Fletcher Security Review Vol.2 no.1
All Rights Reserved.
For Permissions, please email: editor@fletchersecurity.org

Trading Security: A Case Study on Maritime Security Decision Points in the Context of Global Trade

Caroline Troein / Anne Moulakis

30 January 2015

1 Introduction

The term maritime security often evokes destroyers and aircraft carriers, disputes over territorial waters or islands, or piracy and terrorist attacks such as the USS Cole bombing in 2000. In the security world, we less often think of the millions of items ferried across the sea, from mundane automotive parts to exciting new toys. High profile crises can lead us to forget that maritime security is an everyday event; it is about enabling safe transit. Each step within the maritime transport of goods has security challenges and considerations. At the same time, the continued stability and effectiveness of maritime trade is itself a broader security matter of importance to consumers, businesses, and governments. With the "weaponization of finance"[1] maritime trade will play a central role in economic actions being taken out of geopolitical concerns.

International maritime trade works so well and inexpensively that the cost of freight transport is a marginal consideration in deciding where to source or market goods.[2] Though the maritime transportation network functions amazingly well, its complexity and interconnectedness make it vulnerable to disruption. Disruptions within the international maritime trade network can cause far more than inconvenience if not addressed rapidly and intelligently: they can affect the fundamental supply chain that supports commerce and national economies, and thus affect the geopolitical interests as well as the stability of states.

As a result of maritime trade's effectiveness, it is often invisible. Most end consumers and businesses are indifferent and unaware of how goods get to them. They merely want and expect their products to arrive inexpensively and reliably. Consumer expectations have been fed by maritime trade's sustained success and integral contributions to the global economy. Maritime shipping carries 80%-90% of the world's goods, by volume.[3] Globalization, facilitated by trade liberalization, has led to the dispersion of manufacturing and retail sites across vast distances, the rapid worldwide adoption of just-in-time inventory control and tight supply chain management. The low cost of shipping has further encouraged the dispersion of manufacturing and retail: shipping costs as a percentage of final good price has consistently fallen over the past fifty years, and in 2004, accounted for only 3.6% of the value of global imports.[4] Efficient and timely maritime transportation has become central to economic competitiveness for both individual businesses and national economies. It is the maritime movement of goods, enabled by maritime security, that makes the modern global economy possible.

The question of maritime security involves far more than just keeping bad people from doing bad things. It also involves keeping this essential, highly interconnected transportation network operating efficiently and reliably. It is very similar to the importance of the world's financial system. These are "Critical infrastructures" par excellence. Security concerns around Critical infrastructure are high, but also need to be addressed with nuance and an awareness of the effects on the broader network.

By following a hypothetical trip of widgets from China to Nebraska, we can get a sense of the complex web of activities required to move the world's goods. The process outlined by this hypothetical is multiplied over a myriad of companies and thousands of departure-destination combinations. The resulting interconnectedness generates repercussions far beyond individual

[1] Ian Bremmer, "These Are the Top 10 Geopolitical Risks of 2015," Time (2015), http://time.com/3652421/geopolitical-risks-2015-ian-bremmer-eurasia-group/

[2] Martin Stopford, Maritime Economics, 3rd edition, (New York: Rutledge, 2009), 73-74.

[3] United Nations Conference on Trade and Development, 68th Session. Review of Maritime Transport (UNCTAD/RMT/2013). June 2013. (Masthead).

[4] Martin Stopford, Maritime Economics, 3rd edition, (New York: Rutledge, 2009), 89.

shipments or transits. Thus, husbanding the "resource" of maritime trade is as much a security matter as an economic one.

Individual business maritime trade decisions are mostly about maximizing profit and minimizing cost. But the effect of these decisions is far wider; the stability and efficiency of maritime trade affects those profit-based decisions and, by extension, national economies. Maritime trade affects nearly every business and consumer, therefore any problems with that trade can quickly lead to political and security concerns. It is incumbent upon policy makers, port authorities, and maritime companies to invest in the continued stability and resiliency of maritime trade.

2 Hypothetical: From China to Nebraska, By Sea

Your company will be ordering widgets from a manufacturing hub in China. You need to get two containers of these widgets to the US cost effectively, without excessive time delay, and with a minimum of risk. This shipment is important to your company.

