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Supply Chain Leverage and Regulating Health and Safety Management in Shipping

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Cadena de suministro y regulación de la gestión de la salud y la seguridad en el transporte marítimo

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Article abstract

The aim of paper is to understand the role and significance of supply chain leverage in promoting health and safety management at sea, the institutional contexts in which it occurs and under which circumstances it is effective.

This is a qualitative research study that examined the views of seafarers and their managers on what drives the implementation of occupational health and safety (OHS) management arrangements in two shipping sectors, namely, the independent oil and chemical tanker trade and the container trade. It is based on interviews with seafarers working on board several of these vessels and with representatives of the companies managing and operating the ships.

As might be anticipated from previous theorizing of supply chain effects on OHS, the study found there to be strong evidence of its influence on OHS management arrangements on tankers. The most significant driver of this effect for both managers and seafarers appeared to be the surveillance of their OHS arrangements instituted by the heads of the supply chain—in this case the oil majors and their inspection systems. Perhaps more surprisingly, despite the more diffuse, transactional and arms-length supply arrangements in the container trade, in the one case study from this sector examined in the paper, supply chain influences on OHS were nevertheless discernable. However, it also demonstrated the positive role played by the framework for maritime regulation in determining the significance of these influences.

Essentially, the results indicate that, under certain conditions, supply chain relations are useful in helping to support implementation of arrangements for OHS management on merchant vessels. However, it also more broadly demonstrates that such leverage is most likely to be effective when it operates within a wider institutional framework in which public regulation and its surveillance by regulatory authorities remains a key element.

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Supply Chain Leverage and Regulating Health and Safety Management in Shipping

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Seafaring is a hazardous occupation and the industry's complexity and globalization make its governance and regulation challenging. One way in which such challenges might be addressed is through an increased focus on the effects of business processes such as those within supply chain relations. This paper seeks to understand the role and significance of supply chain leverage in promoting health and safety management at sea, the institutional contexts in which such leverage occurs and under which circumstances it is effective. It draws on findings from a research project examining the views of seafarers and their managers on what drives the implementation of occupational health and safety (OHS) management arrangements in two shipping sectors. Essentially, these findings show that under certain conditions, supply chain relations are useful in helping to support the implementation of arrangements for OHS management on merchant vessels. However, such leverage is most likely to be effective when it operates within a wider institutional framework in which public regulation and its surveillance by regulatory authorities remain a key element.

KEYWORDS: regulation, supply chains, shipping, health and safety, management.

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Introduction

Comparisons of occupational mortality and morbidity make clear that despite improvement over time, seafaring remains among the most dangerous of occupations (Roberts, 2002). A greater incidence of occupational injury and ill health in one economic sector relative to others suggests both the presence of a high level of risk and also that the system for managing this risk may not be working as well as it could. Acknowledgement of the latter situation in shipping was one reason for the introduction of the *International Safety Management (ISM) Code*, which brought the industry in line with many other sectors in which a similar approach to *regulating the process* of managing occupational health and safety (OHS) was already in evidence (see, for example, Frick *et al.*, 2000 for a detailed account of these developments elsewhere).

A key issue for the present account is what drives these arrangements made for OHS on board ships. It is with this issue that the present paper is concerned in the wider context of the current search for alternative approaches to traditional command and control methods for achieving compliance with regulatory requirements on occupational health and safety.

The maritime industry is well known for the significant challenges it presents with regard to regulation (see for example, De Sombre, 2006; Walters and Bailey, 2013) and the weaknesses in its systems to ensure compliance (Sampson and Bloor, 2007; Bloor and Sampson, 2009). These challenges arise partly from the global nature of the shipping industry and the complications this creates for the application of national and international laws. They are, however, greatly exacerbated by the highly developed deregulatory trend pursued by the industry and the major shift that "flagging out" has effected in moving ship registration (and hence regulatory control) away from the embedded maritime states to states with little experience of maritime administration and limited capacity for regulatory scrutiny. Moreover, the same process has led to a very limited role played by trade union representatives in health and safety matters at the level of the workplace, since these changes have massively reduced the presence of union representatives among the crews of vessels.

