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FLAG STATE PERFORMANCE AND THE
IMPLEMENTATION OF PORT STATE CONTROL IN
THE EUROPEAN UNION

by

ARMANDO GRAZIANO



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Flag State Performance and the Implementation of
Port State Control in the European Union

Armando Graziano

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Flag State Performance and the
Implementation of Port State Control
in the European Union
a mixed methods approach

Armando Graziano
Italy

A dissertation submitted to the World Maritime University in partial fulfillment of
the requirements for the award of the degree of Doctor of Philosophy
in Maritime Affairs

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A mio padre e mia madre

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Abstract

The implementation and enforcement of international maritime safety standards by Member States has always represented a key objective for both the International Maritime Organisation (IMO) and the European Commission (EC). In spite of a strong global legal framework for safety at sea, harmonisation has always been a challenge. Two points are relevant here: firstly, the level of implementation and enforcement with international regulations varies significantly among countries; secondly, it is a challenge to determine and/or quantify this level of compliance.

Several attempts have been made by the maritime industry, academic studies and policy-makers to develop an appropriate set of criteria and/or measurements to benchmark the performance of Flag States. Currently, the White, Grey and Black list (WGB) list of the Tokyo and Paris Memoranda of Understanding (MoU) on Port State Control are the most widely used indicators. While the list was initially developed solely for targeting purposes, it has been recently criticised in recent academic publications and by the industry for being unsuitable to benchmarking Flag States with a small fleet and to be susceptible to a lack of harmonisation. Moreover, the author argues that, given the way the list has been used, it reduces the overall concept of Flag State Performance (FSP) to an overly simplified detention/inspection ratio.

This dissertation begins with an investigation and examination of Flag State Performance by looking into its underlying concept and connected components. The main aim is to contribute to the general knowledge on the performance of complex systems according to policymakers. Subsequently, this dissertation makes an assessment of an inspection's results as a tool to evaluate the performance, shortcomings and benefits of the complex system under examination. Four research questions have therefore been formulated: (1) *What is Flag State Performance?* (2) *What are the contemporary issues of Port State Control (PSC)?* (3) *How do discrepancies in the Port State Control regime affect the inspection output?* (4) *To what extent is Port State Control a suitable instrument to measure Flag State Performance?*

The dissertation is divided into two main parts. Part I presents the main research questions, the methodological and theoretical discussion, the main findings; and a round-up discussion. Part II contains the four research papers based on data gathered throughout the study.

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1. Introduction

1.1. Historical Background

The implementation and enforcement of international standards by Member States has always been a concern for the International Maritime Organisation and the European Commission (Özçayır, 2009). While some states have a robust administrative structure that supports an effective implementation and a strong enforcement mechanism, others seem to be lacking in that respect. Accidents, such as the *Amoco Cadiz* (1978), *Aegean Sea* (1992), *Braer* (1993), *Erika* (1999), *Prestige* (2002), among others, caused a strong political and public outcry which fostered the perception of the inability of some registries to maintain a functioning administration and a legal framework in order to meet their implementation and enforcement obligations under international law (Kovats, 2006).

The IMO Member States' initial response was to adopt a resolution regulating, among other maritime tasks, the delegation of authority (IMO, 1993) to so-called recognized organizations. Over the years more guidelines were adopted leading to a more comprehensive approach, which was a self-assessment of the performance of a Flag State (IMO, 1999). Unfortunately, this voluntary approach did not elicit the anticipated response among Flag States given that as at November 2003 only 18 self-assessment forms were received (Mansell, 2009b, pp. 141-143). It was therefore necessary to shift the effort towards harmonised implementation and enforcement provisions to a higher level. This was achieved with the adoption of the first version of the Code for the Implementation of the IMO Instruments (III Code) in 2005 (IMO, 2005), which was amended several times until it was made mandatory in 2013 (IMO, 2013), with an expected effect on compliance and harmonisation from 2016 onwards, when it became mandatory.

In parallel, the European Union (EU) was always supportive of any development related to the implementation and enforcement of maritime safety standards. However, the extended periods of time that it took to discuss developments in IMO have always been of concern to EU Member States (Nengye & Maes, 2012). Maritime safety regulations¹ had first been established in EEC at the end of the

¹ In response to the oil spill cause by the *Amoco Cadiz* in 1978, the Council adopted Resolution OJ C162 of 08/07/1978, setting up an action programme on the control and reduction of pollution caused by hydrocarbons discharged at sea. On 21 December 1978, the Council also adopted

1970s, although more effectively in the 1990s, thereby strongly encouraging EU Member States to ratify outstanding IMO conventions. The focus of the EU changed after the *Erika* (1999) and *Prestige* (2002) accidents when the EC, with the ERIKA packages², started to work more proactively and more independently from the regulatory trends in the IMO. Since then important decisions have been taken, such as the development of a dedicated European Maritime Safety Agency (European Parliament and the Council, 2002).

However, the main initiative intended to fill the vacuum left by Flag States and the industry in ensuring proper monitoring and control of their fleet, was the emergence of the various regional agreements on Port State Control, an inspection of foreign-flagged vessels in national ports to ensure that safety, pollution prevention and labour standards are met. The precursor of this initiative was the Hague Memorandum of Understanding that was signed in 1978 by eight North European States. They decided that the recently adopted International Labour Organization (ILO) 147 Convention³ deserved a proper follow-up (Özçayır, 2009).

The ink on the Hague Memorandum had hardly dried when the *Amoco Cadiz* ran aground off the coast of France, spilling more than 200,000 tons of oil. This made it loud and clear that the shipping industry had failed to cope with new challenges and, more importantly, in self-controlling its vessels (David Anderson, 1998; Bell, 1993; Mansell, 2009b; Vorbach, 2001; Özçayır, 2004). It was at the Ministerial Conference held in Paris in 1982 that 14 European states conceived of the first regional-coordinated system of ship inspections by signing the Paris Memorandum of Understanding on Port State Control (Paris MoU) in the attempt to stem the proliferation of substandard shipping.

The efforts of the Paris MoU continued almost in isolation until the beginning of the nineties when the International Maritime Organization, first adopted Resolution A.682 (17) on “Regional co-operation in the control of ships and discharges” (IMO, 1991). This measure caused governments to sign regional agreements on Port State Control, and, secondly, to set up the Flag State Implementation Committee, dealing with common criteria and inspection standards, among other tasks (Bell, 1993). Henceforth, nine regional agreements on PSC have been signed, with different degrees of success. Nonetheless, the Paris MoU is not only the first of the regional

Directive 79/115/EEC regulating compulsory high-sea pilotage in sensitive maritime areas, such as the English Channel and the North Sea.

² Following the *Erika* accident off the Atlantic coast in December 1999, on 21 March 2000 the European Commission adopted a first set of proposals (the ERIKA I package) which was followed by a second set of measures in December 2000 (the ERIKA II package).

³ The 147 Merchant Shipping (Minimum Standards) Convention (C147) was adopted in 1976 during at the 62nd ILO Conference, Geneva. The Convention encompasses 12 Articles and, among various provisions, aims at inspecting foreign-flagged vessels entering port. The C147 was updated by Protocol 147 to the Merchant Shipping (Minimum Standards) Convention, 1976 (P147) which was adopted in 1996 during the 64th ILO Conference, Geneva

agreements aimed at fighting substandard shipping, it also enjoys a special “status” within the borders of the EU. While MoUs are administrative procedures, *ipso facto* non-binding gentlemen’s agreements, since 1995 Port State Control became an EU initiative with the implementation of Directive 1995/21/EC (Council of the European Union, 1995). This made the Paris MoU system mandatory for EU Member States. The Directive is the predecessor of the current legislative instrument in force since 1 January 2011 and introduces the New Inspection Regime (NIR): Directive 2009/16/EC (European Parliament and the Council, 2009a), as amended by Directive 2013/38/EU (European Parliament and the Council, 2013). The directive updated the earlier Port State Control system by introducing new provisions for the targeting/selection of ships, regional commitments, ship-risk profiles, among others.

1.2. Problem Statement and Research Questions

The nature of the shipping industry is inherently international. Vessels engaged in commercial activities far away from their Port of Registry have throughout the years sometimes shown a missing “link” between the vessel and the Flag State⁴. The *MV Erika*, which sank during heavy weather in the Gulf of Biscay in 1999 for example, was flying the flag of Malta, managed by an Italian company and chartered by a French one. The fact that the vessel was carrying the required certificates and had been inspected several times by Port States, Flag States and Classification Society (Özçayır, 2009) did not prevent the ship from slipping through the various safety nets and from spilling heavy fuel oil along the coast of France.

Since the beginning of the nineties with the establishment of the Flag State Implementation Subcommittee⁵, the IMO acknowledged that two challenges facing the organisation was the development of new policies and regulations and the need to guarantee that the already existing ones were seriously taken into account and correctly implemented and enforced (Mansell, 2009b). These fundamental challenges remain today. The different levels of compliance with international standards are not a mystery; indeed, some of the differences became even more evident after the first round of the Voluntary IMO Member State Audit Scheme

⁴ The United Nations Convention on the Law of the Sea (UNCLOS), Article 91, refers to the “genuine link” between owner and Flag States.

⁵ As of July 2014, The FSI Subcommittee has been renamed the III (Implementation of IMO Instruments) Subcommittee.

(VIMSAS)⁶ and the White, Grey and Black list (European Commission, 2010) of the Paris MoU and Tokyo MoU.

Measuring and benchmarking IMO Member States performance when it comes to implementation and enforcement of international standards has recently become mandatory under the III Code (IMO, 2013) which entered into force on 1 January 2016. Through Part II (Flag State) paragraph 42 and 43, the Code point out that:

A Flag State should, on a periodic basis, evaluate its performance with respect to the implementation of administrative processes, procedures and resources necessary to meet its obligations as required by the international instruments to which it is a party. Measures to evaluate the performance of flag States should include, inter alia, Port State Control detention rates, flag State inspection results, casualty statistics, communication and information processes, annual loss statistics (excluding constructive total losses (CTLs)) and other performance indicators as may be appropriate, in order to determine whether staffing, resources and administrative procedures are adequate to meet its Flag State obligations.

Shipping professionals, involved in maritime operations for years, have already developed their own qualitative indicators on where Flag States stand with their performance (Corres & Pallis, 2008). The turning point was the development of quantitative indicators that would allow operators and administrators to have a clear picture of their performance.

Currently, two main initiatives are broadly utilized to measure Flag State Performance:

1. The International Chamber of Shipping Flag State Performance Table.
2. The White, Grey and Black list, published by the Paris MoU and the Tokyo MoU.

The former (Figure 1), is an attempt developed by the industry that represents a qualitative performance table which evaluates Flag State Performance in terms of Port State Control performance, ratification of international conventions, a fleet's average age, the STCW White List⁷ and ILO reporting and attendance at IMO meetings (ICS, 2016). Beside the flawed assumption that ratification implies effective implementation and enforcement (Mansell, 2009b), the extent to which these categories exhaust all elements in effectively assessing Flag State Performance was questioned given that they do not cover the various characteristics of Flag State Performance (Corres & Pallis, 2008). In addition, the table gives only

⁶ Since 1 January 2016, the IMO Member State Audit Scheme has become mandatory with the entry into force of the III Code.

⁷ The International Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention.

a *binary* quantification of performance since each category can either be green (well performing) or red (bad performing).

	PORT STATE CONTROL				RATIFICATION OF CONVENTIONS										A739	AGE	REPORTS	IMO
	PARIS MOU WHITE LIST	NOT ON PARIS MOU BLACK LIST	TOKYO MOU WHITE LIST	NOT ON TOKYO MOU BLACK LIST	USCG QUALSHIP 21	NOT ON USCG TARGET LIST (SAFETY)	SOLAS 74 (AND 88 PROTOCOL)	HARPOL INCLUDING ANNEXES I - E	HARPOL ANNEXES III - VI	LL 65 (AND 88 PROTOCOL)	STCW 78	ILO MEC	GLC/FUND 92	RECOGNIZED ORGANIZATIONS	AGE OF FLEET	STCW 95 'WHITE LIST'	COMPLETED ILO REPORTS	IMO MEETINGS ATTENDANCE
ALBANIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
ALGERIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
ANTIGUA & BARBUDA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
ARGENTINA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
AUSTRALIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BAHAMAS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BAHRAIN	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BANGLADESH	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BARBADOS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BELGIUM	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BELIZE	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BERMUDA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BOLIVIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BRAZIL	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BRITISH VIRGIN ISLANDS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
BULGARIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CAMBODIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CANADA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CAYMAN ISLANDS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CHILE	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CHINA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
COLOMBIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
COMOROS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
COOK ISLANDS	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
COSTA RICA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
COTE D'IVOIRE	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
CROATIA	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red

Figure 1 – Extract from the Shipping Industry Flag State Performance Table 2015/2016 (www.ics-shipping.org)

The latter, the White, Grey and Black list, represents policy-makers' attempt to measure Flag State Performance in the context of Port State Control. Each year ship registries are classified into three groups (black, grey and white) according to the numbers of detentions incurred (ParisMoU, 2015). In the past years, the formula utilized to determine the White, Grey and Black list has been severely criticized by the industry and by several academic publications (Degré, 2007, 2008; Perepelkin, Knapp, Perepelkin, & de Pooter, 2010; Özçayır, 2009) due to the following reasons:

- It is unable to handle a small sample size.
- It does not take into account other meaningful factors (e.g. number of deficiencies, severity of deficiencies).
- It is susceptible to lack harmonisation criteria (deficiency assessment criteria, detention criteria, inspection procedures).

In addition, two considerations need to be taken into account. Firstly, the initial purpose of the White, Grey and Black list was to determine weighting points for the

selection criteria of vessels to be inspected by the interested port state authority. The wider use of the list to determine Flag State Performance, and even rank Flag States, does not fall into the initial scope of the list. Secondly, the overall determination of this concept is based on the ratio between detentions and inspection of a specific country. While this may be of great interest for a port state authority during the process of targeting vessels, it is the author's contention that the concept is much broader and complex in scope.

This dissertation has a threefold aim. In the first part of the study, an answer to the following research question is sought: What is and what constitutes the concept of Flag State Performance? This exploratory part of the study aims at developing a clear understanding of the features and components underpinning this concept. New qualitative indicators which comprise Flag State Performance are investigated. In other words, the author determines what to measure before attempting to measure it.

Given the fact that Port State Control is the most widely used indicator to determine Flag State Performance, the second part of the study investigates both the adequacies as well as inadequacies of Port State Control. This phase aims at the following: (1) Determining the main inconsistencies, if any, of this regime in the EU region; (2) determining the causes for these inconsistencies; and (3) providing evidence of these inconsistencies. The third and last section summarizes and combines the results of the previous two parts and gives recommendations on how Port State Control results may affect Flag State Performance.

To investigate the three factors identified above, four research questions were formulated:

1. What is and what constitutes Flag State Performance?
2. What are the contemporary issues of Port State Control in Europe?
3. How do discrepancies in Port State Control affect the inspection output?
4. To what extent is Port State Control a suitable instrument to measure flag State performance?

1.3. Limitations

Within this section, the author discusses the three main limitations of his research. Several have largely to do with the sharp focus of the topic addressed. The three main limitations are:

- Time frame
- Geographic area
- Corruption

In terms of the time frame, the inspection data to be analysed and collected were selected in the time frame 1 January 2014 to 31 December 2015. This choice is justified by the entry into force of the European Directive 2009/16/EC, as amended, on Port State Control on the 1 January 2011. As part of the Third Maritime Safety Package, the Directive introduced the so-called New Inspection Regime across European coastal waters, as well as the above-mentioned formula to determine Flag State Performance. Since the New Inspection Regime introduced the new targeting criteria by classifying vessels as High, Standard and Low-risk vessels and as a new rationale for the Member States' commitment⁸ to inspection, it was considered suitable to use information from inspections only from that date onwards. This strategy would allow comparison among findings, since all the inspection's activities before the 1 January 2011 were performed under a different legal framework (e.g. different procedures, inspection quotas, a vessel's priority, inter alia).

The second main limitation to the study was identified by considering a restricted **geographic area** for the Port State Control inspection regime. Why is the Paris MoU unique? The fact that the Paris MoU regime is mandatory for EU Member States, which need to abide by the rules of Directive 2009/16/EC as amended, makes it the ideal candidate to be treated for critical case sampling. Critical cases are those that have particular relevance for the topic under analysis and where results can be easily generalised (Flyvbjerg, 2006). In other words, critical cases follow the philosophy "if it happens there, it will happen anywhere" or "if it doesn't happen here, it won't happen anywhere" (Patton, 2015, p.275).

This methodology, successfully used by Goldthorpe et al. (1969) in a famous study on the sociology of different workers, has demonstrated its efficiency in cases where resource constraints (e.g. economics, time) (Patton, 2015, p.276) could affect the generalisation of results. The rationale behind this choice is to eventually produce logical deductions following the line of thought: if it does not work where a legal binding framework is present, it will probably not work where only a

⁸ This mechanism, namely "fair-share", was set up to determine each country quota to the overall inspection regime in a year (Lagoni et al., 2010, p.83).

gentlemen's agreement is in place. A more extensive discussion on this approach will be given in the methodological section of this dissertation.

The third main criticism made relates to the topic of **corruption**. Although many episodes of corruption have been reported within Port State Control in general, however, hitherto few charges of corruption have been levelled against the Paris MoU. In order to cover this aspect, specific questions pertaining to episodes of corruption within the EU were put to the participants of the interview study that was conducted with policy-makers, maritime industry officials and seafarers' representatives. As a result of this inquiry, the author concluded that all data findings, which have been collected and discussed, do not reveal any episode of corruption in Europe. Thus, corruption does not seem to be an issue for the Paris MoU.

1.4. Summary of the Papers

Paper I focuses on findings and answers to the first research question and on determining the so-called *Whats, Whys and How's* of Flag State Performance. In other words, the paper aims to explore the perceptual construction of this concept as articulated by EU policy-makers through two Focus Groups. The findings of two focus groups (n=13) involving officials of the European Maritime Safety Agency are presented. The general results of the study suggest that Flag State Performance appears to be multidimensional in nature and encompasses a wide range of elements pertaining to both vessel and administrative performance. While Port State Control still represents the only currently available and transparent indicator, which determines Flag State Performance, the White, Grey and Black list alone seems too narrow to determine the full spectrum of the concept under examination. Moreover, a need to address factors that led to uncertainty in respect of Port State Control results had arisen.

Paper II seeks answers to the second research question and builds upon some of the results found in the first part of the study and on relevant literature. This paper examines the point of view of key maritime stakeholders with regard to the Port State Control regime in the European Union aiming at determining factors leading to the difference in treatment among EU Member States. Elite interviews (n=14) were conducted with subject-matter experts ranging from policy-makers, to industry and seafarers' representatives. While the paper concludes that Port State Control in Europe seems to be the most efficient and reliable of the regional agreements on this regime, some discrepancies that were identified during the inspection process and the outcome can be highlighted as being due to differences at the inspector and Member State level.

Paper III focuses on the implementation and enforcement of Port State Control among EU Member States. This study collected and analysed 25 reports compiled by the European Maritime Safety Agency at the end of statutory visits to determine the level of implementation of Directive 2009/16/EC, as amended, in the various Member States. This paper summarizes the main shortcomings and observations, as identified in the inspection reports, and concludes that while the Directive has been properly implemented by the Member States, there are areas where harmonisation is yet to be achieved. Those include areas such as Inspection Commitment/Information, Quality of Inspections and Training of port state control officers.

Paper IV focuses on the ramifications of an inspector's number and background on the inspection outcomes. The study is based on a set of data set which covers all inspections carried out from 1 January 2014 to 31 December 2015 within the EU. Overall, the sample comprises 32,206 Port State Control of inspections. On the Member State level, the study identified that differences in detecting at least one deficiency and/or detaining a vessel are significant across countries. On the operational level, the results have shown that team composition and background have an influence on the inspection outcome. The former correlates to the number of deficiencies and detentions and the latter correlates to detecting a certain type of deficiencies according to the specific inspector's backgrounds. However, the significance pertaining the inspector's background is not always consistent.

2. Literature Review

This chapter introduces the literature pertaining to the framework of the topic under investigation. A definition of performance and Flag State Performance is given. Moreover, relevant literature pertaining to Port State Control, the concept of harmonisation and the highlighted discrepancies in the regime will be discussed.

2.1. Flag State Performance

The United Nations Convention on the Law of the Sea (UNCLOS) has always placed the Flag State at the centre of the implementation and enforcement of the international maritime regulations and, by extension, as the core of the whole maritime industry. As the holder of rights and duties, the Flag State has to ensure the effective exercise of its jurisdiction and control over ships to which it has granted its flags. By registering the ship, the State grants to the ship a nationality, which is required before any maritime navigation takes place. In return, it must ensure its jurisdiction and control over those ships flying its flag. While the word “effectively” of Article 94 can be interpreted as a direct link to the concept of performance, Flag State performance is never visibly mentioned in the Law of the Sea

There is no shortage of literature covering the topic of performance in the shipping industry. However, determining what performance for a Flag State comprises is a challenging task. That is mainly due to the complexity of the system under analysis. While common criteria to determine the efforts and performance of a Flag are scarce (Ji, Brinkhuis, & Knapp, 2015), criteria for port performance (Brooks & Pallis, 2008; Brooks & Schellinck, 2015; Da Cruz, Ferreira, & Azevedo, 2013; De & Ghosh, 2003; Dragović, Park, & Radmilović, 2006; Lin & Tseng, 2007; Pantouvakis & Dimas, 2010; Schellinck & Brooks, 2014; Turner, 2000), and shipping companies performance (Chou & Liang, 2001; Giannakopoulou, Thalassinou, & Stamatopoulos, 2016; Jenssen & Randøy, 2006; Lagoudis, Lalwani, & Naim, 2006; Lirn, Lin, & Shang, 2014; Lun, Lai, Wong, & Cheng, 2014; Pantouvakis & Karakasani, 2016; Rialland, Nesheim, Norbeck, & Rødseth, 2014; Syriopoulos & Tsatsaronis, 2011; Triantafylli & Ballas, 2010; Valdez Banda, Hänninen, Lappalainen, Kujala, & Goerlandt, 2016; Yuen, Thai, & Wong, 2016), in terms of business, environmental, financial, operational, organizational, quality

and safety criteria, are abundant. A definition of performance, however, is still missing.

According to the Oxford Dictionary, performance is associated with “the action or process of performing a task or function” or “a task or operation seen in terms of how successful it is performed”. Furthermore, according to the Oxford Advanced Learner’s Dictionary, it also means “how well or badly you do something; how well or badly something works”. Since a task can be defined as the activity or work that is deemed necessary to achieve a specific goal (Bye, Brendeford, Hollnagel, Hoffmann, & Mohn, 1998; Hollnagel, 2012a, 2012b; Stanton, 2006), one can infer that system performance depends on the goal the system wants to achieve. A similar conclusion can be reached through the literature on port and company performance.

In general, the author has identified two main streams characterizing the concept of performance, which may be useful to determine what underpins the concept of Flag State Performance: efficiency and effectiveness. Efficiency measures relate to the “physical quantities” of products or services (e.g. time, income, throughput, production, inter alia), while effectiveness measures relate to how well the system (whether a company, port, or state) uses its strategies and resources to meet its mission and goals and ultimately satisfy the end-user (Brooks & Pallis, 2008).

If the Flag State is the system subject of our inquiry, the goal and/or objective will be defined in order to define the performance associated with it. The International Commission on Shipping of 2000, (Mansell, 2009b, p.3) refers to “demands for nations registering ships to be held more accountable in performance of their responsibilities” thereby indicating how performance is a concept underpinned by the responsibilities of a Flag State. For this purpose, the United Nations Convention on the Law of the Sea (United Nations, 1982) helps us to delineate the main responsibilities of the Flag State. In general, Article 91 of UNCLOS defines a Flag State as “the state in whose territory a ship is registered”. Regardless of the concepts of nationality and sovereignty linked to the definition, the Convention requires Flag States to “effectively exercise jurisdiction and control in administrative, technical and social matters over ships flying their flag” (United Nations 1982, Art.94). The word “effectively” in Article 94 can be interpreted as a direct link to the idea of Flag State Performance (Brooks & Pallis, 2008) if related to the goal of ensuring that water transport of goods and/or people does not pose any hazard to safety, environment and health by executing at its best the task of “control and jurisdiction”. Therefore, the following definition for Flag State Performance will be used throughout the dissertation:

How effectively a Flag State uses its resources, whether human or financial, to ensure safety, environmental protection and proper labour conditions on board its vessels via the exercise of its obligations, as established by the international legal framework

2.2. Evaluating Flag State Performance

As outlined above, the body of literature focusing on Member States is, to the best of the authors' knowledge, limited, and the number of publications identifying possible indicators is equally scarce. Measuring and benchmarking IMO Member States performance when it comes to implementation and enforcement of international standards has recently become mandatory under the III Code (IMO, 2013) which entered into force on 1 January 2016.

In the academic domain, several attempts to determine Flag State performance have been made. Takei (2013) and Mansell (2009b) suggested that the concept of performance should be grounded in the legal responsibilities of Flag States. These encompass exercising jurisdiction and control over administrative, technical and social matters; fisheries; security; and underwater cultural heritage. However, many of these obligations do not require the Flag State to achieve a prescribed goal, rather to exercise its best possible effort (Takei, 2013). Thus, quantification might be difficult.

An initial attempt to determine Flag States' capacity to effectively implement and enforce relevant maritime legislation was performed by Alderton & Winchester (2002) which created an index (FLASCI) based on the weighting of several factors, grouped into seven categories:

1. The fleet
2. Administrative capacity
3. Maritime law
4. Seafarers' safety and welfare
5. Trade union law
6. Corruption
7. Company and corporate practice

In parallel, the industry developed its own qualitative performance table by evaluating Flag State Performance in terms of Port State Control performance, the ratification of international conventions, fleet average age, the International Convention on Standards of Training, Certification and Watch keeping for Seafarers and International Labour Organization reporting and attendance of International Maritime Organization meetings (ICS, 2016). Beside the flawed assumption that ratification implies effective implementation and enforcement (Mansell, 2009b), the extent to which these categories exhaust all elements needed to properly assess Flag State Performance was examined by Corres & Pallis (2008) who added subjective weighting factors to quantitatively rank countries.

From an EU perspective, the measurement of this concept was first adopted in the context of Port State Control. Each year ship registries are classified into three

groups (black, grey and white) - according to the numbers of detentions incurred – in the so called White, Grey and Black list (ParisMoU, 2015). Inspired by the White, Grey and Black list, Perepelkin et al. (2010) proposed a new methodology, which incorporates new factors other than detentions, such as deficiencies and casualties, in order to overcome the shortcomings of the list. A similar approach was also followed by Ji et al. (2015).

Using a different methodology than that suggested by Alderton & Winchester (2002), Corres & Pallis (2008) and Takei (2013) with regard to the White, Grey and Black list, Perepelkin et al. (2010) merge the concept of Flag State Performance with that of vessel performance, discarding the characteristics of maritime administrations. While one could argue that the quality of the fleet is the output of the quality of its maritime administration, the reader should be aware that the ship-owner is responsible for the application of international law.

It is true that shipping professionals, who have been involved in maritime operations for years, have already developed their own qualitative indicators on where Flag States stand with their performance. The turning point was the development of quantitative indicators, which would allow operators and administrators to have a clear picture of their performance. The Baltic and International Maritime Council Shipping key performance indicator, for example, was developed to propose a global shipping industry standard for defining, measuring and monitoring information on ships operational performance by operators.

Currently, two main initiatives are broadly utilized to measure Flag State Performance:

- The Ship Industry Flag Performance Table, published by the International Chamber of Shipping.
- The White, Grey and Black list, published by the Paris MoU and the Tokyo MoU.

The former, is an industry attempt that shows a qualitative performance table used to evaluate Flag State Performance in terms of the following criteria (ICS, 2016):

Port State Control

- Paris MoU White List
- Not on Paris MoU Black List
- Tokyo MoU White List
- Not on Tokyo MoU Black List
- United States Coast Guard quality shipping for the 21st century (USCG QUALSHIP 21)
- Not on USCG Target List (Safety)

Ratification of Conventions

- 1974 International Convention for the Safety of Life at Sea (SOLAS 74) (and 88 Protocol)
- International Convention for the Prevention of Pollution from Ships (MARPOL) Including Annexes I-II
- MARPOL Including Annexes III-VI
- International Convention on Load Lines 66 (and 88 Protocol)
- The International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW) 78
- ILO Maritime Labour Convention (2006)
- 1992 Fund Convention and Supplementary Fund Protocol

A 739

- Recognized Organizations

Age

- Age of the Fleet

Reports

- STCW 95 White List
- Completed ILO Reports

IMO

- IMO Meetings Attendance

The table is an initial attempt to attribute six different areas to the concept of Flag State Performance. The International Chamber of Shipping links this concept to fleet performance under the Port State Control regime in the Tokyo and Paris MoUs and the United States Coast Guard. In the area of Ratification of Conventions, the table reports whether the Flag State has ratified the main relevant international conventions. Under A 739 the table refers to IMO Resolution A.739 (18) (IMO, 1993), amended by IMO Resolution MSC.208 (81) (IMO, 2006), which requires Flag States to establish control over EU Recognized Organizations.

Since the Paris and Tokyo MoUs submit a report entitled “Performance of Flag Administrations and Recognized Organizations” annually, the table positively list those Flag States which do not appear on the list and have submitted the EU Recognized Organization data to the Global Integrated Shipping Information

System. Under Age, the International Chamber of Shipping positively indicates “the 90 per cent of flags whose ships have the lowest average age, among those listed, in terms of ship numbers’ (ICS, 2016). With Reports the table indicates those Flag States which comply with ILO reporting obligations and those Flag States included in the STCW “White List”. Lastly, under IMO, the table positively indicates those Flag States which generally attend the main IMO meetings, such as the Maritime Safety Committee, the Marine Environment Protection Committee and the Legal Committee.

As mentioned in the problem statement, various academic publications (Degré, 2007, 2008; Perepelkin et al., 2010; Özçayır, 2009) and industry operators have criticized the formula. Beside the technical issues affecting the formula (points 1 and 2 highlighted in the introduction), this research study focuses on issues in harmonisation, that is, point 3 highlighted in the introduction). If issues in harmonisation exist, then there is uncertainty on the inspection outcomes (detentions) which are the building blocks for the White, Grey and Black list. This means that the formula may not give the same measurement on the same situation when it uses data collected by different inspectors in different countries. If the list of requirements for measurement instruments in science is recalled, as developed by Hale (2009), then the WBG list formula has issues of reliability. According to the author, a performance indicator is reliable if it answers the following question in the affirmative:

Does it give the same measurement when used by different people on the same situation, or on different occasions by one person on that same situation? (Hale, 2009)

While there is no discussion as to whether Port State Control helps to spot substandard shipping, the question remains if this current system is effective and reliable in portraying Flag State Performance through the White, Grey and Black list. However, before detailing the Port State Control regime and the issues in harmonisation found in the literature, a definition of “harmonisation” in EU law is given in the next section.

2.3. Harmonisation

The concept of harmonisation is widely used in the context of the EU, and especially when drafting EU Community Law. In general terms, harmonisation can be defined as a:

... process in which diverse elements are combined or adapted to each other so as to form a coherent whole while retaining their individuality. In its relative sense, harmonisation is the creation of a relationship between diverse things. Its absolute and most common meaning, however, implies the creation of a relationship of accord or consonance (Boodman, 1991).

When discussing European Community law, the meaning of harmonisation is rather imprecise and, in some measure, undefined, which leaves a fluid and complex notion (Lohse, 2011). In the legal text of the European Union, “approximation”, “coordination” and “harmonisation” are used synonymously and generally to determine the process of developing rules and standards for the internal market (Kurcz, 2001; Lohse, 2011). This approach generates more confusion when trying to develop a uniform definition. A thorough review on the current available literature shows that harmonisation is referred to by several aspects of European Community law, such as taxation (Trandafir, 2013), food (Terlicka & Jukes, 2014), copyright (Hugenholtz, 2012); immigration (Givens & Luedtke, 2004); internal market (Dougan, 2000; Dzabirova, 2009); customs (Dmitriy, 2013); among others. However, while a definition suitable for this research work will be elaborated in the following section, the different forms of harmonisations, such as minimum, total, partial, optional, horizontal, soft, hard or mutual, will not be investigated.

Due to the complexity, heterogeneity and enlargement of the EU as an aggregation of States, the approach of recent policies has involved a flexible development and application of Community law which would ensure “community” and “autonomy” (Scharpf, 1994 as cited by Falkner, Treib, Hartlapp, & Leiber, 2005) or, paraphrasing Kurcz (2001), “integration” measures. Given that we are pursuing a definition suitable to the research project, one should keep in mind that harmonisation was considered a prime goal for the achievement of a common market whereas “differences in the legal orders are seen as obstacles to the free movement of product factors” (Lohse, 2011). When unveiling the functioning of the common market, Kurcz (2001) assigns to harmonisation a double objective: To eliminate any eventual differences among Member States in order to promote the common market and free movement and to avoid distortion of competition. These two points will be further discussed when debating the need for a harmonized Port State Control regime across Europe.

Briefly, harmonisation can be considered as an “act” of EU legislation which aims to set a common European standard, also known as “Euro-Standard”, and modify or

replace domestic law accordingly. Furthermore, this standard-setting process is not carried out only at the European level since it demands a direct involvement of Member States which have to implement and enforce those standards (Lohse, 2011). It is a multistage process which involves decision-making, implementation (transposition and enforcement), application and monitoring (Falkner et al., 2005, p.32).

In simple terms, harmonisation is a process expected to set a “common floor of standards” (Falkner et al., 2005, p.2) and is a path towards integration. It is a task usually achieved through the adoption of Directives (Twigg-Flesner, 2011).

By means of Directives, EU Community law takes the form of a binding legal instrument which lays out certain results (stage one) to be achieved by Member States that are free to choose how to pursue implementation (stage two). This twofold approach represents an advantage for some authors (Kurcz, 2001), while being a disadvantage for others (Twigg-Flesner, 2011). In this sense, on the one hand the use of Directives gives flexibility to Member States as to the forms and methods through which they intend to achieve the prescribed results. On the other, it gives them considerable freedom in the process of transposing EU community law into national law which could lead to different implementation and enforcement patterns among Member States. This is an issue that was emphasized in recent years by the European Court of Justice in several of its rulings (Lohse, 2011).

In this sense, a more homogeneous implementation could be solved by means of Regulations, since they bring the “advantages of clarity, predictability and effectiveness” (Monti, 2010). This is a strategy which is slowly being used when legal acts entail the single market. Furthermore, another effective strategy pertains to the adoption of Directives containing “detailed and sometimes quite technical rules” (Twigg-Flesner, 2011) which makes it difficult for individual Member States to modify the text during the transposition phase (Lohse, 2011).

In conclusion, harmonisation may represent both a soft approach to ensure a common set of criteria among fragmented approaches and the path to creating a single unique, sometimes rigid, standard. According to Terpan (2015), transport, together with the internal market, trade, agriculture, fisheries, inter alia, belongs to the class of policies where hard law applies. In this sense, the author adopts the latter of the two-abovementioned perspective and will try to isolate harmonisation within the Port State Control Directive context.

2.4. Port State Control

The body of literature covering Port State Control is quite broad and encompasses various elements from law, effectiveness, international policy, implementation, discrepancies in implementation, jurisdiction, among others. In order to use a

consistent meaning throughout the text, the definition given by Özçayır (2009) defines Port State Control as “the control of foreign flagged ships in national ports by Port State Control Officers” will be used. Port State Control contributes to ensuring compliance with international regulatory efforts (Ademuni-Odeke, 1997; Bell, 1993; McDorman, 2000; Molenaar, 2007; Payoyo, 1994); to increase safety standards (Li & Zheng, 2008; van Leeuwen, 2015); and to prevent pollution (Bang, 2008; Cuttler, 1995).