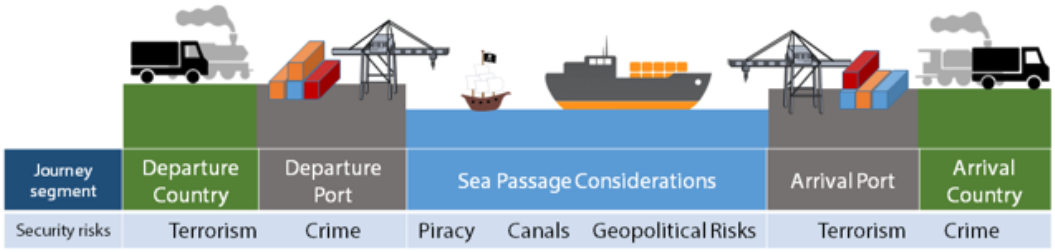

Figure 1: Journey of goods and security risks

2.1 Ports

During its journey, a single container goes through multiple facilities, vessels, and ports. Securing it against tampering, theft, and misuse is very challenging.[5] Ports are central to the security mechanisms in place to protect maritime trade. The quality and efficiency of port security can have a significant impact on port operations and reputation, and thus on user choice of port. However, the commercial choice of departure and destination port will be most directly influenced by a port's connectivity with other world ports, ease of access to and from the interior it serves, and cost in terms of port fees, taxes, and customs procedures.

2.2 Leaving China

Departure port choice is driven by the port's connectivity to manufacturing centers and destination ports, the port's relative efficiency at getting ships loaded and under way, and the costs involved. Each of these elements play into and are affected by port reputation.

[5]U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, "America's Container Ports: Linking Markets at Home and Abroad," (Washington, DC: US Dept. of Transportation, 2011), 35.

Part of a port's reputation is its security posture. Questions of corruption or lax security enforcement can rapidly lead shippers to move their business elsewhere.

The top Chinese ports provide rapid, cost effective, and frequent service. China's central and regional governments view the ports as essential to China's continued economic development. Therefore any disruptions, whether political, logistical, or security related are likely to be addressed quickly.

China is home to most of the world's biggest and busiest ports, with six of the world's 10 busiest ports in 2012 leaving no shortage of choices for departure.[6] While overall trade and transport-related infrastructure, other than the ports themselves, is less developed than in OECD countries, it still is fairly good. The greatest weakness of China's ports is the relative inefficiency of customs. Import and export procedures take up to four times as many days as they do in the US, though they are cheaper.[7]

Our widgets are likely sourced from the two main coastal economic areas in China. These are the Yangtze River Delta, served by Shanghai and Ningbo-Zhoushan ports, and the Pearl River Delta, served by the ports of Hong Kong, Guangzhou, and Shenzhen. As of 2013, Shanghai and Shenzhen were the ports with the highest throughput of containers.[8] Combined with their proximity to key economic areas, they are the most likely departure port choices for our shipment of widgets.

2.3 Entry to the United States

There are three regions of entry to the US for maritime shipments: the West Coast, the East Coast, and the Gulf Coast. Deciding upon a US point of entry determines what routes are preferable. The point of entry will determine the final over-land transit of our widgets, and will depend on cost, time, and reliability.

Los Angeles and Long Beach are two contiguous ports that, combined, have by far the largest throughput for North America and are the primary entry-point to the US for goods from Asia. In 2012 they held 42% of the US container port market.[9] They are equipped to handle the largest container ships and are linked to the rest of the country by a robust rail network into the American heartland.[10] However, over the last year, the West Coast has suffered port congestion due to a combination of factors. In 2014, renegotiation of the labor contract with the International Longshore and Warehouse Union began. The negotiations are contentious because of significant moves toward greater automation at the ports of Long Beach, Los Angeles, and Oakland. Combined with a shortage of trailers used to haul cargo from the ports to inland warehouses, these tensions have led to "the worst shipping crisis in a decade."[11]

[6]Niels van der Graaf and Baas Overtoom, China Top Sector Ports: Opportunities for Dutch Companies, (Rotterdam: Europe Container Terminal BV Rotterdam, 2013), 7, accessed December 15, 2014, http://china.nlambassade.org/binaries/content/assets/postenweb/c/china/zaken-doen-in-china/2014/20140127-kansenrapport-topsector-havens.pdf

[7]Ibid., 11 - 12.

[8]"JOC Top 50 World Container Ports 2013," Virginia Economic Development Partnership, accessed November 23, 2014, http://exportvirginia.org/wp-content/uploads/2014/09/Top-50-Container-Ports-2013.pdf

[9]K.C. Conway, North American Port Analysis: Biggie-Size It, Colliers International, December 2013, 7, accessed December 10, 2014, http://www.colliers.com/us/port-2H

[10]Patrick Burnson, "Top 30 U.S. Ports: Finding the right balance," A Special Supplement to Logistics Management, May 2012, 52A.

[11]Andrew Khouri, "Congestion Worsens at L.A-Long Beach Ports as Holidays near," Los Angeles Times, 24 October, 2014.

The port of New York/New Jersey is the next largest, handling 16% of the US container market.[12] The expansion of the Panama Canal is expected to lead to an increase in traffic, especially if congestion continues to be high at Los Angeles and Long Beach. The port of New York/New Jersey is served by three major rail carriers and has invested in improving its rail and barge intermodal connectivity by developing a Port Inland Distribution Network.[13] However, road distribution is hampered by the port's location along one of the most congested transportation corridors in the country.