While the wider regulatory and socio-legal literature takes many different positions, common standpoints are that regulation needs to be more "responsive" (Ayres and Braithewaite, 1992), and both it and the agencies charged with its administration need to be "smarter," building more on the voluntary engagement of companies in managing health and safety risks (Gunningham and Sinclair, 1999). In this way of thinking a need is seen for new organizational forms for regulation that are capable of bridging the gap between the state and the market, harnessing intermediary players and processes and acting in

reflexive ways to promote various forms of regulated self-regulation (Teubner, 1986, May 2005; Estlund, 2010). Such systems, which combine elements of both public and private regulation, also envisage more dynamic roles for social and economic actors.

In this latter regard, it has been argued, in both policy and academic literature, that there are various ways in which business relations involved in the supply of goods and services may act as a source of leverage in improving arrangements for health and safety management. Walters and James (2011) present a detailed review of these arguments. It is with the achievement of such leverage and the wider institutional environment in which it is most effectively situated and supported in the maritime industry that the present paper is concerned. It seeks to understand the role and significance of supply chain leverage in promoting health and safety management at sea and what motivates attention to such influence.

The paper draws on findings from a research project that examined the experiences and views of seafarers and their managers concerning what drives good practice in relation to implementing health and safety management standards in two sectors of merchant shipping, namely, the independent oil tanker trade and container shipping. We chose these trades because we felt they would represent two situations in which the preconditions for supply chain leverage were different.

In the following account, we first explain what we understand by "supply chain relations" and what we already know from research concerning the ways in which they influence arrangements for managing health and safety at work. We then briefly outline the methods used in the study. Following this, we examine the nature of these relations in the tanker and container trade as experienced by the ship managers and seafarers interviewed and discuss which features were perceived to exert important influences on compliance behaviour. In so doing, we distinguish between the influence of narrow market considerations and dynamics and wider institutional influences in terms of what was regarded as significant in determining the arrangements made for health and safety management on board ships. Finally, we note the absence of worker representation in the shipboard workplaces that feature in this research, reflecting that on merchant ships generally. We acknowledge the consequences of this for the strategies adopted by organized labour to represent the interests of seafarers in the maritime industry and we comment on the possible relevance of our findings for these strategies in the future.

Regulating health and safety at sea and the role of supply chain leverage

Supply chains describe business relationships involved in the procurement and delivery of goods and services. They may involve simple buyer/supplier relationships between two entities or, more commonly, quite complex chains or networks of transactional relationships involving numerous organizations. Business organizations are often simultaneously both buyers and suppliers. As modern business methods associated with the globalized economy have grown in prominence, so too has the interest in supply chain management and the price and delivery demands dominating transactions between organizations. Current business and organizational practices such as downsizing, outsourcing, just in time management, lean production and so on, have further served to increase the importance of supply chains within business relations at both national and global levels (Weil, 2014).

As businesses try to manipulate features of their supply chains to improve their profitability, efficiency and market position, the question of what happens to the health and safety conditions of workers affected by these strategies has become a focus of attention. Current discourse reveals two very different effects on preventive health and safety arrangements. On the negative side, many studies demonstrate that the pressures of outsourcing, particularly the price and delivery demands of powerful buyers, often generate "indirect" adverse effects that cause OHS standards to deteriorate among suppliers (for reviews of these studies see: Quinlan *et al.*, 2001; Quinlan and Bohle, 2008; Walters and James, 2011). Meanwhile, on the positive side, supply relations may occasionally be used to enhance, rather than undermine, health and safety standards. That is, scope exists for powerful supply chain actors to use the market power at their disposal to improve OHS management among their suppliers. They might do so, for example, by laying down contractual requirements as to how this should be accomplished and by taking action to monitor and enforce compliance with these requirements, while threatening the withdrawal of their business should the supplier fail to meet them. As Locke *et al.* (2013), make clear, such surveillance is often critical in influencing the extent of supplier compliance.

