a pirate and the associated risk adjusted costs of being a pirate. Policy analysis in this area has yet to grasp, and therefore understand, the costs and benefits associated with being a pirate. This lack of a bottom up approach to analysis has reduced the effectiveness of policy responses.

Our research has established a cost benefit model to calculate the risk adjusted costs and benefits of piracy. This model is formula driven and requires more than 30 variables, sourced from different data sources and using different assumptions. Using this model, and based on existing information we have been able to determine (i) the opportunity cost of piracy (ii) average incomes per year per

pirate (iii) lifetime earnings and (iv) the risk adjusted costs of death, injury and imprisonment and life earnings, among other outputs. Based on certain economic assumptions, we are also able to extrapolate the likely path of piracy off the

Coasts of Somalia, again based of fairly well founded assumptions.⁸

Opportunities: Clearly, if we use this model, and identify the precise data required to increase

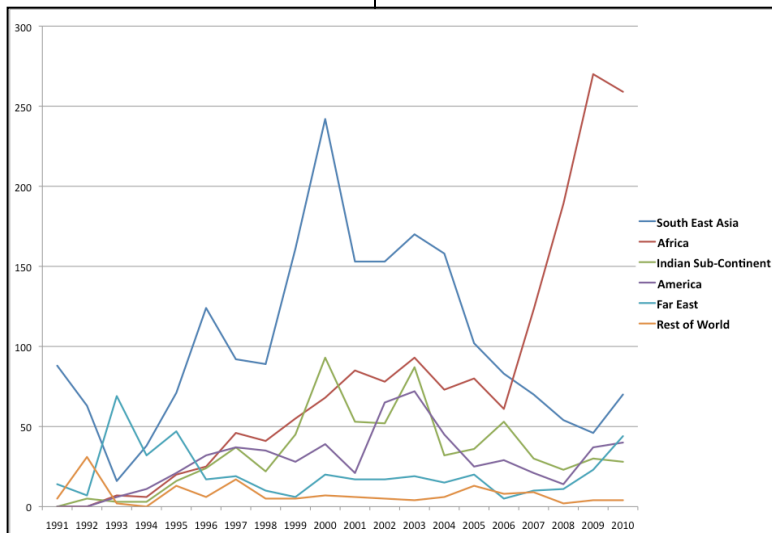
confidence levels, then the overall trajectory of costs and benefits will be far

better understood – aiding the policy response of CGPCS member states.

Further, if field-based research is conducted across the value chain,

and this is linked to tracking finances (See Section 6), alongside law enforcement and deterrent operations, the costs will begin to out weigh the benefits; which they currently do not.

Category	Item	Value	Assumptions
Costs	Death of age 20	100,000	...
	Loss of education/healthcare/lost productivity	...	...
	Loss of life	...	...
	Loss of family income	...	...
	Loss of future earnings	...	...
	Loss of reputation	...	...
	Loss of social status	...	...
	Loss of family support	...	...
	Loss of family care	...	...
	Loss of family income	...	...
Benefits	Number of pirates	...	...
	Number of pirates per year	...	...
	Number of pirates per month	...	...
	Number of pirates per day	...	...
	Number of pirates per hour	...	...
	Number of pirates per minute	...	...
	Number of pirates per second	...	...
	Number of pirates per millisecond
	Number of pirates per microsecond
	Number of pirates per nanosecond



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⁸ It will also be important to undertake cross-national comparative work and to understand why piracy in South East Asia peaked between 1998-2000, and then fell rapidly.

Data Shortfalls: Needless to say the model is as strong as the available data. Whilst certain variables (i.e. piracy incidence) are fairly well documented, other data (i.e. actual ransom payments, number of pirates, number of pirate deaths, ratio of ransom payments accruing across the value chain) are poorly documented. Geopolicity is able to provide an independent source of piracy related data, aggregated across all international organizations and based on both economic/field-based value data.