On the Gulf Coast, the port of Houston is termed the "most indispensable port" because of its strength in container throughput, vital role in the US petro-chemical industry, energy, security, and inland infrastructure.[14] The port of Houston can receive the largest container ships and can effectively distribute the incoming cargo along rail, road, and waterways.

Choosing any of these ports has tradeoffs and consequences. Los Angeles and Long Beach have the benefit of having handled large volumes for many years and of having strong rail connections which travel through less dense parts of the country allowing for longer trains and double-stacking of containers. On the other hand, labor problems combined with insufficient trucking capacity and major eastbound rail already operating near or at capacity pose challenges to the smooth flow of goods.[15] Houston has similarly strong inland access, including waterway access giving it potentially greater flexibility. Yet to date, most of the containers coming through the Port of Houston are destined for relatively close distribution. The Port of New York/New Jersey is located in one of the most densely populated corridors, creating congestion concerns but also leading to the majority of containers remaining within the region.

The commercial decision regarding which port to use will primarily be driven by convenience factors such as the time it takes to process the cargo and get it on its way inland as well as the relative cost of inland routes and connections. Though these decisions are not based primarily on security considerations, they are influenced by any security measures taken to protect ports and container safety. Smooth operation of customs and efforts to maintain the security of containers affect how desirable a port is.

2.4 Port Related Security Considerations

Ports are central nodes in the complex network of interdependent systems that need to operate effectively, efficiently, and in collaboration with each other to maintain the free-flow of goods that national economies rely upon. Maintaining the resiliency of this network is as much a security concern as a commercial one. It involves safeguarding port connectivity inland and across the oceans.

Security, when it relates directly to ports, has two component parts: securing the port itself

[12]K.C. Conway, "North American Port Analysis: Biggie-Size It," Colliers International, December 2013, 7, accessed December 10, 2014, http://www.colliers.com/us/port-2H

[13]Jean-Paul Rodrigue, "Gateways, Corridors and Global Freight Distribution: The Pacific and the North American Maritime/Land Interface", 10, http://people.hofstra.edu/jean-paul_rodrigue/downloads/107_2.2._ Rodrigue.pdf and The Port Authority of New York and New Jersey, "Port of New York and New Jersey Rail Facility Expansion Program", 1, http://northeastdiesel.org/pdf/RailProjectsNERC032806.pdf

[14]K.C. Conway, "North American Port Analysis: Biggie-Size It," Colliers International, December 2013, 9, accessed December 10, 2014, http://www.colliers.com/us/port-2H

[15]Jean-Paul Rodrigue, "Gateways, Corridors and Global Freight Distribution: The Pacific and the North American Maritime/Land Interface", 1, http://people.hofstra.edu/jean-paul_rodrigue/downloads/107_2.2._Rodrigue.pdf

and securing the goods in the supply chain the port participates in. Physical protection of ports and the access to them is as old as ports themselves. Historically, the threats to ports came in the form of attack by other nations or criminal elements, with the aim of either gaining control over the port or crippling it to deprive the owners of its use.

The attacks of 9/11 brought greater attention to the idea of ports as conduits for terrorist, as well as criminal activities. As a result, the US introduced a series of laws to improve port security against terrorism. The provisions in the US legislation, the November 2001 Customs and Trade Partnership Against Terrorism, the 2002 Container Security Initiative, and the 2006 Security and Accountability For Every Port Act were widely adopted through multilateral agreements by countries around the world.[16]

Over the same period, the United Nations International Maritime Organization drafted and approved a comprehensive security regime for international shipping, the International Ship and Port Facility Security Code (ISPS). The ISPS extends existing code governing state and private sector responsibilities with regard to safety at sea to include vessel security and port security. It entered into force on July 1, 2004.[17] Many countries have taken significant steps towards implementing the requirements outlined in the Code.[18]

The US agreements and ISPS are not the only frameworks for port security. The International Organization for Standardization has also issued international risk management standards for port authorities. Many individual port authorities, including those at the major Chinese and US ports, are increasingly working to comply with the various international security standards and procedures, in part as a way to remain competitive, as well as demonstrating they are operating at a world-class level.[19]

After 9/11, the initial focus of effort to bolster port security was primarily on ports as conduits, aimed at improving supply chain visibility and security. However, in recent years, attention shifted to the possibility of ports as targets of attack by non-state actors. As a result, many nations, including the US, have been incorporating ports into security planning for the protection of "Critical Infrastructure."[20] The shift in mindset from ports as conduits to ports as potential targets builds upon supply-chain security efforts. Integrating ports into "Critical Infrastructure" planning recognizes the fundamental role they play in national economies. It provides a framework for planning and investment that takes into account economic and security elements at both the municipal and national level.