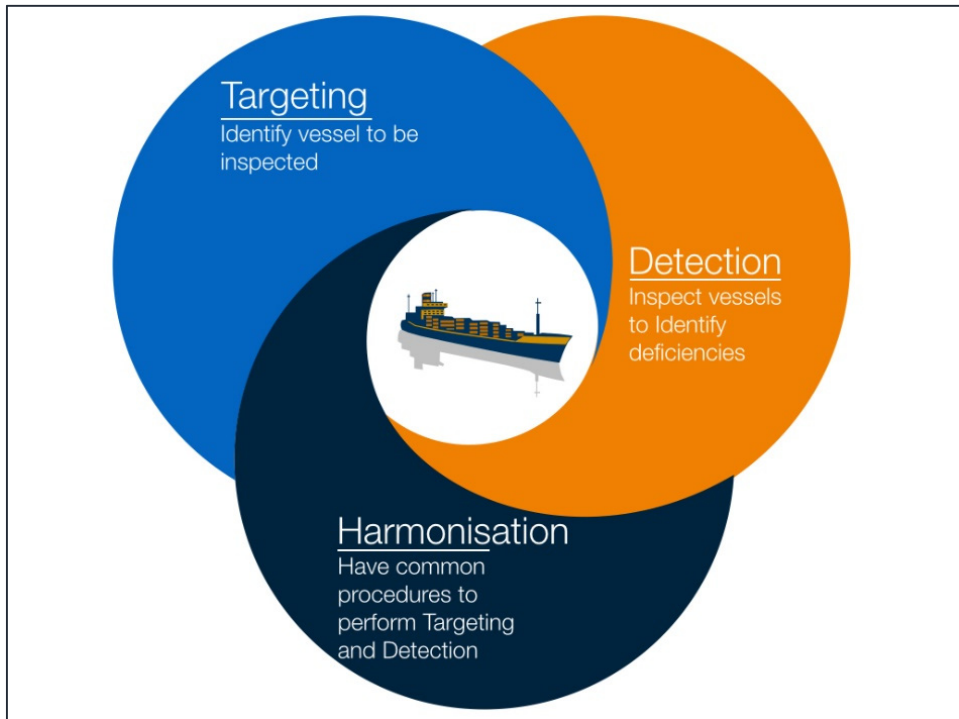


Figure 2
Author's own graphical visualization of Port State Control

The inspection of foreign flagged vessels in national ports is not a novel exercise. Provisions for the inspection or control of foreign vessels by port states have been a feature of enforcement since the 1929 International Convention for the Safety of Life at Sea (SOLAS) (Article 54); the 1930 International Load Line Convention (Article 16); the 1960 International Load Line Convention (Article 21); the 1975 IMO Resolution A.321(IX) “Procedures for the Control of Ships”; and the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships (MARPOL 1978 Protocol) which included control provisions in Annex I, Annex II, Annex III, Annex IV and Annex V.

Moreover, provisions of control were also included in UNCLOS under Article 218 “Enforcement by Port States” (United Nations, 1982). The difference between Port State Jurisdiction and Port State Control is that Port State Jurisdiction entails the prosecution of the vessels in case of alleged breach of international applicable legislation, while Port State Control is limited to the administrative measure of control until various corrective measures have been taken before allowing the ship to sail again (Bang, 2008, 2009, 2013; Bang & Jang, 2012). However, it is not until the emergence of a regional agreement on Port State Control that such an exercise became a common practice in the maritime domain. As mentioned by Özçayır (2004, p.1): “the powers used by port state control officers are not new; it is the willingness to use the power which is new”.

The range of action of Port State Control was largely enhanced in the aftermath of the serious ship accidents⁹ that occurred in the last decades as they caused a strong political and public outcry for more stringent regulations regarding the safety of ships, protection of the maritime environment and living and working conditions (Özçayır, 2004, 2009). According to many authors, these accidents showed the inability of some Flag States in discharging their obligations on vessels flying their flag which left an enforcement vacuum (Ademuni-Odeke, 1997; David Anderson, 1998; Bell, 1993; Bloor, Datta, Gilinskiy, & Horlick-Jones, 2006; Molenaar, 2007; van Leeuwen, 2015; Özçayır, 2009).

In response to the appeal from the civil society and given the diverse (and often unsatisfactory) degree of enforcement of certain maritime administrations (Bell, 1993), eight North European states signed the Hague Memorandum of Understanding in 1978. The main aim of the MoU was to ensure proper implementation of the ILO 147, SOLAS 66 & 74 and Load Line 66 through regional organisations and harmonisation. On a formal level, an MoU is not a treaty (Bang & Jang, 2012; Vorbach, 2001) but an administrative agreement (Bang & Jang, 2012; Özçayır, 2009). In this way, States Parties of the MoU establish a regional regime for information-sharing on vessels without the delays and implementation difficulties that would characterize a formal treaty negotiation (Vorbach, 2001).

Only two weeks after the Hague Memorandum, the *Amoco Cadiz* ran aground off the coast of France spilling more than 200,000 tons of oil making it clear that the shipping industry had failed in dealing with new challenges, and, more importantly, in self-controlling its vessels (David Anderson, 1998; Bell, 1993; Mansell, 2009a; Mansell, 2009b; Vorbach, 2001; Özçayır, 2004). It was at the Ministerial Conference held in Paris in 1982 that 14 European states conceived of the first regional coordinated system of ship inspections by signing the Paris Memorandum of Understanding on Port State Control (Paris MoU, 2017b) in the attempt to stem the proliferation of substandard shipping.

⁹ The *Amoco Cadiz* (1978), *Aegean Sea* (1992), *Braer* (1993), *Estonia* (1994), *Erika* (1999) and *Prestige* (2002), among others.

However, it was not until 1995 that Port State Control was integrated within the European Union framework with the implementation of Directive 1995/21/EC (Council of the European Union, 1995) on Port State Control which made the Paris MoU system mandatory for EU Member States. The development of this Directive directly followed the adoption in 1993 of the European Union's *A Common Policy on Safe Seas* which included a "coherent action programme on priority measures to be taken by the Community and its Member States to enhance maritime safety and pollution prevention" (Council of the European Communities, 1993b). With this policy, the European Commission decided to approve a series of legislation aimed at improving the safety level of ships sailing across European waters and calling at European ports. One of the key pieces of legislation was Directive 95/21/EC (Council of the European Union, 1995) that established a common set of criteria for the control of ships calling in EU ports and harmonized procedures for their inspection and detention, Directive 95/21/EC has been recast several times, the latest version being Directive 2009/16/EC (European Parliament and the Council, 2009a)¹⁰, in force since 1 January 2011 and a key element of this dissertation.

At the global level, the introduction of the Paris MoU received tepid support by the international community with some international actors even considering the Paris MoU as "discriminatory enforcement" of the IMO Convention (Blanco-Bazán, 2004). However, in the early nineties the IMO recognised the success of such a regional approach and adopted Resolution A.682 (17) on *Regional Co-Operation in the Control of Ships and Discharges*.

Firstly, the resolution invited governments to conclude regional agreements on the application of Port State Control measures, and recognised the contribution of the Paris MoU to maritime safety and pollution prevention (Molenaar & Pons, 1996; Vorbach, 2001). Secondly, in 1993 the IMO set up the Flag State Implementation Subcommittee, dealing with common criteria and inspection standards, among other tasks (Bell, 1993). Henceforth, nine regional agreements on PSC have been signed: Europe and the North Atlantic (Paris MoU); Asia and the Pacific (Tokyo MoU); Latin America (Acuerdo de Viña del Mar); Caribbean (Caribbean MoU); West and Central Africa (Abuja MoU); the Black Sea region (Black Sea MoU); the Mediterranean (Mediterranean MoU); the Indian Ocean (Indian Ocean MoU); and the Riyadh MoU.

The main aim of the Memorandums of Understanding on Port State Control is the elimination of substandard ships, which may represent a threat to safety, security and the environment, by using harmonised procedures for targeting and detection (European Parliament and the Council, 2009a). Two of the main reasons to develop regional cooperation for PSC were undoubtedly the need for sharing information between states about the safety records of vessels and to avoid the inspection of a

¹⁰ The Directive was amended by Directive 2013/38/EU to accommodate the Maritime Labour Convention provisions for Port State Control.

vessel at every port within a same region (Hare, 1997). This was underpinned by providing harmonised rules and standards for targeting and inspection procedures.

PSC is transparent through the name and shame policy and system of peer-review (Bloor et al., 2006; Sampson & Bloor, 2007). This makes non-compliance with international legislation by shipowners not as economically advantageous as before since deficiencies and detentions are publicly available (Özçayır, 2009).

2.5. Harmonisation and Port State Control in the European Union

When it comes to Port State Control, the Directive 2009/16/EC on Port State Control, as amended by Directive 2013/38/EU, uses the term “harmonised” seven times in the overall text.

Harmonisation is used specifically when pertaining to the “training and assessment of competences of Port State Control inspectors” in title 10, 25 and Article 22.7 suggesting that Member States, the European Maritime Safety Agency and the EU Commission, shall work together to promote and develop a “harmonised Community scheme” for training. Article 18(a).7 and 23.5, however, introduced with the amendment of 2013, touches upon conferring implementing powers to the European Commission to set up “harmonised procedures for ... follow-up actions taken by Member States.” The articles are strictly related to the correct implementation of the rate provision under the Maritime Labour Convention, 2006.

In a different approach, Recital (7), awaits that “a harmonised approach to the effective enforcement of (these) international standards by Member States in respect of ships sailing in the waters under their jurisdiction and using their ports should avoid distortion of competition” and, continuing, Recital (16) states further that “the rules and procedures for Port State Control inspections, including criteria for detention of ships, should be harmonised to ensure consistent effectiveness in all ports (...).” Lastly, in article 1 (b), it is clearly stated that one the three key objectives of the Directive is “establishing common criteria for control of ships and harmonising procedures on inspections and detention, ...”

To conclude, harmonisation in Port State Control can be characterised by a three-dimensional concept (Figure 4) delimited by: *training*, *inspections* and *detention*. Moreover, the operationalization of the concept should take into account that the purpose is as follows: studying and analysing the level of harmonisation as to how the procedures on training, inspection and detention of vessels are followed among the actors asked to interpret the standards set by the Directive above (Member States and port state control officers). The purpose of such operationalization just referred to was not intended as the harmonisation of law as a high-level objective of the European Union, as explained in paragraph 2.5). Although PSC has been introduced

for several years as a second line of defence against substandard vessels, though some even argue that it is the fourth line of defence (Mejia Jr., 2005), the harmonisation of such activities is still paramount. In fact, policy-makers strive to achieve harmonisation due to the different degree of application of procedures and activities across the various regimes (Özçayır, 2009). Despite the introduction of single international (or regional) standards for inspections, the variety of countries belonging to a single MoU may lead to different interpretations of such standards (Özçayır, 2009) which results in lack of harmonisation and effectiveness when it comes to identifying substandard vessels.



Figure 3
Graphic Representation of Harmonisation in Port State Control as Reported in the Text of Directive 2009/16/EC as Amended

2.6. Discrepancies in Harmonisation

In the years following the emergence of the Paris MoU, several scholars investigated the effectiveness of Port State Control (Darryl Anderson, 2002; Bang, 2008; Bell, 1993; Bijwaard & Knapp, 2009; Bloor et al., 2006; Cariou, Mejia, & Wolff, 2007,

2008; Cariou & Wolff, 2011; Cuttler, 1995; Heij, Bijwaard, & Knapp, 2011; Knapp & Franses, 2007c, 2008; Mansell, 2009a; Payoyo, 1994; Plaza, 1994; Özçayır, 2009) and its legal foundation (Bang, 2008, 2009, 2013; Churchill, 2016; Keselj, 1999; McDorman, 1997; Molenaar, 2007; Ryngaert & Ringbom, 2016). While criticisms in this sphere still appear, it is “conventional wisdom” (Bang, 2008) that Port State Control plays a critical role in ensuring safety, pollution prevention and labour conditions on board a vessel.

Despite the positive reputation of Port State Control gained over the years and its positive effects, which have been highlighted above by many authors, issues in harmonisation have been observed since the early stages of the various MoUs. According to the literature, there are inconsistencies between regions (Bloor et al., 2006; Cariou, Mejia, & Wolff, 2009; Keselj, 1999; Knapp & Franses, 2007b; Knapp & van de Velden, 2009; Knudsen & Hassler, 2011; Mansell, 2009a; Sampson & Bloor, 2007) and sometimes even within the same MoU (Özçayır, 2009).

Given the main objective of guaranteeing harmonized rules and a level playing field in the region, discrepancies in the inspection practices and outcomes can have a profound impact on the credibility of the regional MoUs on Port State Control. By setting a common standard, an MoU’s goal is to avoid unilateral and arbitrary action by Port States which could have a negative impact on the neighbourhood ports within the same region, reducing their commercial attractiveness (McDorman, 2000; Molenaar, 2007) and distorting the market (Knapp & Franses, 2007c). An outcome of such behaviour is the so-called “port-shopping”, a strategic practice by some operators who choose certain ports and/or regions (Bang & Jang, 2012; Knudsen & Hassler, 2011; McDorman, 2000) over others because of their less stringent safety enforcement standards.

The reason for differences in Port State Control enforcement practices may be endemic to a region, a country or be of a more operational nature. For example, some studies recognize cross-regional differences. Knapp & Franses (2007a) and Knapp & van de Velden (2009) investigated differences across the Paris MoU, Tokyo MoU, Caribbean MoU, the Viña del Mar Agreement, Australian Maritime Safety Agency and the United States Coast Guard.

Other authors dedicated their studies to cross-national rather than cross-regional discrepancies. This is the case of Mansell (2009b) who highlighted issues and challenges within the Tokyo MoU. Bloor et al. (2006) and Sampson & Bloor (2007) instead identified differences between India, Russia and the United Kingdom, while Cariou et al. (2009) focused on differences across Australia, India, South Africa and Russia.

As far as the underlying conditions of why discrepancies may appear, Darryl Anderson (2002) suggests that at the regional level some MoUs face several challenges in terms of lack of resources, which many countries encounter, and in ensuring the equal and active participation of all members within the same region. This suggests that “substandard vessels trading in the poor regions of the world have

a significantly lower chance of being detained by Port State Control” (Darryl Anderson, 2002). The scarcity of resources (whether financial or human), as a contributory factor, is also reinforced by Özçayır (2009) and Knudsen & Hassler (2011). For Bang & Jang (2012), the issue is more multifaceted given that some regions lack the infrastructure, technology, financial capacity and action plans or policies necessary for the effective operation of regional MoUs.

On a more operational level, Mansell (2009b) found that some countries in the Tokyo MoU, for example, refused to accept inspections carried out by other states “due to known widely varying standards of Port State Control inspections among members,” while others refrained from conducting follow-up inspections to close out issued deficiencies by other countries. Similarly, Knapp & Franses (2007b) found that certain deficiencies weigh more in the detention process in some regimes compared to others. This was explained either by a different country philosophy (Knapp & Franses, 2007b), or differing priorities (Bloor et al., 2006) in enforcing certain regulations rather than others. In that way, only certain deficiencies were recorded.

As far as inspection practices are concerned, Bloor et al. (2006) found the root of all evil in the subjectivity of the Port State Control regime itself, which is regarded as a discretionary system, given its reliance on the “professional judgment” of the port state control officer (European Parliament and the Council, 2009a; Paris MoU, 2017a). The definition suggested by Coles (2002) states that professional judgment is exercised when a practitioner, in this case the port state control officer, makes judgment calls in an uncertain situation. Discretion, subjectivity, individuality, professional judgment and other equivalent concepts have broadly been interpreted as one of the circumstances leading to differences in treatment across countries and ports (Bloor et al., 2006; Sampson & Bloor, 2007; Özçayır, 2009):

While the flexibility of discretion can be valuable in individualizing the application of the law, its subjectivism can also be the cause of inconsistency in decision outcomes: apparently similar cases may not be treated in the same way by decision-makers . . . An obvious corollary . . . is that discretion can impose similar outcomes on apparently different cases (Keith Hawkins, 1992, pp. 15-16, as cited by Bloor et al., 2006)

Although procedures on detention and inspection practices are clearly defined in the international legal framework (European Parliament and the Council, 2009a; IMO, 2011; Paris MoU, 2017a), making the harmonisation exercise dependent upon the professional judgment of port state control officers may lead to discrepancies due to subjective factors. Among these, their background (Knapp & Franses, 2007a; Ravira & Piniella, 2016), their number on board (Ravira & Piniella, 2016) and the quality of their training (Graziano, Schröder-Hinrichs, & Ölcer, 2017) may be considered.

3. Methodology

The following chapter explains the research strategy adopted to seek answers to the four research questions. One must keep in mind that “the thesis is problem driven and not methodologically driven in the way that it uses the methods that will provide the best help to answer the research question” (Flyvbjerg, 2006).

1. What is and what constitutes Flag State Performance?
2. What are the contemporary issues of Port State Control in Europe?
3. How do discrepancies in the Port State Control regime affect the inspection output?
4. To what extent is Port State Control a suitable instrument to measure Flag State Performance?

3.1. Philosophical bent

The researcher holds the assumption that to explore and solve a contemporary and practical issue, the emphasis should be put on the research problem and the available data collection techniques rather than focus only on method (J.W. Creswell, 2014, p.9). In the same vein the author has no intention of engaging in the controversial debate on the effectiveness of one data collection technique over another. On another level, the researcher strongly believes that the integration of qualitative and quantitative methods in a single study reflects the need to construct knowledge and enhance the research results (Rossman & Wilson, 1985). Lund (2012) characterises mixed methods as a practical/pragmatic attitude through which the “research questions in empirical studies are given high priority, not the philosophy of science, and in that quest qualitative and quantitative methods are used in combination with answering such questions”. In other words, following the definition given by Creswell, Clark, Gutmann and Hanson (2003, as cited by Lund, 2012, p.212):

A mixed method study involves the collection or analysis of both quantitative and qualitative data in a single study, in which the data are collected concurrently or sequentially. They, are given priority, and involve the integration of the data at one or more stages in the process of research.

Since the author strives for an integration of both research strategies, neither of the two opposite or traditional paradigms could be embraced as absolute worldviews. Furthermore, it is the author's personal belief that even if an objective reality was attainable, personal views, experiences and background can shape knowledge and views in a constellation of truths that is worth investigating. The practical nature of the research questions and its day-to-day implications, coupled with the desire to portray the objective of this research from multiple angles, strongly influenced the philosophical bent and the methodology adopted.

(...), Pragmatism, is typically associated with mixed methods research. The focus is on the consequences of research, on the primary importance of the question asked rather than methods, and on the use of multiple methods of data collection to inform the problems under study. Thus, it is pluralistic and oriented towards 'what works' and practice. (John W. Creswell & Plano Clark, 2011, p.46)

One of the philosophical perspectives underpinning the use of a mixed method is called pragmatism. It was adopted to support the current research design given the striving towards real-world practice.

3.2. The European Union scenario, a lesson for a critical case study?

The reason for the focus of this dissertation on the European Union lies in the idiosyncratic nature of the region which makes it arguably a "critical case" scenario (Goldthorpe, 1968). On their study on whether empirical evidence would support the emergence of the notion of *embourgeoisement*, the authors designed the most favourable setting. They argued that should *embourgeoisement* not to be found in the most favourable setting, it would be safe to say that it would be unlikely to occur in less favourable settings. In other words, "if it happens here, it will happen anywhere" or "if it doesn't happen here, it won't happen anywhere" (Patton, 2015; p.275).

Similarly, the nature of the Paris MoU itself suggests that the regime constitutes a critical case study for four main reasons:

1. Since the Paris MoU is the first regional agreement on Port State Control, signed in 1982, the level of experience and maturity is more extensive than in other more recently signed MoUs.
2. While MoUs are, ipso facto, gentlemen's agreements, the Paris MoU is supported by the EU Directive 2009/16/EC as amended, which is legally binding for all the EU Member States.

3. Lastly, the Paris MoU benefits from a set of tools, such as a targeting database system (THETIS), an online distance-learning programme, an inspection support software (RuleCheck) and others, which have only recently been adopted by some other MoUs.
4. All other MoUs have observer status in the Paris MoU meetings and trainings, and routinely receive information on all instructions, guidelines and other information. Although these arrangements are reciprocal, they are highly conducive to the dissemination of the Paris MoU way of working.

Recalling the discrepancies in inspection practices highlighted by Plaza (1994), when discussing the European Union region, the author mentioned that:

Indeed, the establishment of the various regional Port State Control regimes above, essential as it is, is only the beginning. Problems already identified within the European MOU, which after all is composed of quite homogeneous maritime administrations, will be accentuated in other regions where European conformity and affinity does not exist. (Plaza, 1994)

For the four main reasons highlighted above, one can assume that if discrepancies can be found in the EU region, they are more likely to be found in more recent MoUs with less homogeneous political settings.

3.3. Research Approach

As shown in the introduction, the study was divided into four main research questions. For every question, a three-tier approach was followed (Kumar, 2011, p.39):

1. Deciding – “What do I want to find?”;
2. Planning – “How do I find information?”
3. Undertaking – “Collecting needed information”

However, the study was divided in a first exploratory phase (first research question), which then led to the emergence of the following research questions and to embracing a mixed method approach duly honed to provide answers to the inquiry. On a more practical level, when the researcher selects a mixed method design, some key factors need to be taken into account: weighting/priority, timing and approach to mixing the two strands (Creswell & Plano Clark, 2007, p.80; Creswell, 2009, p. 206).

When considering the weighting, in other words which method to prioritize, the researcher should always bear in mind the worldview, the resources available and the audience for the research (Creswell & Plano Clark, 2007, p.82). In this research, neither the qualitative nor quantitative strands prevailed over the other. In other words, the two strands were equally important in seeking an answer to the research questions. In terms of timing, the research adopted a sequential course of actions towards data collection and analysis. Lastly, among the three main strategies¹¹ used to mix the two data types, the author has chosen to merge the data set during the interpretation phase rather than during the data analysis phase.

To conclude, this research adopted a design which John W. Creswell & Plano Clark (2011, p.71) term an *Exploratory Sequential Design*, one which first prioritises qualitative data and then builds from the exploratory results of the initial phase through a second quantitative phase to generalize and confirm the initial results. In fact, in the first two questions, the author is mainly interested in beliefs, understandings, perceptions and meaning pertaining to two very broad topics (Flag State Performance and Port State Control) which are collected through inductive reasoning (Trochim and Donnelly, 2008, p.17). Subsequently, the results of the initial phase are confirmed through quantitative data. An overall overview of the research methodology can be found in Figure 4.

While the overall research project involves both the use of quantitative and qualitative data, the four different research questions do not always use a mixed method of inquiry. In brief, questions 1 and 2 utilize exclusively qualitative data, questions 3 and 4 quantitative data. More details can be found below.

3.3.1. Focus Groups

Question one, for example, has the primary aim of identifying the main definition of Flag State Performance, a topic with a dearth of literature; determining the most optimum indicators; and how to improve the existing ones. This question is exploratory in nature (since little is known of this particular subject), but it is also akin to a descriptive study, since the Flag State Performance's state of the art will also be investigated together with available data.

A focus group can be defined as a moderated group interview, which generally involves a small group of individuals with similar backgrounds and experiences focusing on a specific topic (Lavrakas, 2008, p.643; Patton, 2015, p.284). The main motivation for using focus groups to define Flag State Performance is to explore the perceptions, understandings and experiences of a specific group of people. Focus groups are extensively used to create a broad framework for additional discussion

¹¹ 1. Merging a data set; 2. Embedding data at the design level; and 3. Connecting from data analysis to data collection.

and they represent the baseline for this research study. By gathering first-hand information on the topic of Flag State Performance, the researcher aims to introduce new themes in the current discussion on performance and new, original indicators.

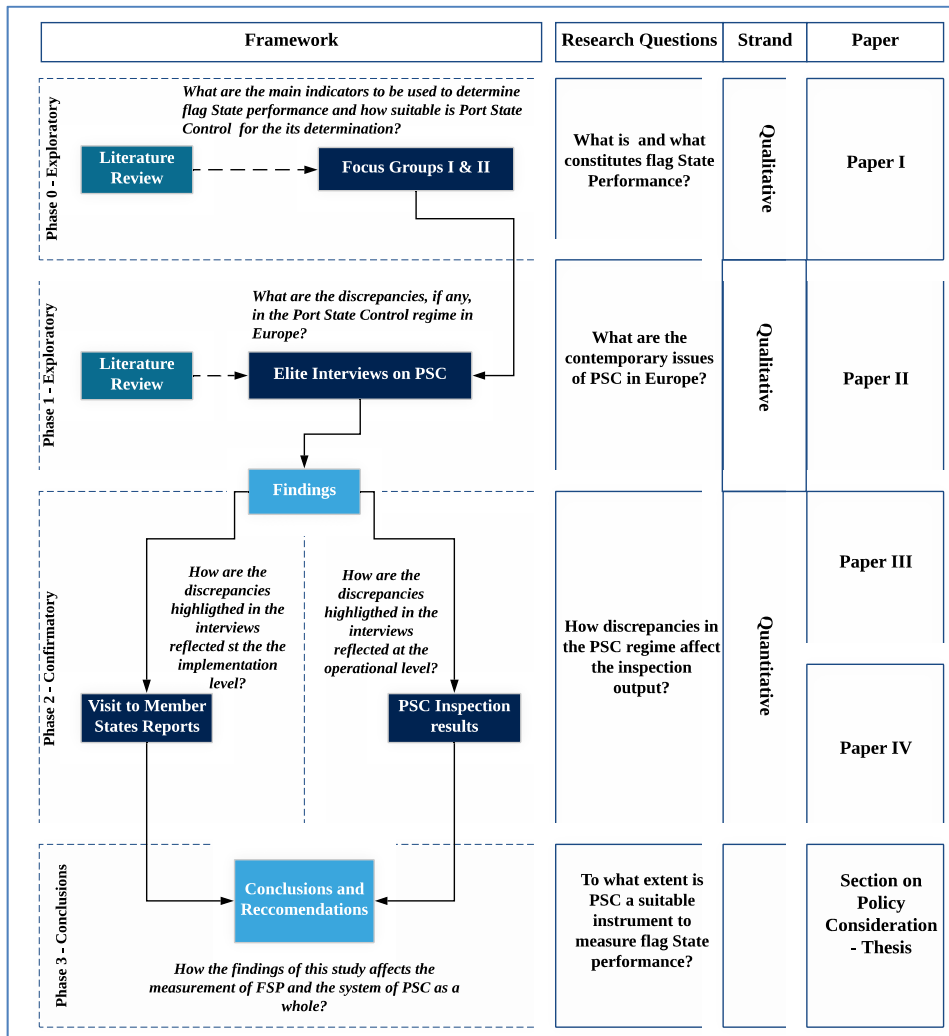


Figure 4
PhD Framework

The participants of the two groups were chosen by taking into account their respective memberships to a specifically selected sector of the Agency dealing mainly with Flag States responsibilities. Although focus groups can be difficult to

steer, they provide several insights on the attitudes, thoughts, perceptions, ideas and feelings of the participants on a specific topic (Krueger & Casey, 2009, p.20).

3.3.2. Elite Interviews

Question two aims to systematically determine the contemporary issues of Port State Control, an approach that could be easily related to explanatory studies (e.g. using literature), but also to exploratory studies (e.g. interviews). Interviews were chosen to conduct in-depth inquiries on the topic and to more closely examine this complex issue (Kumar, 2011; Patton, 2015; Trochim & Donnelly, 2006). Due to the explanatory nature of the research question, an interview study was considered more suitable as its starting point.

More specifically, the researcher used elite interviews, a type of interview mainly used in political science to understand hidden elements of policies and/or legislation by interviewing high-officials or people holding a prestigious role in society (for example, politicians, civil servants, legislators) (Boucher, Maboob, & Dutcher, 2013 citing Dexter 1970; Richards, 1996). For this reason, “elite interview samples tend to be a lot smaller” (Richards, 1996) than other types of interviews. Therefore, a purposive sampling was deemed appropriate for this study due to the narrow research focus and the specific and unique context/case (Miles, Huberman, & Saldaña, 2013).

3.3.3. Analysis of Reports and frequencies of the findings

The documents examined in this research project consist of 25 reports from visits and inspections conducted by the European Maritime Safety Agency in EU Member States. These visits are conducted under the framework of Article 3.1 of Regulation (EC) No. 1406/2002 which states that:

in order to perform the tasks entrusted to it and to assist the Commission in fulfilling its duties under the Treaty on the Functioning of the European Union, and in particular the assessment of the effective implementation of relevant Union law, the Agency shall carry out visits to Member States in accordance with the methodology established by the Administrative Board.

The reports analysed were drafted between March 2012 and April 2016 and summarize the level of implementation of the provisions of Directive 2009/16/EC in the EU Member States. The author used document analysis to analyse the inspection reports provided in this study. Following Bowen (2009), the analysis procedure included a selection, aggregation and interpretation of the data. These data included amount and type of shortcomings and observations. While the analysis of content, frequency and meaning of words was excluded by the methodology, the

author was attentive to the textual structure of the reports (Coffey, 2014). All shortcomings and observations were aggregated into a table and commented by themes.

3.3.4. Statistical Analysis

For the last research question, the author employed a linear probability model to determine whether differences exist across Member States in terms of any deficiencies and any detentions. Moreover, in order to determine the number of deficiencies and apply linear model estimated, the Ordinary Least Square (OLS) method was used. That means that it is assumed that it exists a linear relationship between the amount of deficiencies observed and the covariate explaining such number of deficiencies. OLS was then used to find the best relationship in the knowledge that the main aim was to minimize the distance between the line and real point (error terms).

4. Results

The main initial driver for this endeavour was the exploration and operationalization of the concept of Flag State Performance. However, like in many inductive-inspired studies, the subject slowly transitioned towards verifying the adequacy of Port State Control as an indicator to determine Flag State Performance. The framework of this study was presented in Figure 4 to address the four main research questions. In addition, Table 1 reports the main focus of each paper.

Paper I presents findings from an exploratory study on the conceptualisation of Flag State Performance and it highlights the initial shortcomings of Port State Control. Paper II reports on the findings of the elite interview study on the challenges of European Port State Control. Paper III reports on the implementation of the EU Directive 2009/16/EC on Port State Control, as amended, across EU Member States based on European Maritime Safety Agency visit's reports. Lastly, Paper IV builds upon EU Port State Control inspections' reports and reports the results on the analysis of such inspection reports from EU and verifies the impact of the inspector's numbers and background.

Table 1
Overview of the publication enclosed in this Thesis.

	Paper I	Paper II	Paper III	Paper IV
Main aim of the paper	Explore concept of Flag State Performance	Overall perception on Port State Control in the EU	Analyse the implementation of Directive 2009/16/EC	Analyse discrepancies across EU Member States and the impact of inspectors' number and background
Data	2 Focus Groups	14 Interviewees	25 Reports	140, 000 inspections' results
Method	Focus Groups	Elite Interviews	Document Analysis and frequency of the findings	Binary Regression
Methodology	Qualitative	Qualitative	Quantitative	Quantitative
Inquiry	What is and what constitutes Flag State Performance?	What are the discrepancies, if any, in the EU Port State Control?	What discrepancies are at the implementation level?	What discrepancies exist at the operational level?
Relation to the thesis	Entry point of the research	Explorative phase of the mixed method design	Confirmation of literature and interviews' findings	Confirmation of literature and interviews' findings

4.1. Two sides of the same coin. Flag State Performance as a combination of administrative and fleet performance

Paper I sets the tone of the whole inquiry. It presents the results of two focus groups held at the European Maritime Safety Agency in Portugal involving 13 EU policy-makers. The aim of the study was to define the concept of Flag State Performance by establishing what it represents in the eyes of the participants; how should it be measured; and why is it important.

Figure 5 presents the main result of the study by breaking down the concept of Flag State Performance into two tangible vertical regions, **Administration** and **Fleet**, and three conceptual horizontal regions which depict why the topic under inquiry should be investigated (**Why?**), what comprises Flag State Performance (**What?**) and, ultimately, how to measure it (**How?**).

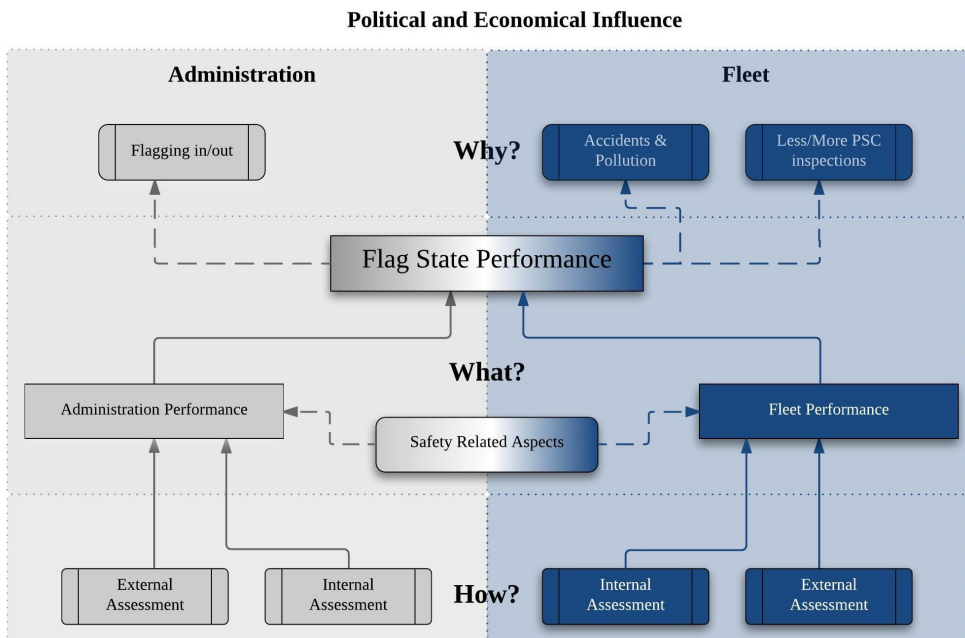


Figure 5
Conceptualization of Flag State Performance as a Result of the Focus Groups.

The majority of the respondents believed that Flag State Performance should be perceived and treated as a bidimensional concept, which suggests a strong interdependence between administration and fleet performance. While the individual components of both administration and fleet performance are extensively discussed in Paper I, the game-changing finding, which shifted the focus of this

study towards Port State Control, was the evaluation of *how* to measure the two performances. It is clear that both an internal/external assessment would be beneficial to ensure a certain degree of independence, but at the same time the commitment by the maritime administration bears scrutiny. Moreover, the transparency of such instruments is somehow questionable.

In reality, the results from internal assessments conducted by the member states on their maritime administrations and fleet (e.g. Flag State inspections) are not publicly available. This is also the case for the external assessments on maritime administrations, such as those conducted by the IMO in the context of the IMO Member State Audit Scheme (IMSAS), since only a handful of member states publish their results.

However, external assessments are performed on the fleets of Flag States, such as those conducted by the Port State Authorities across the world. Since the emergence of the regional MoUs on Port State Control, in fact, the “name and shame” approach to assessment gives public visibility to vessels with poor safety records making it easier to determine their performance.

The participants of the focus groups deemed Port State Control as the only publicly available and transparent indicator, which is an indicator on the fleet performance of a Flag State. Table 2 summarizes the positive and negative aspects of Port State Control according to the participants.

Table 2
Positive and Negative Aspects of Port State Control.

Positive Aspects	Negative Aspects
<ul style="list-style-type: none"> It is the most practical indicator It is a “safety net” against substandard vessels It is a defensive line which sorts the bad from the very bad It is a good output to understand how vessels perform It is almost the only indicator we have It is not the best indicator, but it is effective to measure Flag State Performance It is a proactive measure It is transparent It is independent (external) 	<ul style="list-style-type: none"> It is not multifaceted enough to verify compliance It is subjective and relies too much on expert judgment It has a limited coverage as not all vessels are subject to Port State Control There is lack of harmonisation in Port State Control implementation There are different levels of inspection quality among Port State Control regimes It is a reactive measure It is fallible It lacks effectiveness It is a sample inspection, it does not inspect all vessels It does not cover domestic vessels It underestimates detentions for Flags with a large fleet It should have more subcategories, not only White, Grey and Black It is static and should be updated every week and be dynamic It was created for targeting purposes, not to determine performance It does not consider the number, nature and severity of the deficiencies

A cursory examination of Table 2 indicates that the negative aspects of Port State Control clearly outnumber the positive ones. Some of those, such as *lack of harmonisation, subjectivity*, among others, seem to question the foundation of Port State Control as the third “safety net” of shipping. For this reason and given the discrepancies highlighted by the literature of the past 30 years, the bulk of the dissertation has focused on the adequacy of this mechanism.

4.2. Adequacy and Inadequacy of Port State Control in the European Union

The assessment of EU Port State Control has been conducted through three different methods of research: interviews, document analysis and quantitative analysis of inspection reports. This section of Chapter IV highlights the main results of this inquiry.

4.2.1. Interview Study

The results of the interview study are described in Paper II and outline the main discrepancies of EU Port State Control according to 14 participants associated with three main stakeholder groups: policy-makers, maritime industry officials and seafarers.