Assumptions: Our assumptions are based on high-value data sources wherever possible, but more information is needed to assist the CGPCS. Our research shows that there is a huge paucity of data in relation to the economic and financial aspects of piracy; a problem that we believe can be substantially overcome using action-research. Our research also uncovered significant inconsistencies in published material from official organizations. Our model generates low, medium and high bound assumptions, providing a range of results. The range of assumptions will reduce as the research continues. Some of the core assumptions made are outlined below:

- GDP/capita in Somalia is estimated at US\$500/annum. Over an average working lifetime, which we assume to be 29 years, a Somali man may earn US\$14,500. We use this as our next best alternative to engaging in piracy;
- We assume that pirates engage in piracy for 3-5 years, although further research will be critical to increasing the confidence level of this assumption. We assume the average age of a pirate to be 25 years, this is the age that we assume death, injury or imprisonment may occur;
- Our model runs scenarios based on Jack Lang's figure of 1,500 pirates off

the Coast of Somalia, but also up to 3,000 active pirates, based on varying sources and field based discussions, with annual losses of up to 200 lives a year;

- We assume that piracy success rates range from 22 (as in 2009), 30 (as in 2010) and 40 (as in 2007) per cent based on US Government (Dodd) reports;
- We assume that the average ransom paid hides significant deviation, and therefore compute ransoms from US\$3.5 to US\$4.5 million based on 2010 figures, with **up to** 30% of this reaching the pirate crew. This 30% share is split equally between the average crew size, which we have determined based on numerous sources and interviews; and,
- Financiers and sponsors meet land and sea based operational costs. **Up to** 70% of all ransoms payments are distributed to financiers, sponsors, Government officials and other interest groups, excluding transactions costs.⁹

Pirates face the costs of death, injury and imprisonment. Based on our figures, the risk adjusted cost of death, injury or imprisonment, according to opportunity foregone, ranges from a low US\$1,666 to a high US\$3,333, which is significantly lower than the US\$14,500 arising from the next best alternative of being a pirate. Until the risk-adjusted cost of being a pirate is higher than the benefit of the next best alternative, pirates will still exist. Insufficient resources are being made available to understand and solve the problem of piracy, which risks spreading way beyond the current theater.

⁹ We do not believe the 70:30 split to be accurate, but this is the standard ratio quoted. Further research will go a long way to understanding what determined ratios and value chain splits.

Tables 1 and **2** below provide possible revenue summaries based on existing information and different assumptions.

Table 1 presents **low, medium and high bound scenarios** based on a total of 1,500 pirates, a ransom range of US\$3.5-US\$4.5 million, and success rates ranging from 22-40 %. The scenarios presented are based on known incidents in 2010 (219); again off the coast of Somalia. The results are clear. Based on these broad assumptions and a range of other costs adjusted benefits, the average pirate could earn between US\$33,726 and US\$78,840 a year, depending on the ransom paid. Average lifetime earnings over a period of 5 years range between US\$168,630 and US\$394,000, again depending on the value of ransom payments, which we consider is often over inflated. Either way, even the low case scenario for pirate revenues indicates remuneration at 67 times the current annual per capita GDP – and the higher case up to 157 times that.

Table 2 provides the same statistics based on an assumption that there must be more than 1,500 pirates. This is based on field reports of attrition rates (death, defection, imprisonment etc.) and the expanding incidents rate. Under the 3,000 pirate scenarios, average annual earnings range from US\$30,660 to US\$39,420, for a piracy lifetime earning of between US\$153,300 and US\$197,100. This scenario makes the average pirate salary whilst working as a pirate between 61 and 79 time more profitable than the next best opportunity.

Table 1 Low-High Case Annual/Lifetime Somali Pirate Revenues in US\$ Based on 1,500 Pirates			
	Lower Case	Middle Case	High Case
A No Of Pirates	1500	1500	1500
B Ransoms	\$3,500,000	\$4,000,000	\$4,500,000
C Success Rate	22%	30%	40%
D 2010 Incidents	219	219	219
E GDP/Per Capita	500	500	500
F Average Income/Pirate/Year	US\$33,726	US\$52,560	US\$78,840
G F/E = No of Times Average Income	67	105	157
H Average Pirate Lifetime Earnings	US\$168,630	US\$262,800	US\$394,200

