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Cost Bearers and Beneficiaries of Port Security Investments under the Contemporary Maritime Security Dispensation: Two Sides of the Same Coin?

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ABSTRACT

The concepts of 'port security' and 'maritime security' are interdependent in practice, and the contemporary maritime security dispensation was triggered by the 11 September 2001 (9/11) incident in New York which, ironically, took place on land. The international community and by extension all maritime security stakeholders were ferociously challenged to rethink their strategies and redefine their functional roles with respect to maritime security. The understanding was that any security regime elastic enough to accommodate maritime terrorism with all its facets would obviously accommodate minor related security threats as well. Spearheading this whole effort was the US, followed by Europe. In order to ensure sustainable port security through appropriate investments, it is useful to understand which stakeholders within the maritime industry will bear the costs or stand to benefit relative to such investments, and questions arise as to how best to proceed with an analysis in this regard. This article thus discusses port security investment issues in the post 9/11 era, drawing extensively from US and European secondary sources, although issues concerning Africa and elsewhere are also briefly considered. It discusses the raison-d'être of port security investments from the general and economic perspectives with illustration from the estimated costs and impact of some major global, regional, national and private security measures and initiatives. The article concludes that port security investments are of benefit to 'everyone' and while some stakeholders may try to offset the costs, everyone somehow pays, or at least has to bear the costs as well.

Keywords: *Port security, Maritime security, Port investment, Stakeholder*

I. INTRODUCTION

'Port security' has been variously defined. However, for our purposes, a practical definition for the term may be given as follows:

> [*T*]*he state where a port facility, including its terminals, personnel and all its related infrastructure, as terminal berths and navigations channels,*

[1] Ministry of Transport, Yaounde, Cameroon.

> *vessels at the port, its crew, passengers, service providers during operations at the port, Customs Maritime Units and in general, customers of the port, are free from any unlawful act of violence such as terrorism, sabotage, armed robbery and illegal transportation of drugs and weapons among others* (Nordfjeld, 2018).

Although 'port security' and 'maritime security' involve different types of risks or threats, in practice they are interdependent and interrelated (*ibid*). In fact, 'port security' is a component of 'maritime security', and the latter itself refers to "*the state of being free from the threat of unlawful acts such as piracy, armed robbery, terrorism, or any other form of violence against ships, crews, passengers, port facilities, offshore installations, and other targets at sea or in coastal areas*" (Mejía, 2007). The term thus has to do with those measures employed by owners, operators and administrations of vessels, port facilities, offshore installations and other marine organizations or establishments to protect against maritime security threat. It follows that in discussing port security one ought to keep in mind that ports are a complex of multipart organizations in which functions and players interact at various levels (Vaggelas, 2006). Therefore, the scope and dimensions of port security transcend the International Maritime Organization agenda of 'facility' to include logistics and supply chain security (*ibid*).

Port security was never really given much attention before 9/11, especially in terms of the threat of maritime terrorism. If one takes the case of the United States, for instance, in 2000 the Interagency Commission on Crime and Security in U.S. Seaports defined port security merely as "*the protective measures taken to prevent crime and maintain a state of freedom from danger, harm, or risk of loss to person or property*" (Haveman & Shatz, 2006). Consistent with this definition is the fact that in the fall of 2000 security at America's ports was labeled as generally poor or fair, so much so that immediately after the 9/11 attacks the greatest impediment to improving port security seemed to have been the extent to which it had previously been neglected (*ibid*).

Similarly, in Europe the enhancement of port and supply chain security was not a major policy issue, nor was it treated as a necessary factor to be tackled by the companies involved in trade and transport (Pallis and Vaggelas, 2007). This could be explained in part by the fact that security-related disruptions in maritime transport were rare. Little wonder, therefore, that security focus, if any, was restricted to piracy and armed robbery against ships (*ibid*).

The situation was not any better on the continent of Africa, to say the least. A tip of the iceberg would be the case of Tema Port in Ghana where the security measures put in place were pretty

lamentable (Williams, 2009). The port's perimeter fence, for instance, was incomplete while the completed portions were dilapidated, thereby serving as access routes for unauthorized persons to enter port, with all the attendant safety and security risks (*ibid*).