3 Security Considerations at Sea

The recipients of goods rarely see the broader geopolitical security environment within which maritime trade operates. A business ordering parts from China is focused on profit maximization. As long as goods are delivered reliably and cost effectively, the logistics of delivery is left to freight forwarders and shipping companies. While companies do not take the direct decisions affecting their cargo at sea, they buy into the importance of maritime trade and become part of maritime security matrix.

[16] Olaf Merk ed., "The Competitiveness of Global Port-Cities: Synthesis Report", OECD Public Governance and Territorial Development Directorate, 146.
[17] "Frequently Asked Questions" International Maritime Organization, Accessed 11 December 2014, http://www.imo.org/About/Pages/FAQs.aspx
[18] Olaf Merk ed., "The Competitiveness of Global Port-Cities: Synthesis Report", OECD Public Governance and Territorial Development Directorate, 147.
[19] Ibid., 146-7.
[20] Ibid., 147.

The shipping company itself, based on cost, time, reliability, and security risk, determines shipping routes. For example, the most direct route between the US and China is the Pacific Ocean to the US West Coast, avoiding geopolitical conflicts and piracy. Routes between the US East Coast and China can require passing through paid canals, incurring costs, limiting ship size, and introducing potential political pressure. Ships sailing towards the Suez Canal or Cape of Good Hope must pass through the Strait of Malacca and the eastern coast of Africa, exposing both ship and cargo to the risk of piracy. Travelling around the southern tip of South America avoids tolls and pirates, but costs 10 days in valuable travel time.[21] Travelling through the Arctic along the Northern Sea Route demands favorable ice conditions, Russian approval, and specialized ship equipment, making it more expensive.

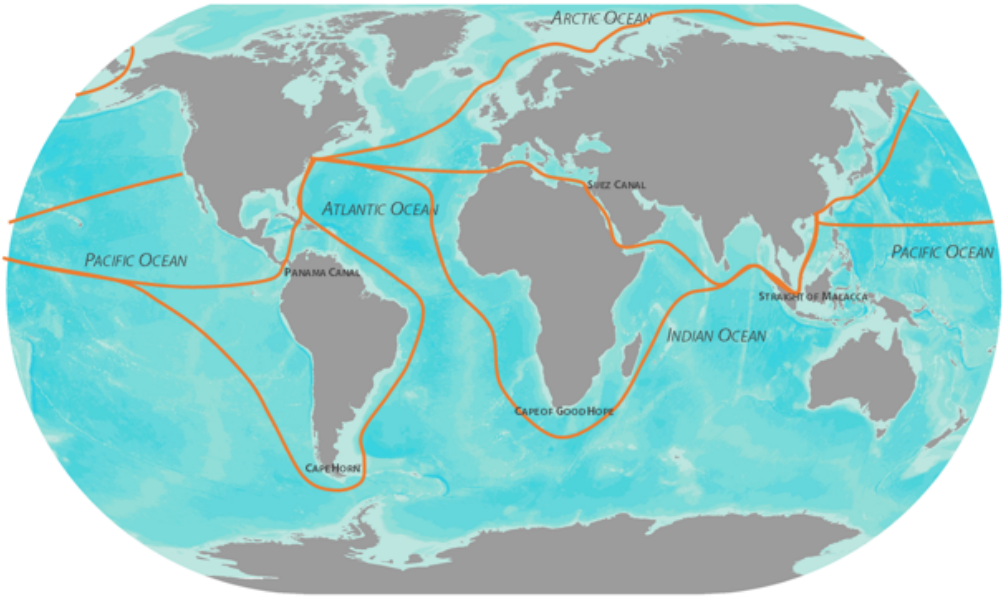

Figure 2: Shipping Routes

3.1 Piracy

Piracy differs from terrorism in that it is financially rather than politically motivated. The financial gains from piracy may be used for political landside operations, criminal enterprises, or purely as a financial endeavor. The line between the two blur when funds are raised through piracy for political objectives. Both acts are criminal under international law;[22] however, counterterrorism is typically a state responsibility, while responsibility for counter-piracy is handled by companies, until the piracy escalates beyond what the private sector

[21] Jonathan Saul, "Suez canal rate hike risks diverting ships round Cape, industry says," The Globe and Mail (2013), accessed December 8, 2014, http://www.theglobeandmail.com/report-on-business/international-business/african-and-mideast-business/suez-canal-rate-hike-risks-diverting-ships-round-cape-industry-says/article8173079/

[22] United Nations Security Council, 63rd Session. Resolution 1851 to the 1988 Convention for the Suppression of Unlawful Acts against the Safety of Navigation (S/RES/1851). December 16th, 2008. and United Nations Convention on the Law of the Sea, 37th Session. Agreement Relating to the implementation of Part XI of the Convention. (1833 UNTS 3; 21 ILM 1261) December 10th, 1982.

can handle.[23]