Table 2 Low-High Case Annual/Lifetime Somali Pirate Revenues in US\$ Based on 3,000 Pirates			
	Low Case	Middle Case	High Case
A No Of Pirates	3000	3000	3000
B Ransoms	\$3,500,000	\$4,000,000	\$4,500,000
C Success Rate	22%	30%	40%
D 2010 Incidents	219	219	219
E GDP/Per Capita	500	500	500
F Average Income/Pirate/Year	US\$30,660	US\$35,040	US\$39,420
G F/E = No of Times Average Income	61	70	79
H Average Pirate Lifetime Earnings	US\$153,300	US\$175,200	US\$197,100

What is important here is not the actual accuracy of the figures per se, although they do provide a significant storyline, it is that with up to 70 % of revenues accruing to financier and sponsors, and with much

of this money going into expanding piracy operations, then piracy is without doubt a growing market. For pirates who were once fishermen, piracy has now become the alternative livelihood of choice.

6. TRACKING FINANCIAL FLOWS

Tracking the financial flows, across the value-chain has never been attempted, yet it is both urgently needed and achievable. Given that Somali pirates have attacked 640 ships and taken more than 3,150 hostages since 2007, tracking finances is not just about money per se, it is also about protecting lives and securing maritime trade in what has become a volatile year across the Middle East and Gulf of Aden. Money transfer operators in Somalia include Dahabshiil, Qaran Express, Mustaqbal, Amal Express, Kaah Express, Hodan Global, Olympic, Amana Express, Iftin Express and Tawakal Express. These operators have connections throughout the Middle East, the UK, mainland Europe, and the US.

The UN, UNODC, INTERPOL/EUROPOL and other specialized agencies are engaged through the CGPCS but there are limits to what formal international institutions with constrained outreach of informal and illicit systems can achieve. The Hawala system in Afghanistan has been heavily studied – in fact even used by the international community – but tracking illicit flows has so far not assisted in identifying individuals involved in trafficking. Whilst

the ultimate aim must be to track down and interdict the financial means that fund piracy operations, this can only be done once the value-chain is documented on a market segmentation basis.

A key focus of future research must be on (i) the payment and laundering of ransom payments (ii) asset tracing (iii) where relevant, informal money transfer systems (iv) pirate value chain analysis (v) panel surveys of pirates (vi) and the consolidation and sharing of data between international cooperation partners. INTERPOL will need to lead much of this work but must be supported by an independent research organization, ideally based in the Middle East with a strong network across the Horn of Africa. Such an organization must also be able to provide a counter-balance to official figures and take greater risks in data and value chain reporting and investigations. **Table 3** below outlines a number of logical maritime piracy financial investigation options – in support of the Financial Action Task Force - ideally to be tackled by a yet-to-be-established **CGPCS Group 5 on Economics and Financing**.

Table 3 Maritime Piracy Financial Investigation Options

	Financial Tracking Sub-Functions	Proposed Approach	Delivery Mechanism
1	Ransom Payment	Research entire ransom payment process / system based on case studies	INTERPOL / EUROPOL Independent Research
2	Asset Tracing	As per standard procedures	INTERPOL/EUROPOL
3	MTO/IVTS	Research into Hawala systems and ransom payment / laundering process	Independent Research
4	Value Chain Research	Conduct detailed in-country value chain analysis of the PVC	Independent Research
5	In Country Pirate Panel Survey	Conduct political-economy analysis, strategic conflict assessment and pirate (panel) survey	Independent Research
6	Data Consolidation, Sharing, Coordination	Establish a global 'Pirate Portal' as a Unified Data Hub, providing common, timely, quality data.	INTERPOL Independent Research

7. PROPOSED ACTION RESEARCH FRAMEWORK

Piracy off the Coasts of Somalia now extends to some 2.5 million square nautical miles, an increase of 1 million nautical miles from just two years ago. This research highlights the scale of individual profits and the likely rise in piracy incidents in the years to come, unless much more is known about the '*economics of criminal motivation*'. It has, we believe, never been more essential to compliment the work of international organizations with independent research, for reasons of burden sharing but moreover because this would bring the following direct benefits:

- First, independent field and desk based research could overcome the problem of state classified-information; strengthening international dialogue and understanding;
- Second, it could provide for a single-consolidated data source that cannot be provided by international organizations due to their often narrowly defined mandates. Independent research could be conducted on an agreed research framework and could populate a central model with institutional information when available. This could be complimented with bespoke field based country value-chain assessment work;
- Third, it would allow difficult subject areas such as the role played by the Hawala system, state sponsored privateer networks and ransom payments to be researched, without direct institutional or legal implications vis à vis findings;

- Finally, it would provide a counterpoint to public information around which assumptions could be tested and strengthened, and policies fine-tuned.