This article thus focuses on post-9/11 port security as it was the World Trade Centre attacks that accelerated work on coherent security measures in maritime transport not only at the international level, but also at the regional and national levels. In this regard, it would be interesting to know what major port security investments have taken place around the world since 9/11 and also have an idea concerning the costs and benefits associated with such investments. This means attempting to answer the following two interrelated questions:

- Who invests in port security and what is the nature of such investment?
- Who benefits from port security investments and what is the nature of such benefit?

A hypothetical consideration here is that the international community, regional blocks, individual governments and even the private sector of shipping have all adopted measures and initiatives aimed at averting maritime violence, including terrorism and its ramifications, and the pecuniary and non-pecuniary benefits of port security investments are enjoyed in various ways and in varying degrees among all port security stakeholders and users. If this hypothesis is valid, then "everyone" pays for port security investment and also stands to benefit from it, either directly or indirectly, yet it is important to discover how and why this is so. One may also wonder if some stakeholders may not want to try to shift some of the costs unto others. What is germane, though, is for the shipping industry to appreciate these various aspects from a holistic perspective because ensuring port security for all stakeholders is a challenge that has come to stay.

II. JUSTIFICATION FOR PORT SECURITY INVESTMENTS

Port security investments may be justified based on 'general or 'economic' considerations.

(A) General considerations

Maritime transport is the backbone of international trade and the global economy. Around 80 per cent of global trade by volume and over 70 per cent of global trade by value are carried by sea and are handled by ports worldwide.[2] There is thus no overemphasizing the fact that the impact of a major maritime security incident such as a terrorist act on the global trade could be huge indeed.

[2] See: https://unctad.org/webflyer/review-maritime-transport-2018

Some scholars have stated that the security risk in maritime transport equals to the combination of two factors, namely, the vulnerability of the maritime transport system and the consequences of a successfully undertaken unlawful act (Vaggelas, 2006). The consequences of such an act are related to two respective measurable magnitudes – the possible number of fatalities and the economic impact of the unlawful acts (*ibid*). The latter is calculated in relation to three variables, namely, the reconstruction costs, the disruption time of the transport flow, and the volume of transport flow (*ibid*). In any event, it is noteworthy that the primary damage of any terrorist attack in terms of direct destruction of lives and capital would be proportionally small as there are likely more attractive targets with high population and asset destinies in most countries (Leamer & Thornberg, 2006). The secondary effects, conversely, might be substantial indeed (*ibid*).

It follows that the economic and strategic situation of a port determines the scale of the terrorist threat related to it. For example, it is logical to assume that a successful terrorist attack on the port of Douala in Cameroon would have a far less impact, in economic terms, than an attack on the port of Singapore. The example of a US port may be helpful in understanding the possible scale of the impact of a terrorist attack on a port. – viz:

> *There are two types of threats related to ports: (1) direct attacks on the ports themselves and transport of dangerous material through ports for use in terrorist plots elsewhere in the country. Like any terrorist attack, an attack on a port would cause injury, death, and have terrible economic and social consequences. Damage to infrastructure and the destruction of inventory in port could seriously disrupt trade not only in the U.S., but also around the world. The damage would be on the order of one hundred times greater if a nuclear device were detonated in a major American city such as New York or Washington, D.C.* (Veronique de Rugy, 2007).

In light of the foregoing, it is useful to recognize that port security investment is a notion that touches on such considerations as the global economy and trade, governments, port authorities, businesses involved with security systems, the supply chain, tax payers, customers etc. (Barbullushi, 2010). In fact, it could be argued that everyone has a stake in port security essentially because of the huge dependence of the global economy on shipping.

(B) Economic Considerations

Scholars have come up with various approaches in calculating the economic effects of a terrorist attack on any point within the supply chain, e.g., a port. It is beyond the scope of this

paper to dwell on these approaches. However, for illustrative purposes, this paper has drawn extensively from "The Costs of a Terrorist Attack on Terminal Island at the Twin Ports of Los Angeles and Long Beach", (Gordon, *et al*., 2006, p.p. 71-89). The authors begin by stating the economic value of the twin Ports of Los Angeles and Long Beach in terms of employment and household income, seaborne trade etc. Using terrorist radiological bomb attack simulations and based on some calculations, they come up with a number of tables showing various ways by which such an attack would affect the economy of Southern California and the US. Two of their tables (at p. 78) have been borrowed and are hereto labeled as **Table 1** and **Table 2**, respectively. The simulations are on a relatively simple terrorist attack simultaneously blowing up three bridges plus a related rail bridge accessing terminal island at the Los Angeles-Long Beach port complex.