How does piracy affect our shipment in transit? There is piracy across the world. Most relevant to our hypothetical shipment is active piracy in the Strait of Malacca and off the coast of East Africa. Starting in 2008, maritime shipping has been heavily affected by East African piracy.[24] For example, Somali piracy in the Gulf of Aden is estimated to cost over $18 billion (USD) annually.[25] After a coordinated effort by various states and implementation of private sector counter-piracy measures on ships, ship capture rates by pirates have declined to zero in 2014 off the coast of East Africa. As a result, financiers of Somali piracy have reportedly become reticent to finance piracy efforts as the return on investment has dwindled.[26] While this is encouraging news for our shipment, it does not mean that the threat of piracy is gone: it is the continued use of counter-piracy technology and other counter-piracy measures by states that causes piracy to be unprofitable in the region. Thus, though currently dormant, piracy remains a risk in East Africa.

Though Somali piracy has dwindled, there has been a resurgence of piracy in the Strait of Malacca. Located in Southeast Asia, the Strait of Malacca is a key passageway for trade between Asia, Africa, Europe, and the US East Coast. At its narrowest point, the Strait is only 1.7 miles wide, creating a geographical bottleneck. It is the second of the world's "most strategic [energy] choke points," according to the US Energy Information Administration.[27] Pirates' targets have primarily been small oil tankers, attacked by armed gangs with knives and guns. This is good news for our cargo: as goods are more difficult than commodities to resell, it is less attractive to pirates.

Overall, global piracy has been on an upward trajectory,[28] ebbing and receding based on opportunity and defense. In early 2000, piracy attacks peaked in the Strait of Malacca. It was not until 2004 that significant measures were taken to secure the strait.[29] With a significant global response, piracy declined and states diverted their interest elsewhere. The cost of piracy to maritime trade varies: with recent downturns in piracy, response costs are expected to decrease further.[30]

3.2 Canals

While states along various straits or sea passages have an interest in reducing piracy, states operating paid canals have a different set of considerations. During the Arab Spring, despite

[23]Maria G. Burns, "Estimating the impact of maritime security: financial tradeoffs between security and efficiency." Journal of Transport Security (2013) vol 6, issue 4. 329-338. Doi: 10.1007/s12198-013-0119-x

[24]Time Schröder ed., "Maritime Highways of Global Trade" World Ocean Review (2001): 173. http://worldoceanreview.com/wp-content/downloads/wor1/WOR1_chapter_8.pdf

[25]Jessica Pugaliese, "Dealing with Piracy in Africa in 2014" Brookings Institute (2014). http://www.brookings.edu/blogs/africa-in-focus/posts/2013/12/24-maritime-piracy-somalia-felbab-brown

[26]Abdi Guled and Jason Straziuso, "AP IMPACT: Party seems over for Somali pirates," September 25, 2012, accessed December 10, 2014, https://news.yahoo.com/ap-impact-party-seems-over-somali-pirates-201115675.html

[27]"World Oil Transit Chokepoints" US Energy Information Administration, November 10, 2014, accessed December 18, 2014, http://www.eia.gov/countries/analysisbriefs/World_Oil_Transit_Chokepoints/wotc.pdf

[28]Time Schröder ed., "Maritime Highways of Global Trade" World Ocean Review (2001): 173. http://worldoceanreview.com/wp-content/downloads/wor1/WOR1_chapter_8.pdf

[29]Catherine Zara Raymond, "Piracy and Armed Robbery in the Malacca Strait" Naval War College Review (2009): 35. https://www.usnwc.edu/getattachment/7835607e-388c-4e70-baf1-b00e9fb443f1/Piracy-and-Armed-Robbery-in-the-Malacca-Strait–A-

[30]Shaddah Sal Musalmy, "Piracy Cost World $6Bn in 2012, Says EU NAVFOR Chief During Muscat Visit," MuscatDaily.com, May 8, 2013, Accessed 21 December 2014, http://www.muscatdaily.com/Archive/Oman/Piracy-cost-world-6bn-in-2012-says-EU-Navfor-chief-during-Muscat-visit-28re

fears that shipping would stop through the Suez Canal, ships continued to pass through, demonstrating the superiority of trade over political dispute.

While canals regularly operate without security incident, security considerations are never far from their operations. In the security world, the Suez Canal is most often thought of in the context of the Suez Crisis in the 1950s. During the Suez Crisis, the UK and France lost control of the canal to the Egyptian government, raising key questions over the future of maritime trade through the canal. The recent Arab Spring resurrected security and geopolitical concerns for shipping. But the economic benefits of the canal created an incentive for Egyptians to keep the Canal open, to the tune of $5 billion (USD) in revenue a year.[31] The high dividend of peace proved to be a stabilizing factor, even during recent uprisings of the Arab Spring.