Figure 6 illustrates the main findings. In general, the interviewees pointed out that the main discrepancies could emerge either at the *Member States* level or at the *Inspector level*. Those circumstances, if deemed relevant, may compromise the *Ship Inspection* operations and, ultimately, influence the procedures and/or the output of a Port State Control. Given the goal of developing a harmonised system of Port State Control across Europe, some of those dissimilarities were further highlighted by the interviewees. In particular, the diversity in the quota of port state control officers used during Port State Control inspections and in the number of hours allocated for their training was significant at the *Member State* level. In parallel, the diversity in the background of port state control officers across countries and the reliance on professional judgment were flagged at the *Inspector level*.

When looking into the group of countries as a whole, slight differences were observed among EU countries from the North and from the South in what has been called the “north-south” slope. As a rule of thumb, some participants have portrayed the southern countries of Europe as the keenest on detaining ships while in the northern Europe, Member States tend to perform an inspection less strictly. This is mainly due to the background of the inspectors employed by the maritime administrations. While port state control officers with a seafaring background

mainly employed in the north EU countries have a less stringent approach towards rules and procedures; their technical knowledge seems more robust. Conversely, port state control officers with different backgrounds, mainly employed in the south EU countries, seem stricter in terms of applying inspection rules and procedures, but lack solid technical knowledge. Hence, the approach towards inspection and the inspection’s output, whether involving detentions or the type or number of deficiencies, may vary from Member State to Member State.

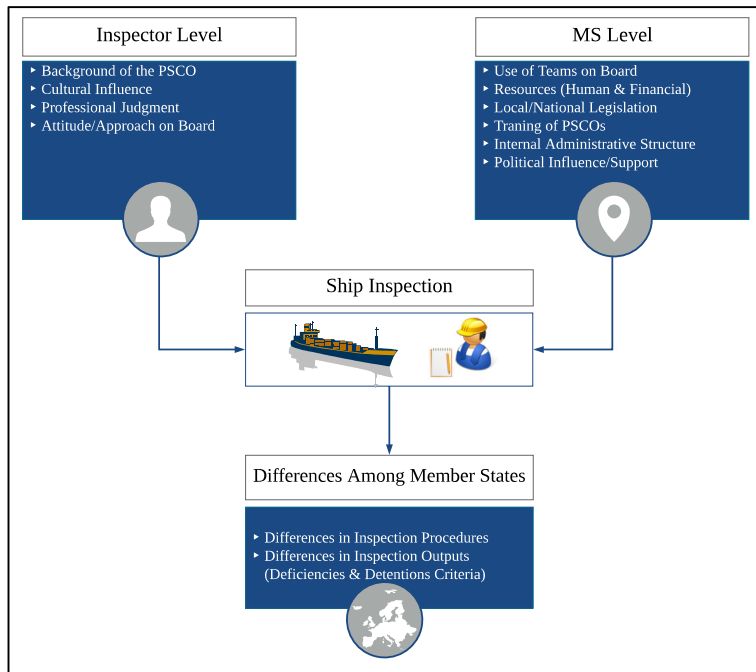


Figure 6
Summary of the findings of Elite Interviews.

4.2.2. Analysis of Reports and frequencies of the findings

The results of the document analysis are shown in Table 3. These results are mainly related to the discrepancies at the Member State level and it summarizes the number of shortcomings (S) and observations (O) for each of the articles of Directive 2009/16/EC for each of the Member States. Shortcomings are represented in red, while observations are in orange; where neither shortcomings nor observations were found, the cell is left green. In circumstances where two or more findings were recorded, the number logged in the cell indicates the total.

The analysis clearly shows areas of the Directive where Member States have struggled and may be struggling with its implementation. Those articles were underlined in the table and grouped into three main areas of interest:

- Inspection Commitment/Information: **Article 5, Article 8 and Article 24**
- Quality of Inspections: **Article 15.1, Article 15.2 and Article 14**
- Training of port state control officers: **Article 22**

As already emerged through the interview study, the quality of inspections in terms of procedures and the training of port state control officers have been highlighted as one of the issues in the harmonisation process. Issues in inspection commitment/information may appear to be of a more organizational nature, while in reality they have a steady impact on the allocation of inspections across the region and could influence the inspection burden on some Member States.

4.2.3. Analysis of the inspections' results

Lastly, the outcomes of the previous data collection have been triangulated through an econometric analysis of the effect of the inspectors' teams, their members' profiles and their background on the output of Port State Control inspections.

On a Member States level, the results of the analysis made it clear that there were significant variations among them as to detecting at least one deficiency and/or detaining a vessel. Significantly, some Member States showed a 40 per cent lower probability of reporting zero deficiencies compared to others. The results also emphasized that differences in Port State Control outcomes were much more important within each Member States than, on average, between them.

Regardless of the characteristics of the vessel, considerable differences emerge when the composition of the team carrying out an inspection on board a vessel varies. Moreover, the probability of finding deficiencies on board and/or detaining a vessel is higher when three inspectors are on board rather than one or two. The probability of finding any deficiencies is 8.8 percentage points higher when there are two inspectors rather than one. The figure rises to 13.4 per cent with three inspectors. Similarly, the probability of having a vessel detained is 3.8 percentage points higher with two inspectors rather than one, and 14.0 percentage points with three inspectors.

The results were not always consistent as regards the extent to which an inspector's particular professional background helped him to detect certain type of deficiencies. However, it was clear that some professional backgrounds were more likely to detect these (e.g. inspectors with a seagoing (engine) background were more likely to detect propulsion and auxiliary machinery deficiencies compared to other inspectors).

Table 3
Summary of shortcomings and observations concerning the implementation of Directive 2009/16/EC (Paper II).

MS ID	Article	TOT																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25				
Organiz.	5				2		3				2									2	2					2				
	6			2			2																			16				
	7																									0				
	8																				2					5				
	9																									16				
	11																									12				
	15.1/2																									2				
	16,																									6				
	21,4/5																									6				
	23																									0				
Commitment	25																								0					
	12																								1					
	13																								3					
	14																								4					
	19																								0					
	21.1																								1					
	15.3																								0					
	24			2		2	3	4	2	2	2	2	2	2	2	3	3	2	2	2	2	2	3	3	3	48				
	28																									0				
	Personnel - Logistics	22																								0				
29																									7					
18																									0					
20																									2					
34																									3					
Right of Sanctions	29																								5					
	18																								0					
	20																								0					
	2																								2					
	4																								1					
TOT	S	O	T	142	125	267																								

	Shortcoming
	Observation
	No Finding

5. Discussion

This chapter summarizes the significance of the research carried out and its impact on day-to-day policy and maritime operations.

The findings of the literature highlighted in Chapter 2 together with the results of the explorative part of this study lead one to ask whether Port State Control represents a valid, independent and reliable tool to determine Flag State Performance.

As mentioned earlier, the exploratory approach to this research study initially aimed at identifying performance indicators for Flag State Performance. Given the strong ties between Flag State Performance and ship safety inspections, the research efforts quickly shifted towards a holistic analysis of Port State Control within the European Union. While Paper I sets the ground for questioning the European Port State Control regime as a suitable tool to determine Flag State Performance, Paper II, Paper III and Paper IV identified important discrepancies in the Port State Control harmonisation process (either at the implementation and operational level) by using different methods and data. Elite interviews, document analysis and regression methods were used to this end. The main purpose for using a triangulation of methods and data, both qualitative and quantitative, was to make raw data more informative through stakeholders' perceptions, and at the same time to make points of view and opinions more robust through statistical evaluations. An overall summary of the findings in the implementation and operation of Port State Control can be found in Figure 7.

Some issues in the harmonisation process were already obtained in Paper I as one of the results of the two focus groups conducted with policy-makers. However, it is through the elite interviews of Paper II that the main points of controversy were identified, although the EU regions are still deemed to be the most reliable regional agreements on Port State Control. While the literature and practice have extensively highlighted endemic issues in the regional agreement on Port State Control, the differences in the EU region comprise key elements in the elaboration of this project.

The binding nature of an EU Directive for its Member States and the EC enforcement power suggests a higher effectiveness of the EU Port State Control compared to the other MoUs (van Leeuwen, 2015). If the critical case study approach is followed (Goldthorpe, 1968), discrepancies in harmonisation found in an ideal setting, such as in the EU region, are also likely to be found in less

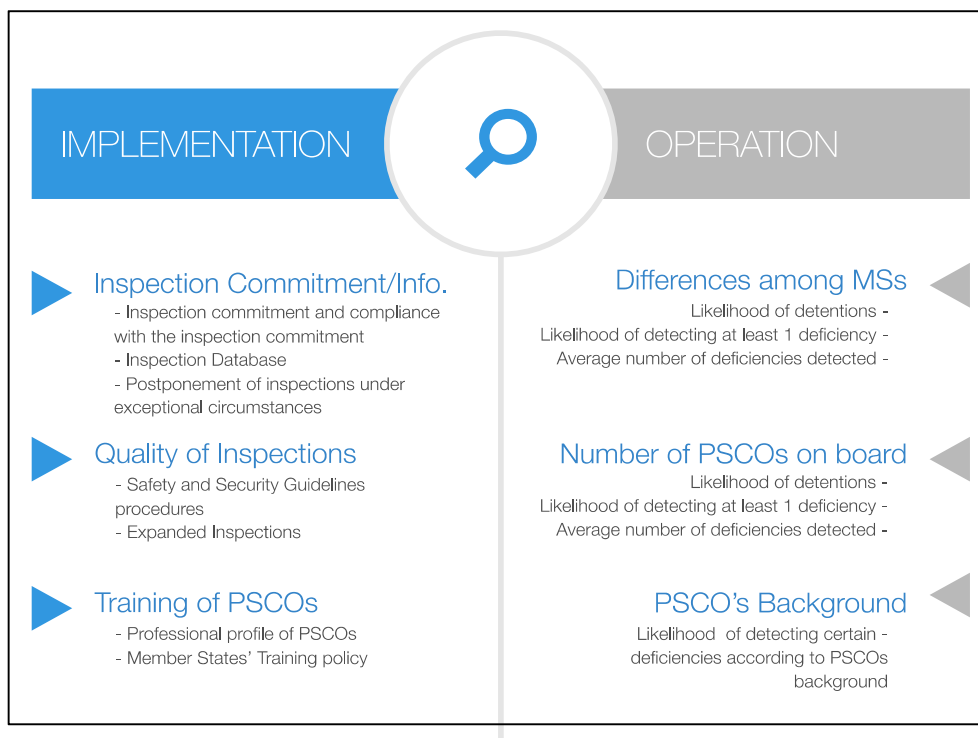


Figure 7
Summary of the Findings in Implementation and Operation of Port State Control in the EU

5.1. General considerations

The elite interviews represented the entry point for this investigation. Overall, it appears that the maritime industry remains more positive towards the current Port State Control regime in Europe than policy-makers. Some even suggested that the quality of Port State Control has decreased over the years, while the regime still enjoys a solid reputation which keeps it functioning.

I think the Paris MoU today is still regarded as the most effective in the region, but I do not think this is the case. What we have created is an area around us, a maritime area, where there is a high level of self-control by shipping companies, by Flag States, by ships in general because of the reputation of the Paris MoU. So that is the indirect effect of the reputation of the Paris MoU. Nevertheless, ships get away with issues because the inspectors have become more relaxed in dealing with problems

Paper II summarizes the results of the elite interview study. The outcome of the analysis (Figure 6) shows two main areas which can lead to differences in inspection's procedures and inspection output: the **Inspector** and the **Member State**. At the inspector level, background, cultural influence, professional judgment and attitude/approach on board can impact the inspection process and its output. In parallel, the use of teams on board, human and financial resources, local/national legislation, training of port state control officers, internal administrative structures and political influence/support are factors at the Member State level which can influence the inspection process and its output.

While specific considerations on inspectors' numbers and background will be postponed in 5.2 and 5.3, general considerations on Port State Control as a discretionary system are addressed here. As it is currently envisioned by the international maritime system, Port State Control is subject to the professional judgment of the port state control officers. The instructions found in the Paris MoU and the IMO procedures for Port State Control refer to the use of professional judgment as a key element in the inspection process. The latter states that the port state control officers should use professional judgement "in carrying out all duties and consider consulting with others as deemed appropriate" (2.3.1), but also that a port state control officers should "determine whether to detain the ship until any noted deficiencies are corrected or to permit a vessel to sail with deficiencies" (4.1) (IMO, 2011).

Similarly, the former says that port state control officers should "exercise professional judgment in determining whether to detain the ship until the deficiencies are rectified or to allow it to sail with certain deficiencies without unreasonable danger to the safety, health, or the environment, having regard to the particular circumstances of the intended voyage." (Paris MoU, 2017a). In the EU legislation on Port State Control, professional judgment is used throughout the Directive in regard to different situations. In article 13, for example, the inspector's professional judgment is the key to determine whether during an initial inspection there are clear grounds that warrant a more detailed inspection. (European Parliament and the Council, 2009a, Article 11) state in Article 11 of 2009 that: "Clear grounds shall exist when the inspector finds evidence which in his professional judgment warrants a more detailed inspection of the ship, its equipment or its crew."

Article 19 recalls the text of the Paris MoU and the IMO on vessels' detention: "When exercising his professional judgment as to whether or not a ship is to be

detained, the inspector shall apply the criteria set out in Annex X” (European Parliament and the Council, 2009a, Article 19). In Annex I Section II.2, the Directive refers to professional judgment when discussing additional inspections: “Ships, to which the following overriding or unexpected factors apply, are subject to an inspection regardless of the period since their last periodic inspection. However, the need to undertake an additional inspection on the basis of unexpected factors is left to the professional judgment of the inspector” (European Parliament and the Council, 2009a, Annex I).

Still in Annex I, Section II.3B (c), the Directive states that in case of an unexpected factor: “A more detailed or an expanded inspection, according to the professional judgment of the inspector, shall be carried out on any ship with a high-risk profile and on any passenger ship, oil tanker, gas or chemical tanker or bulk carrier, older than 12 years of age” (European Parliament and the Council, 2009a, Annex I). Although the procedures are clearly outlined in the texts cited above, professional judgment and its intrinsic subjectivity in the decision-making process is crucial to determine the seriousness of the deficiencies (Bloor et al., 2006).

In their analysis on the Port State Control system, Bloor et al. (2006) regard it as a discretionary system as opposed to a binding system. In his discussion on strategic spatial planning, Albrechts (2004) outlines the difference between the two systems given that “whereas in the binding system the focus is on legal certainty, there is a notable absence of certainty in the discretionary system”. Binding/regulatory/fixed systems and discretionary systems are widely described in the academic literature: the first is underpinned by the “desire to maximise certainty” and the second by “the desire to allow maximum flexibility” (Booth, 1995). Binding systems are inherently rigid and tend to provide consistent and predictable decisions (Murphy, 1991) although they have difficulties in adapting to unforeseen scenarios (Booth, 1995).

A regulatory system of control gives the least possible opportunity for decisions to be made according to whim, chance, or political expediency. (Booth, 1995)

In contrast, discretionary systems are extremely flexible but support vague and indeterminate standards, which make room for arbitrary and sometimes discriminatory decisions (Bloor et al., 2006; Booth, 1995; Murphy, 1991). According to Murphy (1991), for example, reliance on a discretionary approach in family law led to a series of unjust decisions which ultimately increased costs of divorces and settlements.

Despite both systems having a plethora of weaknesses and strengths, the key factor deciding which of the two approaches one selects is whether the system aims at certainty or flexibility. In this context, the regional Port State Control remains hostage to the desire of granting a certain degree of freedom to the Member States and the need for harmonised rules and implementation to guarantee a level playing field within the EU. While port state control officers have to follow a framework of

rules and procedures, their decisions are left partially unconstrained which leaves room for inconsistencies in decision outcomes. For example, a decision could be biased by cultural influences and professional background, as mentioned above.

Here, the question arises as to why such strategy is adopted if its limitations are well known. As far as the experts involved in the study are concerned, some have argued that using fixed checklists, including a strict step-by-step approach, could solve any issue of subjectivism in the decision-making process. Others have argued that some flexibility is needed when dealing with a complex socio-technical system such as a ship. However, all experts agreed that properly **trained** port state control officers are less prone to subjectivity and “hobby-horses.”

Going back to the results of the elite interviews, the interviewees have concurred that the training of port state control officers at the Member State level represents a crucial aspect influencing the inspections’ outcome. Article 22, Recital 7 of Directive 2009/16/EC, as amended, requires the Commission to develop and promote, in collaboration with the Member States, a “harmonised Community scheme for the training and assessment of competences of port state control inspectors by Member States”. Ultimately, the scheme was developed by the Paris MoU Task Force 34 under the name “Paris MoU Policy on the training of the new entrant port state control officers and the professional development scheme for port state control officers” (Paris MoU, 2017c) which establishes a training policy for both new and experienced such officers and specific activities for maintaining their port state control officer qualifications.

These activities translate into points. In order to complete the Professional Development Scheme, the port state control officers “must gain a minimum of 30 points within a 5-year period” (Paris MoU, 2017c, page 20). Among these activities, the policy proposes attending European Maritime Safety Agency/Paris MoU Seminars, National Seminars on Port State Control, completing the Paris MoU Distance Learning Modules and undertaking Port State Control inspections, inter alia. With regard to the content of the training scheme, the Paris MoU policy clearly outlines the learning objectives and the syllabus of competency for new entrants. However, it neither specifies how to conduct the training nor the number of hours required to complete the syllabus.

The implementation of the training policy, as also noted by several policy-makers, is still a Member State’s responsibility, which allows the latter to decide the extent to which the policy is implemented and the learning objectives achieved. As pointed out in Paper II and Paper III, the training procedures among EU Member States are not harmonised. In Paper II, some of the participants considered the training policy of the different Member States a “black hole”, while others pointed to the clear-cut differences between those countries with developed training schemes and those with a “training on the job” policy.

Similarly, Paper III clearly shows that national training efforts are not consistent across the 25 Member States analysed, with some countries focusing more on

theoretical trainings than on practical ones and other countries doing the reverse. Overall, with the exception of some Member States, the majority invest less than 500 hours in training for entry-level port state control officers. The interviewees, for examples, agreed that a harmonised training policy is paramount to ensure a consistent and fair treatment across the region. Trainings, in fact, are deemed vital to instil knowledge and a methodological approach to ship inspections.

For many experts, the training policy is connected to the port state control officers' background. Some interviewees, for example, expressed the view that inspectors with a seagoing background needed less training hours compared to inspectors with a different background. While this may be valid for maritime-related subjects, the author disagrees with this rationale since procedures and inspection methods are unknown to new port state control officers regardless of whether they have a seagoing background or not.

5.2. The background

Many authors dealing with the Port State Control domain have already emphasised that training of port state control officers and their background may influence the outcome of a Port State Control inspection procedures (Bloor et al., 2006; Knapp & Franses, 2007a; Ravira & Piniella, 2016).

On a more qualitative level, the results of Paper II show that the interviewees did not share a common position on the approach on board a ship and the inspection's outcome based on whether the port state control officers have had seagoing experience or not. It appears that inspectors with no seagoing background were more inclined to follow the inspection procedures *by the rules*, preferring less technical rules and procedures and operational knowledge yet a very good knowledge of the inspection procedures of their MoU. In contrast, ex-seafarers tended to be more empathetic with the crew and therefore more indulgent in case of a deficiency and trusting in their abilities to solve a problem.

This attitude could be related to their past experience on board when facing a deficiency, or worse a detention – factors that would promote a stressful environment on board and tension with the company. While such a difference in approach may easily explain the lack of harmonisation within the EU, it also fuels a deeper divergence of views of the overall system of Port State Control as a control strategy. By being more permissive with the crew, port state control officers with a seagoing background tend to verify whether the vessel is seaworthy, therefore minor deficiencies that are not an immediate threat to life or the marine environment could be overlooked.

In contrast, port state control officers who tend to rigidly follow inspection procedures and protocols, appear stricter in the eyes of the crew. However, in point

of fact they are determining compliance of foreign flagged vessels with applicable international standards. Following the same rationale, experts have also concluded that the type of deficiencies found on board is probably dependent on the professional/academic background of the port state control officers performing the inspection. As an empirical proposition, the interviewees pointed out the plausibility that, since an engineer finds himself/herself more comfortable in the Engine Room, a Captain on the Bridge and a Naval Architect with the ship's structure, the inspections and eventual deficiencies identified would very likely reflect their proficiency in these areas when performing an inspection on board a ship.

On a more quantitative level, Paper IV tries to verify the conclusions mentioned above based on actual inspection data. The results showed that whether one takes the average number of deficiencies or of detentions identified by port state control officers, there is little variation in the inspectors' backgrounds. However, as far as the average percentage of detentions is concerned, inspectors listed under "other university" background (e.g. law, economics) have a slightly higher probability of being part of an inspection leading to a detention. However, for all outcomes, the background of an inspector overall has an inconsiderable effect on the final Port State Control outcome.

As to the whether the background of the port state control officers is related to the type of deficiencies recorded, the analysis shows a certain dependence on the two variables. For instance, inspectors with either a seagoing (deck) or seagoing (engine) background more often report deficiencies related to safety or navigation. The reverse pattern is found for inspectors who are either architects, engineers or with another university diploma. Architects or engineers more often report deficiencies related to labour conditions, while inspectors from other university backgrounds more often report deficiencies related to certification and documentation. However, when the analysis moves towards linear probability models to take into account a vessel's characteristics, the results are less significant.

The only results, which are consistent across the different analyses, are those related to fire safety-related deficiencies. These are less likely to be identified by inspectors with a university degree. Deficiencies in labour conditions are less likely to be identified by inspectors with a nautical background. However, both groups are more likely to identify deficiencies relating to living and working conditions-related deficiencies. Lastly, as mentioned by the participants in Paper II, inspectors with a seagoing (engine) background are more likely to detect propulsion and auxiliary machinery-related deficiencies.

However, while the statistical analysis performed in Paper IV could not confirm the hypothesis of the elite interviewees, it is clear that a certain dependency exists between the port state control officers' background and the type of deficiencies recorded after an inspection. This is also reflected by the fact that the Member State itself, if used as a controller, has an influence on the type of inspection detected. Overall, other factors should be taken into consideration, such as, but not limited to,

cultural influence, training and traffic in the port. However, gathering certain type of data may be too complex a task and therefore a complete analysis was difficult to undertake.

5.3. Teams

Ravira & Piniella (2016) were among the first authors to transpose many practitioners' voices into an academic premise: the number of inspectors on board during an inspection has an influence on the type and quality of the inspection's outcome. Reducing the concept to a simple scenario, one can consider a vessel due for inspection entering into port. If a single inspector is selected to perform a generic inspection which is supposed to last approximately X hours, the port state control officer will verify all the items related to that inspection by him/herself.

Instead, if two inspectors are selected, they might share the areas to be inspected and conduct a more thorough inspection given the allocated X hours. Moreover, recalling the discussion above, by adding the variable of having a port state control officer with a marine engineering background and one with a nautical background, the respective areas of proficiency may be different and the inspection would be more complete rather than if conducted by a single inspector. The elite experts in Paper II have pointed to such a scenario, adding that assigning two or more such officers on board also has a twofold behavioural consequence on the individuals. First, the crew and captain are less prone to challenge two port state control officers who, inspecting as a team are more self-assured than when proceeding alone. Secondly, an additional professional performing the inspection may work as a *peer-review* tool and encourage positive competition and thoroughness. In Paper IV, the analysis has shown that regardless of the type of inspection (whether initial, more detailed or expanded), inspections with two or more inspectors are more likely to detect more deficiencies and result in a detention than those with a single port state control officer. Detailed results per type of inspection confirm the positive correlation between the number of inspectors and the Port State Control outcomes, with large marginal effects for detention.

However, the decision to utilize one or more port state control officer during an inspection remains a full prerogative of the Member State and it is subject to several factors. These include but are not limited to the distance from the Port State Control headquarters to the port of inspection, the length of the coastline and associated allocation of resources on the territory and overall financial and human resources. Although there is no fixed rule pertaining to the number of inspector to allocate for a particular type of inspection, experts have recommended that for certain type of inspections the presence of two or more inspectors is paramount to adequately perform the activity.

This is the case for expanded inspections given that the following areas shall be inspected, according to Regulation No. 428/2010 Implementing Article 14 of Directive 2009/16/EC (European Commission, 2010), as amended: Documentation, structural condition, watertight/weather tight condition, emergency systems, radio communication, fire safety, alarms, living and working conditions, lifesaving appliances, pollution prevention and cargo operations. Such inspections not only require several hours to be performed, but the support of multidisciplinary teams would ensure the adequate coverage of all areas.

5.4. Differences across EU Member States

The principal objective of the second phase of this research is to see whether differences between Member States exist. The above sections have mainly addressed the possible causes and underlying factors leading to differences across Member States following the evidence of the analysis. However, the questions remain as to whether evidence of dissimilarities exists within the EU region. To address such an inquiry, Paper II, Paper III and Paper IV have attempted to address discrepancies in harmonisation among Member States on different levels and areas of the implementation process.

On a subjective basis, elite interviewees have described the existence of a so-called “North-South” slope within the EU. Given that northern countries tend to employ ex-seafarers as port state control officers, the latter have sound maritime knowledge, although, at the same time, they lack the more robust approach towards inspection’s procedures and guidelines of their counterparts in southern countries. However, port state control officers in southern countries of the EU are criticised for their inadequate seafaring experience, although they are respected for their adherence to the common rules and procedures of the Paris MoU and the EU.

Nevertheless, such *quality perception* is reversed between industry and policy-makers. Recalling the “divergence of views” briefly explained in Section 5.2, the underlying objective of Port State Control can be perceived differently according to stakeholders’ group. On the one hand, the industry tends to regard this concept as an instrument to verify the seaworthiness of the vessel and avoid harm to humans and the marine environment. On the other hand, policy-makers consider it as the tool to verify compliance of foreign flagged vessels with applicable international standards, as envisaged by the international legal framework.

On a more supranational level, the horizontal analysis of Directive 2009/16/EC, as amended, has shown several discrepancies at the **implementation level** of the Directive. According to the number of observations and shortcomings recorded by the European Maritime Safety Agency team which were analysed in this study, the areas of *Inspection*, *Commitment/Information*, *Quality of Inspections*, and *Training*

of port state control officers still lack harmonisation. The amount of missing information reported under Article 24 of the Directive, for example, has a significant impact on the overall prediction of the fair share of the region. This is due to the fact that the fair share is calculated by taking the average number of inspections required in the previous 3 years in consideration. While this may appear a technicality, not only same states could face unjustified costs related to additional inspections, but also the Port State Control regime's reputation would face extreme criticisms by the industry for excess inspections. In addition, the high number of shortcomings and observations in the area of quality of inspections has revealed that many Member States tend to apply inspection procedures in an inconsistent manner which contradicts the overall objective of achieving common practices in the region. This was valid especially for the Safety and Security Guidelines procedures and the procedures for expanded inspections.

Lastly, the analysis of the training policy of the various Member States for new entrants and refresher port state control officers found that national training efforts were not consistent across the region. This finding is concerning given that the Port State Control system depends on their professional judgment, therefore a harmonised training policy is the principle strategy to ensure a common application of rules and procedures.

On a quantitative level, the analysis carried out in Paper IV demonstrated noticeable discrepancies at the **operational level**. Overall, the analysis showed dissimilarities in the likelihood of vessels' being detained and the number of deficiencies being recorded across the board. Although other authors had previously shown the effect of vessels' characteristics (such as age, type, flag) on the outcome of the inspection process, the inconsistencies shown in Paper IV persist regardless of the characteristics of the vessel. However, a ship's characteristics are still the most important factor explaining the Port State Control outcomes.

By taking Member State 1 as a reference, the disparity between this point of reference and the other Member States is generally noteworthy and even remarkable for certain ones. Some demonstrate the probability of their ships recording zero deficiencies that reach -40% compared to Member State 1. Similar results are also found in terms of number of deficiencies. Compared to MS1, inspections completed in MS3, MS6, MS7, MS12, MS18 or MS24 are associated with less deficiencies (with a gap exceeding 2.5 deficiencies per vessel). Lastly, the inquiry also verified whether differences inside a country might appear. The results showed substantial heterogeneity in the Port State Control outcomes within each country of inspection, which requires further investigation by including information on ports as a variable.

In conclusion, the results of the different and parallel investigations have shown inconsistencies at various levels of EU Port State Control. While Paper II has given regional consideration to the EU Member State, according to elite interviewees, Papers III and IV have extended the inquiry into both the areas of **implementation** and **operation**. Initially, the outcomes of Paper III have shown a lack of

harmonisation in the implementation of the cornerstone of EU Port State Control, namely Directive 2009/16/EC. As already mentioned above, the results of Paper IV have portrayed clear deviations in the inspections' outcome across the EU in terms of detentions and the number of deficiencies.

5.5. Policy Considerations

In terms of policy considerations, the results yield several useful outcomes. The first main outcome concerns the suitability of Port State Control as a tool/indicator to ascertain Flag State Performance. The second main outcome relates to the exercise of Port State Control and its current implementation in the EU.

While this study has found it incontrovertible that in its 40 years of implementation regional Port State Control has improved safety, pollution prevention and labour conditions on board vessels, its application as an indicator to measure Flag State Performance is a subject to be treated separately. The definition and characterisation of the theoretical and practical framework underpinning this concept has been tangentially broached in this research. Surprisingly, the majority of the experts involved in the first phase of the research distanced themselves from the current practice of tying Flag State Performance exclusively to the performance of a fleet.

By keeping in mind the Organization for Economic Cooperation and Development distinction between input, output and performance indicators (OECD, 2014), clearly the experts considered that the performance of a complex system like the Flag State could be reduced solely to performance of its expected output, but rather to the performance of its resources, activities, actions and controls producing that output. Although the 360° implementation of Port State Control makes it a transparent and continuous exercise to verify ships' performance, the enormous amount of data obtained annually through the inspection database THETIS pertains only to some Flag States activities. Moreover, they do not specify areas of the Flag State administration where improvements are needed.

Most of these activities are plainly identified in the international legal framework and the III Code (IMO, 2013) and include delegation of authority, fleet monitoring, training of staff, monitoring of EU Recognized Organizations, ratification and implementation of international conventions, follow-up procedures, among others. By using the White, Grey and Black list, which relies on the total number of detentions compared to the total number of inspections, to define Flag State Performance, all the information pertaining the various Flag States' activities are missed. Moreover, performance not only loses its all-encompassing attribute but, in the end, may be inaccurate. For this reason, the distinction between fleet

performance and administrative performance came to the forefront of our investigation as key determinative elements.

This proposal proposed considering Flag State Performance as a multifaceted concept resting on two inclusive pillars: the performance of the Administration, the entity executing the activities to achieve performance, and the Fleet performance, the tangible outcome of the administration's activities. Consequently, the development of a more complete set of Flag State Performance indicators which includes, but is not limited to, Port State Control is strongly advocated, in light of the policy instruments review, such as Directive 2009/21/EC on compliance with Flag States requirements (European Parliament and the Council, 2009b).

The above considerations are relevant to the debate on the accurateness of the White, Grey and Black list and its formula. Academia and the maritime industry have strongly criticised it, as well as the reliability of Port State Control as a whole. In the debate on Flag State Performance, many experts questioned the latter concept, not on the basis of whether it is enough to portray the complexity of Flag State as a system, but rather on the operational issues of Port State Control, namely, the lack of harmonisation among regions and often within the same region.

These points were a caveat that resulted in a wide range of queries on whether this concept was adequate to measure Flag State Performance or not. Since the introduction of the Hague Memorandum in 1978, the regional MoUs on Port State Control have faced similar obstacles in the implementation of their provisions. As said, this was due to the differences between regions in terms of resources and efforts, but also to the administrative nature of such agreements.

Given the compulsory nature of EU law, one would expect these issues to have been overridden. However, this research has unveiled several aspects of the harmonisation process that are in line with future policy debates. In the area of implementation, for example, the results from the study have shown issues in the current application of Directive 2009/16/EC as amended in some key areas. These include Inspection commitment/information (Article 5, Article 8 and Article 24), Quality of inspection (Article 15.1, Article 15.2 and Article 14) and Training of port state control officers (Article 22).

While the first of the three may qualify as more administrative in nature and also involve organizational issues (Article 9), the other two have strong repercussions on the Port State Control operations, the reputation of the regime and the overall objective of developing a level playing field in the region. Notably, the substantial inconsistencies in the training policies of EU Member States should be highlighted in future policy debates due to the direct link to two main aspects of an inspection, which is a process that is openly reliant on the professional judgment of the port state control officers. Firstly, their training expands their knowledge of the regional procedures on Port State Control. Secondly, a port state control officer's training influences the quality of their professional judgment, hence the quality and thoroughness of their inspections and decision-making.

This conclusion is closely associated with the different numbers of detentions and deficiencies, which vary according to the number of port state control officers taking part in the inspection. This point has been highlighted in the analysis of the inspection data from 1 January 2014 to 31 December 2015. Moreover, the same analysis also showed wide diversities in the number of detentions and deficiencies, according to the Member State where the inspection was conducted.

Although the Paris MoU and the EU Port State Control are regarded as one of the most effective such regimes around the globe, the path towards harmonisation is yet to be completely achieved. By recalling the three main objectives of harmonisation as mentioned by Directive 2009/16/EC (training, inspections and detentions – see Figure 3) the research has shown that these are not entirely met. On a higher level, the development of a harmonised system of inspection and targeting procedures is one of the most important goals of Port State Control regional agreements. Thus, the existence of different standards for inspection can represent a failure of the system as a whole.

On another level, the essence of the problem can be both technical and economic. From a technical point of view, differences can undermine the targeting system, based on previous inspection's results and weaken the effective implementation of international regulations. From an economics point of view, discrepancies may promote the so-called "port shopping". In every case, issues related to harmonisation negatively impact the reputation of any regional system of Port State Control.

Lastly, one last provocative question is whether this concept is a suitable indicator for Flag State Performance. No one would expect a clear-cut answer to this complex topic. It is true that issues in harmonisation, whether regarding the number and types of deficiencies or of detentions, have an impact on the reliability of Port State Control as an indicator. However, it is a 360 degrees instrument, which, even if it lacks the thoroughness of a more targeted survey, works 24/7 and produces an incredible amount of data and information on the well-being of vessels entering European waters.

Despite the fact that some improvements are advocated, if paired with other indicators coverings aspects of Flag States, which are not exclusively fleet-related, Port State Control remains one of the most effective tools in terms of completeness and transparency as far as fleet performance is concerned.

6. Conclusions

After years of research, investigation and interpretation of data, then the question “what is next?” arises. In other words, what can effectively be done after taking into account the results of this work.

The initial aim of this dissertation was to formulate a new framework for Flag State Performance. It can be said that both industry and policy makers should acknowledge the necessity for more comprehensive performance instruments. These should embrace the more encompassing role of Flag States. Overall, the obsolete characterisation of Flag State Performance as the mirror of fleet performance was abandoned and substituted with a more comprehensive and inclusive framework, one which takes into account the multifaceted activities of Flag States. By relinquishing the overreliance on fleet performance, actors such as administrators, industry and policy makers can therefore address activities and responsibilities of Flag States which are otherwise overlooked and left unanswered by traditional Flag State Performance instruments. In addition, the additional focus on administrative-related aspects mitigates the conundrum of whether poor vessel’s conditions are to be attributed to the shipowner, which is responsible to maintain vessels in compliance with the international legal framework, or the Flag State, which is responsible to monitor that the vessel is in compliance with the international legal framework.

Given the wide use of Port State Control to determine Flag State Performance, the objective of the research slowly shifted to investigating the adequacy or inadequacy of this instrument in an effort to determine its challenges and successes after 40 years of implementation within EU waters. For this purpose, an analysis of Port State Control was undertaken to determine if it was suitable to measure Flag State Performance and to ascertain whether issues arise within this concept as a system. In this regard, this research has shown that a series of inconsistencies in implementation and enforcement of Port State Control activities, both at the Member State and port state control officers level, arise within the EU region. The findings, especially those in the training policy and inspection outcomes, are paramount to highlight areas of further improvement at different levels but mainly for policy makers and the harmonised implementation of the Directive 2009/16/EC, as amended. More specifically, these inconsistencies may lead the way for a revision and/or recast of this piece of legislation with the objective of enhancing even further the process of harmonisation of Port State Control activities in the EU.