Table 1

Output and Employment Losses from a 15-Day Closure of the Ports of Los Angeles and Long Beach following terrorist attack

	Output ($ Millions)				Jobs (Person-Years)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
City of Los Angeles	264	94	65	423	1,186	724	729	2,639
City of Long Beach	69	12	7	88	502	80	75	657
Los Angeles County	657	220	157	1,034	3,091	1,654	1,768	6,513
Orange County	156	62	45	262	688	480	501	1,669
Ventura County	43	18	12	73	182	121	131	435
Riverside County	37	14	13	64	163	111	147	421

San Bernardino County	53	20	16	89	230	152	186	568
Sum of five counties	946	334	243	1,522	4,354	2,519	2,733	9,606
Out of region	1,782	515	440	2,736	8,050	3,907	4,957	16,914
Total	2,728	849	683	4,259	12,404	6,427	7,690	26,521

Source: (Gordon, *et al*. 2006, p. 78).

NB: Columns and rows may not sum to totals because of rounding.

Table 2

Output and Employment Losses from a 120-Day Closure of the Ports of Los Angeles and Long Beach following terrorist attack

	Output ($ Millions)				Jobs (Person-Years)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
City of Los Angeles	2,113	753	520	3,385	9,492	5,788	5,831	21,111
City of Long Beach	554	93	53	700	4,008	640	601	5,249
Los Angeles County	5,252	1,759	1,260	8,271	24,722	13,233	14,142	52,097
Orange County	1,247	496	357	2,100	5,502	3,841	4,009	13,352
Ventura County	345	143	93	581	1,459	971	1,052	3,482

Riverside County	296	115	102	513	1,306	890	1,175	3,371
San Bernardino County	424	161	129	715	1,842	1,218	1,487	4,548
Sum of five counties	7,564	2,674	1,941	12,179	34,831	20,154	21,865	76,850
Out of region	14,256	4,116	3,520	21,892	64,401	31,259	39,655	135,316
Total	21,820	6,791	5,461	34,071	99,232	51,413	61,520	212,165

Source: (*ibid*)

NB: Columns and rows may not sum to totals because of rounding.

It is obvious that the relatively simple terrorist attack as described earlier could inflict massive damage to the economies of Southern California and the United States. Furthermore, the extent of such damage would depend on the length of the interruption in shipping activity, which in turn would depend on policy decisions regarding the pace of rebuilding, etc. It is thus safe to state, rather laconically, that port security investments are necessary in order to prevent far more costly consequences in case of a terrorist attack.

III. PORT SECURITY MEASURES AND INITIATIVES

Port security measures and initiatives could be international, regional, or national in character.

(A) International, regional and national measures and initiatives

As already indicated, transport security has become a vital issue since 9/11. Consistent with this is the fact that security of the whole supply chain, including ports, has been transformed into a key theme of public port policies (Pallis & Vaggelas, 2007). It is in that light that regulatory measures and initiatives aiming to minimize risk and increase the security and operational reliability of the port sector have been introduced at the national level (e.g., the USA); peripheral/supranational level (e.g., the EU); and international level (e.g., the International maritime organization or IMO) (*ibid*). It is useful to note that port security

measures and initiatives, whatever their emanating point, do filter down to the private sector of shipping where some further specific/adapted measures may be taken as well. After all, is it not true that most of the elements within the supply chain have to do with the private sector, essentially? This brings into focus stakeholders such as the port operator or concepts such as cargo handling in general. Private sector considerations are discussed under paragraph 3.2 below.

At any rate, **Table 3** below gives a list of some of the major port security measures and initiatives that have been taken world-wide under the contemporary maritime security dispensation. Needless to add, it is beyond the scope of this article to attempt to present an exhaustive list.