This short paper makes few claims. It does however (i) deepen the debate around economics and financing (ii) identify an alternative set of complimentary approaches (iii) provide compelling arguments as to why the weakest link in a complex chain – pirates themselves – are the most logical point of analysis given that this is the coal face of the entire piracy market. We outline a number of opportunities and entry points, relevant to would-be Group 5 of the CGPCS.

Opportunities and Entry Points: This research has been conducted using an in-house model to calculate both aggregate international costs and costs at the level of the actual pirate value chain, and we believe that continuing this research will yield significant results. Understanding the global costs of piracy will strengthen arguments for greater resourcing. However, only country based action value-chain work, supported by desk based analytical and diagnostic work and financial tracking will identify who is financing and sponsoring piracy, how and where. The following 6 entry points would appear to provide a logical framework for future action-research.

Entry Point 1: Costing Piracy: Based on standard economic modeling deliver regular reports to the CGPCS members, providing up to date quarterly analysis on global and pirate level costs and benefits;

Entry Point 2: Value Chain Analysis:

Undertake direct value-chain work on and off the coast of Somalia to clearly identify value added across the entire land and maritime value-chain, including different sovereign channels, so that the simplistic 70:30 splits are a thing of the past, and we can identify who gets what, when, and how. Figure 2 outlines a simplistic view of the agency framework;

Entry Point 3: Understanding Piracy and the Informal Money Transfer Systems:

Launch a thorough research program, based on surveys and key informant analysis in Somalia and third countries to track ransom payment flows (slips and codes), possible laundering of revenues to third countries and other related financial crimes;

Entry Point 4: Financial and Asset Tracking:

It is logical to detect, track, disrupt, and interdict illicit financial transactions connected to PFR and the criminal networks that finance them. Developing procedures for piercing informal bank secrecy practices will need to be developed.

Entry Point 5: Independent Data Analysis:

Build on an established economic research capability; to provide a central hub for cross-national comparative work, economic analysis and value-chain tracking.

Entry Point 6: Identifying Alternative Livelihoods and Growth Futures:

It will be vital to understand the main economic factors driving one-time fisherman to undertake highly criminal activities. Clearly the drivers expanding piracy stem from a fundamental restructuring in income sources, due to foreign fishing off the Coasts of Somalia and conflict,

following the collapse of Siad Barre's Government in 1991. Yet, as a result of insecurity, international reporting on GDP/GNP growth, growth composition, un-employment and the binding constraints to growth, poverty and social marginalization have never been conducted, undermining our understanding of how piracy is becoming the alternative income of first choice. There is an urgent need therefore, at marginal cost to the international community, to undertake growth diagnostic and investment climate work to understand the impact of over fishing and dumping of toxic waste on once licit maritime livelihoods; in support of preventive not just curative action. Even though the so-called 'Volunteer Coastguard of Somalia' now includes criminal gangs, it seems logical that many of the root causes of criminal activity at sea are in fact to be found on dry land.

Financial and asset tracking will fail to stop piracy unless national law and enforcement authorities deal with sponsors, financiers and pirates. For this to happen, each littoral state needs to criminalize the financing of piracy, piracy acts and piracy networks. Clearly, Somalia will need to implement measures to freeze, without delay, funds or other assets of sponsors, financiers and pirates, as well as aiding suppliers. Research in this area would lay the foundation for a long-term solution.

Meeting the objectives of the Djibouti Code of Conduct and UN Security Council Resolutions requires the members of the CGPCS to consider these entry points as a means to both combating the spread of piracy, and progressively removing the causes of this modern day scourge.