The Suez Canal is undergoing an expensive remodeling in order to increase capacity. The canal can already take ships larger than Panamax — the largest ship size able to cross through the Panama Canal. In 2013, Maersk, the world's largest container shipping company, decided to stop using the Panama Canal, and instead use the Suez Canal to ship from Asia to the US East Coast.[32] This reflects a wider trend of transit through the Suez Canal becoming the preferred choice for shipping from Asia to US East Coast.[33] Larger ships mean that fewer ships are needed, enabling shippers to lower costs through economies of scale. In turn, this increases the strategic value of the Suez Canal.

While political challenges in Egypt and regional conflicts are concerning on a larger geopolitical front, their impact has been minimal on shipping through the Suez Canal. Because the canal represents a significant revenue source for the Egyptian state, Egypt has an incentive to keep the canal safe and operational. The canal is also a source of pride for Egyptians, leading millions to buy investment certificates to support the canal's expansion plans.[34]

Ships sailing via the Suez Canal to the US East Coast may make a call at a European port. This can increase security concerns, as it increases the handling points of your shipment.

If instead of going west, either by the Suez Canal or around the Cape of Good Hope, your shipment could head east. It would have crossed the Pacific Ocean and then onward to a US East Coast port. It would need to navigate either the Panama Canal, or the Cape Horn. The Panama Canal is often preferred due to saving approximately 10 days of shipping time, or over 4,500 miles, compared to the Suez Canal or the Cape of Good Hope.[35]

The security concerns surrounding the Panama Canal are more safety oriented and geopolitical. Safety-wise, the frequency of large ships means that careful navigation is necessary to avoid collisions.[36] Around 5% of global seaborne trade, and 12% of American international shipping, passes through the Panama Canal.[37] In contrast to the Suez Canal's complicated

[31] Juli Berwald, "Under the Ships in the Suez Canal" New York Times, November 12, 2014, Accessed December 10, 2014, http://www.nytimes.com/2014/11/13/opinion/under-the-ships-in-the-suez-canal.html

[32] Kyunghee Park, "Maersk Line to Dump Panama Canal for Suez as Ships Get Bigger," Bloomberg (2013). Accessed 21 December 2014. http://www.bloomberg.com/news/2013-03-11/maersk-line-to-dump-panama-canal-for-suez-as-ships-get-bigger.html

[33] "Suez Canal increases share of Asia-US east coast transit," Lloyds List: Containerisation (2014), Accessed December 10th 2014, http://www.lloydslist.com/ll/sector/containers/article451837.ece

[34] Fady Labib, "Where did all that money come from?" Watainet (2014), Accessed 10 December 2014, http://en.wataninet.com/features/economy/where-did-all-that-money-come-from/12338

[35] Silvia de Marucci, "The Panama Canal: It's all about connectivity" Canal de Panama (2014), Accessed December 10th, 2014, http://www.eia.gov/conference/2014/pdf/presentations/silviademarucci.pdf

[36] Tom Andel, "Risk Will Expand with the Panama Canal," Material Handling & Logistics News (2014), Accessed December 20th, 2014. http://mhlnews.com/global-supply-chain/risk-will-expand-panama-canal?page=1

[37] Jean-Paul Rodrigue, "Factors Impacting North American Freight Distri-

formula for tolls, Panama charges a flat rate based on net ton. Between 10,000-15,000 ships pass through the Panama Canal yearly, paying an average toll of $54,000 (USD).[38] Transit fees increased in 2013, as the Canal authority sought to fund its ongoing $5.25 billion (USD) expansion.[39] For East Coast ports, the Panama Canal expansion represents an important possibility encouraging more trade, rather than having ships dock on the West Coast and then transport goods over land.[40]

3.3 Geopolitics and Sea Routes

Geopolitics have long been part of sea routes. Ships chose ports and routes based on geopolitics in both subtle and explicit ways. On the face of it, geopolitics does not threaten shipping security. Instead, geopolitical considerations are rooted in the options which trade bestows: economic security spurs diplomatic and security posturing between states.

States seek to amend the geopolitical chess table through facilitating routes favorable to their trade flow. For example, China and Russia support a Nicaraguan Interoceanic Grand Canal to rival the Panama Canal.[41] This support has several implications. The first is symbolic: the Panama Canal's historic connection to the US coincided with the US' growth into the world's mega-economy. Secondly, the deal is extremely practical. With the Hong Kong based HKND Group gaining the right to build and operate the Nicaraguan Interoceanic Grand Canal for 100 years, China has an opportunity to shape the flow of trade. In turn, shipments of Chinese goods to the US East Coast and to Europe can move with greater ease. For Russia, the deal is a way to exert greater influence in the region.[42]

Even travel across the Arctic through the Northern Sea Route (NSR) has a geopolitical element, as approval is needed from Russian authorities in order to begin the journey. Travel along the NSR, north of the Russian border, has become increasingly viable given warming conditions in the Arctic. While the journey time is shorter when travelling between Asia to Europe, its benefits are less clear for US destined cargo. NSR travel incurs extra risk: ships traversing the Arctic need specialist crew training and equipment in order to operate safely. Russia operates the Search and Rescue Area in the NSR and requires icebreaker escort. Russia's control over the passage increases the political risk of NSR transit.