Table 3

Some major world-wide port security measures and initiatives taken since 11 September 2001

US Led	EU	International
1. **Container Security Initiative (CSI):** Programme led in the mid-2000s by U.S. Customs and Border Protection in the Department of Homeland Security focused on screening containers at foreign ports. CSI is implemented on a reciprocal basis, allowing participating countries to send their customs officers to major US ports in order to inspect containerized cargo being exported to their countries).	**1. European Council Declaration of March 2004:** It called for the strengthening of the security of all forms of transport through the enhancement of the legal framework and the improvement of prevention mechanisms. The reaction to this was to decisively co-ordinate European reactions in the aftermath of the endorsement of the CSI by the US in 2003.	**1. International Ship and Port Facility Security Code (ISPS Code):** The ISPS Code was a 2002 amendment to SOLAS and it is an International Code for the Security of Ships and of Port Facilities.
2. **Customs-Trade Partnership Against Terrorism (CTPAT):** Voluntary compliance programme for companies to improve the security of their corporate supply chains. This is an initiative operating on a voluntary basis with participants enjoying specific benefits as a motive for joining it. The most important one is the Green Lane award According to which, Green Lane awarded operators are exposed to less customs inspections and consequently, decreased clearness time for cargo and customs procedures in US ports.	**2. EU Regulation 648/2005:** It details a revised EU custom code, in turn setting up common European secure custom systems. The revised customs code introduced measures to tighten security for goods entering or leaving the EU.	**3. ISO/PAS 28000:** Established by the International Organization for Standardization, it has to do with *specification for Security Management Systems for the Supply Chain*. It offers public and private enterprise an international high-level management standard that enables organisations to utilise a globally consistent management approach to applying supply chain security initiatives.
3. 24-hour Advance Cargo Declaration (ACD), 24-hour Advance Manifest Rule (AMR): Introduced under the Trade Act of 2002, it has to do with maritime transport advance information to assist targeting.	**3. Authorized Economic Operator (AEO) status:** This is a core element for enhancing supply chain security. When an operator complies with the administrative rules and supply chain security requirements, as defined by the EU Custom Code, he is awarded	**Global Trade Exchange data-mining programme:** Designed to collect financial information about shipments, with the objective of determining if cargo shipments are safe.

	the AEO status and experiences reduced customs inspections (a status similar to the Green Lane award that is established in the United States under the C-TPAT regulation).	
4. Operation safe Commerce: A richly-funded set of intelligent freight technology, it deals with e-seal, intrusion detection, radiation and biological detection sensors, non-intrusive scanners etc.	**4. Regulation 725/2004:** Tackles the issue of security at the ship/port interface.	**Framework of Standards to Secure and Facilitate Global Trade:** Adopted in 2005 by the World Customs Organization (WCO), it consists of supply chain security standards for Customs administrations, including Authorized Economic Operator (AEO) programmes.
	5. Directive 65/2005: Directive 65/2005 Relates to the enhancing of security in the broader port area, giving particular attention to RO/RO vessels carrying passengers and vehicles.	**Pilot private sector company initiatives:** In the mid-2000s some initiatives were taken by private sector companies to track and monitor the integrity of cargo containers moving around the world using technologies such as RFID and GPS.
	6. European Programme for Critical Infrastructure Protection (EPCIP): Aims to cover the infrastructures that are vital for the EU. European critical infrastructures are those physical resources, services and information technology facilities, networks and infrastructure assets or parts thereof that if disrupted, or destroyed, would have a serious impact on critical social functions, supply chain etc.	**Strategic Council on Security Technology (SCST):** Launched Smart and Secure Trade lanes (SST) in the mid-2000s.

Source: Drawn from (Lee, 2005), (Pallis & Vaggelas, 2007) and some on-line sources.

(B) Costs and impact of international, regional, national and private sector port security investments

As pointed out earlier, port security measures taken at the international, regional or national level will eventually filter down through the supply chain, involving as it were the private sector. In fact, the private sector of shipping does sometimes come up with security initiatives as well. The costs and benefits associated with these investments are bound to impact on all stakeholders and port users either directly or otherwise. To try to elucidate the issues involved here, this sub-section presents two tables (below). The first, **Table 4**, is a basic indication of some costs involved in implementing the International Ship and Port Facility Security (ISPS) Code in the United States, while the second, **Table 5**, is indicative as well, but with respect to a private sector initiative in the European Union. Following each of the tables is a brief cost-benefit analysis consistent with the subject of this article.