Research suggests that these effects depend on the presence of certain pre-conditions, which can be grouped into two main categories, one encompassing dynamics related to market considerations and the other wider institutional influences, such as those related to regulation and its enforcement. The existing evidence, for example, indicates that they are likely to be crucially affected by the characteristics of the goods and services provided, and the objectives and wider business interests of buyers and sellers, as well as by the distribution of power between them. Moreover, there are a number of theories that help explain

how the buyer/supplier relationship involves asymmetric information, conflicting objectives, differences in risk perceptions and so on, with the potential for very different consequent outcomes (Halldorsson *et al.*, 2007; Sako, 1992; Weil, 2014). The recent literature further suggests that these outcomes will also be influenced by their institutional (including regulatory) contexts (Short and Toffel, 2010). In particular, studies have shown such positive effects to most likely occur when actions to support improved OHS management are backed by adequate monitoring and penalty regimes (from both public and private regulatory sources), where the relationship between buyers and suppliers is a direct one in which they have worked together satisfactorily for a relatively long time, and where the wider institutional contexts are supportive (Walters and James, 2011).

Conversely, buyer attempts to influence supplier health and safety management have been found to be less likely to be successful where: a- they clash with the business interests of suppliers; b- suppliers regard the risks of failing to comply with them to be relatively low; and c- the nature of the supply relationship between buyers and suppliers is indirect, distant, transactional or complex (see for example, Cousins and Crone, 2003; Marchington *et al.*, 2005; Truss, 2004;).

In the shipping industry the most obvious example of the type of situation in which previous studies would lead us to anticipate positive effects on arrangements for health and safety from supply chain influences is in the oil tanker trade, where major oil companies are able to monitor the OHS management standards they contractually require from the independent tanker companies that carry their oil (Bhattacharya and Tang, 2012). A somewhat similar system operates in the case of chemical tankers where the chemical industry funds an inspection system for the transport and storage of bulk liquid chemicals (Chemical Distribution Institute, 2011).

The interest of the oil majors in ensuring good OHS management is bound up with their awareness of the reputational and regulatory risks (especially in the case of environmental regulation) involved in failure and the possibility of serious and long-term financial losses through the loss of cargo, large-scale environmental pollution damage, penalties and associated loss of business. Therefore while corporate concerns may not be directly about the health, safety and well-being of seafarers, their consequences are increased requirements for, and scrutiny of, arrangements for safety management on board. Since the connection between the oil companies and the tanker companies that carry their goods is both direct and dependent, it anticipates a straightforward exercise of influence of one over the other.

Elsewhere in the shipping industry more complex business relations exist and the role of supply chain influences is likely to be less straightforward. In the container and general cargo trades, for example, not only are the consequences

of corporate safety failure likely to be less catastrophic, and therefore the reasons for corporate safety standards less pressing, but the structural arrangements and business relationships between the owners of the goods carried, their shippers and the companies and individuals with responsibility for managing health and safety on board ships are more diffuse. Consequently, both the corporate benefits to buyers from promoting and monitoring safety standards among suppliers and the ways to achieve them are less obvious.

Methods

The paper draws on interviews which took place in the course of fieldwork for a research project funded by the Institute of Occupational Safety and Health (IOSH) reported in 2012 (Walters *et al.*, 2012). As part of this study, data that were originally gathered for other purposes from the petrochemical tanker industry in pursuit of two PhD research projects (Bhattacharya, 2009; Xue, 2012) were also re-analyzed.

In total some 130 seafarers were interviewed while researchers sailed with them on board nine different vessels including four oil tankers, four chemical tankers and one container/car-carrying vessel. On most ships, there were a mixture of nationalities among crews, reflecting the global supply of labour in this industry, with no dominant pattern; the working language was English and interviews were undertaken in English. Patterns of work encountered reflected those commonly found on board merchant vessels. That is, there were strongly maintained hierarchical divisions of labour between officers and ratings and task oriented divisions between deck and engine crews; shift work was normal, as were excessively long working hours, as more comprehensively described in previous accounts (see, for example, Sampson, 2013; Walters and Bailey, 2013). There was no formal workplace trade union representation on board the vessels either for general industrial relations matters or specifically concerning the representation of seafarers' interests on occupational health and safety.