Table 4 Core Options for Economic and Financial Tracking

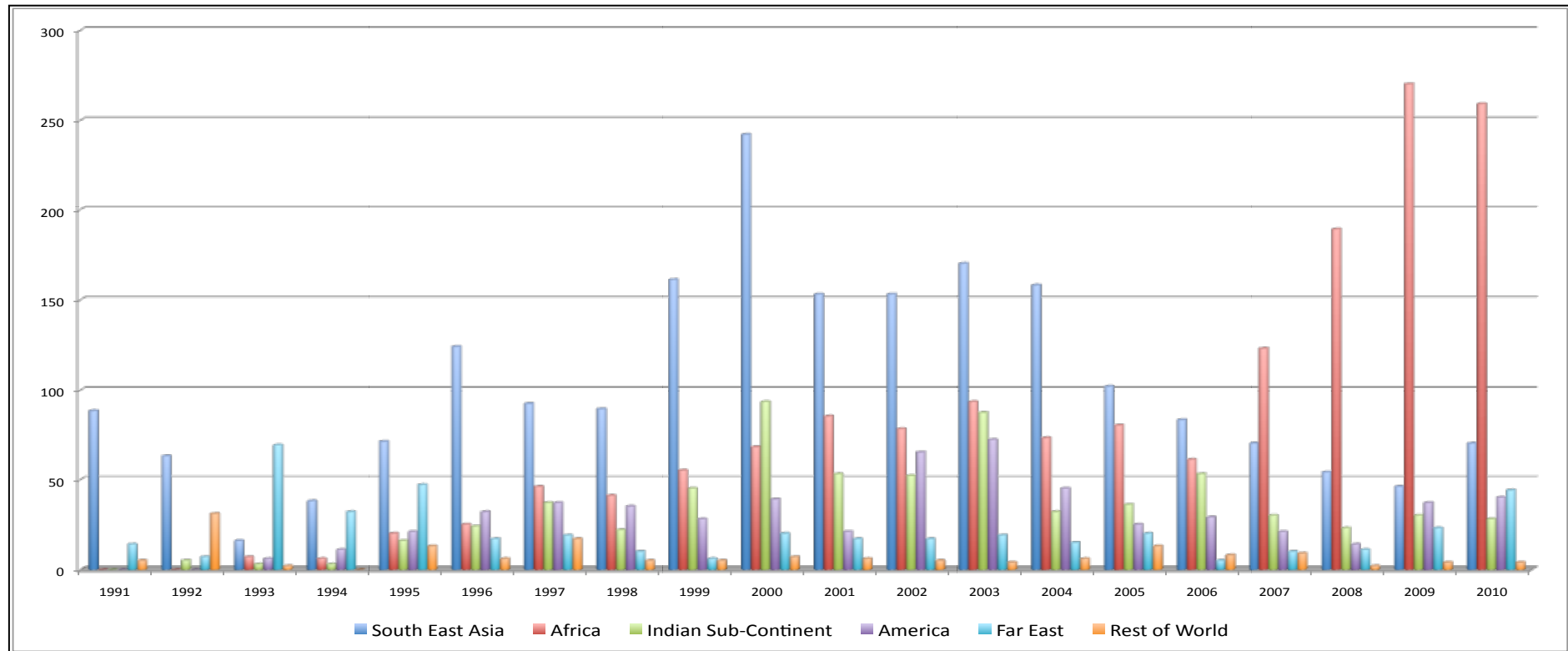
Entry Points	Main Activities	Expected Results	Possible Responsibility
1. Costing Piracy	Based on the Global Economic Piracy Model developed here, aggregate international primary and secondary data, thus increasing confidence levels and relevance, strengthening assumptions, and removing contradictions to understand the cost-benefit ratio in real and nominal terms.	<ul style="list-style-type: none"> ▪ Quarterly 'Cost of Piracy' Reports to the CGPCS; ▪ Supply and demand scenarios ▪ Cost and geographical forecast projections; ▪ Understanding pirate (financial) drivers. 	<ul style="list-style-type: none"> ▪ UN ▪ Independent Research Team ▪ OEF
2. Pirate Value Chain Analysis: Understanding the Piracy Business Model	Following the money trail (proceeds flow up the pirates chain of command) provides a formidable opportunity to understand the structure and functioning of maritime piracy networks. Standard value chain work to identify the agency chain involved will be supplemented with socio-economic work to understand what drives piracy, from a profit making perspective. Value-added by agent will reveal sponsor, financier and pirate shares and the entire supply and demand chain.	<ul style="list-style-type: none"> ▪ Clearly document how money flows across the entire value-chain; ▪ Describe the value-addition process; ▪ Identify turning and investment leverage points; ▪ Understand and use to CGPCS member advantage what motivates piracy attacks; ▪ Identifying then hitting selected pirate supply lines ▪ Understand links between ransom payments and al-Shabaab 	<ul style="list-style-type: none"> ▪ Independent Research Team
3. Understanding the IVTS Process	Intensive investigative fieldwork would be conducted through formal and informal discussions with a wide variety of informants, on the ground in Somalia and in littoral states off the Gulf of Aden and Horn of Africa. The research would cover the main IVTS dealers in 3-4 littoral states to build up a solid understanding of how the regional network functions and which agents are favored by the maritime piracy networks.	