Despite the uptick in interest in the region, actual passages remain few. Four vessels made the crossing in 2010, 34 in 2011, and 46 in 2012.[43] Still, Russia has made it clear that it

bution in View of the Panama Canal Expansion," The Van Horne Institute (2010). Accessed December 28th, 2014. http://people.hofstra.edu/jean-paul_rodrigue/downloads/Panama%20Canal%20Study%202011%20Final.pdf

[38]"Shipping through the Panama Canal," GlobalForwarding.com (2012). Accessed December 2014. http://globalforwarding.com/blog/shipping-through-panama-canal

[39]Kyunghee Park, "Maersk Line to Dump Panama Canal for Suez as Ships Get Bigger," Bloomberg (2013). Accessed December 21st, 2014. http://www.bloomberg.com/news/2013-03-11/maersk-line-to-dump-panama-canal-for-suez-as-ships-get-bigger.html

[40]Jean-Paul Rodrigue, "Factors Impacting North American Freight Distribution in View of the Panama Canal Expansion," The Van Horne Institute (2010). Accessed December 28th, 2014. http://people.hofstra.edu/jean-paul_rodrigue/downloads/Panama%20Canal%20Study%202011%20Final.pdf

[41]Yuri Paniyev, "Russia and Nicaragua to cooperate on construction of interoceanic canal. Russia Beyond the Headlines (2014). Accessed January 2nd, 2015. http://rbth.co.uk/international/2014/05/14/russia_and_nicaragua_to_cooperate_on_construction_of_new_intero_36645.html

[42]"Russia Plans to Join Nicaragua Canal Project", The Moscow Times, May 6th, 2014, Accessed 12 December 2014. www.themoscowtimes.com/article/499603.html

[43]Eirik Mikkelsen, "Not important shipping route – yet," norut - Northern Research Institute (2012). Accessed 13 December 2014. http://norut.no/en/news/not-important-shipping-route-yet

is interested in promoting the development of the NSR, as well as asserting its exclusive jurisdiction over it.[44] Currently, Arctic shipping is primarily intra-Arctic, transporting goods from one Arctic port to another. With no direct security threats to Arctic shipping, geopolitical security questions may spill over to affecting NSR transit. Still, when the scales between geopolitics and money are evaluated, geopolitics weigh less. Should the NSR become more popular, the impact of western tensions with Russia would be negligible, as long as western shippers are willing to pay the tolls needed to pass.

When maritime security fails along any of these routes, prices shift, states are called upon to respond, or shipping companies decide to turn private security firms in order to protect their cargo. With all of these complicated decision points, it is unsurprising that so many shipments from China to the US go directly across the Pacific Ocean to the popular ports of Los Angeles and Long Beach.

All in all, route choice is a balance between risk mitigation, cost, time, and reliability, with each element tied into security concerns. As a response, hundreds of different security firms now offer maritime protection services, with the UK serving as a hub for these firms. With the continued willingness of shippers to employ maritime security firms,[45] maritime route security will continue to be a burden primarily dealt with in the private sector, but enabled through state actions.

3.4 Insurance Considerations

Insurance is an important complement to any shipping endeavor, as it can offset the potential losses due to risks encountered. It also shifts actors' willingness to engage in security incidents. In essence, maritime insurance is the monetization of maritime security.

Maritime insurance has existed since the advent of modern shipping. In 18th century, underwriters took on the risk of losses in return for a proportion of the profits. They soon learned to inspect ships before deciding whether to insure them, leading to the first classification societies and ships standards. In 1906, the UK's Marine Insurance Act was enacted, leading to new standards in maritime insurance worldwide. Today, maritime insurance encompasses a wide range of categories, from insuring aspects of the ship to the items being transported; most relevant for a company is cargo insurance. Cargo insurance covers the specific cargo of the ship, as well as passenger belongings. Insurance coverage is often either based on the voyage, covering the time the goods are between ports, or more commonly, a specified time period.

Insurance is important because of its role in the event the security of the goods is threatened. If the goods are replaceable, and insurance premiums acceptable, it becomes more viable to write goods off, rather than seeking their recovery. However, when insurance premiums rise to untenable levels, the calculus shifts. The calculus for crewmen lives is quite different. In the case of piracy, the focus on ransom is on the lives of the crew, rather than ransoming the cargo. This focus is for simple reasons: pirates rarely know what cargo they have captured. By contrast, the ransom for people is much more straightforward: about $2 million (USD) per person.[46]

As piracy rose in 2008, there were questions whether the marine insurance industry would be

[44] Margaret Blunden, "Geopolitics and the Northern Sea Route," International Affairs 88:1 (2012): 115-129, doi: 10.1111/j.1468-2346.2012.01060.x

[45] Oliver Bennett, "Private security: The high seas' unsung heroes." Management Today, October 2013, 38.