A last source of reflection is given by the prospect of transferring the *lessons learnt* from this work to other MoUs and regions in the World. As often advocated in the text, the EU has been regarded as the most favourable region where harmonisation of Port State Control activities may be achieved. Such conclusion is based on a series of positive circumstances such as the binding nature of the legislative framework, the level of maturity of Port State Control activities, the IT support, amongst others. According to the critical case sampling strategy, through which “if it does not work here, it does not work anywhere”, the results of this research can be transferred to younger MoUs on Port State Control and foster further cooperation and harmonisation.

In conclusion, it was made clear that Port State Control in the European Union is still regarded as the most advanced and reliable of the MoUs. While it is true that discrepancies in the inspection outcome can impair the reliability of Port State Control as a suitable indicator for Flag State Performance, it still maintains its continuous and transparent attributes which makes it easy to include in the framework for Flag State Performance. Although it is unequivocal that Port State Control has to be coupled with other indicators to provide a full picture of Flag State Performance, policy makers should foster a culture of transparency in the shipping industry and the maritime administrations. Instruments such as the IMSAS, Flag State inspections, internal audits, level of delegations to Recognised Organisations, near-misses, accidents, among others, would represent a richer source of information to determine Flag State Performance compared to Port State Control alone, if made publicly available. For this reason, the author does not only strongly advocate for the development of multiple performance indicators to capture the complexity of Flag State activities and responsibilities, but also for the transparency and availability of information.

7. References

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ANNEXES (Papers I to IV)

Paper I

Graziano A, Praetorius G, Schröder-Hinrichs J-U, Mejia MQ Jr, Kataria A (2018). It takes two to tango: EU policy makers' bi-dimensional approach to flag state performance. *Ocean Yearbook*, 32, 477-496.

It Takes Two to Tango: EU Policy Makers’ Bi-dimensional Approach to Flag State Performance

*Armando Graziano**

Maritime Risk and System Safety (MaRiSa) Research Group, World Maritime University, Malmö, Sweden
agr@wmu.se

Gesa Praetorius

Kalmar Maritime Academy, Linnaeus University, Kalmar, Sweden

Jens-Uwe Schröder-Hinrichs

Maritime Risk and System Safety (MaRiSa) Research Group, World Maritime University, Malmö, Sweden

Maximo Q. Mejia Jr.

World Maritime University, Malmö, Sweden

Aditi Kataria

Maritime Risk and System Safety (MaRiSa) Research Group, World Maritime University, Malmö, Sweden

Introduction

Article 91 of the United Nations Convention on the Law of the Sea (UNCLOS)¹ defines a flag State as “the state in whose territory a ship is registered.” Regardless of the concepts of nationality and sovereignty linked to the definition, Article 94 of UNCLOS requires flag States to “effectively exercise jurisdiction and control in administrative, technical and social matters over ships

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¹ United Nations Convention on the Law of the Sea, 10 December 1982, 1833 *United Nations Treaty Series* 3 [UNCLOS].

flying their flag.” In this article, the word “effectively” is treated as the degree to which something is successful in producing a desired result. It is interpreted as a direct link to the idea of performance and takes into account multiple components in the same manner as exemplified by Brooks and Pallis² in the context of ports.

The importance of such a concept is directly connected to the need for coastal or port States to prevent or minimize undue risks in their waters presented by substandard shipping. Such concerns are typically manifested in the follow-up to accidents resulting in severe marine pollution, such as the *Amoco Cadiz* (1978), *Estonia* (1994), *Erika* (1999), and *Prestige* (2002) to name only a few prominent examples. Issues that arise in the discussions following such accidents often relate to a perceived inability of some flag States to maintain a functioning administration and a legal framework in order to meet their implementation and enforcement obligations under international law.³ The weakness in performance highlighted by some of the above-mentioned accidents pushed the maritime community to develop proactive measures to determine the extent to which flag States and their vessels comply with international maritime safety and marine environmental pollution prevention standards.⁴

This article explores the perceptual construction of flag State performance (FSP) as articulated by European Union (EU) policy-makers through two focus groups at the European Maritime Safety Agency (EMSA). It must be noted that when performing qualitative inquiries in a domain dominated by quantitative studies, “the temptation of stakeholders and practitioners to summarize complex and sometime elusive processes (e.g., sustainability or a single-market policy) into a single figure to benchmark country performance for policy consumption seems likewise irresistible.”⁵ The reader must be aware that the study does not contribute to the literature promoting the concept of indicators, whether leading or lagging, outcome or activity, output or input, process

2 M.R. Brooks and A.A. Pallis, “Assessing port governance models: Process and performance components,” *Maritime Policy & Management* 35, no. 4 (2008): 411–432.

3 L.J. Kovats, “How flag states lost the plot over shipping’s governance: Does a ship need a sovereign?,” *Maritime Policy & Management* 33, no. 1 (2006): 75–81; J. Kuronen and U. Tapaninen, “Evaluation of maritime safety policy instruments,” *WMU Journal of Maritime Affairs* 9, no. 1 (2010): 45–61.

4 J.N.K. Mansell, *Flag State Responsibility: Historical Development and Contemporary Issues* (Heidelberg: Springer, 2009).

5 M. Saisana, A. Saltelli and S. Tarantola, “Uncertainty and sensitivity analysis techniques as tools for the quality assessment of composite indicators,” *Journal of the Royal Statistical Society Series A* 168, no. 2 (2005): 307–323.

or personnel among others.⁶ Rather, this inductive, inspired study contributes to the body of research concerning the performance of maritime administrations and aims to build a clear understanding of the phenomenon to be measured and its subcomponents. In other words, knowing what to measure before attempting to measure it.⁷

Literature Review

There is no shortage of literature covering the topic of performance in the shipping industry. While common criteria to determine the efforts and performance of a flag State are scarce,⁸ criteria for port performance⁹ and shipping companies' performance,¹⁰ in terms of business, environmental, financial, operational, organizational, quality, security, and safety abound.

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- 6 A. Hale, "Why safety performance indicators?," *Safety Science* 47 (2009): 479–480; A. Hopkins, "Thinking about process safety indicators," *Safety Science* 47 (2009): 460–465; K. Øien, I.B. Utne, and I.A. Herrera, "Building safety indicators: Part 1—Theoretical foundation," *Safety Science* 49 (2011): 148–161; K. Øien et al., "Building safety indicators: Part 2—Application, practices and results," *Safety Science* 49 (2011): 162–171; J. Wreathall, "Leading? Lagging? Whatever!," *Safety Science* 47, no. 4 (2009): 493–494.
- 7 Organisation for Economic Cooperation and Development (OECD), *Handbook on Constructing Composite Indicators. Methodology and User Guide* (Paris: OECD, 2008).
- 8 X. Ji, J. Brinkhuis and S. Knapp, "A method to measure enforcement effort in shipping with incomplete information," *Marine Policy* 60 (2015): 162–170.
- 9 See n. 2 above; M.R. Brooks and T. Schellinck, "Measuring port effectiveness: What really determines cargo interests' evaluations of port service delivery?," *Maritime Policy & Management* 42, no. 7 (2015): 699–711; T. Schellinck and M.R. Brooks, "Improving port effectiveness through determinance/performance gap analysis," *Maritime Policy & Management* 41, no. 4 (2014): 328–345; R.P. Da Cruz, J.J.M. Ferreira, and S.G. Azevedo, "Logistics resources in seaport performance: Multi-criteria analysis," *Maritime Policy & Management* 40, no. 6 (2013): 588–613; B. Dragović, N.K. Park and Z. Radmilović, "Ship-berth link performance evaluation: Simulation and analytical approaches," *Maritime Policy & Management* 33, no. 3 (2006): 281–299; L.C. Lin and C.C. Tseng, "Operational performance evaluation of major container ports in the Asia-Pacific region," *Maritime Policy & Management* 34, no. 6 (2007): 535–551; A. Pantouvakis and A. Dimas, "Does ISO 9000 series certification matter for the financial performance of ports? Some preliminary findings from Europe," *Maritime Policy & Management* 37, no. 5 (2010): 505–522; J. Mileski, M.Q. Mejia Jr. and T. Ferrell, "Making lemonade out of lemons: Port operators' perceptions of their port security regulation compliance," *WMU Journal of Maritime Affairs* 14, no. 1 (2015): 93–108.
- 10 T.-Y. Chou and G.-S. Liang, "Application of a fuzzy multi-criteria decision-making model for shipping company performance evaluation," *Maritime Policy & Management* 28, no. 4 (2001): 375–392; E.N. Giannakopoulou, E.I. Thalassinou, and T.V. Stamatopoulos,

According to the Oxford Dictionary, “performance” is associated with “the action or process of performing a task or function,” or “a task or operation seen in terms of how successful it is performed.”¹¹ Since a task can be defined as the activity or work that is deemed to achieve a specific goal,¹² it can be inferred that the performance of a system is dependent upon the goal the system aspires to achieve. A similar conclusion can be achieved through the literature on port and company performance. The authors have identified two main streams characterizing the concept of performance, which may be useful to determine what underpins the concept of FSP: *efficiency* and *effectiveness*. Efficiency measures relate to the physical quantities of products or services (e.g., time, income, throughput, and production, etc.), while effectiveness measures relate to how well the system (whether a company, port, or state) uses its strategies and resources to meet its mission and goals and ultimately satisfy the end-user.¹³ According to these definitions and recalling the word “effective” in Article 94 of UNCLOS, evaluating the performance of a flag State is knowing *what* a flag State is supposed to do (the goal) and evaluating *how* well this is carried out.

As outlined above, the body of literature focusing on FSP is, to the best of the authors’ knowledge, limited; equally scarce is the number of publications

“Corporate governance in shipping: An overview,” *Maritime Policy & Management* 43, no. 1 (2016): 19–38; J.I. Jenssen and T. Randøy, “The performance effect of innovation in shipping companies,” *Maritime Policy & Management* 33, no. 4 (2006): 327–343; I.N. Lagoudis, C.S. Lalwani, and M.M. Naim, “Ranking of factors contributing to higher performance in the ocean transportation industry: A multi-attribute utility theory approach,” *Maritime Policy & Management* 33, no. 4 (2006): 345–369; A. Pantouvakis and M. Karakasnakis, “An empirical assessment of ISM Code effectiveness on performance: The role of ISO certification,” *Maritime Policy & Management* 43, no. 7 (2016): 874–886; K.F. Yuen, V.V. Thai, and Y.D. Wong, “The effect of continuous improvement capacity on the relationship between of corporate social performance and business performance in maritime transport in Singapore,” *Transportation Research Part E: Logistics and Transportation Review* 95 (2016): 62–75.

11 “Performance,” *Canadian Oxford Dictionary*, 2nd ed., ed. K. Barber (Don Mills, Ontario: Oxford University Press, 2004), p. 1156.

12 A. Bye et al., *Human-Machine Function Allocation by Functional Modelling—Fame—a Framework for Systems Design* (Halden, Norway: Institutt for energiteknikk, 1998); E. Hollnagel, *Fram: The Functional Resonance Analysis Method: Modelling Complex Socio-Technical Systems* (Farnham, Surrey, England: Ashgate, 2012); “Task Analysis: Why, What and How,” in *Handbook of Human Factors & Ergonomics*, ed. S. Gavriel (Hoboken, NJ: John Wiley & Sons, Inc., 2012); N.A. Stanton, “Hierarchical task analysis: Developments, applications, and extensions,” *Applied Ergonomics* 37 (2006): 55–79.

13 See n. 2 above.

identifying possible indicators. Takei,¹⁴ for example, suggests that the concept of performance should be grounded in the legal responsibilities of flag States. These encompass exercising jurisdiction and control over administrative, technical and social matters, as well as fisheries, security, and underwater cultural heritage. However, many of these obligations do not require the flag State to achieve a prescribed goal, but rather to exercise its best possible effort;¹⁵ quantification thus becomes a challenge.

An initial attempt to determine flag States' capacity to effectively implement and enforce relevant maritime legislation was performed by Alderton and Winchester¹⁶ by determining a flag State conformance index (FLASCI) based on the weighting of several factors grouped into seven categories:

1. The fleet
2. Administrative capacity
3. Maritime law
4. Seafarers' safety and welfare
5. Trade union law
6. Corruption
7. Company and corporate practice

In parallel, the industry developed its own qualitative performance table by evaluating FSP in terms of performance of port State control (PSC), ratification of international conventions, average fleet age, STCW (standards of training, certification and watchkeeping for seafarers), and ILO (International Labour Organization) reporting and attendance at IMO meetings.¹⁷ Besides the flawed assumption that ratification implies effective implementation and enforcement,¹⁸ the extent to which these categories exhaust all elements assessing FSP was questioned by Corres and Pallis, who added subjective

14 Y. Takei, "Assessing flag state performance in legal terms: Clarifications of the margin of discretion," *The International Journal of Marine and Coastal Law* 28, no. 1 (2013): 97–133.

15 Y. Takei, "International legal responses to the flag state in breach of its duties: Possibilities for other states to take action against the flag state," *Nordic Journal of International Law* 82, no. 2 (2013): 283–315.

16 T. Alderton and N. Winchester, "Globalisation and de-regulation in the maritime industry," *Marine Policy* 26 (2002): 35–43.

17 International Chamber of Shipping, "Shipping Industry Flag State Performance Table 2015/2016" (2016).

18 See n. 3 above.

weighting factors to quantitatively rank countries.¹⁹ From an EU perspective, the measurement of FSP was first adopted in the context of PSC. Each year ship registries are classified into three groups, white, black, and grey (the so-called WBG list), according to the numbers of detentions incurred.²⁰ Inspired by the WBG list, some authors proposed a new methodology, which incorporates new factors other than detentions, such as deficiencies and casualties, to overcome the shortcomings of the list.²¹

Different from the overarching methodology suggested by Alderton and Winchester, Corres and Pallis, and Takei,²² the author Perepelkin et al., as well as the list published by the Paris Memorandum of Understanding on Port State Control (Paris MoU), merge the concept of FSP with that of vessel performance,²³ discarding the characteristics of maritime administrations. This article contributes to the body of literature identifying performance in terms of effectiveness and aims at supplementing the measurability of FSP in future research.

Methodology Used in the Study

The following section introduces the overall methodological approach employed in this study. The exploratory nature of the study called for a type of group interview covering a very specific and defined topic, but using an unstructured design to allow participants to freely interact and describe their thoughts and perceptions. In addition, this approach allowed people who worked in the same organization, but in different sectors, to challenge each other's views and reach a collective understanding and definition, and enrich the quality of the data at the same time.

Methodological Tools

Two focus group sessions were conducted. A focus group is defined as a group interview with a predetermined topic that is aimed at collecting views, perceptions, and experiences by fostering interactions between the

19 A.-J.E. Corres and A.A. Pallis, "Flag state performance: An empirical analysis," *WMU Journal of Maritime Affairs* 7 (2008): 241–261.

20 Paris MoU, Port State Control: Adjusting Course Annual Report 2014 (The Hague, 2015).

21 M. Perepelkin et al., "An improved methodology to measure flag performance for the shipping industry," *Marine Policy* 34 (2010): 395–405; X. Ji, J. Brinkhuis and S. Knapp, "A method to measure enforcement effort in shipping with incomplete information," *Marine Policy* 60 (2015): 162–170.

22 See n. 14, n. 16, and n. 19 above.

23 See n. 20 and n. 21 above.

participants.²⁴ The two focus groups were held at the premises of EMSA, in Lisbon, Portugal, for approximately two hours each.

Participants of the Focus Groups

Thirteen maritime professionals participated in the study. The choice of the participants was driven by the aim to decompose maritime administrations into their multifaceted obligations and tasks. All participants in the study are involved with different tasks and obligations of the EU maritime administrations, which vary according to the sector to which they belong in EMSA. The participant demographics are given in Table 18.1. Each participant (P) was

TABLE 18.1 *Demographics.*

FG	P	Age	Sector in EMSA	Years of experience	Background	Class.	Mar. Adm.	Inspection experience
I	P1	35-44	Accident Investigation	11-20	Public Administration	N	Y	FSC, PSC
I	P2	35-44	Ship Safety & Marine Equipment	11-20	Naval Architect	N	N	None
I	P3	45-54	Classification Societies	21-30	Naval Architect	Y	N	Class.
I	P4	45-54	Classification Societies	11-20	Naval Architect	Y	N	Class.
I	P5	45-54	Standards for Seafarers	21-30	Nautical Sciences	N	Y	FSC, PSC
I	P6	45-54	PSC	31-40	Nautical Sciences	N	Y	FSC, PSC
I	P7	35-44	Marine Environment	11-20	Naval Architect – Mechanical Engineer	Y	Y	FSC, PSC, Class.
II	P1	45-54	Accident Investigation	21-30	Naval Architect	N	Y	FSC, PSC
II	P2	55-64	Classification Societies	>40	Marine Engineer – Mechanical Engineer	N	Y	FSC, PSC
II	P3	55-64	Classification Societies	>40	Nautical Sciences	N	Y	FSC, PSC
II	P4	35-44	Ship Safety & Marine Equipment	11-20	Maritime Administration	N	Y	None
II	P5	45-54	PSC	11-20	Coast Guard	N	Y	FSC, PSC
II	P6	55-64	Standards for Seafarers	>40	Nautical Sciences	N	Y	None

²⁴ M.Q. Patton, *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*, 4th ed. (Thousand Oaks, CA: Sage Publications, 2015).

numbered by 1 to N according to the Focus Group (FG) they were involved in, either FG I or FG II. Table 18.1 also identifies the sector to which they belong in EMSA, their years of experience, their background, whether they have worked for a classification society or not (Class.), whether they have worked for a maritime administration or not (Mar. Adm.), and what type of inspection experience they have (port State control, flag State control (FSC), class, or none).

Procedure

The focus group was moderated by a researcher and began with a presentation of the overall scope of the study. Participants were informed of their rights prior to being asked to sign a consent form and complete the demographics sheet. Both focus groups were recorded with the participants' permission and were organized to provide perceptions and opinions on three main questions:

1. How would you define the whats, whys, and hows of FSP? (60 minutes)
2. What elements would you consider to develop an indicator for FSP? (30 minutes)
3. How would you consider PSC as an indicator to measure FSP? (30 minutes)

All questions were posed in plenary in chronological order. Question 2 was first answered individually and then discussed in plenary. In order to explore elements that should be taken into consideration for the determination of FSP, respondents were engaged with the K-J method, also known as "affinity diagram." This method helps participants of focus groups in brainstorming and/or organizing random ideas in natural categories.²⁵ Participants were asked to work individually for approximately fifteen minutes and list all the variables they considered necessary for determining FSP. The notes were then shared on a white board and categorized and debated. At the end of each question, the moderator summarized the main conclusions to the participants. All the notes were collected at the end of each session to support transcription and further analysis of the collected data.

Data Analysis of the Results of the Focus Groups

All recordings were transcribed verbatim. Next, the collected data were analyzed by three researchers individually. Then concepts for FSP indicators and

²⁵ W. Widjaja et al., "Discusys: Multiple user real-time digital sticky-note affinity-diagram brainstorming system," *Procedia Computer Science* 22 (2013): 113–122.

interactions with the various components were developed iteratively based on the individual analyses.

Results of the Study

This section presents the results of this study. It starts by examining what constitutes FSP in the eyes of the participants, how should it be measured, and why is it important. Further, the results of the affinity diagram are presented. Finally, an evaluation of PSC in the context of FSP is presented.

The Whats, Whys, and Hows of FSP

Figure 18.1 encompasses the participants' perspectives and considerations on the topic of FSP. In general, the figure is organized into three horizontal levels depicting, from the top, why FSP should be deemed a topic worth investigating (Why?), what constitutes FSP (What?), and ultimately how to measure FSP (How?). Moreover, the figure is further arranged into two vertical regions: administration and fleet. The outer box suggests that every discussion pertaining to FSP must be embedded in a political and economic context. Finally, the

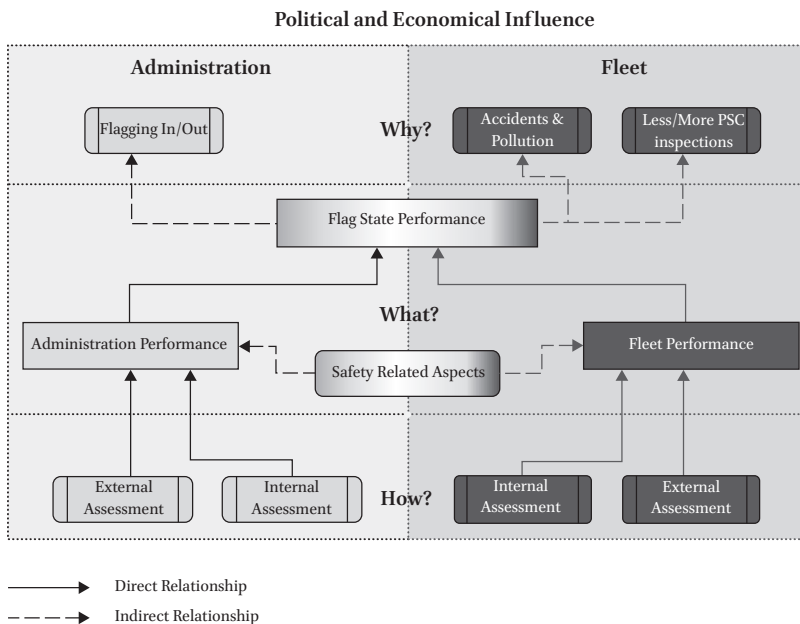


FIGURE 18.1 *The whats, whys and hows of FSP.*

dashed lines indicate a simple influence (indirect) of one element on the other, while the solid line represents a direct relationship between the elements.

Conceptually, FSP is perceived to be a bi-dimensional concept characterized by two main components: administration (on the left) and fleet (on the right). This sharp categorization was suggested by the majority of the respondents in order to highlight that a single measure, such as PSC, may not be sufficient to fully comprehend the complexity of FSP. It is the combined performance of the two domains that leads to the overall FSP. At the same time, the lower part of Figure 18.1 suggests that the performance of the two components is evaluated by means of external and internal assessments. For fleet performance, the internal assessment would be conducted by the administration through flag State inspections. In contrast, external assessments would be conducted by third parties, such as PSC. Similarly, for administrative performance, the internal assessment would be conducted by the administration via internal audits while the external assessments would be conducted by third parties through IMO audits.

The extent to which fleet performance is a component of FSP was strongly debated in the two focus groups. In Focus Group I (FG I), participants did not correlate unsatisfactory vessel performance with a lack of enforcement by flag States since PSC deficiencies and detentions, casualties, and incidents were perceived to result from factors related to negligent shipowners and/or insufficient recognized organization (RO) activities. In contrast, a participant in Focus Group II (FG II) noted, "On the majority of the ships, the port State control figures, detentions, inspections, deficiencies are not measuring the flag State actions. We are measuring the RO actions and the company-crew actions. And then we are extrapolating to the Flag State." Generally, FG II participants conceded that poor FSP erodes the performance of the vessels; the same participant indicated that this was "because the work of the administration is shown through the fleet situation."

Regarding Figure 18.1, the upper part shows potential consequences of a positive/negative FSP. The moderator of the focus groups concluded that the administrators involved in the study did not feel that they would be able to fully influence the fleet performance as there may be too many factors beyond their control that could result in a negative fleet performance, despite good administrative arrangements.

Elements for FSP

Table 18.2 provides a summary of the affinity diagram exercise with respect to the necessary measures to construct FSP and the relationships between the different measures. The table is organized in two main sections. The first three

TABLE 18.2 *Affinity diagram results.*

Category	Sub-Category	Element	Freq.	Imp.	
Fleet Performance	PSC Performance (2)	Number of deficiencies/inspections	6	7	
		Number of detentions/inspections	6	6	
	FSC	Number of ISM deficiencies	1	2	
		Number of deficiencies	1		
	Accidents	Number of accidents compared to the fleet	3	2	
	Characteristics	Crewing considerations	1		
		Nationality of the crew on board	1		
		General age of the fleet compared to the ship types	1		
		General distribution of ship type	1		
		Manning level	2		
Administration Performance	RO Delegation & Monitoring (5)	Communication procedures with ROs	1	1	
		Tools for RO monitoring	1	1	
	Grade of delegation	1			
	Number of authorized RO	1			
	International Association of Classification Societies ROs?	3	1		
	Number of tasks delegated to the RO	1			
	Ratification/Implementation/Enforcement	Ratification of IMO/ILO instruments	4	1	
		Implementation of IMO/ILO/EU standards	5	8	
	EU infringement procedures	1	1		
	Quality System	Does the flag State hold and implement quality management system for flag State activities?	6	4	
		Staff	Selection criteria for staff personnel	1	
	Accidents	Staff	Training procedures for flag State staff (administrative and surveyors)	3	4
			Qualification for flag State staff	3	
Quality of staff		1	3		
Accidents		Implementation of safety recommendations from accident investigations	2	1	
	Conduct accident investigations & follow-up	2			
Fleet Monitoring (3)	Fleet Monitoring (3)	Frequency of flag State inspections	5	4	
		Number of inspectors compared to the size of the fleet	1	1	
	ISM monitoring	1			

TABLE 18.2 *Affinity diagram results. (cont.)*

Category	Sub-Category	Element	Freq.	Imp.
	General	Active monitoring and certification of maritime training centers	1	
		Criteria for selecting shipowners	1	
		Size of the administration compared to the size of the fleet	2	1
		Transparent procedures to implement "safety first" policies	1	1
		Number of equivalence of derogation	1	
		Activities in international fora (e.g. IMO)	1	
		Owners nationality	1	
		Clear organization profile and organigram	1	
		Results of IMO audit	1	

columns reveal the items deemed necessary by the participants. The resultant classification into categories and subcategories emerged through the data analysis. The relationship among subcategories and variables were discussed in plenary. Additionally, participants were asked to classify the five most important elements from all the identified items in the affinity diagram exercise. As a result, the last two columns illustrate how many times a single element appeared in the affinity diagram (Freq.), and how many experts perceived the specific element to be important (Imp.).

The results given in Table 18.2 support the findings seen in Figure 18.1 concerning the bi-dimensional nature of FSP. In addition to the broad categorization into fleet performance and administration performance, the second column indicates the main subcategories in which the two domains can be classified. As can be seen, the elements in the different subcategories under administration performance are more complex than the elements under fleet performance. However, among the subcategories in administration performance, participants highlighted the importance of two subcategories in particular, RO delegation and monitoring, and fleet monitoring, to determine the performance of a maritime administration. One of the participants in FG I noted, "If the flag state does not have efficient tools to monitor what the RO does or how the company actually implements their procedures on board, something (related) to the International Safety Management (ISM) Code to

other tools, then probably the performance is low because of no monitor.” The participants of the two focus groups reported that PSC performance is the main subcategory for determining fleet performance.

As described above, the left section of the table summarizes the strength of the identified elements in terms of frequency and importance. The table shows that within fleet performance, the elements number of deficiencies/inspections (Freq. 6; Imp. 6) and the number of detentions/inspections (Freq. 6; Imp. 6) have been ranked as the most frequent and important. Within fleet performance, the second most frequent element is the number of accidents (Freq. 3; Imp. 2).

Comparing the findings in the category of administration performance, the elements indicated as important by the participants are Implementation of IMO/ILO/EU standards (Freq. 5; Imp. 8), followed by quality system (Freq. 6; Imp. 4), training procedures for flag state staff (Freq. 3; Imp. 4), frequency of flag State inspections (Freq. 5; Imp. 4), and finally quality of staff (Freq. 1; Imp. 3). Participants made a clear differentiation between ratification of international conventions and their implementation. The element implementation of IMO/ILO/EU standards (Freq. 5; Imp. 8) is more frequently highlighted than ratification of IMO/ILO instruments (Freq. 4; Imp. 1).

Port State Control

Table 18.3 represents the general attitude of the participants toward the use of PSC and the WBG list as a tool to measure FSP. The left side of the table summarizes the positive aspects of PSC while the right side shows the negative ones. The words highlighted in italics in the table indicate aspects concerning the WBG list.

A comparison of the two sides of the table shows that the negative elements outnumber the positive ones, suggesting that PSC has some inconsistencies to be considered. Among the negative elements, special attention should be given to the subjectivity of the inspection procedures, suggesting an overreliance on expert or professional judgment—something that some participants referred to as lack of harmonization. This may affect the possibility of the comparison of inspections results and it appeared to be a common problem when discussing PSC in general. Overall, the inspection process itself was depicted as not thorough enough to adequately detect certain types of non-compliance. One of the participants in FG I remarked that there were certain pitfalls of non-compliance with regulations that the inspectors would “never be able to see.” This participant further commented that because some of the non-compliance is not visible, inspectors should look to materials such as drawings, standards of equipment, or policy controls to see where they have been improved, but

TABLE 18.3 *Positive and negative aspects of PSC and the WBG List.*

Positive Aspects	Negative Aspects
<ul style="list-style-type: none"> • It is the most practical indicator. • It is a safety net from substandard vessels. • It is a defensive line that sorts the bad from the very bad. • It is a good output to understand how vessels perform. • <i>It is almost the only indicator we have.</i> • <i>It is not the best indicator, but it is effective to measure FSP.</i> • It is a proactive measure. • It is transparent. • It is independent (external). 	<ul style="list-style-type: none"> • It is not deep enough to verify compliance. • It is subjective and relies too much on expert judgment. • It has a limited coverage; not all vessels are subject to PSC. • There is lack of harmonization in PSC implementation. • There are different inspection qualities among PSC regimes. • It is a reactive measure. • It is fallible. • It lacks effectiveness. • It is a sample inspection; it does not inspect all vessels. • It does not cover domestic vessels. • <i>It underestimates detentions for flags with big fleets.</i> • <i>It should have more subcategories, not only white, grey, and black.</i> • <i>It is static; it should be updated every week and be dynamic.</i> • <i>It was created for targeting purposes, not to determine performance.</i> • <i>It does not consider the number, nature, and severity of the deficiencies.</i>

he/she noted, PSC is “not deep enough for that.” However, based on the overall perceptions, it is safe to indicate that PSC seems to be the only easily accessible indicator to determine fleet performance, but it is not the only indicator. As a participant in FG II summed up, “But there are other indicators of how flag States are set up and how they delegate, and how they control and how they implement.”

Discussion

The stated aim of this study was to explore FSP by collecting experts' perceptions and to develop a common understanding of the concept. This relates to the concept of FSP as a bi-dimensional concept, the implication of FSP in the context of PSC, and future options for further research on FSP.

Fleet and Administration: Two Sides of the Same Coin?

The emergence of a clear categorization of FSP into administration performance and fleet performance represents a new approach to the topic (Figure 18.1). When considering the different approaches to FSP indicated during the literature review, some scholars have combined both aspects of fleet and administration performance,²⁶ while others have concentrated entirely on the tangible output of low performance of vessels.²⁷ However, consensus among the participants could not be found on whether the fleet performance mirrors the performance of the administration and, ultimately, FSP. The debate followed two main streams. On the one hand, some participants argued that the fleet performance is the natural output of flag States' control on their vessels. On the other hand, other participants highlighted that the responsibility of keeping the vessels in compliance with international standards lies primarily with the shipowner. In a context where vessel deficiencies, detentions, and accidents are used to measure FSP, it appears challenging to draw the line at whether responsibilities apply to the flag State or shipping company. For this purpose, the authors accept the approach suggested by Takei where "persistent pattern of infractions by individual vessels gives rise to the presumption that the flag state has not exerted its best efforts," whereas isolated infractions cannot be considered flag States' responsibility.²⁸ In practice, limiting the complexity of FSP to fleet performance alone was deemed advantageous, but not exhaustive.

A second point raised in the discussion can be summarized by the following question: to what extent can one measure administration performance if part of the activities is delegated to an external organization, namely an RO? According to applicable international rules and standards, a flag State may delegate statutory obligations such as surveys and certification to authorized or recognized organizations, which invariably are classification societies.²⁹ This

26 See n. 14, n. 16, and n. 19 above.

27 See n. 21 above.

28 See n. 14 above.

29 International Maritime Organization (IMO), "IMO Instruments Implementation Code," Res. A.1070(28), 28th IMO Assembly (December 4, 2013).

feature of delegation, in fact, generated uncertainty among the participants of the focus groups. Some experts argued that ROs' performance is independent of FSP, while others underlined the pitfalls of their public/private role when surveying ships.³⁰ The practice of delegating authority does not suggest that a flag State washes its hands of its responsibility, but rather suggests quite the opposite. According not only to the RO Code,³¹ but also to relevant EU legislation, flag States "must supervise, monitor and evaluate the work of those classification societies acting on behalf of them."³² For this reason, the subcategory RO delegation and monitoring was included in the category of administration performance and indicated by more than one-third of the participants.

Overall, it seemed clear that a link between fleet performance and FSP exists. While one could argue that the responsibility of compliance with international maritime safety standards pertains to the shipowner, it should be emphasized that oversight and enforcement still remain the fundamental responsibilities of maritime administrations. Performance can only be optimized if both sides deliver on their respective mandates. It takes, as it were, two to tango. The magnitude of oversight exercised by a maritime administration likewise produces effects on the quality of its fleet.

Hence, in order to cover the full spectrum and complexity of flag States and their responsibilities, the other side of the coin should be contemplated. The assessment of the administration *per se*, for example, through the IMO Member States Audit Scheme (IMSAS),³³ should lead the way to a new generation of assessment of FSP based on the combination of elements from both administration and fleet performance.

30 N. Lagoni, *The Liability of Classification Societies*, Hamburg Studies on Maritime Affairs (Berlin/Heidelberg, Germany: Springer, 2007); J.M. Silos et al., "the role of the classification societies in the era of globalization: A case study," *Maritime Policy & Management* 40, no. 4 (2013): 384–400.

31 IMO, "Code for Recognized Organizations," IMO Doc. Res. MSC.349(92) (adopted on June 21, 2013), *Report of the 92nd Session of the Maritime Safety Committee*, IMO Doc. MSC 92/26/Add. 1 (June 28, 2013), Annex 1.

32 H. Jessen, "Commentary on Regulation EC/391/2009 on common rules and standards for ship inspection and survey organisations and Directive 2009/15/EC on common rules and standards for ship inspection and survey organisations and for the relevant activities of maritime administrations," in *EU Maritime Transport Law*, eds., H. Jessen and M.J. Werner (Baden, Germany: Nomos Verlagsgesellschaft, 2016), pp. 685–730.

33 L.D. Barchue, "The voluntary IMO member state audit scheme: An accountability regime for states on maritime affairs," *WMU Journal of Maritime Affairs* 8, no. 1 (2009): 61–70.

Port State Control

PSC represents the most used indicator to evaluate FSP through the WBG list published annually by at least two regional MoU on PSC, namely, the Paris MoU and the Tokyo MoU.³⁴

Numerous weaknesses highlighted by the participants (Table 18.3) are corroborated by academic publications.³⁵ These weaknesses may influence the consistency and coverage of the adopted measure. For example, discrepancies in harmonization and overreliance on expert judgment may introduce an element of uncertainty in the inspection results, which could ultimately bias the risk profile of vessels. Additionally, the depth of the inspection and the exclusion of other parameters such as type, seriousness, and number of deficiencies make us question whether data collected from PSC inspections afford people in the field the basis to assess, in qualitative terms, the complexity of FSP as a whole.

Nevertheless, many participants emphasized the role of FSP inspection in the attempt to evaluate performance. First, PSC results are publicly available through the “name and shame” policy adopted by several MoUs. This implies that PSC results, unlike other measures suggested in Figure 18.1, are transparent and readily accessible. One could also argue that accidents are publicly accessible. However, the authors feel that the underreporting of maritime accidents, incidents, and near-misses is an issue that still needs to be managed and that accident reports are not often available to the general public.³⁶ Second, PSC inspections are performed 365 days a year, which makes the considerable

34 *Paris Memorandum of Understanding on Port State Control* (January 26, 1982); *Tokyo Memorandum of Understanding on Port State Control in the Asia-Pacific Region* (December 1, 1993) [Tokyo MoU].

35 M. Bloor et al., “Unicorn among the cedars: On the possibility of effective ‘smart regulation’ of the globalized shipping industry,” *Social & Legal Studies* 15, no. 4 (2006): 534–551; S. Knapp and M. van de Velden, “Visualization of differences in treatment of safety inspections across port state control regimes: A case for increased harmonization efforts,” *Transport Reviews* 29 (2009): 499–514; O.F. Knudsen and B. Hassler, “IMO legislation and its implementation: Accident risk, vessel deficiencies and national administrative practices,” *Marine Policy* 35 (2011): 201–207; H. Sampson and M. Bloor, “When Jack gets out of the box: The problems of regulating a global industry,” *Sociology* 41, no. 3 (2007): 551–569; M.Q. Mejia Jr., P.K. Mukherjee and R. Akselsson, “The ISM Code in the context of Swedish port state control statistics,” *Ocean Yearbook* 21 (2007): 405–426.