<ul style="list-style-type: none"> ▪ An adapted framework for targeting financial flows from piracy, perhaps similar to other organized transnational criminal networks ▪ Tracking ransom payment processes for known high profile hijacking incidents (Based on case studies) ▪ Quantifying the nexus between piracy and Hawala system; ▪ Assessing the importance of Hawala networks for the movement of piracy related profits. 	<ul style="list-style-type: none"> ▪ US State ▪ Independent Research Team ▪ UNODC ▪ World Bank / IMF
4. Financial and Asset Tracking	The unchecked flow of piracy proceeds is a formidable obstacle to deterrence. Therefore, based on investigative work and field based panel surveys, options for developing procedures to pierce bank and Hawala secrecy practices whilst confiscating criminal incomes and assets needs to be developed. Researching asymmetric alternative could yield significant results.	<ul style="list-style-type: none"> ▪ Follow the money through the formal and informal money transfer system; ▪ A framework for dealing with piracy as a transnational crime; ▪ A framework for integrating financial and asset tracking into international law enforcement operations; 	<ul style="list-style-type: none"> ▪ UNODC ▪ INTERPOL (BADA) ▪ INTERPOL Anti-Money Laundering Unit ▪ EUROPOL ▪ US Treasury
5. Independent Data Analysis	To establish a global 'integrated' data hub for analysis and diagnostic work, to meet the needs of the international community, building a strong foundation of evidence for strengthening policy and institutional responses to piracy.	<ul style="list-style-type: none"> ▪ One Stop Online Data Point for All Maritime Piracy Related Data ▪ Timely information, improved international system efficiency and effectiveness. 	<ul style="list-style-type: none"> ▪ Independent Research¹⁰ ▪ OEF
5. Identifying Alternative Livelihoods and Growth Futures	Undertake growth diagnostic and investment climate work to understand the littoral and maritime economies, identifying the sources of growth and alternative livelihood opportunities.	<ul style="list-style-type: none"> ▪ Sources and Drivers of licit and illicit growth ▪ Macro-economic and livelihood gains of a resumption in international fishing, and options for fleet protection and wealth redistribution 	<ul style="list-style-type: none"> ▪ Independent Research