All the ships maintained crew numbers that were within statutory requirements on manning levels. Employment contracts also reflected those commonly found in the industry, that is, ratings were employed on short fixed term contracts for the duration of the voyage and recruited through crewing agencies in the countries in which they were domiciled, while officers were employed for longer durations and sometimes on permanent contracts. In one exceptional case, both the officers and ratings crewing the container ship that we studied were regularly re-employed and returned to the same ship. Interviewees included a balance of officers and ratings, from among deck and engine room personnel, representing the full range of work activities on board ships. No differences were discerned

in their accounts concerning broad perceptions of supply chain influences on safety arrangements, nor were there differences in this respect between deck and engine room personnel, although clearly the nature of their jobs meant that some were more exposed to different forms of these influences than others.

The vessels were all trading globally, between Europe and North America and in Asia. In addition, interviews were undertaken with 31 shore-based managers in the five companies that were responsible for operating these vessels. In each company, the managers interviewed included those responsible for procurement, operations and health and safety management. Two further interviews were conducted with representatives from a peak organization representing the independent tanker trade and a major container shipping company.

All the interviews were recorded, transcribed, coded for the themes indicating external drivers of OHS management practice (and especially those derived from supply chain relations) and analyzed using IT assisted conventional qualitative methods to examine the influence of these drivers in greater detail. Interviewees were informed of the confidentiality of the interview and the independence of the researchers. Because of the length of time researchers spent on board each vessel, sharing social as well as work-space with the seafarers, there was considerable opportunity to reinforce these messages and to reduce possible suspicions concerning the affiliation or purpose of the researchers which could have influenced the nature of responses.

The interviews sought information on ship operating company strategies in relation to OHS management and the seafarers' experiences of these strategies on board ships. Transcripts were thus coded to enable close scrutiny of the experience of the operation of systems to implement the ISM Code and cover reporting and communication systems for safety management and regulatory and other inspection practices, including those of audit and review. The interviews further sought information on the perceptions and experiences of seafarers and managers of the influence of business relations with the customers with which they traded and for which they provided the service of securing arrangements for OHS management on board—data of particular relevance to the present paper. The analysis of the present paper draws on the perceptions of the seafarers interviewed concerning their experiences of these influences and their impact on shipboard OHS management arrangements and strategies and, in the case of the shore-side managers, their experiences and impressions of the influence of supply chain relations as drivers of the arrangements they made for OHS management on board ships and their reasons for them.

We did not seek to examine the success of OHS management strategies in terms of improved OHS outcomes on board ships since the aims of the study

were limited to gaining an understanding of the perceptions of seafarers and their managers concerning the influence of business relations as *drivers* of these strategies. However, the tanker trade is widely acknowledged to have the best safety performance in merchant shipping and in the case study in the container trade, the companies involved in ship management and cargo handling were also able to demonstrate a comparatively high level of safety performance. All the companies involved therefore considered themselves to have good health and safety management systems in place and good records of OHS performance.

Supply chain influence and health and safety management in oil tankers and container and car shipping

We begin with an account of supply chain influences on OHS management practices in the independent oil and chemical tanker trade. We describe the structure of the relevant business arrangements, and an account of their effects on OHS management on board ships. This is followed by a similarly structured account of the case study conducted in container and car shipping, before discussing the wider significance of both sets of findings.

The oil and chemical tankers

Oil and chemical tankers normally carry hazardous cargoes and are subject to particularly stringent requirements concerning safe transport. With their capacity to select the ships they employ, charterers have the opportunity to influence the way ships are operated. The oil sector has arguably advanced furthest along this road, due to the small number of large players in the sector. Major oil companies (oil majors) claim to account for some 20-30% of the market, with the other 70-80% being served by independent tanker operators.