[46] Ibid.

able to handle the rise in payouts. Still, premiums charged more than covered the payouts.[47] Insurers were also more concerned with commodities shipments, such as oil tankers, as these ships are easier to seize by pirates. Because of their construction, container ships ride higher in the water, making them harder to take by the small boats pirates use.[48]

In sum: a company will choose to insure cargo based on risk tolerance. Insurance has an effect on the value of piracy, and, in turn, piracy can increase the value of insurance. The containers of widgets on their way to Nebraska from China are at little risk, because they are on a container ship. Further, the rate of incidents is low, depending on the route taken. Still, the company is likely to want to have an insurance policy in place to buffer any losses. As a result, the company would insure.

4 Maritime Trade and Maritime Security: Inseparably Linked

Day-to-day maritime security ensures the safe passage of container ships, oil tankers, bulk carriers, and all the other vessels that transport goods and people over the seas. In turn, the security of maritime sea-lanes, ports of call, and the infrastructure supporting sea-trade are essential to the global and national stability. Without consideration of the maritime trade dimension in maritime security, states risk undermining the trade upon which the global economy and nations so depend.

While trade represents business decisions, policy makers and businesses must recognize that these are decisions made in a highly geopolitical environment. This has been true since the beginning of international shipping, but has become particularly true in our ever-more inter-dependent world. The decisions presented in our hypothetical are multiplied over thousands of companies and thousands of shipments each year. Companies make decisions based on their own immediate cost-benefit analyses. Yet, their decisions are have influenced by and affect the maritime security environment.

Somali pirates would not have become so powerful if they had not been located near a bottleneck of major trade routes. Similarly, the Suez and Panama Canals are located in volatile regions of the world. The trade implications of any instability surrounding the canals heighten interest and tensions in these regions. The canals are choke points in maritime trade, and thus are a scarce resource. "Resources that are both economically important and scarce can produce conflict between the nations and groups who need and/or use them."[49]

As countries and ports collaborate to improve maritime security, both of ports and of ships with the goods they carry, a framework of governance is emerging. The high seas are still a global frontier, but this does not mean that they are a lawless Wild West. The maritime industry, specifically the shipping industry, has developed a robust self-governance structure that has supported trade and commercial stability over the centuries. Governments and international organizations have mostly built upon that structure to good effect.

The interests of governments play an important role, particularly in protecting their territory

[47] Rawle O. King, "Ocean Piracy and Its Impact on Insurance" Congressional Research Service. December 3rd, 2008.
[48] Ibid.
[49] Donna J. Nincic, "Sea Lane Security and U.S. Maritime Trade: Chokepoints as Scarce Resources," Globalization and Maritime Power, ed. Sam J. Tancredi (Washington, DC: National Defense University Press, 2002), 139.

and people. However, maritime trade operates in a global commons. Protecting the "Critical Infrastructure" of maritime trade must happen at a global level. International organizations will need to complement private sector solutions in order to protect maritime security for the good of global economic resiliency. A multi-stakeholder model in maritime security is essential for the future of maritime trade.

The next logical question to address is the relative role of actors in the multi-stakeholder model and how to most effectively sustain maritime trade's resiliency and security. However, addressing the question would require an entire article itself. Questions which would, ideally, be addressed include:

- Should stakeholders work to simplify the governance structure, or should they accept the complexity of overlapping jurisdictions as part of maintaining flexibility?
- How should states protect their self-interest without damaging the global common good that is maritime trade?

About the Authors:

Caroline Troein specializes in business and policy strategy in technology contexts. She currently works as a researcher at the Fletcher School. She focuses on strategic technologies in the global commons, applying systems analytics and security studies to cyber, space, and maritime questions. She has worked as a consultant on cross-country user technology behavior. Before that, she worked as a Congressional staffer in the US House of Representatives, where her policy portfolio included technology, space, and cyber issues. She also has a strong interest in the Arctic, having traveled there and worked on conferences addressing strategic implications of changes in the region.

Anne Moulakis has been studying and working with maritime affairs since 1991. Maritime affairs were a central theme in her MA in Mediterranean Studies at the Department of War Studies, King's College London and during her current studies at the Fletcher School. Prior to Fletcher, as a legislative aide for US Senators Wellstone and Boxer Anne worked with maritime affairs by covering transportation, commerce, environment, defense and foreign policy. Subsequently, Anne spent seven years as a political and counter-terrorism analyst for the US Department of Defense. More recently, Anne helped develop an education campaign in support of improving US fishery management for the Ocean River Institute, and is currently the project coordinator for Fletcher's Fourth Annual Warming Arctic Conference.