36 M. Hassel, B.E. Asbjørnslett, and L.P. Hole, “Underreporting of maritime accidents to vessel accident databases,” *Accident Analysis and Prevention* 43 (2011): 2053–2063; G. Psarros, R. Skjong and M.S. Eide, “Under-reporting of maritime accidents,” *Accident Analysis and Prevention* 42 (2010): 619–625.

amount of data available an added value to develop quantifiable indicators. To date, its accessibility and transparency makes PSC the only available and quantifiable indicator readily applicable to determine FSP.

Quality of the Research Study

Validity, reliability, objectivity, and generalizability are considered to be core concepts in evaluating the quality of research. In recent years, however, a large body of research suggests that those concepts traditionally used might not be the best fit to deem the quality of qualitative inquiries.³⁷ Therefore, alternative criteria for determining the soundness and quality of research have been developed by Guba and Lincoln,³⁸ among others. The criteria credibility, dependability, confirmability, and transferability are applied in great detail in this study.

To establish credibility and confirmability of the results, the manuscript was submitted to the thirteen focus group participants and, at the same time, to two disinterested maritime experts with flag and port State experience. In parallel, to ensure a high degree of dependability, three different researchers were involved in the coding process and the results discussed together. Finally, to provide transferability, thorough information regarding the boundaries, the participants, the context, the methods employed, and the length of the study are described to the reader.

Limitations and Future Research

This study represents the pilot for a broader study that will include validation from a large population and, more importantly, a quantification phase. This exploratory study has proposed the first elements necessary to develop an instrument for measuring how well flag States meet their obligations under international conventions. It explicitly advocates a combination of criteria from both the merchant shipping fleet and the maritime administration.

37 D. Davies and J. Dodd, "Qualitative research and the question of rigor," *Qualitative Health Research* 12 (2002): 279–289; M. Hammersley, "The issue of quality in qualitative research," *International Journal of Research & Method in Education* 30, no. 3 (2007): 287–305; M.C. Hoepfl, "Choosing qualitative research: A primer for technology education researchers," *Journal of Technology Education* 9, no. 1 (1997): 47–63; C. Stenbacka, "Qualitative research requires quality concepts of its own," *Management Decision* 39, no. 7 (2001): 551–556; K. Yilmaz, "Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences," *European Journal of Education* 48, no. 2 (2013): 311–325.

38 E.G. Guba and Y.S. Lincoln, *Fourth Generation Evaluation* (London: Sage Publications, 1989).

One of the main limitations of this study relates to the interpretation of the subject itself since it has been exclusively associated with the main responsibilities stated in the international legal framework. This stand in the discussion was taken in order to find common ground among researchers and increase the readability and interpretability of the concept under investigation. Business, financial, and environmental performance, among others, are all different concepts that may complement FSP in other domains, but are not discussed here.

A second limitation is that the focus groups' results are collected based on the perception of policy-makers only, which makes the sample limited to a single stakeholder group. The current study recommends enlarging the sample of the research to other groups of stakeholders such as shipowners, classification societies, seafarers, and others. In addition, these findings are limited to EU policy-makers who enjoy a favorable environment due to the fact that in case of non-compliance, EU maritime legislation is directly enforceable by the European Commission. Although this may not present an issue due to the experience of the participants with non-EU maritime administrations, it is suggested that the policy-makers sample be expanded to take into account other international actors and entities.

A secondary objective of the study is to supplement the measurability of FSP in future research and help in the development of a specific taxonomy. For this reason, the reliability and validity of the items listed under Table 18.2 should be tested in further studies.

The next step in this research endeavor will take into consideration three additional focus groups representing different stakeholders such as shipowners, classification societies, insurance companies, as well as international and national policy-makers. At a later stage, once the main findings are aggregated into categories and subcategories and validated by a larger population, the elements that are quantifiable in terms of output will be identified and appropriate measurable performance indicators will be developed (e.g., number of surveyors, number of ships inspected, and number of deficiencies, etc.). In cases where an element is not measurable but deemed necessary, expert judgment methods such as Delphi or multi-criteria analysis shall be considered.

Conclusion

In the last decade, the topic of FSP and the demand for new indicators has become increasingly popular. The WBG list developed and published by the Paris and Tokyo MoUs has, by default, become the most widely accepted benchmark

to determine FSP. However, the computational issues of the formula and the excessive simplicity of its criteria call into question the depth and thoroughness possible for using the WBG list. Hence, the call for a comprehensive set of indicators to go beyond the WBG list has found support from international policy-makers and shipping industry.

It is evident that PSC represents the only transparent indicator currently available to determine FSP. However, the focus of the WBG list alone is too narrow to determine the full spectrum of FSP, and there may be factors outside the influence of a maritime administration that may have an impact on fleet performance. Elements such as the practice of delegating authority, overseeing of the fleet, and implementing international conventions are part of a long list of elements deemed complementary to broadening the concept of FSP.

The general results of the study suggest that the traditional approach to FSP, the one based on fleet performance, should be diversified and include a higher degree of complexity by considering factors such as maritime administrations' performance. The participants of the two focus groups suggested that FSP is bi-dimensional in nature and encompasses a wide range of elements belonging to vessel and administration performance.

Apart from looking at different options to determine more quantifiable indicators, it is necessary to address factors that result in uncertainty with respect to PSC results. Elements such as lack of harmonization, differences in quality across the regimes, and subjectivity of inspection practices may hamper the effectiveness of such an instrument to measure FSP. A thorough and parallel investigation of PSC's main problem drivers could help to make PSC results a more reliable indicator for FSP. Nonetheless, the main outcome of this pilot study is the shift from a unidimensional concept for FSP to a bi-dimensional one, and to lay the foundation for further research, including quantification.

Paper II

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After 40 years of regional and coordinated ship safety inspections: Destination reached or new point of departure?



Armando Graziano^{a,*}, Jens-Uwe Schröder-Hinrichs^a, Aykut I. Ölcer^b

^a Maritime Risk and System Safety (MaRiSa) Research Group, World Maritime University, Fiskehamngatan 1, 21118 Malmö, Sweden

^b Maritime Energy (MarEner) Research Group, World Maritime University, Malmö, Sweden

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ABSTRACT

Port State Control (PSC) is the major global strategy for fighting substandard shipping since the signature of The Hague Memorandum in 1978. In the last years, the increased volume of trade, the enlarged number of main international conventions and the highlighted differences among the various Regimes have posed new challenges to the modern system of PSC, which may need to find its new course.

This paper examines the point of view of key maritime stakeholders with regard to the EU PSC regime. Elite interviews (n = 14) were conducted with subject matter experts ranging from policy makers, to industry and seafarers' representatives. The study aims to determine factors leading to difference in treatment among EU Member States. The study concludes that PSC in Europe seems to be the most efficient and reliable of the regional agreement on PSC. However, some discrepancies during the inspection process and outcome can be highlighted due to differences at the inspector and Member State level.

1. Introduction

Since the emergence of the various regional agreements, Port State Control (PSC) has become a robust and omnipresent reality in the maritime day-to-day operations, or what Bloor et al. (2006) define as an 'enforcement agency'. On March 2018, the shipping industry will approach the 40th anniversary of the Amoco Cadiz disaster, which accelerated the emergence of those agreements for coordinated ship safety inspections. Accidents such as the Aegean Sea (1992), Braer (1993), Estonia (1994), Erika (1999) and Prestige (2002), caused a strong political and public outcry for more stringent regulations regarding safety of ships and protection of the maritime environment. In line with this appeal, regional cooperation and coordination for ship inspections were established and responded to the general belief that many of the existing flag States were ineffective to thoroughly fulfil their obligations on their vessels (Anderson, 1998; Bloor et al., 2006; Özçayır, 2009; van Leeuwen, 2015).

The Hague Memorandum had been just signed when two weeks after, the Amoco Cadiz ran aground off the coasts of France spilling more than 200,000 t of oil and making clear, out and loud, that shipping failed in coping with new challenges and, more importantly, in self-controlling its vessels (Anderson, 1998; Bell, 1993; Mansell, 2009; Özçayır, 2004; Vorbach, 2001). It was at the Ministerial Conference held in Paris in 1982 that 14 European states conceived

the first regional coordinated system of ship inspections by signing the Paris Memorandum of Understanding on Port State Control (Paris MoU) in the attempt to stem the proliferation of substandard shipping. However, it was not until 1995 that PSC became a European Union (EU) initiative with the implementation of Directive 1995/21/EC on PSC which made the Paris MoU system mandatory for EU Member States (MSs). The Directive represents the predecessor of the current legislative instrument, in force since 1st of January 2011: Directive 2009/16/EC, as amended by Directive 2013/38/EU.

Since its introduction, the areas of application of PSC have greatly increased. While enforcement provisions have been included in recent conventions, such as the Maritime Labour Convention (MLC) or the Ballast Water Management (BWM) Convention, inspection results are also widely used to determine Flag State performance resulting in the compilation of a Black-White and Grey (BWG) list. However, despite the major efforts, discrepancies in harmonization efforts were found by different studies (Anderson, 2002; Bloor et al., 2006; Cariou et al., 2009; Hjorth, 2015; Knapp and van de Velden, 2009; Knudsen and Hassler, 2011; Ravira and Piniella, 2016; Sampson and Bloor, 2007) asserting that PSC 'does not have uniform application in all different regions and sometimes not even within the same MoU' (Özçayır, 2009).

This article does not aim to be a historical review of PSC; it is taken for granted that the increased use of coordinated and harmonised ship safety inspection efforts has profoundly impacted the shipping industry

* Corresponding author.

E-mail address: agr@wmu.se (A. Graziano).

and increased safety standards (Anderson, 2002; Cariou et al., 2008; Hare, 1997; Özçayır, 2009; Vorbach, 2001). Rather, the purpose of this article is to investigate what are the main factors contributing to the disparities in harmonization among EU MSs by focusing on Directive 2009/16/EC, as amended. According to this objective, ten elite interviews with fourteen key experts in the maritime domain were conducted covering a large spectrum of policy-makers (European Commission, EMSA, Paris MoU Secretariat), ship-owner representatives (BIMCO, INTERCARGO, INTERTANKO, INTERMANAGER), classification societies representatives (IACS) and seafarers' representatives (Nautical Institute, CESMA).

2. Literature review – A glance at the past

Two of the main reasons to develop regional cooperation for PSC were undoubtedly the need for sharing information between states about the safety records of vessels and to avoid that a vessel was inspected at every port within the same region (Hare, 1997). At the same time, this was underpinned by providing harmonised rules and standards for inspection procedures. By setting a common standard, MoUs' goal is to avoid unilateral action by Port States which could have a negative impact on the neighbourhood ports within the same region, reducing their commercial attractiveness (Molenaar, 2007), and distorting the market (Knapp and Franses, 2007a). In parallel, discrepancies may influence the outcome of performance measurement such as the BWG list (Perepelkin et al., 2010), by differing safety records and targeting factors.

Issues in the harmonization and standardization process have been identified since the emergence of the first MoUs. While major academic studies have focused on the legal basis for Port State jurisdiction (Anderson, 1998; Bang, 2009; Bell, 1993; Keselj, 1999; Molenaar, 2007; Özçayır, 2004; Payoyo, 1994) and the improvement of the targeting system (Anderson, 2002; Cariou et al., 2009; Cariou and Wolff, 2015; Degré, 2007, 2008; Sage, 2005), inconsistencies in the application of PSC were already highlighted by Plaza (1994). In the study conducted by Sampson and Bloor (2007), the perception of inconsistencies in inspection practices between different countries in different MoUs emerged during stakeholders interviews and field studies. Differences in treatment were also underlined by Knapp and van de Velden (2009) and Knudsen and Hassler (2011), which concluded that a degree of harmonization and uniformity across the various PSC MoUs is far from being reached. Nevertheless, studies targeting inconsistencies within the same region are scarce (e.g., Cariou et al., 2009) and none of those regard the EU as their main focus.

Özçayır (2009) was concerned by the lack of uniform application of inspection standards. The author suggested that if, on the one hand, insufficient funds and lack of personnel are the main contributors for differences among states, the subjectivity of PSC Officers (PSCO) for detaining vessels on the basis of their professional judgment represents a major drawback rooted in their background and training. This aspect of discretion in PSCOs is re-evoked and reinforced by Bloor et al. (2006) in the results of an ethnographic-inspired study which involved 3 maritime authorities, more than one hundred observations on board and around 30 interviews with key stakeholders. In their study on cross-national (rather than within-national) differences in inspection practices, the background of the inspector emerged as one contributing factor.

Following the stream of PSCO's background and training, Knapp and Franses (2007b) suggested that the probability of detention appears to be slightly higher if the inspection is conducted by an inspector with engineering background compared to nautical background. Similarly, Ravira and Piniella (2016) analysed the influence of the professional background of PSCOs within the framework of the Spanish Administration. The authors concluded that both professional background and the use or lack of teams for the conduction of an inspection has an influence on the inspection outcome.

While the literature has shown that some inconsistencies may be found in the various regions, this study focuses on those which emerge within the same region and, specifically, the EU region. Lastly, this article aims not only at unrevealing disparities, if any, but also to the underlying contributory factors.

3. Methodology

The reported findings are derived from an interview study designed to accommodate ten elite interviews with fourteen participants.

3.1. Elite Interviews and purposive sampling

An elite interview is a type of interview mainly used in political science to understand hidden elements of policies and/or legislation by interviewing high-officials or people holding a prestigious role in society (e.g. politicians, civil servants, legislators, etc.) (Boucher et al., 2013 citing Dexter 1970; Richards, 1996). For this reason 'elite interview samples tend to be a lot smaller' (Richards, 1996). A purposive sampling was deemed appropriate for this study due to the narrow research focus and the specific and unique context/case (Miles et al., 2013).

The key requisite for the choice of participants was to cover the wide spectrum of stakeholders involved in PSC. The demographic could not be presented in this paper and will not be shared to the readers for confidentiality reasons and due to the high-profile of the interviewees. All information that could be shared is presented in Table 1.

A semi-structured interview was chosen in order to unveil a broad amount of themes/areas to be explored during the interview. The interview guide (Appendix A) was developed and tested with one representative of the United States Coast Guard with long-standing experience in PSC inspections and one senior researcher in the area of communication and sociology. The interview is part of a larger study on Port State Control. This paper focuses on questions relevant to Section 4 and Section 5 of the Interview Guide in Appendix A.

Prior to the interview, all participants were informed of the average time for the interview (30–45 min). The interviews started by presenting the overall scope of the study and by providing information on the participants' rights. Thereafter, the informants were asked to sign a consent form and complete the demographics sheet. The interviews were recorded with permission.

3.2. Critical case study

The focus of this paper on the Paris MoU lies in the peculiar nature of the regime which makes it arguably a 'critical case' scenario (Goldthorpe, 1968). In their study on whether empirical evidence would support the emergence of the notion of *embourgeoisement*, the

Table 1
Elites participating in the interviews, their Organization and Background.

Participant ID	Organization	Background
P1	European Commission	Law
P2	EMSA	Master Mariner & PSCO
P3	EMSA	Other & PSCO
P4	BIMCO	Master Mariner
P5	INTERTANKO	Master Mariner
P6	IACS	Naval Architecture
P7	INTERMANAGER	Master Mariner
P8	NAUTICAL INSTITUTE	Master Mariner
P9	INTERCARGO	Naval Architecture
P10	CESMA	Master Mariner
P11	Paris MoU Secretariat	Master Mariner
P12	Paris MoU Secretariat	Master Mariner
P13	CESMA	Master Mariner
P14	CESMA	Master Mariner

authors designed the most favourable setting. They argued that should *embourgeoisement* not be found in the most favourable setting, it would be safe to say that it would be unlikely to occur in less-favourable settings. In other words ‘if it happens here, it will happen anywhere’ or ‘if it doesn’t happen here, it won’t happen anywhere’ (Patton, 2015; p. 275).

Similarly, the nature of the Paris MoU itself suggests that the regime constitutes a critical case study for four main reasons:

1. Since the Paris MoU is the first regional agreement on PSC signed in 1982, the level of experience and maturity is higher than other more recently signed MoUs.
2. While MoUs are, *ipso facto*, gentlemen’s agreements, the Paris MoU is supported by the EU Directive 2009/16/EC as amended, which is legally binding for all the EU MSs.
3. Lastly, the Paris MoU benefits from a set of tools such as a targeting database system (THETIS), an online distance-learning programme (DLP), an inspection support software (RuleCheck) and others, which have only recently been adopted by some other MoUs.
4. All other MoU’s have observer status in the Paris MoU meetings and trainings, and routinely receive for information all Instructions, Guidelines and other information. Although these arrangements are reciprocal, they are highly conducive to the dissemination of the Paris MoU way of working.

For these four main reasons, it is presumed that if discrepancies can be found in the Paris MoU regime, it is likely that those can be found in more recent MOUs.

3.3. Data analysis

All audio-recordings were verbatim transcribed and anonymized. All collected data and transcriptions were entered in MAXQDA 10 software and analysed using template analysis.

In essence, the method structures the collected data through data coding aiming at identifying the main themes of the study. This method works well in studies where a comparison between different groups within a specific context is performed (Patton, 2015). The term ‘template analysis’, however, does not refer to a clear and uniquely identifiable method but rather a ‘group of techniques for thematically organizing and analysing textual data’ (King, 2004). It suggests identifying some *a priori* codes which then will be modified and updated through *in vivo* codes during the analysis.

Since the study follows a deductive-inspired approach, the analysis did not begin with a *tabula rasa*, but with a set of pre-defined categories or codes, known as template (Table 2). They were later refined and revised with the *in vivo* codes. An extract is shown in Appendix B and pertains to Section 4 and Section 5 of the interview. The *a priori* codes were derived from previous literature and were discussed with three experienced Port State Control Officers (PSCOs).

Given the pragmatic approach underpinning the research philosophy of this study and the intended recipients of the findings, the authors adopted an output oriented approach (Patton, 2015; Reynolds et al., 2011) to determine the quality of the findings in terms of

credibility, transferability, dependability and confirmability (Trochim and Donnelly, 2006). For this purpose, an analytical triangulation has been conducted through a review by inquiry participants and an independent expert audit review (n = 3).

4. Results & discussion

The following section provides the results and discussion of this study with a focus on the challenges/discrepancies that can be found in the Paris MoU regime. In the original template (Table 2), the *a priori* code “Challenges/Discrepancies” was changed into “Challenges/Discrepancies Paris MoU” to distinguish the Paris MoU from the other regions of the World. However, the “Challenges/Discrepancies” highlighted for other MOUs have not been included in this paper as well as other clusters such as “Background History”, “Effectiveness of PSC” and “Areas of Improvement” because it is not in the scope of this article.

4.1. An overview of discrepancies and challenges in the European Union region

Fig. 1 shows the main themes and how often certain codes can be found in the interviews’ transcriptions. The more often the code has been assigned to a participant, the larger the square. The size of a single square is determined by its relation to all other squares in the matrix and gives a general overview of the distribution of the segments for all codes and participants (the figure can be read both vertically and horizontally).

Contrarily, Fig. 2 illustrates the distribution of the codes for the individual participant (the figure must be read vertically) which indicates for every participant (P stands for participant) which were the most used codes and the size of the square is compared to the other squares in the same column. (confusing)

In general, the software counts how many times a code has been used, regardless of the length of the sentence and number of words. This means that the following two quotes are both regarded as one code:

“I think they made a huge difference. And it would be very wrong to not accept that. They achieved something which is maybe more important for me. There is a standardization, there is cooperation, there is a body where we can lodge our complain, where we can have a discussion. It’s not arbitrary like it was ‘you can’t-you can’t talk to me, I am guru and I know what I am talking about’. So they definitely achieved that. By doing that, if you look at the safety record of shipping industry it’s bloody excellent. And compare us with air industry and you would be surprised. We are really, really good and Port State Control must be congratulated on that.” (INTERMANAGER)

And:

“Some countries ahem have an elaborate system which requires that the Port State Control Officer almost finishes like ahem a university degree in Port State Control before Master’s Degree before he’s allowed to work as a Port State Control Officer.” (EMSA)

This is because the objective of the visualization is to show how often a certain topic has been discussed by the participants, regardless of the size of the sentence.

The two figures are divided according to their stakeholder group: Policy Makers (P1 – P2 – P3 – P11 – P12), Seafarers representatives (P10 – P13 – P14 – P8 – P7), Industry’s representatives (P7 – P4 – P5 – P9 – P6). Due to the current active role of P7 in two stakeholder groups, the participant has been included in both seafarers and ship-owners’ representative groups.

As shown in Fig. 1, Participants 2 and 7 were the most active in highlighting discrepancies in Europe, mainly focusing their attention

Table 2
A priori codes used for the data analysis.

1st level code	2nd Level code
Background history	N/A
Challenges/Discrepancies	Background of PSCOs Inspection procedures Detention Criteria Training of PSCOs
Effectiveness of PSC	N/A
Areas of improvement	N/A

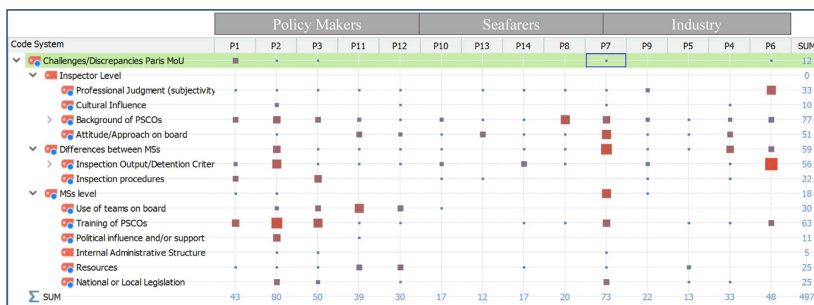


Fig. 1. Discrepancies and Challenges in the EU region (overall).

on Background of PSCOs, Differences between MSs, MSs level and Training of the PSCOs; the results of both participants alone represent 31% of the overall coded segments. An outcome which might suggest that these actors are particularly involved in these themes. In addition, the most frequently discussed themes among the participants were: Attitude/Approach on board, Background of PSCOs, Difference between MSs and Training of PSCOs.

In general, policy makers were the most active group in focusing on the discrepancies in the regime. This might be a consequence of the availability of non-public information they have access to through the management of the regional PSC database THETIS, by training PSCOs and by conducting visits to the various MSs on the implementation of the PSC Directive. Topics such as Training of the PSCOs, Team/No Team on board and the influence at the MSs level (e.g. resources, national or local legislation, etc.) were thoroughly addressed by policy makers while the same cannot be said for other stakeholders. This is also why the former tend to have a more critical approach towards the harmonization and uniformity of the MoU while industry (with the exception of INTERMANAGER) and seafarers had a very positive attitude towards the Paris MoU and its equal treatment. An outcome which was interpreted by one of the participants as an outcome of the regime's reputation:

“I think the Paris MoU still today is regarded as the most effective region which I think it's not the case. What we have created is an area around us, a maritime area, where there is a big a high level of self-control by shipping companies, by flag States, by ships in general. Because of the reputation of the Paris MoU. So that is the indirect effectivity, you have created a name for yourself and we still use that reputation [...] So (ahem) to say it in normal words (.) ships

get away with issues (.) detected and all, where they should not. And in the past would not have gone away with it, so (ahem) the inspectors have become more relaxed to dealing with problems” (EMSA).

Fig. 3 organizes the findings in a brief diagram where the three main clusters found are summarised in: **Inspector Level**, **MS Level** and **Differences Among MSs**. While the details of the findings will be further explained in the next sections, it is crucial to conceptualise the meaning of the figure. The two clusters on top of the figure (input), namely *Inspector Level* and *MS Level*, encompass the main factors identified by the interviewees which could lead to discrepancies during a *Ship Inspection*. Conversely, the bottom of the figure, namely *Differences Among MSs*, illustrates the output of a PSC inspection where the two clusters on top had a negative influence on the inspection process (output).

4.2. Member states level

At the MS level the participants have highlighted some factors, or better, local factors, which could negatively influence a PSC inspection. Those are:

- Use of Teams on Board
- Resources (Human & Financial)
- Local/National Legislation
- Training of PSCOs
- Internal Administrative Structure
- Political Influence/Support

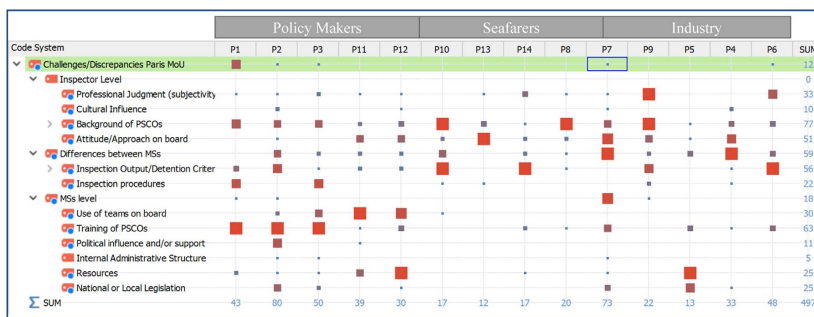


Fig. 2. Discrepancies and Challenges in the EU Region (participants).

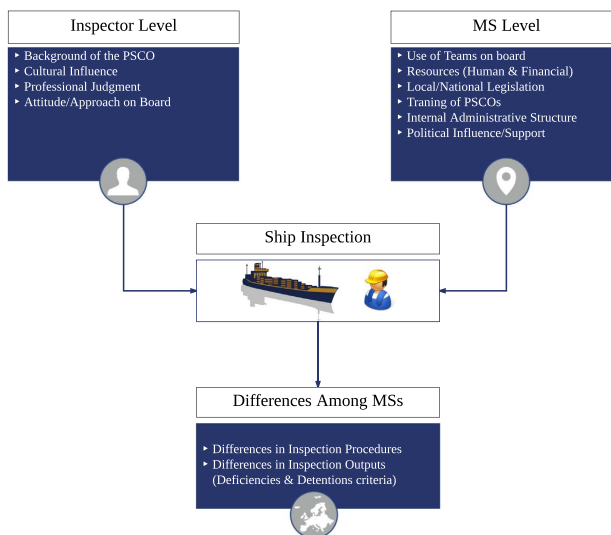


Fig. 3. Input and Output of a discretionary ship inspection system.

Some of those local differences were already suggested by Plaza (1994) and further by Bloor et al. (2006) and Knudsen and Hassler (2011).

Among the various legal acts through which the EU achieves its goals, Directives and Regulations are the most common. While both legislative acts are binding for the EU MSs, the level of flexibility changes greatly. A Directive sets out a goal or result that then the individual MS is still free to choose how to pursue its implementation through transposition into national legislation. Conversely, a Regulation must be applied entirely into national legislation throughout the union without further transposition (Coleman and Jessen, 2016). In other words, a Directive ensures a higher degree of flexibility for MSs which may leave wide gaps in the implementation process (Falkner et al., 2004). It is therefore assumed that the choice of enacting common PSC procedures by means of Directive 2009/16/EC, as amended, represents the origin of part of the highlighted disparities in the implementation and enforcement efforts. This has also been highlighted by some of the policy makers during the interview study.

Since *Resources*, *Local/National Legislation*, *Internal Administrative Structure* and *Political Influence/Support* have mainly been discussed in relation to *Training of PSCOs* and *Use of Teams on Board*, those two factors are explored in more detail in the following sections.

4.2.1. The use of teams – an issue of resources?

The use of teams of PSC officers on board to perform a PSC inspection was indicated as a factor that could lead to different inspection outcomes compared to single PSCO inspections. Knapp and Franses (2007b) suggested that the inspector background is reflected in particular deficiencies while Ravira and Piniella (2016) strongly advocate for multidisciplinary team on board. However, some participants from the policy making group have highlighted that the decision of using teams of two or more inspectors is not part of the EU legislation and therefore is a decision of the MS whether to avail of one or more PSCOs during a single inspection (P11-P12-P2-P3). This decision is strongly influenced by the availability of resources of the

country (financial and human resources), by the internal organization of the country, the distance between ports, the presence or absence of regional PSC offices, among others.

“[...] in some countries it depends on the distance to travel. You send one person in a car for four hours or do you send two?” (Paris MoU Secretariat).

With regard to the travelling distance that needs to be covered by the PSCO to inspect a vessel, some participants suggested to investigate the existence of a travelling policy within the country compared to the miles of coastline or the travelling time from one port to another compared to the miles of coastline.

It seemed clear that inspections conducted in isolation do not only accentuate the cultural and/or background differences, but leave the subject exposed to the ship's crew and the shipowner. The use of a team dims the effects of external pressure on the inspectors while allowing for interaction between the team members (peer review and complementary expertise). This interaction tends to mitigate negative effects connected to the use of professional judgment in uncertain/unclear situations.

4.2.2. A (non-)harmonised training policy

Same as for the decision to make use of teams for PSC inspections, the training of PSCO is a national prerogative. In their annexes, the PSC Directive (Annex XI) and the Paris MoU text (Annex VI) determine the professional profile of the inspectors and establish the so-called “minimum criteria” for PSCO. Those criteria, such as having an appropriate qualification from a nautical institution and having completed a minimum of one year of service as a flag State inspector, have become mandatory for EU MSs so that PSCO would have appropriate theoretical knowledge and practical experience of ships and their operation. While the Directive establishes the minimum criteria, the Paris MoU has developed the *Paris MoU Policy on the training of the new entrant PSC Officers and the professional development scheme for PSC Officers* which establishes a convergent training policy for both new and experienced PSCOs. Although this

policy determines a thorough professional development scheme and a syllabus, it neither specifies how to conduct the training nor the number of hours necessary to accommodate the various elements of the policy. As pointed out by several policy makers, the implementation of the training policy is still a national responsibility and cannot be enforced by the EC. It is not included in the text of the Directive, which would make it legally binding.

“What training is implemented nationally? Because actually on a national level we don’t really know how they do it. It’s their responsibility [...] Let’s say on the other side as soon as they are port state control officer from that moment on they become either a new entrant in our training policy or they are the experienced PSCOs and they go for the professional development scheme. That’s all laid out, what are the requirements, what are the minimum standards, what is the material (ahem) so that’s let’s say something that we are much better able to monitor” (Paris MoU Secretariat)

According to the group of the Policy Makers, the participants were almost unanimous in suggesting that training procedures among EU MSs are not harmonised. Some considered the training policy of the different MSs as a ‘black hole’ (P1), while others made a clear-cut difference between those countries with developed training schemes and those with a ‘training on the job’ policy:

“Some countries (ahem) have an elaborate system which requires that the Port State Control Officer almost finishes like (ahem) a university degree in Port State Control before Master’s Degree before he’s allowed to work as a Port State Control Officer [...] there are other countries where they hire a new guy who is then left alone from day one. And only has to call back to the office when he has a problem. Which is a massive difference of course and this is then (ahem) visible in inspection results, it is visible in reactions of companies towards inspection and it’s damaging or not to the reputation of the organization, the Paris MoU in general or the MoU in general” (EMSA)

However, with other stakeholders, with the exception of INTERMANAGER and IACS, the topic of training was rarely mentioned.

The participants convened that a harmonised training policy is the most effective tool to ensure common treatment. In fact, it was suggested that the national attitude towards training has a deep impact on the way PSCOs approach their job, what methodology they learn and apply, what knowledge of the relevant conventions they have, etc. In order to develop a comprehensive picture of the training commitment of the various MSs, the total number of training hours (both desk and practical training) per person, provided to new and existing personnel, should be investigated through the reports compiled by EMSA at the end of the visits to MSs investigating the implementation and enforcement of Directive 2009/16/EC, as amended.

4.3. Inspector level

The second main cluster of codes, which summarizes some of the circumstances that may determine discrepancies in the output of the inspection process, entails the inspector level. In detail:

- **Background of the PSCOs**
- Cultural influence
- **Professional Judgment**
- Attitude/Approach on Board

Since *Cultural influence*, and *Attitude/Approach* on board have mainly been discussed in relation to the *Professional Judgment* and *Background of the PSCO*, these two factors will be explored with more detail in the following sections.

4.3.1. Professional judgment

Discretion, subjectivity, individuality, professional judgment and other equivalent concepts have broadly been interpreted as one of the circumstances leading to difference in treatment across countries and ports (Bloor et al., 2006; Özçayır, 2009; Sampson and Bloor, 2007). The definition suggested by Coles (2002) states that professional judgment is exercised when a practitioner, in this case the PSCO, makes judgment calls in an uncertain situation. The text of the Annex I of the Paris MoU itself states that:

“The Port State Control Officer will (...) use his professional judgement in deciding whether and in what respects the ship will be further inspected” (Paris MoU, 2017)

and also, in the PSC Committee instructions on “Guidance on Detention and Action Taken”:

“The PSCO will exercise professional judgment in determining whether to detain the ship until the deficiencies are rectified or to allow it to sail with certain deficiencies without unreasonable danger to the safety, health, or the environment, having regard to the particular circumstances of the intended voyage” (Paris MoU, 2016)

Some participants have expressed severe criticisms on the over-reliance on expert judgment which inherently does not contribute to the harmonization process. Others, such as some industry and seafarers’ representatives, seem to appreciate the flexibility which would not be achievable if other strategies would be applied (e.g. checklists, etc.).

Overall, two main issues can be raised. Firstly, professional judgment may undermine the main objective set by Directive 2009/16/EC, as amended, which is to enforce rules and standards of international applicable conventions. Allowing for subjectivity can cause inconsistencies in decision outcomes (Hawkins, 1992 as cited in Bloor et al., 2006). Secondly, the exercise of professional judgment implies that the PSCO must be a professional. The existence of minimum criteria for PSCO has already been clarified above. However, inconsistencies in the training policy of MSs and different professional backgrounds may affect the level of professionalism matured by the PSCO.

Several factors may influence expert judgment: prejudices, cultural attitude, professional background, training, ego, personal opinions among others (P1 – P2 – P3 – P6 – P7 – P8 – P9 – P11 – P12 – P13). Some of these factors, for example, were identified also in a study conducted by Carter (2006) on the variance of police behaviours. Taking into consideration the input provided by the participants, a mitigation could be achieved by means of a soft or hard approach. The soft approach focuses on harmonising the training policy pertaining inspection procedures, detention criteria and convention requirements. Conversely, the hard approach would suggest more prescriptive procedures and, ultimately, the use of checklists during inspections.

4.3.2. Background of the PSCOs

The background of the inspector has dominated the discussion in all interviews. It seemed clear that whether nautical, engineering or naval architecture, the background has a leading role not only in determining the outcome of the inspection itself (e.g. detaining or not the vessel, type of deficiencies found, etc.), but sometimes even on the attitude and approach on board. As a criterion, it was pointed out that since an engineer finds himself/herself more comfortable in the Engine Room as well as a Captain finds himself/herself more comfortable on the Bridge, the inspections and eventual deficiencies would reflect their proficiency in these arenas:

“You’ve done 30 years as a deck officer therefore your Port State Control is always limited to an inspection of the bridge. You’re never going to the Engine Room” (IACS)

Or also:

“[...] if you are if you are, say, you are technical background. Your comfort zone is engine room. Ok? So our so you-the tendency is if I am a ships ‘captain, as a Port State Control I’ll tend to spend more time on the bridge because I know what hole I can find wrong. The opposite can happen if you’re engineer you will spend more time in the engine room. If you’re a naval architect, you might spend more time on the structural issues rather than (ahem) the operational issues related to... and not more on navigation. He will might look into the ship structure and the (ahem) the steel work et cetera.” (NAUTICAL INSTITUTE)

This issue could be avoided by sending two inspectors with different background to perform a PSC inspection. It seemed clear that if the inspection would be conducted by an individual (and not a team) with one of the background mentioned above, the type of deficiencies and/or the areas visited on board could be the result of their professional skills developed before becoming a PSCO. Conversely, inspectors lacking a seafaring background have the tendency to conduct the inspection by the rules, having less technical and operational knowledge (P2-P4-P13-P8) yet a very good knowledge of the inspection procedures of their MoU (P2-P3).