Table 4

Summary of OECD[3] and USCG[4] estimates of ISPS Cost Compliance for US Ports ($ million)

	Nature of estimates	Initial costs	Annualcosts	Indirect costs
Port Facility Security Assessment (PFSA)	US Port Costs (US Coast Guard) Global Port Costs (OECD)	23 27.9	1 0.8	0 0
Port Facility Security Plan (PFSP)	US Port Costs (US Coast Guard) Global Port Costs (OECD)	23 27.9	1 0.8	0 0
Port Facility Security Officer (PFSO)	US Port Costs (US Coast Guard) Global Port Costs (OECD)	335 Undetermined	335 Undetermined	Undetermined Undetermined
Security Training Drills	US Port Costs (US Coast Guard) Global Port Costs (OECD)	17 Undetermined	52 Undetermined	Undetermined Undetermined
Security Staff/Equipment	US Port Costs (US Coast Guard) Global Port Costs (OECD)	565 Undetermined	146 Undetermined	Undetermined Undetermined
Total ISPS	US Port Costs (US Coast Guard) Global Port Costs	963 Undetermined	509 Undetermined	Undetermined Undetermined

[3] 'OECD' stands for Organization for Economic Co-operation and Development, an international organization that works to build better policies for better lives.
[4] 'USCG' stands for United States Coast Guard.

	(OECD)			

Source: (Pallis & Vaggelas, 2007, P. 8)

Generally speaking, the costs of implementing the ISPS Code depend on the peculiarities of each ship or port, rather than on a standard and uniform approach for every ship or port, the challenge being to address potential ways of financing the implementation (*ibid*).

There are three distinctive approaches as regards the financing of such implementation. These are:

- The facility operators might finance the entire cost which is then recharged to customers;
- The port authority might cover the financial burden; and
- The cost might be shared between different parties, for instance the state, the port authority and the port operator(s), with each one assuming responsibility for recovering its own costs (UNCTAD, 2006).

Table 5

Major costs of some private sector mandatory and voluntary security schemes in the EU: A Comparison

Cost	Mandatory	Voluntary
Supply chain companies	€60 billion	€12.1 billion
Member States (audit, implementation)	€ 2.7 billion initial three years period + €1,167 billion p.a	€ 514 million initial three years period + €227 million p.a.
Enforcement	€450 million + €50 million p.a.	€450 million
Coverage (freight flows)	100% (4.75 million companies)	75% (904.500 companies)

Source: (DNV Consulting, 2005), cited in (Pallis & Vaggelas, 2007)

The endorsement of either the mandatory or voluntary scheme provided in Table 5 will extend the societal benefits resulting from trade facilitation, the reduction of the risks of human casualties and economic damage from a security incident, and the increased confidence in the

supply chain (Pallis & Vaggelas, 2007). Furthermore, for the participating companies there are further benefits resulting mainly due to the reduction of cargo theft, the prevention of damage to the brand, and the reputation of a company (*ibid*). Indeed, it is generally agreed that a cargo theft reduction by 10% within the EU supply chain will result in €10 billion savings for the EU economy (*ibid*). It could be said, therefore, that the short-term effects might be negative due to the required investments, but the medium to long-term impacts are likely to be beneficial, at least for the certified and recognized operators involved.

IV. CONCLUSION

It is difficult to rely on a study of this nature in drawing a clear-cut line between cost bearers and beneficiaries within the context of port security investments under the contemporary maritime security dispensation. A related consideration is that stricter security measures produce ancillary economic effects, including invisible collateral benefits and costs which are difficult to be measured in a context in which there is no security incident in reference. Nevertheless, it would be safe to say that everyone, from the ordinary user who benefits from trade, the private security company operating within the port, the port operator and every other link within the supply chain, the national, regional and global economy stands to gain in some way from port security investments. All these port stakeholders and users also bear some costs as well. The state, for example, is able to fund port security measures through taxes from citizens and money used through the port authority to fund maritime security comes from the budget, etc.

The critical point, though, is that the shipping industry does not seem to be willing to bear the costs. In the case of ports, for example, the various ownership and management structures result in the absence of a uniform financial scheme. Thus, some ports are known to have increased port tariffs in order to recover security costs; others have imposed a separate ISPS tariff (e.g., the port of Rotterdam). Other ports have opted to finance the cost of instruments such as the ISPS implementation from subsidies.

The fact, though, is that port security investment has come to stay. Accordingly, the ‘beneficiary pays’ principle might just be one sure way forward, meaning the shipping industry would have to continue to impose higher prices on those who benefit from port security investments. The state, for its part, will have to continue to assume its responsibilities, by imposing higher taxes or simply making sure that port security investments are adapted to any given context.

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