To be able to compete for contracts with the oil majors, independent tanker companies must ensure that their ships are maintained and operated at the levels contractually demanded by the oil majors. Vessels and the companies that operate them are vetted and required to meet a matrix of procedural and manning requirements that influence, among other things, the management of OHS. Oil majors carry out vetting primarily to protect themselves and their business, to be seen to be exercising due diligence and to provide the necessary paper trails in the event of an accident. Their investment in the management of this vetting process is considerable. Inspections are performed through a Ship Inspection Report (SIRE) program, operated on behalf of the Oil Companies International Marine Forum (OCIMF), and according to its standard report formats. They provide each oil company's vetting department with information needed for the selection and/or continued use of tankers and their operating companies. Where a fleet operation

fails to meet the required standards, even if it is the result of the poor performance of only one ship, it may result in the entire fleet being denied business.

SIRE was launched in 1993 as a response to concerns about sub-standard shipping. There are 576 SIRE accredited inspectors, the majority (463) accredited to inspect larger tankers, while a few (8) are accredited for small tankers and others (105) for inspecting various additional kinds of vessels. There are 28 experienced SIRE auditing inspectors, who audit approximately 150 SIRE inspectors each year. During a SIRE tanker inspection, a standard inspection guide is followed and information is entered into a database enabling potential charterers to access up-to-date inspection information concerning oil tankers (OCIMF, 2012). Since its introduction, more than 180,000 inspection reports have been submitted to SIRE. On average, Program Recipients access the database at a rate of more than 9,000 reports per month.

In addition to the SIRE program, the Tanker Management and Self-Assessment (TMSA) program provides instruction and methods encouraging ship operators to assess their safety management systems against key performance indicators and develop continuous improvement and provides an on-line tool enabling them to share their results with those who might request them for the purposes of their own internal vetting. The advantages to oil companies of the implementation of such a tool are obvious, as is the business necessity on the part of such tanker companies to ensure that they comply with the requirements of the scheme. According to a recent OCIMF Annual Report (2012) the TMSA program continues to grow, with more than 1,500 companies now registered to submit reports.

The independent oil tanker industry is therefore marked by an elaborate and extensive institutional structure for private regulation in which the economic dependency of suppliers upon buyers helps to ensure compliance with its demands. Drawing upon the data obtained from our interviews in the sector, it also seems clear that both ship operating company managers and seafarers take these supply chain influences seriously. A considerable majority among the officers and ratings we interviewed held the view that the inspections enhanced safety management arrangements on board ships, and that their effects represented a significant addition to those of the public regulatory system and the requirements of insurers. Typically, they said:

> We have several types of inspections from PSC, Terminal, Harbour Master, also audit[s]—internal as well as external, and from the P&I Club and on and on. They are all important. You can't start [a] cargo operation without [the] Terminal or Harbour Master's approval, deficiencies pointed out by PSC don't help either; we need insurance cover from the P&I Clubs, but on the whole you'll have to say that ships are safer due to Oil Majors.- *Captain*

A measure of the seriousness with which seafarers regarded the inspections instigated by the oil companies was in the way they compared them with other forms of inspection and monitoring of arrangements for OHS management on board ships. They often found them more demanding than the regulatory inspections to which their vessels were subject under the requirements of Port State Control[1] (PSC):

> Compared to PSC these people are more organized, more thorough. *Captain*

Company management, like the seafarers, also saw the additional inspections undertaken on behalf of the oil majors as the feature distinguishing safety arrangements on these ships from those on other merchant vessels:

> Tankers are better managed because they have so many extra inspections. Who takes interest in bulk carriers? We have [equivalent bulk charterer] but they don't get excited about safety, although we all know bulk carriers are probably far weaker in construction and take a lot of beating... *Manager*

They were further aware that the business relationships in which they were involved with the oil majors were not equal in terms of power and that their company had little choice but to follow terms dictated by the oil companies. This dependency dominated interviews with company managers and the sense that profitability depended on them doing the oil companies' bidding was reflected strongly:

> When we go to any terminal [non- Oil Major] or even charter our ships to non-Oil Majors we still need to be inspected and passed by them. Such is their reach in this sector. The whole [oil] industry is run by them —you can't do business without their approval. *Manager*

Not only did captains and senior officers feel considerable pressure to ensure successful outcomes from these inspections, but so did other crew members, as the comments of many ratings made clear. Typically they said:

> There is a lot of pressure to pass oil major inspections… if inspections fail, the company will be in trouble. *Motorman*

There was also a direct effect on the form and content of safety management systems (SMS), brought about by adherence to the requirements of the TMSA scheme, with a willingness on the part of the ship operating companies to alter their SMS in response to these requirements, as well as those of the SIRE inspections:

> Nowadays, the revision of the SMS is directed by the syllabus of the oil majors. Since the oil majors' inspection syllabus has often been changed, the SMS was led by their change. Since their syllabus kept changing, we must track and follow their revision and its latest requirement. *Company quality and safety manager*

Altogether, the findings were unequivocal in the extent to which they confirmed the powerful influence of the oil companies' requirements on safety management practice on board vessels in the tanker trade. The relationship described by interviewees fits closely with the conclusions of the review of the wider supply chain literature undertaken by Walters and James (2011) in which they argue that in relatively highly regulated situations, where the business dependency of suppliers on their buyers is sufficient, and where the business benefits of compliance with the demands of buyers outweigh those of non-compliance, suppliers would be motivated to comply.

While the systematic OHS management arrangements made by ship operators in response to these pressures may have cost implications, neither the ship operators nor their charterers saw them as significant in comparison with the potential costs of failures. Price and delivery pressures associated with negative effects on health and safety arrangements among suppliers are therefore unlikely to cause their non-application or circumvention.

In their review of the evidence from the wider literature, Walters and James (2011) further argued that influence on supplier health and safety management is likely to be more effective in the presence of monitoring and penalty regimes. In the tanker trade, the head of the supply chain—the association of major oil companies (OCIMF)—influences practices of safety management on board tankers to meet its requirements, partly through the TMSA scheme and partly through monitoring compliance with its standards through the system of vetting inspections undertaken by SIRE accredited inspectors and the like. SIRE reports are made available to companies belonging to OCIMF, which can use them to decide which company will receive their business.

In scenarios where the business risks of failing to comply with buyers' demands are widely regarded as substantial and significant, it is the arrangements for monitoring compliance that really focus the attention of suppliers. The requirement of external inspection of safety arrangements on board ships was clearly a significant presence in their minds—as were the consequences associated with failing to satisfy such inspection.

The container and car shipping trade

Our case study in the container trade concerned a cluster of companies connected to a ship management company (Company A) based in the UK. Business relations involved in the ownership, management and operation of its ships were somewhat complicated and fairly typical of those generally found in the container trade.

Company A provided technical management for a modest fleet which comprised vessels for two sister companies (the same parent owned all three companies) and

for Company B, which, however, took responsibility for cargo management on its ships and had a direct relationship with the vessel in relation to cargo planning. Company B was, in turn, owned by a large shipping line—Company C (although this latter company played little part in the ship's activities). In total, Company A provided technical management for fourteen vessels in a variety of trades.

Company B made many of the operational decisions about its vessels' cargoes and was a major point of contact for the ship management company (for example, the purchasing manager liaised directly with them). As the ship management company, Company A had held the contract to manage the vessels on behalf of Company B for approximately 18 months at the time of our investigation.

On board ship, both Company A and Company B were recognized by seafarers as having a strong association with them and with operational matters. The seafarers were employed either directly by Company A or its Philippines-based crewing agency. Officers had permanent contracts but ratings did not. Rather unusually for the shipping industry, all the seafarers were on rotations back to the same vessel.

The nature of the business relations between the companies and those whose goods they were transporting were quite different to those in the oil tanker trade. In the container and car shipping undertaken by Company A and B, goods belonging to a considerable range of clients could be loaded and carried on board their vessels in any one voyage. The safety interests of the smaller of these clients made little impact on the management and crew of the vessels, while those shown by larger clients were restricted to the conditions under which their goods were transported.