¹⁰ Could be coordinated with Intelligence Operational Frameworks: Sana ISC covers the North, Mombasa ISC covers Area Central and Dar Es Salaam covers Area South

Annex 1 Global Piracy Incidents

Global Piracy Incidents (1991-2010) by Region																					
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
South East Asia	88	63	16	38	71	124	92	89	161	242	153	153	170	158	102	83	70	54	46	70	2,043
Africa	0	0	7	6	20	25	46	41	55	68	85	78	93	73	80	61	123	189	270	259	1,579
Indian Sub-Continent	0	5	3	3	16	24	37	22	45	93	53	52	87	32	36	53	30	23	30	28	672
America	0	0	6	11	21	32	37	35	28	39	21	65	72	45	25	29	21	14	37	40	578
Far East	14	7	69	32	47	17	19	10	6	20	17	17	19	15	20	5	10	11	23	44	422
Rest of World	5	31	2	0	13	6	17	5	5	7	6	5	4	6	13	8	9	2	4	4	152
	107	106	103	90	188	228	248	202	300	469	335	370	445	329	276	239	263	293	410	445	5,446

Source: IMB 'Reports on Acts of Piracy and Armed Robbery Against Ships' Annual Reports.



Locations of actual and attempted attacks, January - December (1991 - 2010)

Location	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Indonesia	55	49	10	22	33	57	47	60	115	119	91	103	121	94	79	50	43	28	15	40	1,231
Red Sea/ GOA* **										13	19	11	18	18	10	10	13	92	132	78	414
Somalia/ Djibouti **				1	14	4	5	9	14	9	1	6		3		10	31	19	80	139	345
Malacca Straits	32	7	5	3	2	3		1	2	75	17	16	28	38	12	11	7	2	2	2	265
India		5	1		8	11	15	12	14	35	27	18	27	15	15	5	11	10	12	5	246
Nigeria			2		1	4	9	3	12	9	1	14	1			12	42	40	29	19	198
Malaysia	1	2		4	5	5	4	10	18	21	19	14	5	9	3	10	9	10	16	18	183
Philippines		5		5	24	39	16	15	6	9	8	10	12	4		6	6	7	1	5	178
South China Sea	14	6	31	6	3	2	6	5	3	9	4		2	8	6	1	3		13	31	153
Brazil			4	7	17	16	15	10	8	8	3	6	7	7	2	7	4	1	5	9	136
Vietnam				2	4		4		2	6	8	12	15	4	10	3	5	11	9	12	107
Oman												1	39	28	16		3		4		91
Singapore Straits				3	2	2	5	1	14	5	7	5	2	8	7	5	3	6	9	3	87
Thailand					4	16	17	2	5	8	8	5	2	4	1	1	2		2	2	79
Peru					1	2	1	1	2	4	1	6	7	5	6	9	6	5	13	10	79
Ecuador				3		3	10	10	2	13	8	12	2	1		1		2	2	3	72
China/Hong Kong/Macau			1	6	31	9	5	2	2	2	1	3	1	3	4	1		2	1	1	67
Venezuela					1	3	1		6	3	1	8	13	7	2	4	1	3	5	7	65
Guinea				1	1	2	3	2	6	6	5	2	4	5	1	4	2		5	6	55
South Africa										1	3		3	2	35		11				55
Tanzania			2	1	2	3	4	3	3	2		3	1			9		14	5	1	53
Sri Lanka			2	1	6	9	13	1	6	3	1	2	2			1	4	1			52
HK/ Luzon/Hainan			27	12	7	4	1														51
Colombia			1		1	3		4	4	1	1	7	10	5	2	2		1	5	3	50
Senegal						2	6	2	1			3	18	8	10						50
Ivory Coast				1		4	4	1	5	5	1	5	2	4	3	1		3	2	4	45
Cameroon						3	5	3	2	7	5	5	2	4	2	1		2	3	5	44
Ghana					1	2	2	4	2	2		5	3	5	3	3	1	7	3		43
Location not available	5	31	2		1			1			1										41
Dominican Republic						1	3	4	2	4	5	7	6	2	1						35
Guyana			1			2		2		1		12	6	2	1	1	5			2	35
Sierra Leone						3	3				11	1	8	5		2	2				35
Jamaica						1	3	2	2			2	5	7	8	3	1				34
Kenya								7		5	9	2	1	1			4	2	1		32
Togo										1	8	1	5	2	7	1		1	2		28
Haiti									1	1		1	1	6	2		2	2	4	5	25
Iran					8	2	3	1	3	1	1		2			2	2				25
East China Sea		1	10	6		1	1			1	2	1									23

Locations of actual and attempted attacks, January - December (1991 -2010)

