



# THE ECONOMICS OF MARITIME SECURITY

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## 1. Introduction

- Since 11/09/2001 there has been a general heightened awareness about security
- This is generally true in the area of maritime transportation and facilities
  - Maritime facilities such as seaports and ocean-going ships are naturally attractive targets for terrorists
  - Best practices for designing and implementing maritime security is therefore an important way for achieving the most effective security system
- However, implementation of maritime security entails effective collaboration across various parties in the supply chain and entails considerable costs; thus, it has raised a number of economic issues and questions
- This preliminary paper aims to examine the economic implications of maritime security:
  - Evaluate the technology requirements
  - Evaluate its compliance costs and benefits
  - Analyse the issue of how the costs should be shared

## 2. Overview of Maritime Security Initiatives

**Table 1: Maritime Security Initiatives by the US and International Groups**

<i>Initiatives</i>	<i>Date</i>	<i>Summary</i>
C-TPAT (Customs-Trade Partnership Against Terrorism)	2001, Nov	Voluntary cooperative anti-terrorism partnership with business to improve international supply chain and the US
OSC (Operation Safe Commerce)	2002, Apr	Designed to track and trace import intermodal cargo on a real time basis to get at problem shipments
SST	2002, Oct	Comprehensive and practical security initiative for intermodal cargo community
CSI (Container Security Initiative)	2002, Nov	Designed to screen containers before departing for US ports
24H Rule	2002, Dec	Filing cargo with US customs at foreign ports electronically 24 hours prior to loading
MTS	2003, Oct	Applies to all US ports including facilities and vessels (foreign and US) operating within the port
ISPS (International Ship and Port Facilities Security) Code	2004, Jul	Provides a standardized framework for evaluating risks
Safe Port Act	2006, Oct	Codified into law a number of programs to improve security of US ports; requires radiation detectors and scanning of all

### 3. Technology Requirements

- Maritime technologies have been developed in phases:
  - First generation is characterised by policy formulation, procedures and funding processes
    - For example, US DHS dispatched their security inspectors of SAFE Port Act to 58 major ports
    - DHS is undertaking 180 days evaluation process to check if the SAFE Port Act is an effective measure
  - Second generation technologies are more oriented towards integrating various technologies to facilitate interoperability among different technology systems and architectures developed in the first generation
  - The third generation are currently developing toward tailored solution geared for more customised purpose

### 3. Technology Requirements

**Table 2: New Maritime Security Technologies**

<i>Initiatives</i>	<i>Summary</i>
E-seal technologies	Developed by Savy-Technology, used to protect cargoes from unauthorized break- ins
Bio-meter ID information on seafarers' ID documents	Designed to store photos, fingerprints and other ID information of sailors
Intelligence Video	Can see what humans can miss using cameras in motion
PORCO CCTV	Designed to track movements of goods from manufacturing all the way to the end of the supply chain
Mobile Maritime Credential Checking	Facilitates fast control and monitoring between headquarters and local offices
Underwater Surveillance using SONAR technology	Can check suspicious divers in coastal areas with low visibility using hi-resolution scanning SONAR
OPPI Verispreader	Sensors attached to spreaders of container cranes; information taken through sensors can be transmitted anywhere . PSA is considering to use this system while Matson is testing this technology at one of their terminals
Satellite container monitoring: Autonomous Node Transportation System (ANTS)	Enables information to be taken via reusable tags to be provided for customers via satellites anywhere in the world; ANTS tags can be attached to container boxes, carriers or logistics providers' equipment and facilities and information taken from the tags is transmitted via satellite system' ANTS can talk to each other

## 4. Economic Issues

- What are the economic benefits and costs of Implementing these initiatives?
- Is this cost fair and proportional to the benefits of
- Maritime security?
- How should these costs be shared among the participants?

# Economic Benefits

- Although there is some agreement on the political benefits and the disruption costs that can be saved from an effective security system, there is still controversy over whether its benefits will exceed its costs.
  - Impact of maritime security on operational efficiency
    - Most empirical studies are focused on the negative implications of maritime security (Wolfe, 2002; White, 2003; Thai, 2007)
    - Other empirical studies (i.e. Abbot, 2002; Thai, 2007) pointed to positive implications for efficiency
      - When their level of IT and TDI utilization is quite limited prior to the Installation of security measures
      - Investments in IT accompanied by improvements in operational processes And procedures would lead to more transparency and visibility in transactions, Increased speed of service performance
      - Efficient exchange of information

## Economics Costs

- Compliance costs remain main hindrance for SMEs
  - 2 Types of compliance costs
    - Cost of implementation
      - Cost of training officers
      - Investments in IT and other equipment
    - Cost of ineffective security management
      - Cost of damages
      - Opportunity cost
- Are the costs exceeding the potential benefits of maritime security?
  - The costs are easy to measure but the benefits are hard to measure while some benefits are external

# Economic Costs

- How should the costs be shared?
  - Debate in the US: Federal, State, Local Governments, Maritime industry, or cost sharing arrangement?
    - Some argue that the Federal government should foot the bill since this is a national concern
    - Others argue that the costs should be paid by shipping lines based on user-pays principle
      - Based on efficiency and equity principles
      - All beneficiaries will pay and the share of the costs should be proportional to their benefits

# Economic Costs

- This paper argues for beneficiary–pays principle but due to measurement and free rider problems, this principle can only be approximated.
- It is suggested:
  - Ports in the same region will contribute to the establishment of a common fund based on their market shares of maritime trade
  - It is then up to the ports how they should pass on this cost to the shipping lines and shippers
  - Inter–port competition and compromise on safety and security standards
    - This can be minimized by instituting a mechanism for Monitoring port performance and implementation of security standards

## 5. Conclusion

- Economics no doubt is an important part of maritime security
- It is therefore important to examine the costs and benefits of compliance and the costs should be shared
- This is just a preliminary attempt to consider the economic issues and is not meant to provide solutions as much as stimulate more discussion of important economic aspects of maritime security



*Thank You!*