The seafarers perceived the charterers to have limited interest in the arrangements made for their health and safety. Instead, they generally saw their priorities as being focussed on getting the cargo in an undamaged condition from point A to point B as quickly as possible. Thus, the charterers took an interest in the cargo holds, the lashings and cleanliness, but generally this interest did not extend to the arrangements for managing the health and safety of the crew. Their overall view seemed to be that while some cargo owners dealing with Company B did take a certain interest in the vessel, this interest did not really drive standards forward or change things on board:

> *Interviewer*: And when they come, do they speak to you? Are they interested in safety on-board?
>
> *Seafarer*: Not totally, they are just only focused in the cargo. If they see something that is not good for the cargo, then they will tell us.
>
> *Interviewer*: So they are checking on the cargo?

Seafarer: Yeah, yeah.

Interviewer: Did you ever see anybody take an interest in the crew, from the customers? Any of the customers take an interest in safety?

Seafarer: No they didn't actually.

In this respect, the business relations between customers and the management and crew of the vessels carrying their goods were more typical of the arms-length trading relations that Sako (1992) argues are least likely to be characterized by buyers exerting a significant influence over the internal management practices of their suppliers. There was almost no evidence of clients whose goods were being shipped imposing any specific requirements on either the ship operator or the ship management companies to manage health and safety on board the vessels shipping them.[2]

Arguably, there were two main reasons for this, both of which are in contrast to the situation described in the oil tanker trade. One was that, beyond the safeguarding of their goods, there was no *immediate or obvious* business or regulatory reason why clients should require particular standards of OHS management on board the ships transporting them. The second reason was that the structure of the supply chains involved were too diffuse and the position of the clients too remote, to allow processes such as procurement and monitoring activities to be used effectively to influence safety arrangements on the vessel we studied.

However, there were signs that this was a relatively narrow expression of a more complex reality, since effective safety management *was* regarded by both the personnel of the ship management company and its seafarers as implicit in the maintenance of good business relationships. From the perspective of managers in the ship management company, for example, the vessel charterer wanted to show off a well-run and safe fleet to attract custom:

> The way I see the client we've got, well… you know they want to show a vessel, a reasonable standard to the customer because they have got to convince the customer to send their goods, and there are a lot of other shipping companies out there. But if you can show your customer a nice, clean, well operated, well manned ship, well maintained, he is more likely to send his goods with you than somebody who comes in with a [mangy] old rust bucket hanging to bits. You know, you are going to say, are my goods going to get across the Atlantic? *Manager*

While these managers were not subject to audits from shippers and charterers in the same way as in the oil tanker trade, they were nevertheless aware of the business advantage to be gained from maintaining a good record in relation to Port State Control inspections. This was especially because regional groupings of Port States made public the records of their enforcement actions. Thus, for the operators of the container ship, "a clean sheet" from regulatory inspections by

Port or Flag State authorities was an important measure of the reputation of both the ship management company and the charterer/ship owner.

> *Manager*: Because effectively these days, I don't know if you know the Paris MOU and the company calculator, because whatever ships you have directly reflects on the company rating.
>
> *Interviewer*: So you are very much trying to avoid deficiencies and detentions?
>
> *Manager*: Yeah, which is exactly what, what the client wants anyway, whatever they say. So we offer the best—the best practice that we can.

We will have cause to return to the role of public regulation in the following section but here we simply note that ship management personnel were very aware of the contribution of public regulatory inspection to an institutional framework which served to heighten business pressures on the company to demonstrate that it maintained high standards of safety.

In short, therefore, while supply chain relations with clients did not themselves provide much *direct* influence on the OHS management arrangements, these relations did *indirectly* influence perceptions concerning OHS management on board. As the seafarers pointed out, there was a perception in both Company A and Company B that if their clients had cause to believe that their goods might be at risk as the result of the poor management of their transport, they would take their business elsewhere. It was therefore important to Company B to contract the management of the ships it had chartered to a company whose standards of management were of suitable quality and, in turn, it was important to this ship management company to be seen to be delivering this quality. Since quality generally was associated with indicators of good safety performance, this helped to promote Company A's efforts to maintain good standards of health and safety on board ship. The success of the business of Company B with its shippers was seen to be at least to some extent dependent upon the maintenance of these standards by Company A. There was also a sense among these companies, which were operating at the "better end" of the market, that quality management was one of the indicators of competitive edge and therefore worthwhile pursuing from a business perspective.