Following the discussion on the background, a difference in approaches and attitudes has been underlined. Experts have indicated that ex-seafarers seem to be more indulgent towards the ship and the crew; it is easier to “get away with deficiencies” (P4). This might be explained by being more empathetic with the crew and by believing in the skills and the capability of the crew to fix deficiencies on their own (P2). To summarize, two inspection approaches have been identified: the first is where the PSCO on board tends to determine whether the vessel is safe to sail (approach more related to PSCOs with a seafaring background), while the second is to find deficiencies strictly following guidelines and procedures (approach more related to PSCOs lacking seafaring background, P2-P4-P8-P7-P6). However, this different perception may suggest that PSC has different perceived objectives according to the group of stakeholders dealing with it. Policy Makers seem to aim at finding substandard ships and increase the safety standard of the vessels sailing across EU waters by using common procedures which is in line with the rationale of the Directive, IMO Resolutions and the MoU text. Contrariwise, ship-owners seemed keener on targeting issues and in making sure that the general demeanour of PSCOs was to verify the seaworthiness of the vessel rather than compliance with the international legislation. While this approach may seem more reasonable, it does not take into consideration the main objective of PSC: determining compliance of vessels with applicable international rules and standards.

4.4. Differences between EU member states. Diverse structure and knowledge towards a north-south slope?

While the legal texts of the different MoUs are virtually identical, the enforcement of these provisions may change due to financial resources, training capabilities and/or infrastructures (Bang and Jang, 2012; Knudsen and Hassler, 2011; Plaza, 1994). Shipowners’ and seafarers’ representatives were almost unanimous in defining the Paris MoU as the best PSC regime where discrepancies are infrequent. However, slight differences between EU MSs have been highlighted (Sampson and Bloor, 2007); this is true especially when the debate pertains southern and northern countries in what has been called ‘north-south slope’ (P2). Some participants, such as P4-P2-P6-P7, have portrayed the southern countries of Europe as the keenest on detaining ships while in the north of Europe, MSs tend to perform an inspection ‘less by the rules’:

“Let me say that the barrier for where you are detained is less in the South and higher in the North. In the North, you can in more cases talk your way out of it” (P4 - BIMCO).

PSC in Northern countries has been considered more robust in terms of maritime knowledge since PSCOs are generally ex-seafarers. However, a structured approach towards procedures seems challenging to be achieved. The consequence is that the perception of quality is higher for seafarers and industry (P4-P7) but not for policy makers. Conversely, in Southern countries, the subjectivity of the inspectors and the lack of seafaring experience may play a larger role in the conduction of inspections. However, whereas seafaring knowledge may be lacking, adherence to structured procedure seems easier to achieve. This way, the perception of quality seems higher for policy makers but not for seafarers and industry.

4.5. Quality of the research

In recent years, some authors have suggested that validity, reliability, objectivity and generalisability may not be the best suitable criteria to evaluate qualitative inquiries (Hammersley, 2007; Hoepfl, 1997; Patton, 2015; Yilmaz, 2013). For this reason, alternative criteria such as those of credibility, dependability, confirmability and transferability were initially developed by Guba and Lincoln (1989) and adopted for this study. The overall work was subject to an analytical triangulation conducted through a review by inquiry participants an independent audit review (n = 3).

In detail, to establish high level of credibility, the manuscript was submitted to three independent experts which evaluated the methodology and the quality of the findings. At the same time, to determine confirmability, the manuscript was submitted to the 14 participants to collect their views and potential post-comments in the paper discussion. Dependability was achieved through a code-recode procedure throughout the analysis of the data after waiting at least two weeks from the initial coding. Lastly, to provide transferability, thorough information regarding the participants, the context and the methods employed are illustrated to the reader.

4.6. Limitations and future perspectives

It should be noted that this paper has been primarily focused on the identification of discrepancies and challenges (if any) in the Paris MoU region, targeting EU countries only, and does not address other areas explored during the interview study.

Although the use of elite interviews is highly beneficial to gain insights into the decision-making process, to provide information non-recorded in official reports and to shed light on hidden elements in the area under investigation (Richards, 1996), the results can be affected by biases. Overall, issues of accessibility of the participants and the power relationship between interviewer and interviewee may shape the data and the reliability of the data collected (Boucher et al., 2013). While no accessibility issues were reported in the study, Berry (2002) suggests that the most efficient way to steer the conversation is for the interviewer to become an expert in the subject; experience which is covered by the authors of this paper. Moreover, the authors favoured semi-structure interviews instead of fully open-ended interviews (as generally suggested for elite interviews) to ensure a higher degree of transferability and dependability.

The findings of this study are restricted to individuals/experts which have a broad knowledge of the topic under investigation and also hold a position of prestige in the hierarchy of the contacted agency, entity, company or association. This also suggests that due to their public/private roles, the participants may have refrained to give strong statements and opinions. It is suggested for future studies to expand the scope of the study to other subject-related experts such as PSCOs, Administrators and multiple seafarers. In addition, it must be taken into consideration that the participants may have wanted to cover only some issues rather than others by focusing their attention on topics they are more involved into.

On a higher level, since EU policy makers are embarking on the

revision of the relevant legal framework, the findings of this article may highlight areas needful of amendments for a new Directive on PSC and steer the regime towards a new course.

5. Conclusions

The body of literature dealing with PSC in the last years has greatly focused on demonstrating whether differences in treatment would exist among MoUs. However, few studies have discussed whether differences appear within the same MoU. This article complements other scientific work by highlighting the main factors leading to differences in approach at the inspector and MS level in the EU region.

According to the results, it is fair to say that the Paris MoU appears the most effective and reliable of the regional agreement on PSC. This is true especially for seafarers' and shipowners' representatives while policy makers maintain a more neutral assessment.

Nonetheless, a difference in maritime knowledge and structure of the inspection process was identified between Northern and Southern EU countries. PSCOs from the former group of countries tend to have a thorough maritime knowledge due to their professional background. Still, they lack a structured ship inspection approach due to over-reliance on experience and expertise. On the contrary, PSCOs from the latter group of countries seem to rely more on a structured ship inspection approach due to their lack of seafaring experience.

Despite the positive achievements reached in 40 years of coordinated PSC by the EU, some strategies were suggested to overcome the

differences identified. Above all, advocating for a single training policy for PSCOs, multidisciplinary teams on board and more structured inspection procedures appeared the main mitigation approaches suggested by the participants. In addition, it is our belief that the introduction of a different legal system, such as a Regulation, would prevent transposition and application concerns and favour harmonization. The authors hope that this study and its findings can contribute to the corpus of reference materials that will inform EU policymakers as they embark on a recast of the relevant legal framework. An initiative which could represent a new point of departure for EU Port State Control.

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Appendix A. Interview guide

General objective: What is the perception of PSC among diverse actors within the maritime domain?

1. Demographic:

- What is your age?
- What is your nationality?
- What is your current position/occupation?
- What training/qualifications do you have that are of relevance to your current position or occupation? (e.g. Master degree, etc.)
- How long have you worked in this position or occupation?

2. Inquiry about the participant's general perception on Port State Control, covering objectives and effectiveness:

- When discussing about PSC regimes, how would you define their primary goals/objectives?
- What aspects would make you consider effective a PSC regime?

3. Inquiry about the challenges/differences, if any, among PSC regimes across the World. Determine in what aspects and what factors:

- Do you believe differences exist among PSC regimes across the World?
- Follow up with probing questions such as “in what aspects?” – “what factors would influence these aspects?”

4. Inquiry about PSC in the European Union. Determine the general evaluation of the PSC regime and what aspects and/or factors would determine challenges/differences in the current regime:

- How do you evaluate the overall PSC regime in Europe in reaching its objectives?
- How would you consider the application of PSC in Europe in light of consistency?
- According to your professional experience, in what aspects PSC is applied less/more consistently?
- What factors would influence these aspects?
- Do you think that the inspector background could influence the inspection outcome? In what way?
- Do you think that the inspector training could influence the inspection outcome? In what way?
- How would you evaluate the detention criteria across Europe?

5. Inquiry about what would be needed to be changed in the current PSC Regime in Europe.

- What aspects would you modify in the current PSC regime in Europe?

General probing questions used in the study:

- Could you elaborate more on that?
- What could be the influencing conditions?
- What do you mean by [...]?
- I'd like to hear more about [...]?
- May I ask you to think back and elaborate more on that?
- According to your professional experience [...]

Appendix B. Extract of the final template

1st level code	2nd Level code	3rd Level code
Challenges/Discrepancies in Europe	Inspector Level	Professional Judgment (subjectivity) Cultural Influence Background of PSCOs Attitude/Approach on board
	Difference between MSs	Inspection Outcome/Detention criteria Inspection procedures Use of teams on board
	MSs Level	Training of PSCOs Political influence and/or support Internal Administrative Structure Resources National or Local Legislation

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Paper III

Graziano A, Mejia MQJr, Schröder-Hinrichs J-U. Challenges and successes of the European Directive on Port State Control: a holistic analysis.

Undergoing review by an international scientific peer-reviewed journal.

Challenges and successes of the European Directive on Port State Control: a holistic analysis

As a response to the strong political and public outcry for more stringent regulations regarding safety of ships in the wake of a series of maritime disasters in the 1980s and 1990s, the European Commission adopted a number of Directives on Ports State Control (PSC) that has made the provisions of the Paris Memorandum of Understanding (MoU) on PSC binding on all EU Member States (MSs). Directive 2009/16/EC, as amended, which entered into force on January 2011, is the latest version of those Directives. Aside from specifying targeting, inspection, and detention procedures, this piece of legislation establishes that each Member State (MS) shall be inspected every five years by the European Maritime Safety Agency (EMSA) to monitor the level of implementation and enforcement of the Directive. We analysed 25 inspection reports prepared by the Agency in connection with MSs inspections, to determine levels of implementation, compliance, and harmonisation with the provisions of the Directive 2009/16/EC. This article summarizes the main shortcomings and observations as identified in the inspection reports and concludes that while the Directive has been properly implemented by the MSs, there remain areas where harmonisation is yet to be achieved. In detail, this article detects gaps between policy and practice for EU policy makers which aim at ensuring a level playing field in Europe and avoid safety competition among countries.

Keywords: Port State Control, Implementation, European Union Law, Maritime Policy, Harmonisation

1 Introduction

Maritime safety and marine environmental protection are promoted through an international legal framework that consists primarily of the United Nations Convention on the Law of the Sea (UNCLOS), 1982, and a number of safety conventions adopted under the auspices of the International Maritime Organization (IMO). These international instruments provide comprehensive standards that serve as bases for the formulation of domestic laws that regulate the design, manning, equipment, operation, management, maintenance, and disposal of ships (Mejia Jr., 2005).

At the regional level, the above framework also served as one of the bases for the adoption in 1993 by the European Union (EU) of “A Common Policy on Safe Seas.” The EU’s Common Policy included a “coherent action programme on priority measures to be taken by the Community and its Member States to enhance maritime safety and pollution prevention” (Council of the European Communities, 1993). However, growing frustration with the seemingly endless string of serious maritime accidents in the final decades of the 20th century¹ and the perceived lethargic pace of change in the international legal framework at IMO (Nengye and Maes, 2012; Tan, 2005; van Leeuwen and Kern, 2013) prompted the European Commission (EC) to adopt a series of legislation² designed to induce significant improvements in the level of safety of ships of all flags calling in European ports and of all European-flagged vessels sailing around the world. This series of legislative acts enabled the EU to address the perceived lacuna in the enforcement of global shipping standards. One of the key pieces of legislation was Directive 95/21/EC (Council of the European Union, 1995) that established a common set of criteria for the control, as well as harmonized procedures for the inspection and detention, of ships calling in EU ports. 95/21/EC has been recast several times, the latest version being Directive 2009/16/EC (European Parliament and the

¹ *Amoco Cadiz* (1978), *Scandinavian Star* (1989), *Aegean Sea* (1992), *Braer* (1993), *Estonia* (1994), *Sea Empress* (1996), *Erika* (1999), *Prestige* (2002) to name a few.

² The series was based on four pillars: convergent implementation of existing global international rules; uniform enforcement of global international rules by the port states; development of navigational aids and traffic surveillance infrastructures, and; reinforcement of the EU’s role as the driving force for global international rule making.

Council, 2009)³, in force since 1 January 2011. The Directive drew upon the experience of the Paris Memorandum of Understanding on Port State Control (Paris MoU), the first ever regional agreement on port state control (PSC).

While IMO is responsible for the development of the international legal framework for the shipping industry, the implementation and enforcement of its different elements remain the responsibility and prerogative of its member states primarily through the exercise of flag state administration and regulatory functions over ships in their registry. However, under the so-called open registries, “it is not uncommon for a ship to rarely, if ever, visit its port of registry in its service life, thereby keeping it beyond the reach of surveyors and inspectors of the flag state” (Mejia Jr. et al., 2007). In such situations, when flag states who “have the primary responsibility of safeguarding against substandard ships... fail to meet their commitments, port states must act as the last safety net in the control system” (Özçayır, 2009). Focusing on compliance with the core IMO conventions, port states have joined efforts through regional agreements, known as PSC Memoranda of Understanding (PSC-MoUs or simply MoUs), to coordinate and optimize effectiveness. The aforementioned Paris MoU was the first of these, having it been established in 1982 (Özçayır, 2004).

It has been argued that the non-binding nature of MoUs⁴ constitute an inherent weakness and challenge to their stated objectives (Bang, 2008; Bang and Jang, 2012; Molenaar, 2007; Molenaar and Pons, 1996). This weakness has been overcome in the European context because Directive 2009/16/EC has made the provisions of the Paris MoU binding for all EU Member States (MSs). The PSC regime in Europe is enforced by virtue of Directive 2009/16/EC through visits and inspections and, as a last resort, through procedures before the European Court of Justice (König, 2002). As a practical effect the Directive promoted a harmonised approach to PSC as well as introducing a risk-based system for targeting and selection.

This article seeks to establish the level of implementation and harmonisation with Directive 2009/16/EC as amended by Directive 2013/38/EU (European Parliament and the Council, 2013), across EU and European Free Trade Association (EFTA) states. This is undertaken through a content analysis of the reports of the 2009/16/EC-

³ The Directive was amended by Directive 2013/38/EU to accommodate the Maritime Labour Convention (MLC) provisions for PSC.

⁴ PSC-MoUs are gentlemen’s agreements rather than legally binding treaties.

mandated visits conducted by the European Maritime Safety Agency (EMSA) in 25 EU/EFTA MSs during 2012 to 2016. Observations and shortcomings for every MS are aggregated and discussed by magnitude and topic. The authors conclude that while compliance with the objectives are clearly being achieved in many areas specified in Directive 2009/16/EC, the EU/EFTA MSs are still not harmonised. Therefore, the study highlights gaps between policy and practice and suggest a review of the Directive to EU policy makers.

2 Background

The sections that follow cover three main aspects of this study namely, an overview of past literature on PSC, a review of the main discrepancies common to PSC regimes, and a summary of the enforcement powers of the EC and of the main features of Directive 2009/16/EC.

2.1 Port State Control

The body of literature covering PSC is quite broad and covers various aspects such as elements of law, effectiveness, targeting, discrepancies in implementation, among others.

Part of the literature developed during the 1990s acknowledges the emergence of regional agreements on PSC as a positive phenomenon and investigates its effectiveness. Scepticism was raised in the initial years of the Paris MoU due to the perception of a ‘discriminatory enforcement’ (Blanco-Bazán, 2004) of IMO conventions by EU countries. Many scholars explored the extent to which PSC was being a successful strategy in decreasing substandard shipping (Bell, 1993; Cuttler, 1995; Kiehne, 1996; Payoyo, 1994; Plaza, 1994; Vorbach, 2001) many investigating the legal basis for PSC and port state jurisdiction (Ademuni-Odeke, 1997; Hare, 1997; Keselj, 1999; König, 2002; McDorman, 1997, 2000; Molenaar and Pons, 1996). In the early 2000s, when the “enforcement agency” (Bloor et al., 2006) and “third-party control” (Mejia, 2005) functions of PSC became clearly entrenched, the literature shifted towards new topics and authors evaluated the tangible effects of PSC on shipping. Knapp and Franses (2007a), for instance, estimated the effect of PSC inspections on the probability of casualties as well as consequent saved costs (Knapp et al., 2011). Cariou et al. (2008) determined the effectiveness of PSC in reducing the

number of deficiencies in subsequent inspections. Others contributed to developing and/or testing an improved targeting/selection system (Cariou et al., 2007, 2008; Cariou and Wolff, 2011, 2015; Knapp and Franses, 2007a, 2008). van Leeuwen (2015) even claimed that the gaps in the implementation process left by flag states had slowly and effectively closed because of PSC.

This study embraces the “conventional wisdom” (Bang, 2008) that PSC has played, and continues to play, a prominent role in ensuring compliance with international regulatory efforts (Ademuni-Odeke, 1997; Bell, 1993; McDorman, 2000; Molenaar, 2007; Payoyo, 1994), and in increasing the standards of safety (Li and Zheng, 2008; van Leeuwen, 2015), pollution prevention (Bang, 2008; Cuttler, 1995), and labour protection.

2.2 Discrepancies in PSC

Significant inroads against substandard shipping notwithstanding, PSC has had to deal with cross-national discrepancies in implementation since its early stages of development (Bloor et al., 2006; Cariou et al., 2009; Keselj, 1999; Knapp and Franses, 2007b; Knapp and van de Velden, 2009; Knudsen and Hassler, 2011; Mansell, 2009; Özçayır, 2009; Sampson and Bloor, 2007).

As early as 1994, Plaza (1994) had already highlighted how discrepancies were becoming evident due to disparities in stages of development and other peculiarities among countries in some regions. Anderson (2002) also recognised that “substandard vessels trading in the poor regions of the world have a significantly lower chance of being detained by PSC.” This may be aggravated by unequal participation of states within the same region (Anderson, 2002), lack of resources (Anderson, 2002; Bang and Jang, 2012; Knudsen and Hassler, 2011; Özçayır, 2009), and scarce infrastructure, technology, and policies (Bang and Jang, 2012). From the point of view of the inspector, part of the literature attributes this to the heavy influence of the individual PSCO’s subjectivity and professional judgment (Bloor et al., 2006; Özçayır, 2009). Others, such as Knapp and Franses (2007b), Ravira and Piniella (2016), and Bloor et al. (2006) claim that differences in the training and experience may lead PSCOs to focus on certain areas of competence rather than others.

A question then arises as to why differences in treatment would have to be an issue. On a higher level, the development of a harmonised system of inspection and targeting procedures is one of the most important goals of PSC regional agreements. Needless to

say, having different standards for inspection can represent a failure of the system as a whole. On a deeper level, the crux can be both technical and economical. From a technical point of view, differences can undermine the targeting system, based on previous inspection's results (Knapp and van de Velden, 2009), and weaken the effective implementation of international regulations (Bloor et al., 2006; Knudsen and Hassler, 2011). From an economical one, discrepancies may promote the so-called "port shopping" (Bang, 2008; Keselj, 1999; Knudsen and Hassler, 2011; McDorman, 2000). This is a strategic behaviour adopted by some operators which consists of choosing certain ports (Knudsen and Hassler, 2011) or certain regions (Bang and Jang, 2012) over others, based on divergent enforcement standards.

2.3 Directive 2009/16/EC and its Enforcement

Directive 2009/16/EC is part of the series of legislative measures adopted by the EC under the so-called *Third Maritime Safety Package* aimed at improving the EU maritime regulatory framework. With its entry into force on 1 January 2011, the Directive introduced what has been referred to as the New Inspection Regime (NIR) featuring an array of requirements and provisions to improve the current system of PSC and strengthen its three main components: Harmonisation, Targeting/Selection and Inspection (Figure 1).

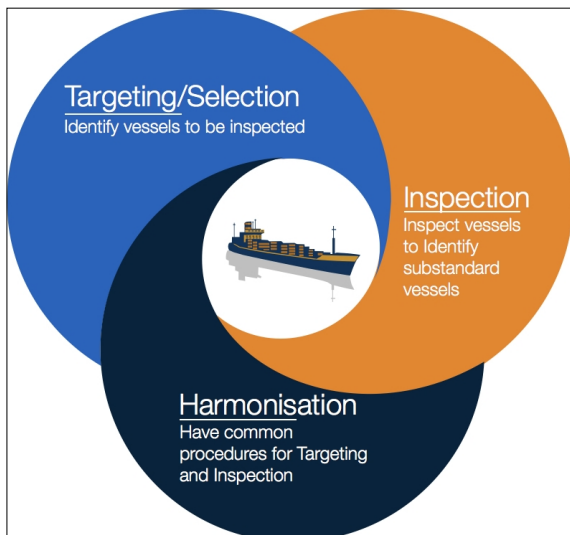


Figure 1 – Main PSC components

For this and other purposes, a priority and a risk profile are assigned to every vessel. The former indicates whether a ship entering into EU ports should not be inspected (No Priority), must be inspected (Priority I) or may be inspected (Priority II). The latter, whether High, Standard, or Low risk, establishes time windows for inspection. For example, a High Risk ship becomes Priority II after 5 months since the previous inspection and Priority I after 6 months. These are called *periodic* inspections. However, regardless of the period since the last inspection, in lieu of overriding⁵ (must be inspected) or unexpected⁶ (may be inspected) factors, ships could be subject to *additional* inspections.

Pertaining its enforcement prerogatives, the EC has assigned EMSA the task of conducting visits to MSs in order to evaluate and monitor the effective implementation of Directive 2009/16/EC and to monitor the overall functioning of the Union's PSC regime. The rationale behind the visits is to review the infrastructure and legislative and administrative provisions adopted by the MS to ensure the fulfilment of the requirements of the Directive. The visits examine the following five processes and areas:

1. Organization;
2. General Commitments;
3. The Cycle of PSC Inspection – Information System;
4. Personnel – Logistics;
5. Enforcement and Sanctions.

Under the heading *Organization*, EMSA examines the manner in which maritime authorities have organized their national PSC systems. The second area considers the *General Commitments* undertaken by MSs for complying with the main requirements of the Directive together with the necessary arrangements, activities, and actions taken. The *Cycle of PSC Inspection – Information System* process considers activities undertaken in respect of performing the actual PSC inspection, the procedures followed by PSCOs, and the insertion of all relevant information in the database system. The examination of the *Personnel – Logistics* process covers the professional profile,

⁵ List of overriding factors in Annex I, Part II 2A.

⁶ List of unexpected factors in Annex I, Part II 2B.

qualification and competence of inspectors and their compliance with the minimum criteria laid down in the Directive. Finally, the *Enforcement and Sanctions* process covers the requirements of the Directive on the right of appeal and for enforcement and sanctions.

Table 1 below shows the 5 different processes, with a detailed description of the articles examined.

Table 1 – Overview of the areas covered during the EMSA visits to EU Member States.

PROCESS	ARTICLE	DESCRIPTION
ORGANIZATION	1	Purpose
	2	Definitions
	3	Scope
	4	Inspection powers
GENERAL COMMITMENT	5	Inspection system and annual inspection commitment
	6	Modalities of compliance with the inspection commitment
	7	Modalities allowing a balanced inspection share within the Community
	8	Postponement of inspection and exceptional circumstances
	9	Notification of arrival of ships
	11	Frequency of inspections
	15.1 & 15.2	Safety and security guidelines and procedures
	16	Access refusal measures concerning certain ships
	23	Reports from pilots and port authorities
25	Exchange of information and cooperation	
THE CYCLE OF PSC INSPECTIONS – INFORMATION SYSTEM	12	Selection of ships for inspection
	13	Initial and more detailed inspection
	14	Expanded inspections
	19	Rectification and detention
	21	Follow up to inspections and detentions
	15.3	Safety and security guidelines and procedures
	24	Inspection database
	28	Reimbursement of costs
PERSONNEL - LOGISTICS	22	Professional profile of inspectors
ENFORCEMENT & SANCTIONS	29	Data to monitor implementation
	18	Complaints
	18.a	Onshore MLC 2006 complaint-handling procedures
	20	Right of appeal
	34	Penalties

3 Methodology

This section outlines the content of the collected documents, and it clarifies how the analysis was conducted.

3.1 Data overview

This study analysed 25 reports inspection produced between March 2012 and April 2016 by a team of two to three inspectors from EMSA. All the findings were duly anonymised and an ID from 1 to 25 was randomly assigned to the concerned MSs. Confidentiality was required by EMSA to granting access to the documents and for publication purposes.

Each report has the following table of contents:

- List of Tables;
- List of Figures;
- List of Abbreviations;
- Executive Summary;
- Acknowledgments;
- Cross-Reference for Directive Articles;
- 1. Introduction;
- 2. Background;
- 3. Detailed examination of the port state control system in relation to the Directive
 - 3.1 Organisation
 - 3.2 General Commitments
 - 3.3 The Cycle of the PSC inspection – Information System
 - 3.4 Personnel – Logistics
 - 3.5 Right of Appeal – Enforcement and Sanctions
- **4. Summary of Findings;**
- Appendix A – Visit programme;
- Appendix B – List of persons involved;
- Appendix C – Pre-visit questionnaire on the implementation of the Directive

Since all reports have the same structure and the visits adopt the same methodology, no comparability issues were highlighted.

3.2 Data analysis

The inspection reports, which were regarded as official documents, were analysed to

perform a systematic and holistic evaluation of the implementation of the Directive in the since its introduction. The authors availed of document analysis to analyse the inspection reports provided in this study.

The analytical procedure included selecting, aggregating, interpreting and synthetizing the data contained in the documents (Bowen, 2009). In this context, data are the **number** and **type** of shortcomings and observations recorded. The narrative, content meaning, frequency of words and/or the themes were not analysed since deemed not within the scope of the study. Particular attention was given to the ‘textual organizations of the documents’ (Coffey, 2014) and their structure.

The analysis has focused on Chapter 4 *Summary of Findings* to determine number, type, description and linked Article of the various shortcomings and observations. All the reports were initially skimmed, then thoroughly read before any interpretation and data aggregation. Whereas further information was regarded as necessary, the authors consulted the applicable subchapters of Chapter 3 *Detailed Examination of the Port State Control System in relation to the Directive*. Lastly, all data were then aggregated into their process/area of significance by following the structure and the articles of the Directive as previously shown in Table 1.

All findings, observations, and shortcomings were then presented to two EMSA officials involved in the MS visits in order to gather further comments, perceptions, and insights.

3.3 *Quality of the Data and Limitations*

The EMSA inspection reports were viewed as authoritative sources which are documents produced with ‘an explicit goal of unbiased knowledge’ (O’Leary, 2004, p.178) and entail a certain level of credibility, authenticity and representativeness (Bowen, 2009). However, even official sources may not be a firm evidence of what is reported (Coffey, 2014). The composition of the EMSA team may vary in terms of number of inspectors, background, experience and nationality. The authors do not have control over the inspection practices of EMSA and it is recognised as limitation that discrepancies in the inspection teams may have an influence on the way results were produced and included in the reports (O’Leary, 2004, p.183).

Overall, a high degree of stability is given due to the fact that the documents ‘exist independently’ of our action (Rapley, 2007, p.9) and the presence of the authors does

not influence the results but provides further exactness (Bowen, 2009). Moreover, the homogeneous structure of the reports ensures that, regardless of the authors analysing the reports, the results will remain consistent and accurate (Golafshani, 2003; Yilmaz, 2013).

4 Results & Discussion

This section provides and discusses the results of this study. It begins with a complete overview of shortcomings and observations recorded during the visits (Section 4.1). Subsequently, this section continues by exploring specific areas marked by a considerable number of findings (Sections 4.2, 4.3, 4.4 and 4.5). This section then ends with a summary on the (in)-adequacies of port state control followed by suggestions for policy-makers (Section 4.6).

4.1 *A Summary of the findings concerning compliance with Directive 2009/16/EC*

Table 2 offers an overview of shortcomings and observations recorded during the visits conducted by EMSA in the concerned MSs. The left side of the table indicates the relevant processes and articles of the Directive scrutinised during the visits. The top row indicates the assigned IDs of the 25 anonymised MSs. The columns on the far right hand side summarises the number of shortcomings⁷(S) and observations⁸(O) for each of the articles, as well as the sum total (T) for the two. Shortcomings are represented in red, while observations are in orange; where neither shortcomings nor observations were found, the cell is left green. In circumstances where two or more findings were recorded, the number logged in the cell indicates the total.

As shown in the table, majority of the findings were discovered in *Article 24 – Inspection Database* (23% - 61) followed by *Organization* (10% - 26), *Article 22 – Professional profile of Inspectors* (10% - 26), *Article 15.1/2 – Safety and Security Guidelines Procedures* (9% - 25), *Article 14 – Expanded Inspections* (8% - 22), *Article 9 – Notification of Arrival* (7% - 18), and lastly *Article 8 – Postponement of Inspection*

⁷ A shortcoming is a clear violation of provisions stated in one of the Articles of the Directive.

⁸ An observation is a violation pertaining the application of a procedure outlined in the Paris MoU Manual and/or guidelines and/or instructions

and *Exceptional Circumstances* and *Article 5 – Inspection System and Annual Inspection commitment* (6% - 16). Given their nature and objectives, the Articles were grouped into three main areas of interest:

- **Inspection Commitment/Information:** Articles 5, 8 and 24
- **Quality of Inspections:** Articles 15.1, 15.2 and 14
- **Training of PSCOs:** Article 22

Article 9 and Organization were considered to be of a more administrative nature, and thus assessed separately (Section 4.5).

It is worthwhile to note that these findings show a twofold outcome. On the one hand, many processes of the Directive are fully implemented. Only sporadic, if any, findings were recorded in some of the articles, suggesting success in the implementation of the legislation at the national level. On the other hand, some processes are deficient for the majority, if not all, of MSs involved. This suggests challenges in the implementation and harmonization activities of specific areas of the Directive. *Article 15.1/2* and *Article 24*, for instance, seem consistently deficient for all MSs, implying underlying issues related to the Directive itself. Others, such as *Article 22* which highlights inadequacies in the professional background of PSCOs or *Article 5* portraying discrepancies in the inspection commitment, may otherwise expose the inspection practises to criticism. The following sections undertake thorough discussions for each of the main findings.

Table 2 – Summary of shortcomings and observations

MS ID	Process	Article	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOT							
			S	O	T																														
Organiz.	5					2			2				2									2						2	8	18	26				
	6				2																								16	0	16				
	7																												1	0	1				
	8																												5	0	5				
	9																						2						16	0	16				
	11																												12	6	18				
	15.1/2																												2	6	8				
	16, 21.4/5										2																		0	25	25				
	23																												1	3	4				
	25																												0	4	4				
PSC of Information cycle of The System	12																												0	5	5				
	13																												0	1	1				
	14																												13	9	22				
	19																												4	7	11				
	21.1																												1	0	1				
	15.3																												0	0	0				
	24																												0	0	0				
	28																												48	13	61				
	Personnel - Logistics																												0	0	0				
	Right of Appeal	22																												7	19	27			
29																														5	0	5			
18																													0	0	0				
20																													0	2	2				
34																													3	1	4				
			142	124	267																														



4.2 Inspection Commitment/Information

This section contains a commentary of Article 5 (in combination with Article 6 and 7), Article 8, and Article 24.

4.2.1 Articles 5, 6 and 7 - Inspection commitment & compliance with the inspection commitment

Table 2 shows that in respect to compliance with Article 5, 14 (56%) out of 25 MSs visited by EMSA between 2012 and 2016 did not meet their annual inspection commitment for at least one of the years since the entry into force of the Directive. Although the majority of the findings were recorded for Article 5, merit should be given to the overall set of requirements and modalities for compliance with the annual inspection commitment (or fair share) as laid down in Articles 5, 6, and 7 as a whole.

Except for specific and exceptional circumstances, MSs shall inspect all Priority I vessels and conduct a number of inspections equal to the MS's annual inspection commitment. In this regard, the Directive abandons the previous 25% quota which is replaced by a system considering the individual ships calling at ports of the MS concerned in relation to the regional commitment. This is calculated by taking the average number of inspections required in the previous 3 years in consideration. Nevertheless, an allowance is granted for missing such an inspection ratio. Article 6 provides that this ratio shall not exceed 5% of the total PI ships with a High-Risk Profile (HRP) and 10% of the total PI ships other than HRP.

In case the number of PI calls exceeds the annual inspection commitment, the MS is identified as *overburdened (OB)*, and the missed rate of PI inspections shall not exceed 30% (given that its annual quota is fulfilled). Conversely, if the number of PI and PII calls is inferior to the annual inspection commitment, the MS is identified as *underburdened (UB)* and it shall inspect all PI ships and 85% of the PII ships calling at its ports and anchorage.

Non-compliance with the provisions of Articles 5, 6, and 7 has profound implication on the foundations and goals of the regime. In case of a missed inspection, for example, the interested MS makes the vessel a burden for the next port of call and it allows a potential substandard vessel to sail. Similarly, MSs that over-inspect vessels beyond

their annual commitment, expose the regime to complaints by the industry and distort the calculation for the regional commitment.

It must be made clear that the majority of the shortcomings were recorded in the first years of the entry into force of the Directive, suggesting that MSs were still adjusting to the new system. What attracts greater concern, however, are those shortcomings recorded in recent years, which highlight the struggle by some maritime administration to find adequate resources to meet their annual commitment.

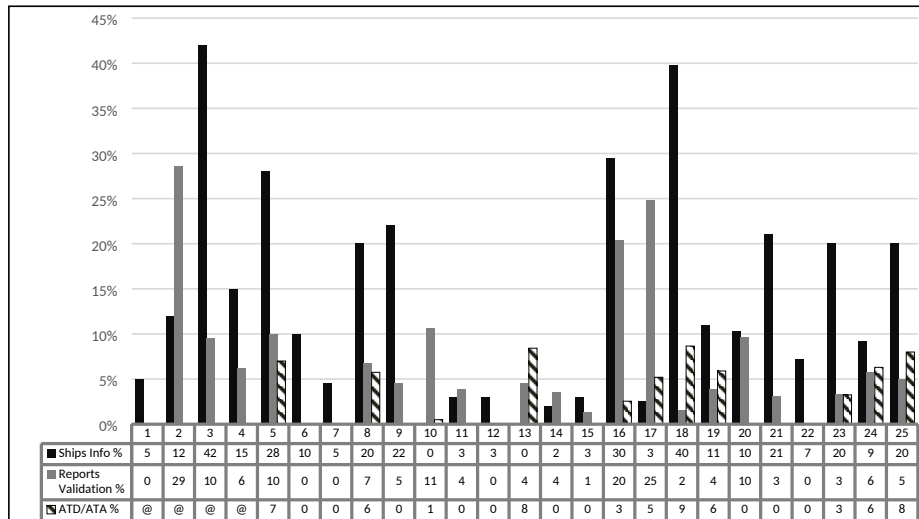
4.2.2 Article 24 – Inspection Database

Article 24 sets provisions for the EC to develop, maintain and update the inspection database (THETIS), as well as other general provisions for MSs. Under this article, MSs are required to:

- Ensure that information concerning the actual time of arrival (ATA) and the actual time of departure (ATD) are transferred in the database;
- Ensure that information related to inspections are transferred to the database as soon as the inspection report is completed or the detention lifted. Within 72 hours, MSs shall ensure that the information transferred to the inspection database is validated for publication purposes.

Table 3 shows the percentage of missing information recorded during the visits. *Ship Info* indicates the percentage of ship calls that, either at ports or at anchorage, were not/incorrectly transferred to THETIS by the individual MSs. *Reports Validation* denotes the percentage of reports which were not validated within the prescribed time-frame. Lastly, *ATD/ATA* reveals more specifically the amount of ships calling at the MSs' ports where an ATA, but not an ATD, was recorded. It must be noted that not all reports cover the last aspect.

Table 3 – Overview of shortcomings and observations in Article 24 (MSs' IDs on the horizontal axes)



Regardless of the various degree of compliance, some considerations must be made. According to subject-matter experts, delays in *Reports Validation* are quite consistent but do not represent a critical factor since it does not affect the inspection priority of the ship. In contrast, *Ship Info* and *ATD/ATA* can be quite critical. Although some of these figures may seem relatively low compared to the overall number of ship calls, incomplete, incorrect or missing registration of ship calls have a detrimental effect on the inspection commitment calculations and MSs daily operations. An **incorrect registration** of a vessel in port otherwise registered as ‘at anchorage’, influences the annual inspection commitment since calls ‘at anchorage’ are not included in the general calculation. A **missed registration** means that a vessel is virtually not in the port. Although this may seem a virtual exercise, a missed registration is beneficial for the interested MS since the port authority does not have to inspect the vessel and it makes it a burden for the next MS. Lastly, in cases of an **incomplete registration** with missing ATDs, ships remain virtually in port even though these may have departed.

It is evident that Article 24 is the challenging to implement and harmonisation in this respect is not achieved. However, just like with Article 5, the high value of missing information was mainly recorded in the first two years of the entry into force of the Directive. The visit reports often noted a decreasing trend in the missing ship call information in more recent years.