Angola		3				1	1	1	3	1		3			4	1	2			20
Iraq										2			1	10	2	2			2	19
Myanmar				1	1	2		1	5	3			1				1	1		15
Gabon				1			2	3	2		7									15
Arabian Sea **									2			2	2	2	4		1	2		15
Yemen					1	5			1	1	5	1								14
DRC															3	4	1	2	3	13
Egypt			1				2	1	1	2			1		2				2	12
Mozambique									2	1	1			1		3	2			10
Zaire								2			7									9
Papua New Guinea					1	1	3			1	1					1				8
Madagascar						1					3		2	1		1				8
Solomon Islands						1		1	2		2					1				7
Guinea Bissau								1			3	2						1		7
Albania						5	1				1									7
Italy				1	2		1	2				1								7
Taiwan				2						2		1								6
Panama				1								2								6
USA						1	1					1	1							6
Morocco								1												6
Cambodia		1	1	1	1	1										1	1			5
Caribbean			1									4								5
Costa Rica												1						3	1	5
Trinidad and Tobago										1			2	1		1				5
Mauritania									1				1	2		1				5
Cuba												4								4
Congo									1	1							1		1	4
Gambia										3	1									4
Greece					1	2														4
Indian Ocean **										1	1			1				1		4
Turkey				1	1	2														4
Honduras									1				1	1						3
Salvador					1	1								1						3
Liberia																1	1		1	3
UAE									1				2							3
UK												2							1	3
Mexico								1		1										2
Nicaragua				1	1															2
Suriname																2				2

Locations of actual and attempted attacks, January - December (1991 -2010)

Algeria				1							1										2
Benin												1							1		2
Equatorial Guinea									1								1				2
Bulgaria											1	1									2
Denmark					1		1														2
France								1										1			2
Russia				1			1														2
Saudi Arabia																1		1			2
Argentina															1						1
Guatemala									1												1
Martinique												1									1
Uruguay						1															1
Eritrea																	1				1
Arabian Gulf												1									1
Australia									1												1
Belgium															1						1
Caspian Sea																			1		1
Georgia												1									1
Gulf of Oman **																			1		1
Malta							1														1
Netherlands							1														1
Pacific Ocean													1								1
Portugal							1														1
Seychelles																					0
Total for the year	107	106	103	90	188	228	248	202	300	469	335	370	445	329	276	239	263	293	410	445	10,89
																					2

Source: IMB 'Reports on Acts of Piracy and Armed Robbery Against Ships' Annual Reports.

* Gulf of Aden attacks only added as of 2001. Further, Gulf of Aden and Red Sea attacks were originally calculated in two separate rows from 2006 - 2010.

** From 2006 - 2010, attacks in Gulf of Aden, Arabian Sea, Red Sea, Somalia, Gulf of Oman and Indian Ocean are attributed to Somali pirates

Somalia Regional – Varying Statistics (2010)										
Country	GDP/Capita USD ¹¹	Population ¹²	HDI Score ¹³	HDI Ranking	TI ¹⁴ Ranking	TI Score	Imports USD ¹⁵	Exports USD	International Tourism receipts US \$ million (2008) ¹⁶	Navies ¹⁷
Somalia	600	9,359,000	N/A	N/A	178	1.1	798 Million	300 Million	Not included	N/A
Kenya	887	40,046,566	0.47	128	154	2.1	10.77 Billion	4.882 Billion	1,398,000,000	17 inc. coastguard
Yemen	1,061	23,580,000	0.439	133	146	2.2	9.215 Billion	9.234 Billion	886,000,000	26 inc. coastguard
Tanzania	560	43,739,000	0.53	151	116	2.7	5.901 Billion	2.49 Billion	1,358,000,000	19 coastguard only
Eritrea	424	5,224,000	0.472	165	123	2.6	601 Million	14 Million	Not included	21 inc. coastguard
India	1,176	1,193,458,000	0.519	119	87	3.3	287.5 Billion	175.7 Billion	12,461,000,000	109 inc. coastguard
Sudan	1,638	43,939,598	0.531	150	178	1.6	7.75 Billion	13.62 Billion	331,000,000	10 inc. coastguard
Seychelles	10,714	24,837	0.843	57	49	4.8	952 Million	425 Million	366,000,000	5 coastguard only

¹¹ IMF, World Economic Outlook Database (2010)

¹² UN World Population Prospects, India-Indiastat

¹³ United Nations Human Development Report (2010)

¹⁴ See Transparency International, Country Rankings (2010)

¹⁵ See CIA World Fact Book (Used given lack of IFI reporting on Somalia)

¹⁶ See World Bank, International Tourism Receipts, (2008)

¹⁷ See Janes Fighting ships and Indian Navy Combatant vessels (2010)

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