4.2.3 Article 8 – Postponement of inspections under exceptional circumstances

Article 8 provides clear guidance for MSs which may decide to postpone the inspection of a Priority I ship under specific circumstances and operational reasons.

Table 2 shows that 15 out of 25 MSs breached the provisions of the article and 16 observations were recorded. The majority of the observations indicated that the postponement justifications were not used or not properly conducted. In many cases, for example, the vessel was either recorded ‘*at anchorage*’ while in port, ‘*call during night hours*’ while outside night hours or ‘*inspection would create a risk*’ with no specified reason; all circumstances, those, in which a postponement of inspection is permitted under Article 8.

If misused, the postponement of inspection has consequences on the fairness of the regime. To begin with, a postponement is allowed only if the inspection may be carried out in the next port of call of the ship in the same MS or in another port of call within the Union or the Paris MOU region within 15 days, provided the State in which such port of call is located has agreed in advance to perform the inspection⁹. Needless to say, the latter scenario imposes a burden on the next MS. Furthermore, a postponement of inspection is not counted as a *missed inspection* which can be an advantage if considering the allowed ratio of missed inspections.

For the above-mentioned reasons, it is clear that failures in the execution of the provisions of Article 9 still occur and harmonisation in implementation has not yet been achieved.

4.3 Quality of Inspection

This section contains a commentary of Article 15.1, Article 15.2 and Article 14.

4.3.1 Article 15.1 and 15.2 – Safety and Security Guidelines procedures

Article 15.1 and 15.2 focus on the safety and security guidelines procedures provided by Annex VI of the Directive and the Paris MoU for the control of ships. In the preparatory phase of the visit, a sample of inspection reports are scrutinised in order to verify whether the concerned MS abides by these procedures. The findings reported in Table 2

⁹ The only exception to this provision is whether a ship is calling exclusively at night hours and the situation is judged dangerous by the relevant authority.

showed that all MSs, with the exception of MS24, were deficient in implementing and following harmonised inspection procedures.

Table 4 provides further detail and summarizes which specific procedure was not followed by the correspondent MS. This is indicated by an 'x'. Among the several findings, subject-matter experts highlighted some of those which can be critical to ensure a harmonised PSC regime (italics in the table). A lack of *Compliance with the ISM instructions*, for example, and wrong *Attribution of RO responsibility* has a tangible effect on the calculation for Company and RO performance and it suggests that some administrations yield towards avoiding conflicts with ROs. *Missing or incorrect convention references to detainable deficiencies* deprives the industry of appropriate feedback in case of detentions and, more importantly, allows discretion by recording deficiencies not supported by legal references. Last but not least, both the facts that *Not all areas were covered during an inspection* and that the decision concerning the *Type of inspection conducted* was not always made according to the rules, highlight a lack of understanding and/or adequate training in PSC procedures.

While the magnitude of the observations could not quantitatively be estimated, the results of Table 4 indicate that inspection procedures are not consistent among MSs and harmonisation has not been achieved.

4.3.2 Article 14 – Expanded Inspection

Article 14 specifies what categories of ships are eligible for expanded inspections and the scope of the inspection, including the risk areas to be covered (Annex VII as supported by Regulation 428/2010).

Table 2 shows that the provisions of the article are generally deficient for the majority of the MSs examined, specifically 20 (80%) out of 25. Most of the findings are related to either missing evidence for not performing an expanded inspection (e.g. local limitations related to the terminal, cargo operations, etc.) or to specific items not verified during the inspection. Three items were recurrent in the reports:

- The fire drill was not performed;
- On passenger ships, the abandon ship drill was not performed;
- On bulk carriers and oil tankers, the ballast tanks inspection, either internally or from the manhole, was not performed.

Beside the impact that lack of compliance with Article 14 bears in terms of harmonization, the non-verification of these items may be rooted in factors that are less evident. EMSA experts asked to provide comments in this respect have highlighted that performing an expanded inspection with a single inspector, especially for demanding vessels such as passenger ships, can be challenging and deteriorate the quality of the inspection process. Performing and assessing a drill is time consuming for both the crew (in terms of working and resting hours) and the inspectors (e.g. check bridge operations and communications, the master stations, the cargo areas, etc.), especially if the PSCO is performing the inspection alone. Similarly, the visual inspection of ballast tanks, by definition, can be a dangerous activity. For this reason, a PSCO may refrain from performing this activity especially without the support of a colleague.

These results lead to a threefold interpretation. First, harmonization for expanded inspections practice has not yet been achieved. Second, empirical evidence suggests that to perform an effective expanded inspection, the presence of minimum number of inspector is advisable and should be mandatory under this article. Third, the Directive should take into consideration the recently growing limitations that terminals are posing to vessels.

4.4 Training of PSCOs

This section comments solely on Article 22.

4.4.1 Article 22 – Professional profile of inspectors

Article 22 provides stringent provisions on the qualifications of PSCOs.¹⁰ To be specific, the article requires the EC to promote a harmonised Community scheme for training and assessment of competences. The scheme was ultimately developed by the Paris MoU Secretariat and named “Paris MoU Policy on the training of the new entrant PSC Officers and the professional development scheme for PSC Officers” (hereafter referred to as Harmonised Community Training Scheme or simply “Policy”) which establishes a training policy for both new and experienced inspectors and criteria¹¹ to be fulfilled by PSCOs in order to maintain their qualification. While the Policy is detailed in terms of subjects to be covered, it neither specifies how to conduct the training nor the number of hours necessary to deliver it. This implies that the EMSA team can verify the existence of a national training program and records of the training, but cannot comment on the veracity or accuracy of its application.

Referring to the results given in Table 2 above, a harmonised implementation of Article 22 has not yet been reached. While only six out of 25 MSs did not comply with the minimum requirements for PSCO provisions (MSs 1, 2, 3, 9, 21), 16 MSs did not fulfil some of the requirements of the Harmonised Community Training Scheme (MSs 1, 2, 3, 4, 5, 7, 9, 11, 16, 18, 19, 20, 21, 24, 25); this is mainly related to performing the Distance Learning Programme (DLP) modules. Furthermore, two MSs lacked both a structured national training program and records of the training, while two other MSs were admonished for the deployment of PSCOs across the territory in a manner which was not in line with the number of ship calls eligible for inspection.

Several authors have alluded to the influence that the background and training of PSCOs may have on the outcome of the PSC inspection being it the type of deficiencies

¹⁰ The minimum requirements for PSCOs are laid down in Annex XI of the Directive

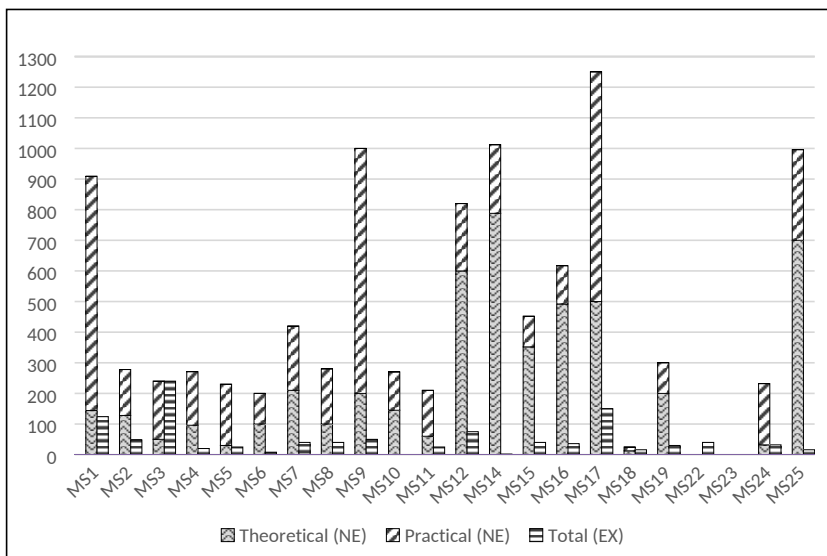
¹¹ These criteria comprise both compulsory activities, such as carrying out at least ten PSC inspections per year and carrying out the Distance Learning Programme (DLP) on Paris MoU procedures, and others that contributed to gaining the minimum number of points (30) required in a five-year period.

detected and/or leniency during inspection procedures (Bloor et al., 2006; Knapp and Franses, 2007b; Ravira and Piniella, 2016). Table 5 shows the training hours (practical and theoretical) for new entrant PSCOs (NE in the table) and total training hours for existing PSCOs (EX in the table) as offered by the national training scheme of the various MSs.¹²

As clearly shown, national training efforts are not consistent across the 25 MSs. In some countries, the theoretical training appears to have a more significant role than the practical one (e.g., MS12, MS14, MS15, MS16, MS25), while in others it is the contrary (e.g., MS1, MS5, MS9, MS17, MS23). With the exception of some MSs (mainly MS1, MS9, MS12, MS14, MS17, MS25) and the very limited efforts for existing PSCOs, the majority of the MSs invest less than 500 hours in training for entry-level PSCOs. The lack of training for existing PSCOs may be explained by the fact that MSs rely heavily on training offered by the Paris MoU Secretariat and EMSA.

Both the results from Table 2 and Table 5 portray dissonant training programmes among the 25 EU/EFTA MSs. This imbalance may impact not only the outcome of the inspections, but more importantly the key objective of ensuring harmonised inspection procedures to vessels entering regional ports and avoid port shopping.

Table 5 – Training hours for New Entrant and Existing PSCOs according to the MSs' National Training Scheme.



¹² No data available for MSs 13 - 20 – 21.

4.5 Other Areas of Concern

This section comments on shortcomings and observations recorded in Article 9 and Organization.

4.5.1 Article 9 – Notification of Arrival

Article 9 provides that the operator, agent, or master of a ship, which under Article 14 is eligible for an expanded inspection and bound for a port or anchorage of a Member State, shall notify the port authorities of the concerned MS of its arrival (72 hours pre-arrival notification). In practice, the article requires companies and/or operators to be aware of their vessel(s)' eligibility to an expanded inspection.

The majority of shortcomings and observations recorded for this article relate mainly to the lack of evidence that all ships liable for an expanded inspection provided the required pre-arrival notification. Although there is no indication that breaches in Article 9 trigger concerns in the context of harmonisation, it is worthwhile mentioning that these provisions seem to discharge part of the responsibilities of targeting and notification to the shipping company rather than to the MS.

Two approaches may be adopted to mitigate the high number of findings in this process. Either the provisions should be applicable only to the MSs rather than to the shipping company. Otherwise, the operator, agent or master of a ship which is entering a port of anchorage of a MS, shall always provide a 72 hours' pre-arrival notification and the article should be deleted by the Directive.

4.5.2 Organization

This process examines the way in which the maritime authorities have organised the national PSC system and includes Articles 1, 2, 3 and 4 of the Directive. The visit includes an overall assessment of the national maritime organization and, specifically, the national PSC Organization (e.g., whether centralised or decentralised).

While the legal conformity verification of the transposition of the Directive into national legislation is the sole prerogative of the EC, the only activity conducted in this regard during the visits is a sample verification of the operational aspects of the Directive as transposed into national legislation. In other words, shortcomings and observations in this process mainly indicate MSs which transposed the directive beyond

the deadline (MSs 11, 14, 20, 25) or those which did not incorporate all amendments or relevant instruments into national legislation (MSs 7, 9, 10, 11, 12, 16, 19, 20, 22, 25). Other types of observations regarded either issues related to human resources (MSs 16, 19, 24), unclear processes for amending and implementing IMO Conventions (MS 20) or, lastly, limited oversight, coordination and monitoring of PSC activities (MS 23).

In general, the findings suggest that the Directive has been largely transposed into national legislation with minor, if any, issues for 11 (44%) of the 25 MSs examined. These are issues that have not been considered serious or critical to the proper operational conduct of PSC inspections. However, observations related to problems of resources and oversight may have a stronger impact on PSC activities as pointed out in other studies (Anderson, 2002; Bloor et al., 2006; Özçayır, 2009; Sampson and Bloor, 2007), and should be further investigated for short-time and long-time effects.

4.6 (in)-adequacy of EU Port State Control?

In order to summarize the main results, the study has found that Articles 5, 8, 9, 14, 15.1, 15.2, 22 and 24 are the articles where the majority of the findings were recorded. The high number of observations and shortcomings suggests that the Directive has not yet fostered harmonisation among MSs for these aspects. In detail, three major areas of improvement and simplification may be considered by policy makers in a future revision exercise: **Inspection Commitment/Information, Quality of Inspections, and Training of PSCOs.**

In general, it is evident that some MSs struggle with meeting their annual inspection commitment. Despite the provisions for *overburdened* (OB) and *underburdened* (UB) maritime authorities, the calculation for the fair share itself can be eroded by an unbalanced application of some key provisions. The number of missing information reported under Article 24, for example, or MSs that inspect in excess of their annual share are factors that have a significant impact on the overall prediction of the fair share. As a consequence, some MSs may face undue additional costs in terms of resources and the regime may be exposed to criticisms by the industry.

Another criticality is represented by the designation of OB and UB MSs. To be specific, a generic MS is exclusively held to be OB/UB at the end of each calendar year, once all PI and PII calls are registered. Thus, MSs are unaware whether the provisions under Article 6 (5% for HRP and 10% for other ship risk profile missed inspection allowed) are applicable or not. Although the previous year could be taken into

consideration, this ambiguity does not allow the various maritime authorities for the planning of preventive measures. On an even higher level, since it is clear that OB states do not inspect PII vessels entirely while UB states are obliged to do so, policy makers may even wish to rethink the Priority rationale itself.

From an operational perspective, the higher number of shortcomings and observations observed in Article 14, 15.1, and 15.2 reveal a tendency for inspection procedures to be applied in a disorderly manner. This outcome is at odds with the overarching objective of ensuring common inspection standards in the region. If examined in combination with inconsistencies in training practice, as highlighted during the commentary of Article 22, these findings call for specific actions to improve the adherence with inspection procedures. Despite these considerations, improvements in the area of quality of inspections could be achieved either through a more comprehensive training policy embedded into the text of the Directive, or a centralised training centre for EU/EFTA PSCOs. Another approach could be to introduce a system of external and internal peer reviews. The external review could consider a series of indicators to identify faulty inspecting behaviours by different port authorities and inspectors (e.g., pattern of deficiencies detected by individual ports, type of deficiencies determined at t and t+1 inspections, etc.). In parallel, an internal review could be adopted through the national PSC Coordinator.

It is also fundamental to reiterate that Directives, as legislative instruments of the EC, have to be transposed into domestic legislation by the various MSs, with great latitude for national interpretation (Kurcz, 2001; Twigg-Flesner, 2011). This practice may, *per-se*, impair the process of implementation and harmonisation (Lohse, 2011) while a more stringent legal instrument, such as Regulations, may increase the level of harmonisation and avoid potential distortion caused in interpretation (Coleman and Jessen, 2016; Monti, 2010).

The aforementioned findings not only demonstrate that harmonisation has not yet been achieved in some key areas, but point to the need to undertake a revision exercise that will, among others, lead to a simplification of some of the Directive provisions.

5 Conclusions

This study has analysed 25 reports produced by EMSA after inspections to EU/EFTA MSs with the objective of determining the level of compliance with Directive

2009/16/EC as amended by Directive 2013/38/EU. Particular attention was given to the implementation and harmonisation of the Directive's provisions and to identify gaps between policy and practice.

Europe has been at the forefront of regional and organised ship safety inspections since the establishment of the Paris MoU in 1982. With the adoption of a series of legislative acts on PSC, the EU has made binding for EU/EFTA MSs provisions of what was originally a non-binding regional agreement on PSC. The Directive entered into force on 1 January 2011, boosting and increasing targeting and selection of substandard vessels, inspection procedures, and overall harmonisation in the region. The level of harmonisation and implementation more than six years since its introduction is therefore extremely important to ensure that the standards specified under the Directive are uniformly applied in the region and to highlight discrepancies to be addressed in the upcoming revision.

The Directive has been successfully transposed into national legislation by the 25 EU/EFTA MSs investigated. While many of its provisions have been successfully implemented, challenges in some areas remain an obstacle to the overarching objective of ensuring common standards in the region. This study has identified Inspection Commitment/Information, Quality of Inspections, and Training of PSCOs as some of the weakest links in the on-going process of harmonising PSC systems and procedures.

Port state control has become an indispensable feature in the successful implementation and enforcement of the legal framework for maritime safety, security, and marine environmental protection not only in Europe, but worldwide. The possible amendment of the Directive can only further the cause of PSC harmonization. Discrepancies in harmonisation may hamper the achievement of a level playing field across Europe and foster safety competition between neighbourhood countries of the same region. The authors hope that this study and its findings can contribute to the corpus of reference materials that will inform European PSC policymakers as they embark on a revision of Directive 2009/16/EC.

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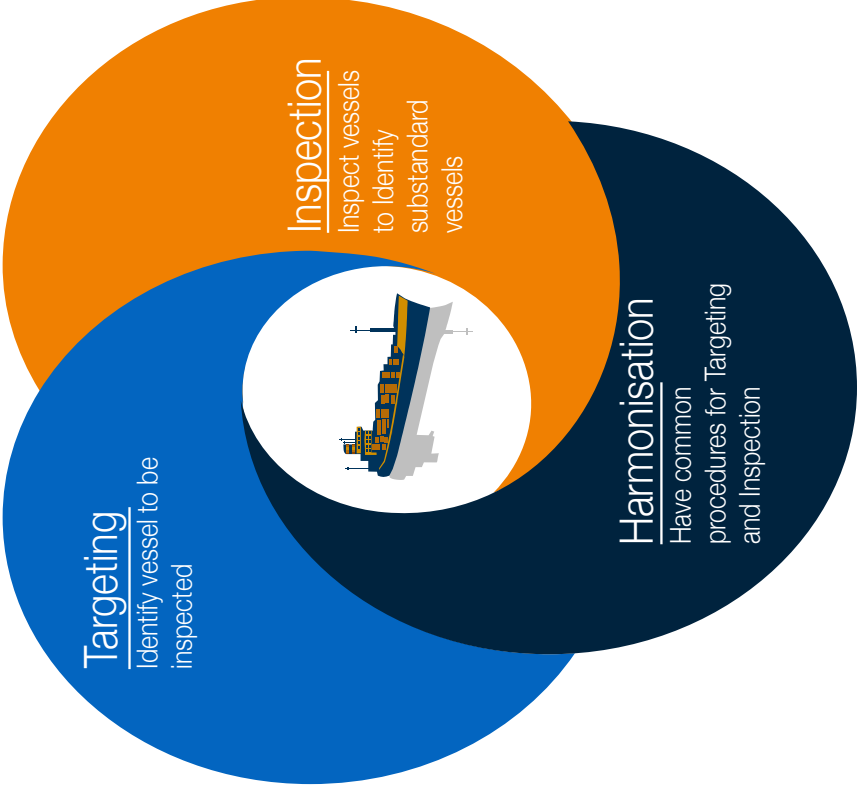
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Targeting

Identify vessel to be inspected

Inspection

Inspect vessels to identify substandard vessels

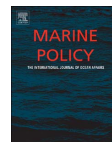
Harmonisation

Have common procedures for Targeting and Inspection

- The Port State Control Directive has been successfully transposed in all Member States.
- A holistic analysis of the implementation of the PSC Directive 2009/16/EC is performed;
- Complete harmonisation of the main elements of the EU Directive 2009/16/EC is not yet achieved;
- Training of Port State Control Officers, Inspection Commitment/Information and Quality of Inspections are the areas where most shortcomings and observations were recorded;
- Gaps between policy and practice were identified;
- A review of the Directive 2009/16/EC is suggested to policy-makers.

Paper IV

Graziano A, Wolff FC, Cariou P, Mejia MQJr, Schröder-Hinrichs J-U (2018). Port state control inspections in the European Union: do inspector's number and background matter? *Marine Policy*, 88:1, 230-241.



Port state control inspections in the European Union: Do inspector's number and background matter?



Armando Graziano^{a,*}, Pierre Cariou^b, François-Charles Wolff^{c,d}, Maximo Q. Mejia Jr^a, Jens-Uwe Schröder-Hinrichs^a

^a World Maritime University, Fiskehamngatan 1, 211 18 Malmö, Sweden

^b Kedge Business School, 680 Cours de la Libération, 33405 Talence, France

^c LEMNA, University of Nantes, BP 52231 Chemin de la Censive du Tertre, 44322 Nantes Cedex 3, France

^d INED, Paris, France

A B S T R A C T

The succession of maritime accidents in the last decades of the 20th Century caused a strong political and public outcry for more stringent maritime safety regulations and measures. One of the most significant developments in this regard was the establishment of several regional agreements on Port State Control (PSC) – the first of which was the Paris MoU – with the specific objective of fighting substandard shipping through coordinated and harmonised inspection procedures. This article is based on results from 32,206 PSC inspections carried out by the European Union and European Free Trade Association Member States within the Paris MoU region from 1 January 2014 to 31 December 2015 to assess whether discrepancies among Member States exist after the entry into force of Directive 2009/16/EC and the introduction of the New Inspection Regime. Further, the study proceeds by investigating whether PSC team composition and inspector's background influence inspection outcomes. The study has identified that differences in detecting at least one deficiency and/or detaining a vessel are significant among Member States. With regard to team composition and background, it appears that the former correlates to the number of deficiencies and detentions and the latter, though the significance is not always consistent, to detecting a certain type of deficiencies according to the specific inspector's backgrounds. The paper concludes by presenting potential policy implications.

1. Introduction

The inspection of foreign flagged vessels in national ports is not a novel exercise. Provisions for the inspection or control of foreign vessels by port states have been a feature of enforcement since the 1929 SOLAS Convention. However, it was not until the emergence of regional agreements – the so-called ‘Memoranda of Understanding on Port State Control (PSC MoU)’ – that such practice became a regular element in the promotion of maritime safety. As mentioned, “the powers used by Port State Control Officers (PSCOs) are not new; it is the willingness to use the power which is new” [1, p.1].

As often occurs in the policy making process, the catalyst for an increased use of port state control (PSC) is to be found in a series of very serious maritime accidents which occurred in the final decades of the

20th century.¹ These accidents highlighted the unsatisfactory degree of enforcement exercised by certain maritime administration [2–8] and caused a strong political and public outcry for more stringent regulations regarding safety of ships, protection of the maritime environment and living and working conditions [1,4].

In response, eight north European states signed The Hague Memorandum of Understanding (MoU) in 1978, promptly superseded by a more comprehensive gentlemen's agreement in 1982, the Paris MoU [7,9,10], in order to stem the proliferation of substandard vessels across European waters. The Paris MoU served as the archetype for other MoUs which were established in other regions during the 1990s [10]². It also served as the backbone for the three PSC Directives adopted by the European Union (EU) since 1995.

The main purpose of regional enforcement is to “drastically reduce

* Corresponding author.

E-mail addresses: agr@wmu.se (A. Graziano), pierre.cariou@kedgebs.com (P. Cariou), francois.wolff@univ-nantes.fr (F.-C. Wolff), mm@wmu.se (M.Q. Mejia), ju@wmu.se (J.-U. Schröder-Hinrichs).

¹ Amoco Cadiz (1978), Aegean Sea (1992), Braer (1993), Estonia (1994), Erika (1999) and Prestige (2002), among others.

² At present nine regional agreements exist: Tokyo MoU (Pacific Ocean), Acuerdo Latino or Acuerdo de Viña del Mar (South and Central America), the Caribbean MoU, the Mediterranean MoU, the Indian Ocean MoU, the Abuja MoU (West and Central Atlantic Africa), the Black Sea MoU, and the Riyadh MoU (Persian Gulf).

substandard shipping in the waters under the jurisdiction of Member States” (MSs) by developing, among other factors “common criteria for control of ships by the port State and harmonising procedures on inspection and detention” [11]. However, issues in the harmonisation process have been identified since the emergence of the early MoUs [2,12–17] that may result in different inspection output, either detentions or deficiencies, depending on the inspecting port authority. Asymmetrical inspecting behaviours can undermine the effective implementation of international regulations [2,14] and distort the level playing field within the region.

This paper inquires into the adequacy in EU Port State controls as reflected by either relative homogeneity or heterogeneity in inspection outcomes depending on where vessels are inspected. For that purpose, the study relies on a dataset from the European Union with detailed records from approximately 48,000 inspections and 130,000 deficiencies detected during the time frame 1 January 2014 to 31 December 2015. A unique feature of the database is that it includes complementary information on the number and background of PSCOs who carried out inspections, giving us the possibility to investigate whether these elements may be correlated to any inadequacies in the PSC inspection regime.

The data is analysed in the following manner. First, an investigation is performed on whether single EU countries record a higher number of deficiencies and detention compared to others. An econometric analysis is used to control for the fact that vessels inspected in different countries do not have the same observable characteristics. Second, an exploration of whether inspection outcomes are correlated to the number and background of PSCOs present on board at the time of inspection is implemented. Overall, the results show that discrepancies in harmonisation have been encountered and that accounting for PSCO’s characteristics have an influence on inspection outcomes.

The remainder of the article is organized as follows. Section 2 provides a brief review of the literature concerning PSCs and presents some research hypotheses. In Section 3, a description of the data sample is provided and econometric results are discussed in Section 4. Finally, conclusions and potential policy implications are presented in Section 5.

2. Background

During the first years of its implementation, the Paris MoU underwent some criticisms as it was perceived as a ‘discriminatory enforcement’ of International Maritime Organization (IMO) conventions [18]. This led several scholars to verify the effectiveness of PSC [2,4,7,12,13,19–29] and its legal foundation [6,10,21,30–34]. According to these investigations, it is nowadays conventional wisdom that PSCs contribute to ensuring compliance with international regulatory efforts [6–8,19,35] and increase safety standards [5,36], pollution prevention and standards for seafarers on board vessels [20,21].

Despite the numerous positive effects observed, even at the early stages of the introduction of regional initiatives on PSC, cross-national differences have emerged in inspection practices and results, whether number of deficiencies or probability of detention. Discrepancies in inspection practices have a profound impact on the credibility of the regional MoUs on PSC. These can distort the market [16] by promoting the so called “port-shopping” phenomenon [10,14,21,35], a strategic practice by some operators who choose certain ports/regions [14,15] over others because of their less stringent safety enforcement standards. Moreover, differences can undermine the targeting system that relies on the accuracy of inspection results [16]. Reasons for discrepancies can be multiple and diverse.

In the context of international law, an MoU is not a treaty but an administrative agreement [4,15,37] which implies that its provisions are, *de jure*, non-binding for the signatory parties. In the case of the EU, however, the provisions of the Paris MoU have been made mandatory and enforceable for EU MSs through the issuance of Directive 2009/16/EC. Clearly, an administrative agreement that does not contemplate

binding provisions may allow for differences in application while hard law, such as the EU Directive, may presuppose a more harmonised approach.

On a country level, regional differences may be induced by the various stages of development and peculiarities within different regions [12]. Differences across Paris MoU, Tokyo MoU, Caribbean MoU, Viña del Mar Agreement, AMSA and the USCG were identified by Knapp and Franses [16] and Knapp and van de Velden [38]. On a cross-national level, differences were identified within the Tokyo MoU [22], between India, Russia and the UK [2,39] and also among Australia, India, South Africa and Russia [17]. However, aside from a recent interview study from Graziano, Schröder-Hinrichs and Ölcer [40] focusing on discrepancies within the EU region, no empirical study based on PSCs have investigated cross-national differences in the EU following the entry into force of Directive 2009/16/EC.

Considering the reason why discrepancies may appear, Anderson [13] suggested that the lack of appropriate resources and unequal participation of states in the same MoU are factors to be taken into consideration. Anderson [13] also calls into question the diversity in resources, whether manpower, financial, or technological as well as the lack of specific action plans for proper enforcement. Knapp and Franses [16] argue that various port authorities seem to adopt different inspection philosophies in the detention of vessels which translates to perceived cross-national differences.

On a more operational level, ship-related elements play a prominent role on the inspection outcomes. Authors have identified age, ship type, flag of registry as determinants of the number of deficiencies recorded [24]. In spite of the fact that those elements proved to be significant predictors of the inspection results, differences across inspecting authorities, even when controlled for, remain and are still responsible for the number of deficiencies and probability of detentions [16,17]. A supplementing conclusion can be reached if considering subjectivity and reliance on professional judgment as inherent contributing elements to cross-national difference [2,4,40]. More specifically, some authors have suggested that further investigations should be conducted on the influence that the background of PSCOs and the number of inspectors on the inspection team have on inspections results [16,41].

This paper contributes to the body of literature investigating cross-national differences of PSC practices within the EU as a region. Its first aim is to assess whether particular EU countries record a higher number of deficiencies or higher detention rates. For that purpose, an econometric analysis is applied as there may be differences in the characteristics of the vessel inspected among countries. Following the previous empirical evidence of [16,17,23,24,28,29,39], two research hypotheses are formulated.

Hypothesis 1. PSCs may lead to country differences both in number of deficiencies and in rates of detention within the EU region even when the characteristics of the fleet inspected are controlled for.

Moreover, in line with [16,40,41], an investigation is performed on whether the number of inspectors allocated for an inspection and the background of inspectors can help in understanding the potential cross-national differences in PSC outcomes.

Hypothesis 2. PSC outcomes can be influenced by the number and background of inspectors within the EU region.

Numerous studies take for granted that the mandatory nature of the European PSC regime, by virtue of Directive 2009/16/EC, translates to a more effective PSC inspection system compared to other PSC MoUs [5].

3. Data and descriptive statistics

The hypotheses were tested using PSC inspection data carried out within the EU and European Free Trade Association (EFTA) region within the Paris MoU framework. Originally established in 1982, the

Paris MoU includes 27 maritime authorities covering the coastal waters of the European states and the North Atlantic from North America to Europe.³ These authorities agreed to implement a harmonised system of PSC in the aftermath of the *Amoco Cadiz* accident in 1978. In this framework, only the 25 EU and EFTA countries belonging to the Paris MoU have been included in the study since they abide by the provisions of Directive 2009/16/EC. Canada and the Russia Federation were excluded from the original dataset.

The selection of vessels to be inspected is based on results from a ship risk profile calculator and a company performance calculator.⁴ The influential parameters are the type of ship, whether the ship is older than 12 years, the flag and its performance (from white to black high risk), whether the flag is IMO audited, whether all certificates are issued by flag, the recognized organization and its performance (from very low to high), whether the organization is EU recognized, and the ISM company performance (from very low to high).⁵ The ship risk profile also depends on historical parameters from the last 36 months: at least one inspection, all inspections with 5 or less deficiencies, and number of detentions. A high risk profile is assigned to ships whose score is at least 5 points.

Based on a ship's risk profile, the Inspection and Selection Scheme determines the scope, frequency and priority of inspections. According to the risk profile of ships, the PSC Database THETIS informs the PSC authorities of the priority of a ship entering their ports, whether No Priority (ship should not be inspected), Priority II (PII - ship may be inspected) or Priority I (PI - ship must be inspected). Ships become due for periodic inspection in the following time windows: for high risk ships (HRS), the ship is PII during the first 5 months following the last Paris MoU inspection and PI after 6 months. For standard risk ships (SRS), the ship is PII during 10 months following the last inspection and PI after 12 months. Lastly, for low risk ships (LRS), the ship is PII during 24 months following the last inspection and PI after 36 months.

Each inspection leads to a report, publicly available on THETIS, that includes the following information: date of inspection, type of inspection (initial, expanded, more detailed inspection), country of inspection, ISM company performance, vessel flag of registry, flag performance (white-grey-black list) and risk profile (high, medium, low).⁶ The database also includes information on the year when the vessel was built (from which the age at the time of the inspection is calculated), ship's total length and ship type (general cargo, oil tanker, container, etc.). A unique feature of the dataset is that it also includes the inspector's identification number.⁷ As discussed later, this will allow to account for the background of inspectors when explaining PSC outcomes. Due to this specific information on inspectors, the various Members States are anonymized in the dataset.

For each inspection, the number of deficiencies and the number of deficiencies leading to detention are reported. The PSC outcomes are defined in the following manner. *DEF* is a binary variable equal to one when, following an inspection, a specific vessel had at least one deficiency detected (and it is equal to 0 otherwise). *DEF_N* is the number of deficiencies recorded. *DET* is a binary variable which takes the value of one when a vessel is detained and is equal to 0 otherwise. For each deficiency, each type of deficient or defective item is also recorded.

The empirical analysis is based on an exhaustive dataset provided by the EC with inspection as observation unit. It covers all inspections carried out from January 1, 2014 to December 31, 2015.⁸ Overall, the sample comprises 32,206 PSC inspections. Out of these, 10,076 are initial inspections (31.3%), 17,431 more detailed inspections (54.1%), and 4699 expanded inspections (14.6%). An initial inspection is a visit on board of a ship in order to check the certificates and documents listed in Annex 10 of the MoU text, the overall condition and hygiene of the ship, if the vessel meets generally accepted international rules and standards and to verify, whether deficiencies found by an Authority at a previous inspection have been rectified. A more detailed inspection is carried out whenever there are clear grounds for believing, during an inspection, that the condition of the ship or of its equipment or crew does not substantially meet the relevant requirements of a relevant instrument. An expanded inspection includes a check of the overall conditions, including human element where relevant, in 14 different risk areas.⁹

Table 1 presents some descriptive statistics of the sample. The proportion of inspections with at least one deficiency is 53.5%. The average number of deficiencies detected during an inspection is 2.4 (with a standard deviation of 4.0). The proportion of inspections leading to detention is equal to 3.4%. As expected, the PSC outcome is strongly affected by the type of inspection. The proportion of vessels with at least one deficiency is 29.3% for initial inspections, but around 65.0% for more detailed and expanded inspections. By definition, detention follows a more detailed or an expanded inspection and the conditional detention rate is 5.0% in both cases.

General cargo is the type of vessel that is the most frequently inspected with 29.9% of inspections, followed by bulk carrier (18.3%). There are substantial differences in PSC outcomes depending on the vessel type. There are more deficiencies detected for general cargo (62.7%), passenger vessels (58.3%) and bulk carriers (58.3%). Detention is also much more frequent for general cargo (5.9%) and to a lesser extent bulk carrier (3.5%) than for other vessels. The average age of vessels subject to inspection is 15.1 years. There exists a positive correlation between inspection outcomes and age at inspection. Having at least one deficiency is found for 45.9% of vessels aged between 5 and 10, but 71.6% for vessels older than 30 years.¹⁰ In the same vein, flags of registry performance is playing on the likelihood of having more deficiencies and a detention. The average number of deficiencies is 2.1 for the white category, 4.0 for the grey category, 5.7 for the black medium risk category and even 8.1 for the black medium to high and high risk categories.

To detect potential disparities across the various locations where inspections are taking place, let n be the total number of inspections and n_j that for country j . The average proportion of vessels with any deficiencies \overline{DEF} for the whole sample may be expressed as:

$$\overline{DEF} = \sum_j \left(\frac{n_j}{n} \right) \overline{DEF}_j \quad (1)$$

This corresponds to a weighted sum of the average proportion of vessels with any deficiencies in each country \overline{DEF}_j .

Fig. 1 sheds light on heterogeneity in the number of inspections n_j between the various countries and for the 32,306 PSC inspections carried out by the 25 different EU and EFTA countries. Due to anonymization, the various Members States are relabeled using codes ranging from MS1 to MS25. The average number of inspections per country is 1288, with a standard deviation of 991. It ranges from 138 (MS11) to

³ The current member states are Belgium, Bulgaria, Canada, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, the Russian Federation, Slovenia, Spain, Sweden and the United Kingdom. For further details on the Paris MoU, see www.parismou.org.

⁴ These calculators are available online at <https://portal.emsa.europa.eu/web/thetis/calculators>.

⁵ The International Safety Management (ISM) Code is a mandatory international standard for the safe management and operation of ships and for pollution prevention.

⁶ Inspection results can be found at <https://portal.emsa.europa.eu/web/thetis/inspections>.

⁷ Access to the data used in this paper was made possible through an agreement with the EC.

⁸ In this administrative dataset filled in by maritime authorities, there is no issue of missing data. Data are re-checked by national coordinators once filled in the system. In case of mismatches, the data are verified once more by EMSA personnel dealing with ship inspection support.

⁹ See <https://www.parismou.org/inspections-risk/library-faq/inspection-types>.

¹⁰ The proportion of detained vessels is higher for vessels older than 30 years (8.5%) compared to vessels aged between 15 and 20 years (4.1%).

Table 1
Descriptive statistics of the sample.
Source: anonymized data from the EU region 2014–2015, authors' calculations.

Variables	DEF (in %)	DEFN	DET (in %)	Distribution (in %)
Type of inspection				
Initial inspection	29.3	0.7	0.0	31.3
More detailed inspection	64.1	3.0	5.0	54.1
Expanded inspection	66.4	3.6	5.0	14.6
Type of vessel				
Bulk carrier	54.8	2.5	3.5	18.3
Oil tanker	39.4	1.3	1.4	7.7
Chemical/gas tanker	42.9	1.4	1.5	11.3
Containership	47.6	1.7	1.6	10.8
General cargo	62.7	3.3	5.9	29.9
Passenger	58.3	2.5	1.8	2.2
Ro-ro	52.3	2.2	2.0	7.7
Other	52.9	2.1	3.1	12.2
Age at inspection				
0–5	37.8	1.1	0.9	16.5
5–10	45.9	1.6	1.9	27.1
10–15	51.4	2.0	2.3	15.6
15–20	61.3	2.8	4.1	14.7
20–30	65.5	3.5	5.7	13.5
30+	71.6	4.5	8.5	12.5
Flag Performance				
White	51.1	2.1	2.7	91.2
Grey	69.3	4.0	8.8	4.3
Black medium risk	82.7	5.7	12.1	2.9
Black medium to high risk	94.7	8.1	15.7	1.6
All vessels	53.5	2.4	3.4	

Note: DEF is for any deficiency, DEFN is for number of deficiencies, and DET is for detention.

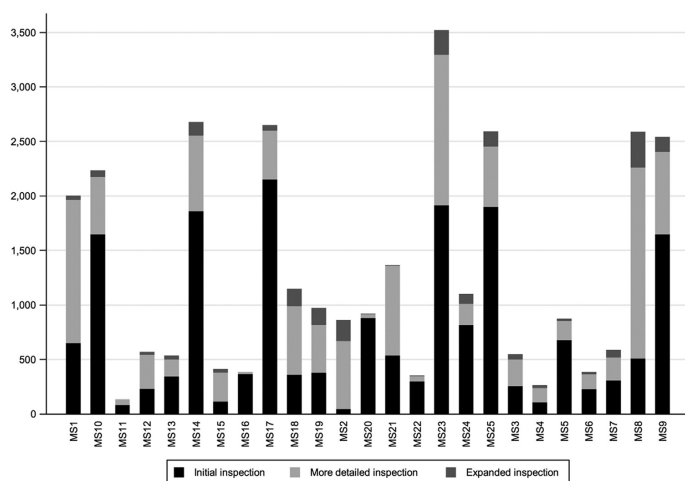


Fig. 1. Number of inspections, by member country. Note: MS1–MS25 refer to the different inspection countries. Source: data from EU region 2014–2015, authors' calculations.

3520 (MS23). There are large country differences by type of inspections. The average is 403 for initial inspection (with a standard deviation of 339) and 697 for more detailed inspections (with a standard deviation of 546).

Fig. 2 represents the various PSC inspection outcomes for each member state. The data shows large differences in the region. The average proportion of deficiencies ranges from 69.2% when vessels are inspected in MS4 to 20.4% in MS12. This proportion exceeds 60% in 8 member states (MS4, MS10, MS19, MS2, MS25, MS1, MS21, MS13),

while it is below 30% in 5 states (MS12, MS7, MS6, MS24, MS20). On average, the number of deficiencies per inspection is larger when inspections are carried out in a port located in MS19 (4.2), MS10 (3.8) and MS2 (3.5).¹¹ The probability of detention is more likely when inspections are conducted in MS4 (11.8%), MS10 (6.9%) and MS11 (6.7%). Conversely, there is no detention when vessels are inspected in

¹¹ The lowest figures are in MS7 (0.4), MS12 (0.7), MS24 (0.7) and MS6 (0.7).

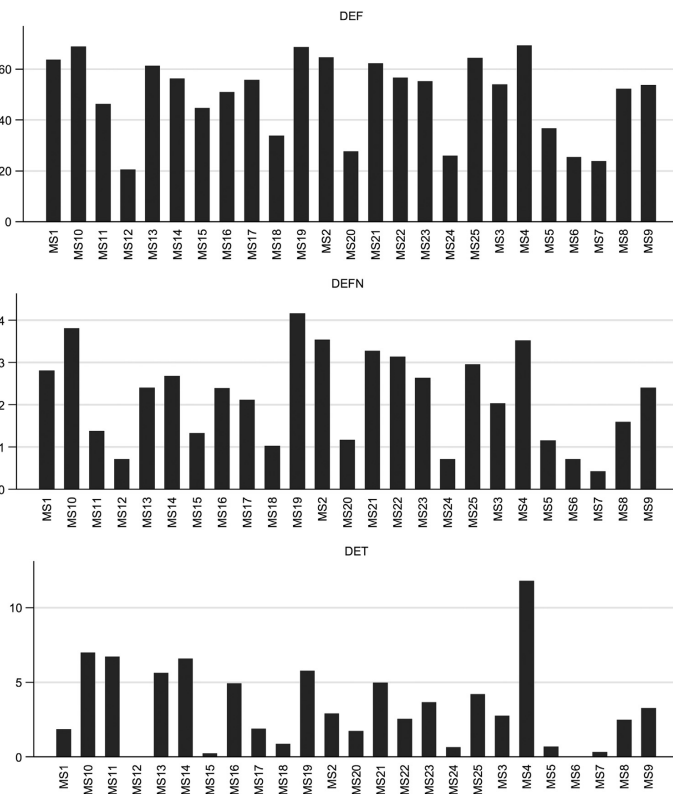


Fig. 2. Results of inspections, by member country. Note: MS1-MS25 refer to the different inspection countries. Source: data from the EU Region 2014–2015, authors' calculations.

MS6 and MS12. In addition, detentions are not necessarily higher in a country where more deficiencies are detected on average. For instance, in MS11, the detention rate is 6.7% while the average number of deficiencies is 1.4.

From a descriptive viewpoint, a variance decomposition analysis is implemented to assess the extent to which differences in PSC outcomes stem from differences between countries (due to differences in the average outcomes of countries) or differences within countries (due to variation in the outcomes for each country). Let DEF_{ij} a dummy variable indicating whether inspection i occurring in country j leads to the report of any deficiencies. Denoting by $V(\cdot)$ the variance operator, $V(DEF_{ij})$ can be expressed as:

$$V(DEF_{ij}) = V(\overline{DEF}_i) + V(DEF_{ij} - \overline{DEF}_i) \tag{2}$$

The first term $V(\overline{DEF}_i)$ is the between variance and refers to differences in the average proportion of having any deficiencies between countries. The second-term $V(DEF_{ij} - \overline{DEF}_i)$ is the within variance and corresponds to differences in the PSC outcome observed in any given country with respect to the average level of that country.

For the likelihood of having a deficiency detected, the contributions of the between and within terms to the total variance (equal to 0.248) represent 6.5% and 93.5%, respectively. Very similar results are found for the number of deficiencies with weights equal to 5.3% and 94.7% for the between and within variances, respectively. These findings

stress that although there are differences in the average PSC outcomes between countries, there are still large differences in PSC outcomes within each country. This pattern is consistent with two main explanations. On the one hand, there may be some lack of consistency in inspection procedures under the authority of each individual port state. On the other hand, there may be some heterogeneity in vessels calling within each country. In the next Section, the role of vessels' characteristics is taken into account using an econometric analysis.

4. Results

4.1. Differences by country of inspection

The average number of deficiencies detected within a given country can be higher if vessels inspected in this country are, on average, in bad condition. To account for this effect on the various PSC outcomes, linear probability models for DEF and DET and an OLS regression for $DEFN$ ¹² are estimated. In addition to country of inspection dummies, the following list of control variables is included in the various regressions: type of inspection, type of vessel, age at inspection and flag of registry. Table 2 focuses on the influence of country of inspection and reports the

¹² Similar conclusions were reached using Probit models for DEF and DET .

Table 2

Estimates of inspection results – marginal effects for member countries.
Source: data from the EU Region MoU 2014–2015, authors' calculations.

Country of inspection	DEF (in %)	DEFN	DET (in %)
MS1	Ref	Ref	Ref
MS10	-10.8***	-0.6***	1.7***
MS11	-29.9***	-2.3***	3.3
MS12	-48.5***	-2.6***	-3.2***
MS13	-11.4***	-1.0***	2.8***
MS14	-13.4***	-0.7***	3.3***
MS15	-28.6***	-2.3***	-3.5***
MS16	-24.3***	-1.2***	1.6
MS17	-11.0***	-0.9***	-0.6
MS18	-39.3***	-2.5***	-2.3***
MS19	-8.6***	0.3*	1.7**
MS2	-21.7***	-1.7***	-4.8***
MS20	-41.1***	-2.1***	-1.1**
MS21	-22.0***	-1.9***	-2.4***
MS22	-14.7**	-0.4*	-0.9
MS23	-14.2**	-0.6***	0.8*
MS24	-44.7**	-2.6***	-2.1***
MS25	-6.2***	-0.3**	1.6***
MS3	-29.1***	-2.7***	-3.6***
MS4	-13.8***	-1.0***	6.1***
MS5	-31.4***	-2.0***	-2.1***
MS6	-42.7**	-2.6***	-2.8***
MS7	-43.9***	-2.7***	-2.0***
MS8	-16.8**	-1.6***	-0.2
MS9	-14.5***	-0.7***	1.0**
Type of inspection	YES	YES	YES
Type of vessel	YES	YES	YES
Age at inspection	YES	YES	YES
Vessel flag	YES	YES	YES
Number of observations	32,206	32,206	32,206

Note: estimates from linear probability and linear regression models. Significance levels are 1% (***), 5% (***) and 10% (*).

corresponding marginal effects for each outcome.¹³

Estimates show that almost all country of inspection fixed effects are statistically significant at the 1 percent level. This means that, net of the type of inspection and of vessel characteristics (type, age, flag), there are still differences across countries of inspection, a result similar to [16,17]. Turning to the likelihood of having at least one deficiency detected (column 1, Table 2), all marginal effects are negative. This implies that the probability for a vessel of having at least one deficiency detected is higher when the inspection is carried out in MS1. The gap is impressive for some countries. Compared to MS1, the probability of having a vessel without deficiency is more than 40 percent points lower in MS6, MS7, MS12, MS20 and MS24.

Similar results are found for the number of deficiencies (column 2, Table 2). Compared to MS1, inspections completed in MS3, MS6, MS7, MS12, MS18 or MS24 are associated with less deficiencies (with a gap exceeding 2.5 deficiencies per vessel). The situation is different for detention (column 3, Table 2). Compared to the reference country MS1, the probability of having a vessel detained increases by 6.1 percentage points when the vessel is inspected in MS4 and by 3.3 percentage points in MS14. Conversely, detention decreases by 4.8 percentage points when the vessel is inspected in MS2 and by 3.6 when inspected in MS3.

The comparison of the three PSC outcomes (DEF, DET, DEFN) shows that there is an impact from being inspected in a country instead of another, though there is no clear hierarchy. On the one hand, some countries such as MS10, MS19 or MS25 rank higher compared to MS1 in terms of all three PSC outcomes. Specifically, MS19 ranks third in terms of any deficiency, it ranks first in terms of number of deficiencies and it ranks fifth in terms of detention. Differently, MS11 ranks 18th in terms of any deficiency and number of deficiencies but it is ranks

second for detention. If these empirical findings confirm the first hypothesis on PSC country differences, both in number of deficiencies and in rates of detention, they also confirm that vessels' characteristics impact PSC outcomes. The R^2 associated to the model explaining the probability of having any deficiency is more than three times higher with both vessels' characteristics and inspection country dummies ($R^2 = 0.221$) than with country dummies only ($R^2 = 0.065$). The same ratio is around 4.3 both for number of deficiencies and detention. As expected, vessels' characteristics are the most important factor explaining the PSC outcomes.

For instance, age is positively related to deficiencies or detention. Compared to the reference age category which is less than 5 years old, the probability of having a vessel detained increases by 4.7 percentage points when the vessel is more than 30 years old, and by 2.1 percentage points for the number of deficiencies. Also, Passenger and Ro-Ro vessels are subject to less detention and deficiencies compared to the "other vessels" category, while general cargo are more often detained and with more deficiencies detected.

In order to assess the within-country differences, a variance decomposition based on the regression estimates was calculated from the random effect regression which describes the number of deficiencies DEF_{ji} . Let X_{ji} be the control variables and $\hat{\beta}$ the estimated coefficients. The predicted number of deficiencies,

$$D\hat{E}F_{ji} = X_{ji}\hat{\beta} \quad (3)$$

is decomposed in a between observed variance $V(\overline{D\hat{E}F_j})$, which refers to the average differences between countries, and a within observed variance $V(D\hat{E}F_{ji} - \overline{D\hat{E}F_j})$, which refers to the differences in deficiencies with respect to the average level within each country of inspection. A much larger contribution of the within variance (88.7%) compared to the between variance (11.3%) is found, meaning that even net of the vessel characteristics, substantial heterogeneity remains in the PSC outcomes within each country of inspection.

4.2. Number of inspectors

This subsection investigates whether the number of inspectors allocated to carry out an inspection could explain the cross-country differences identified in the previous section and in former studies [16,17]. As reported in Fig. 3, there are indeed large disparities in the number of inspectors mobilized for an inspection. For the whole sample, more than one-half of inspections (56.8%) were carried out using one inspector. They are two for 36.9% of inspections and three and more for 6.3% of inspections.

More inspectors are mobilized for more detailed and expanded inspections. The proportion of inspections with exactly two inspectors is 31.4% for initial inspections, 37.3% for more detailed inspections and 47.5% for expanded expansions. The decision of engaging one or more inspectors on board is not part of the EU legislation and is a sovereign decision remaining in each individual member state. This flexibility may be positive since MSs are in a position to allocate the number of inspectors on the foundation of financial circumstances, personnel and territorial extension.

Fig. 4 shows some statistics on the average number of inspectors per inspection for each member country and by type of inspection. These averages are calculated because of the correlation between the number of inspectors and the type of inspection evidenced in Fig. 3. Again, there are large differences by country. For initial inspections, the average number of inspectors per inspection ranges from 1.0 in MS16 and MS20 to 1.8 in MS8 and 2.1 in MS2. Almost the same rankings are found for more detailed inspections, with the lowest averages in MS20 (1.0) and MS16 (1.1) and the highest averages in MS8 (1.9) and MS2 (2.2). For expanded inspections, the highest average numbers of inspectors are found in MS8 (2.4), MS4 (2.6) and MS7 (2.7) and the lowest are still in MS16 (1.1) and MS20 (1.1).

¹³ Detailed results for all covariates with coefficients, t-values and marginal effects are available from the authors upon request.

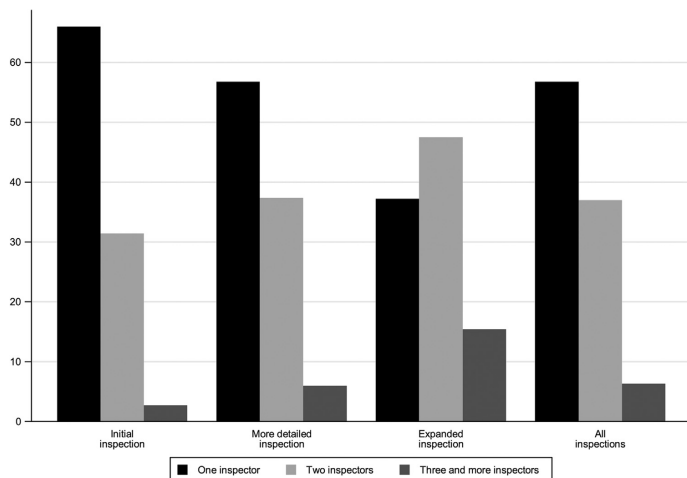


Fig. 3. Number of inspectors, by type of inspection. Source: data from the EU Region MoU 2014–2015, authors' calculations.

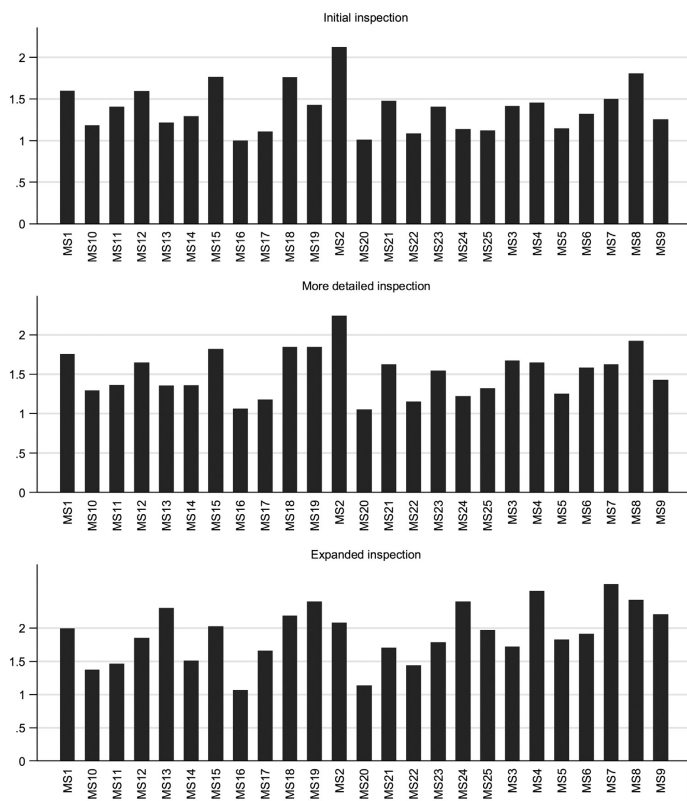


Fig. 4. Number of inspectors per inspection, by member country and type of inspection. Source: data from the EU Region 2014–2015, authors' calculations.

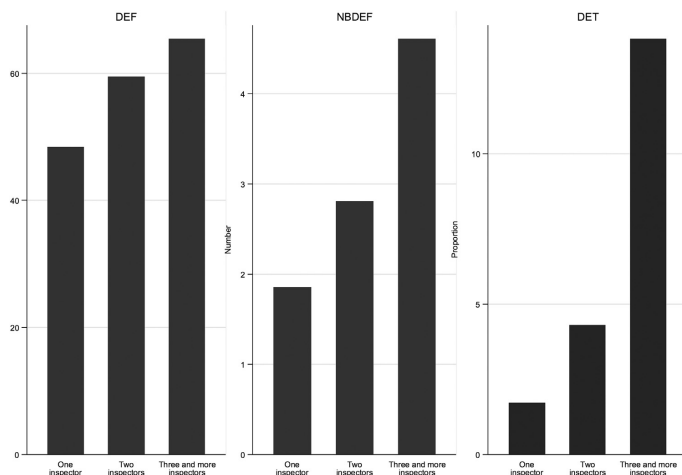


Fig. 5. Results of inspection, by number of inspectors. Source: data from the EU Region 2014–2015, authors' calculations.

The number of inspectors is likely to influence the PSC outcomes. A higher number of inspectors affords the inspection of more specific areas within the same amount of time spent on board the ship. For instance, a single inspector with a deck background might spend 20 min inspecting the navigation bridge and life-saving appliances and then another 20 min to sweep through the engine room, cargo spaces, and marine pollution prevention related logs and records. On the other hand, a team of three inspectors could concentrate the same 40 min on only one or two specific areas. This invariably leads to closer examinations and therefore higher probabilities of noting deficiencies and even ordering detentions.

Fig. 5 confirms the relevance of such an assumption. The mean number of deficiencies detected is 4.6 when three or more inspectors are mobilized against 2.8 when there are two inspectors and 1.9 when there is only one. The gap is even larger when examining the impact on the detention rate, which is 13.8% with three inspectors against 4.3% for two inspectors and 1.7% for one. Interpreting these results remains nonetheless difficult as they may be subject to the issue of reverse causality. As explained above, the decision to dispatch one or more inspectors on board depends on the MS according to the travelling distance from the office to the port, the internal organization of the maritime administration, the national policy and the size of the vessel, among other reasons.

Table 3 assesses whether the number of inspectors has an influence on PSC outcomes once vessel characteristics are introduced as explanatory variables in the various regressions. When considering the whole sample of inspections (panel A), the probability of having any deficiencies is 8.8 percentage points higher when there are two inspectors rather than one and even 13.4 percentage points with three inspectors. In the same vein, the probability of having a vessel detained is 3.8 percentage points higher with two inspectors (rather than one) and 14.0 percentage points with three inspectors. Detailed results per type of inspection confirm the positive correlation between the number of inspectors and the PSC outcomes, with large marginal effects for detention.

The results are in line with the second hypothesis as well as with former studies. In their study on the Spanish Maritime Administration, Ravira and Piniella [41] strongly advocated for multidisciplinary teams on board given the enhanced likelihood of detecting deficiencies as well as a more efficient decision-making process. Nevertheless, it is clear

that the data obtained does not provide any information on the time and effort spent by each inspector during each inspection. So, at that stage, it can only be concluded that the number of inspectors assigned to each inspection is one element explaining the country differences in PSC outcomes observed in our data. However, the study is not able to explain through which mechanisms this effect operates.

4.3. Background of inspectors

As the database includes an inspector identifier, additional information on the educational background of the 845 inspectors involved in the 32,206 inspections was collected through the questionnaire that each MS fills in during the preparatory phase of the five years' cycle of visits. Those visits monitor compliance and performance of MSs with regard to the PSC Directive [11] following the provisions of Article 30. There are 24 initial different educational backgrounds that were grouped into the five following categories: seagoing (deck), seagoing (engine), architect/engineer, other university degrees, and others/unknown.¹⁴

Out of the 845 inspectors, 33.4% have a seagoing (deck) background, 23.4% have a seagoing (engine) background, 11.2% are architects or engineers, 19.1% have another university degree and 12.9% are in the other/unknown category. At the country level, there exist large disparities in both the total number and background of inspectors. The average number of inspectors per country is 33.8, with a standard deviation of 35.9. The number of inspectors ranges from 2 in MS16 to 120 in MS14. Five countries have 60 inspectors or more: MS10 with 65, MS8 with 93, MS23 with 106, MS25 with 100, and MS14 with 120. In MS14, 75.8% of inspectors have a university-related degree while those with the same background represent 17.0% in MS25. In that country, 40.0% of inspectors have a seagoing (deck) background against 2.5% in MS14.

To study the relationship between the inspector's background and

¹⁴ Information for 35 inspectors (4.1% of inspectors) could not be obtained. The detailed categories are: Seagoing (deck); Seagoing (Radio Officer); Seagoing (Deck – Radio); Seagoing (engine); Naval Architect – Seagoing (deck), Architect or engineer (Naval Architect: Naval Architect; Naval Engineer; Marine Engineer (MSc)), Other University (Law and Economics, the other Engineers not related to Maritime; Nautical Science; Nautical (University Degree); Nautical - Marine Technology (MSc) and Others (0 or unknown).

Table 3

Marginal effect of number of inspectors on inspection results.
Source: data from the EU Region 2014–2015, authors' calculations.

Variables	DEF (in %)	DEFN	DET (in %)
A. All inspections (N = 32,206)			
One inspector	Ref	Ref	Ref
Two inspectors	8.8***	1.0***	3.8***
Three and more inspectors	13.4***	2.7***	14.0***
Controls	YES	YES	YES
B. Initial inspections (N = 10,076)			
One inspector	Ref	Ref	
Two inspectors	8.9***	0.3***	
Three and more inspectors	6.0**	0.2*	
Controls	YES	YES	YES
C. More detailed inspections (N = 17,431)			
One inspector	Ref	Ref	Ref
Two inspectors	8.4***	1.3***	5.7***
Three and more inspectors	16.5***	3.9***	21.0***
Vessel characteristics	YES	YES	YES
D. Expanded inspections (N = 4699)			
One inspector	Ref	Ref	Ref
Two inspectors	11.4***	1.3***	4.5***
Three and more inspectors	14.1***	2.6***	11.2***
Controls	YES	YES	YES

Note: estimates from linear probability and linear regression models. Significance levels are 1% (***), 5% (**) and 10% (*). Each regression also includes type of inspection, type of vessel, age at inspection, vessel flag and state of inspection as explanatory variables.

the PSC outcomes, the data is transformed so that the unit level is now the inspector. In this new sample, a vessel inspected by two inspectors therefore contributes to two observations. This way, a sample of 48,636 individual inspections is obtained.

The results illustrate little variation for the proportion of vessels having at least one deficiency (DEF), and for the average number of deficiencies (DEFN), according to the inspector's background. The average number of deficiencies is for instance 2.6 for inspectors with seagoing (deck) background, 2.9 with seagoing (engine) background and 2.7 for architect or engineer. Concerning detention, the likelihood is somewhat higher for inspectors being either architects/engineers (5.6%) or with other university background (5.8%) than inspectors with seagoing (deck) background (3.8%). At a more detailed level, inspectors with a background in either law or political sciences have a higher probability of being part of an inspection leading to a detention (8.4% and 7.6%, respectively).

Next, regression models are estimated to study the influence played by the inspector's background on PSC outcomes. Table 4 reports only marginal effects of the inspector's background.¹⁵ For all outcomes, the background has in general a very small effect in magnitude on the final PSC outcome. The largest effect on the number of deficiencies is for instance equal to 0.2 for initial inspections. When considering all inspections, the likelihood of having a vessel detained is higher when inspections are carried out by inspectors with a seagoing (engine) background (+0.5 percentage point) and by inspectors with a background of architect or engineer (1.0 percentage point). Those results are similar to Knapp and Franses [16] who estimated the probability of detention for inspectors with nautical background versus those with engineering background as oscillating between 1% and 3%.

A last concern is whether the background of inspectors has an influence on the type of deficiencies registered during the inspection. As shown in the last column of Table 5, the most frequent deficiencies are related to certificate and documentation (15.8% of total deficiencies), fire safety (14.0%), safety of navigation (12.3%) and labor conditions (10.2%). A χ^2 test shows that the type of deficiencies and the background of

¹⁵ The list of explanatory variables includes type of inspection, type of vessel, vessel age, flag of registry, country of inspection and number of inspectors when the vessel is inspected.

Table 4

Marginal effect of background of inspectors on inspection results.
Source: data from the EU Region 2014–2015, authors' calculations.

Variables	DEF (in %)	DEFN	DET (in %)
A. All inspections (N = 48,636)			
Seagoing (deck)	Ref	Ref	Ref
Seagoing (engine)	-1.7***	-0.0	0.5**
Architect or engineer	-0.8	-0.0	1.0***
Other university	-1.2	-0.1*	0.2
Other or unknown	2.0**	0.1**	-0.1
Controls	YES	YES	YES
B. Initial inspections (N = 13,787)			
Seagoing (deck)	Ref	Ref	
Seagoing (engine)	-3.9***	-0.1***	
Architect or engineer	0.4	0.0	
Other university	-2.9*	-0.1**	
Other or unknown	1.8	0.2***	
Controls	YES	YES	YES
C. More detailed inspections (N = 26,196)			
Seagoing (deck)	Ref	Ref	Ref
Seagoing (engine)	-1.1*	0.0	0.4
Architect or engineer	-2.1**	-0.1	1.0*
Other university	-1.5	-0.1	0.2
Other or unknown	1.9*	0.1	-0.4
Vessel characteristics	YES	YES	YES
D. Expanded inspections (N = 8653)			
Seagoing (deck)	Ref	Ref	Ref
Seagoing (engine)	-1.2	-0.1	0.4
Architect or engineer	0.4	-0.0	1.8*
Other university	1.3	-0.0	0.3
Other or unknown	3.0*	-0.0	-0.3
Controls	YES	YES	YES

Note: estimates from linear probability and linear regression models. Significance levels are 1% (***), 5% (**) and 10% (*). Each regression also includes type of inspection, type of vessel, age at inspection, vessel flag and state of inspection as explanatory variables.

inspectors are not independent. For instance, inspectors with either a seagoing (deck) or seagoing (engine) background report more often deficiencies related to safety or navigation. The reverse pattern is found for inspectors being either architect or engineer or having other university diploma. Architects or engineers more often report deficiencies related to labor conditions, while inspectors from other university backgrounds more often report deficiencies related to certificate and documentation.

Table 6 shows the estimated probability for an inspector to report a given type of deficiency.¹⁶ Again, linear probability models are used to take into account the role of vessel characteristics. When the country of inspection is not controlled for (panel A), some significant impacts related to the background of inspectors (other or unknown backgrounds being the reference category) are found. For instance, deficiencies related to certificates and documentation are more likely for inspectors with a background from other university. Deficiencies related to safety of navigation are more frequent when inspectors have a background in seagoing (deck) or seagoing (engine).

However, these results are not any longer significant when the country of inspection is controlled for (panel B). The results which are consistent across panel A and B are related to fire safety-related deficiencies which are less likely for inspectors with a university degree, labor conditions-related deficiencies which are less likely for inspectors with a nautical background while living and working conditions-related deficiencies are more likely for these inspectors. Finally, as expected, inspectors with a seagoing (engine) background are more likely to detect propulsion and auxiliary machinery-related deficiencies.

It is clear that, beside their background, PSCOs may be influenced by bureaucratic and cultural practices in their country, the extent of their training, the administrative and political support of their administration among other factors already discussed in the literature.

¹⁶ The focus is restricted to the 10 most frequently reported types of deficiencies.

Table 5

Type of deficiencies by background of inspectors.

Source: data from the EU Region 2014–2015, authors' calculations.

Type of deficiencies	Background of inspectors					Proportion (in %)
	Seagoing (deck)	Seagoing (engine)	Architect or engineer	Other university	Other or unknown	
Certificate and documentation	15.4	15.1	16.4	17.7	16.1	15.8
Fire safety	14.3	13.1	12.7	14.9	15.8	14.0
Safety of Navigation	13.1	13.3	10.0	10.2	11.1	12.3
Labor conditions	9.9	9.1	12.1	10.3	12.4	10.2
Life saving appliances	8.8	8.5	7.3	8.4	9.0	8.5
Emergency systems	4.9	5.2	6.2	6.1	5.9	5.4
Pollution prevention	4.9	5.4	5.9	5.3	4.7	5.2
Living and working conditions	5.2	6.3	3.8	4.8	2.9	5.1
Propulsion and auxiliary machinery	4.5	5.5	5.6	4.0	4.6	4.9
Structural conditions	4.6	4.4	5.0	4.0	4.7	4.5
ISM	4.3	4.3	4.4	5.0	4.2	4.4
Water/weathertight conditions	4.4	4.4	4.6	4.1	3.7	4.3
Radio communications	2.5	2.4	2.5	1.7	2.1	2.3
Alarms	1.0	1.3	0.9	0.9	0.8	1.1
ISPS	0.6	0.6	0.8	1.2	0.7	0.7
Other	0.8	0.6	1.0	0.5	0.9	0.7
Cargo operations including equipment	0.5	0.3	0.5	0.6	0.3	0.4
Dangerous goods	0.2	0.2	0.3	0.3	0.2	0.2

5. Concluding comments and policy implications

The rise of the various memoranda of understanding since 1982 has set the ambitious aim of harmonising the enforcement standards within the region where the MoU was established [42]. However, the limits and complexity faced trying to achieve this goal has been highlighted by several publications in the past thirty years [2,4,10,14,17,22,38,39,43]. Taking as a reference the EU region, the purpose of this paper was to determine whether single EU countries record a higher number of deficiencies and/or detention net of the characteristics of the vessel inspected. Also, an attempt was made to determine whether discrepancies in the output of an inspection are influenced either by the team composition at the time of the inspection or by the background of the PSCOs.

With regard to the first aspect, results have made clear that some of the differences in terms of detecting at least one deficiency and/or detaining a vessel are significant with some MSs showing a probability 40% lower of reporting zero deficiencies compared to others. Such findings raise doubts on whether the establishment of harmonised procedures on inspection and detention, as stated in the Article 1 of the EU Directive on PSC [11], is being achieved. Moreover, the results enable policy makers to flag those countries which are struggling with the implementation process of harmonised standards and, in view of reviewing the 2009/16/EC, ascertain overhaul strategies.

Results also emphasize that differences in PSC outcomes are much more important within each MS than, on average, between MSs. This result holds even when the characteristics of inspected vessels are taken into account. Still, there may exist substantial heterogeneity between ports where vessels are inspected within a given country. This could be due to the endemic traffic characteristics, whether in terms of size or type, of some ports compared to others. Hence, it would be beneficial to investigate more closely inspection's differences between ports within the same MS, especially for bigger MSs with significant length of coastline and number of ports. A topic, this which could be addressed in further studies after being able to access specific ports data which could not be retrieved as part of this investigation.

Considering the team composition element in the inspection process, the results confirm, at the European Union level, the findings of previous studies [40,41]. The analysis clearly shows that the likelihood of detecting deficiencies and detaining vessels is higher if the number of inspectors on board is more than one. Finally, the extent to which inspectors report certain types of deficiencies according to their background is investigated, as suggested already by some authors

[16,40,41]. While the significance is not always consistent, it is clear that some backgrounds are more likely to detect certain types of deficiencies. For example, inspectors with a seagoing (engine) background are more likely to detect propulsion and auxiliary machinery deficiencies compared to other inspectors.

A potential drawback of this study is that it sheds light on correlations between the role of inspectors and PSC outcomes. As previously emphasized, the interpretation of some results is subject to reverse causality issues. If for instance two or three inspectors are systematically chosen when vessels are presumed to be in bad conditions, then the positive correlation between the number of inspectors and the number of deficiencies sounds obvious. What matters is knowing whether choosing *ex ante* a higher number of inspectors increases in a causal way the number of deficiencies during the inspection or whether assigning an inspector with some specific background indeed leads to a higher number of reported deficiencies.

A simple empirical strategy to further examine the relevance of causal effects is to turn to randomized experiments. Starting from a list of vessels to be inspected, a randomized allocation of either the number of inspectors (either one, or two, or three) or the background of inspectors would provide the ideal framework. Once inspectors are randomly selected, then a comparison of the PSC outcomes between different groups of vessels (those being inspected by one inspector only versus those being inspected by exactly two inspectors for instance) will provide the causal effect of the number of inspectors. Such random experiments can certainly be implemented at low cost by port authorities and would provide very useful information. A random allocation of inspectors between ports could be of interest to assess whether PSCOs have an influence on the differences observed within each EU MS. However, this exercise could be easier for smaller MSs while challenging for MSs with a significant length of coastline.

In conclusion, discrepancies in harmonisation have been encountered. In the first part, differences across MSs have raised doubts encompassing the PSC system as a whole. However, particular attention should be given to some neglected areas such as team composition and inspectors' background. Despite the valid grounds for an arbitrary team composition by MSs, the harmonisation of such process should be considered in future policy considerations. These results would benefit any policy study that might consider recommending a review of Directive 2009/16/EC.

Table 6
Linear probability estimates of the main type of deficiencies.
Source: data from the EU Region 2014–2015, authors' calculations.

Variables	Certificate and documentation	Fire safety	Safety of navigation	Labor conditions	Life saving appliances	Emergency systems	Pollution prevention	Living and working conditions	Propulsion and auxiliary machinery	Structural conditions
Panel A. No control of MS										
Inspector's background	-0.8	-1.4***	1.9***	-2.5***	-0.1	-0.8***	0.2	2.3***	-0.3	-0.0
Seagoing (deck)	-0.8*	-2.3***	2.0***	-0.8***	-0.4	-0.7**	0.9***	3.2***	0.8***	-0.2
Seagoing (engine)	-0.3	-3.2***	-1.0**	-0.1	-1.6***	0.5	1.2***	1.1***	0.9**	0.3
Architect or engineer	2.0***	-1.2*	-0.7	Ref	Ref	Ref	Ref	1.8***	-0.8***	-0.7***
Other university	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Other or unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Country of inspection	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039
Panel B. Control of MS										
Inspector's background	0.8*	-0.3	0.0	-1.7***	0.3	-0.0	-0.3	0.6**	-0.4	-0.1
Seagoing (deck)	-0.2	-0.1	-0.8**	-1.5***	0.2	0.2	0.1	0.5*	1.0***	-0.0
Seagoing (engine)	-0.6	-0.7	-1.2***	-0.6	-0.6	0.3	1.0***	1.2***	-0.1	0.2
Architect or engineer	0.6	-2.2***	-0.2	1.0**	0.3	-0.5	0.2	0.0	-0.8**	-0.2
Other university	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Other or unknown	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Country of inspection	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039
Number of observations	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039	131,039

Note: estimates from linear probability models. Significance levels are 1% (***), 5% (**) and 10% (*). Each regression also includes type of inspection, type of vessel, age at inspection, vessel flag and state of inspection as explanatory variables.

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