However, as we explore further in the following section, it was clear that these influences did not operate alone, but were one element of a set of determinants in which both regulation and regulatory inspection were also important.

A constellation of influences?

At first sight, our findings lend some weight to the notion that supply chain-related business considerations have a direct effect on driving the implementation of health and safety management arrangements in the mainstream oil tanker

trade, and further, that they have a similar impact, albeit rather more indirectly, at the better end of the container trade. However, while it is true that both seafarers and their managers in the tanker sector clearly found the requirements of the oil majors to be powerful influences, they did so within the context of working in an already heavily regulated sector. As our shipboard interviews indicate, seafarers often felt that the supplementary inspections undertaken on behalf of the oil companies were even more demanding than those to which they were subject under state-based regulation, but they did not regard them as a substitute for such surveillance. Moreover while OCIMF, SIRE and the TMSA were all products of the private institutions of the oil companies, the salient features of the safety management systems they promulgated were elaborations of those ideally required by regulation under the ISM Code.

This was even clearer in the case study of container transport. Here, the indirect role of supply chain influence was one of several elements of regulatory influence to which the seafarers and their managers felt subjected. Closer examination demonstrated the role of regulation and especially that of the strategies adopted by the regulatory bodies to improve compliance among ship operators. Managers in the cluster of companies we studied were aware of, and influenced by, these strategies which helped focus their market-based attempts to improve business by demonstrating elements of good health and safety practice.

The particular vessel on which our fieldwork was undertaken was flagged under the Swedish Maritime Authority. Seafarers on board regarded this as a significant influence on arrangements for health and safety:

Interviewer: And of those, which would you say is the most influential in terms of bringing up standards?

Seafarer: Swedish Maritime Authority.

Interviewer: That is the Flag State?

Seafarer: Yeah

This is exceptional in the modern shipping industry. As we have already indicated, many observers of the deregulatory trends in the industry have pointed out that the practice of flagging out (where ships are registered with flags of convenience or on second registers of embedded maritime states—as were all the other ships in the study) has greatly reduced the regulatory impact of Flag States overall (see, for example, Alderton and Winchester, 2002).

On the container ship, seafarers were also clear about the role of Port State Control. Overall, while they were concerned about being blamed for failing to meet its standards, they nevertheless understood its purpose. As one seafarer said of this regulatory inspection:

> They go on board not for them, they go on board for us because they are looking for safety and safety is for us. When they talk safety, it is all for the safety of the crew, not for them… you must know your work, you know most what to do and don't be afraid [of] any port state that will be on board as long that you be following the rules. *Seafarer*

The public availability of information on the regulatory compliance of ships meant that both buyers and suppliers of services could and did use it as a source of information with which to gauge the quality of ships, their owners and their operators. Our case study showed that these measures could be used in both directions in determining potential business relations between buyers and suppliers of services. This was an effect of the "smart" regulatory regimes adopted by regional associations of Port States, in which the regulatory history of ships' compliance with Port State Control is made public through web-based records such as the EQUASIS website. Managers were aware of the potential for a bad business image that could result from the public availability of records of non-compliance and sought to avoid such non-compliance as much as they could. When contracting the management of their vessels to Company A, Company B sought a "quality" operator with a good reputation. The management at Company A identified their reputation *vis-à-vis* both safety and regulatory compliance as an essential factor in winning the contract to run Company B's vessels. Equally, through the same sources, they could make themselves aware of ships with records of poor compliance and thus avoid them when seeking new business.

It is important to qualify this influence. The ship was trading in the North Atlantic region, on routes between northwest Europe and ports in the US and Canada. This region is well known for the relatively strict regulatory scrutiny imposed on vessels through Port State inspection. Seafarers were aware of this:

> I think it is the Port States and of course the US coastguard because we are trading for [the] United States, so they have a great impact. We have to listen [to] them very carefully…

But experience of Port State Control more widely is mixed. Some authors have found its regime to be effective, especially in relation to trade in the North Atlantic and similar regions (see, for example, Knapp and Franses, 2007; Li and Zheng, 2008), while others have shown that such influence is not consistent elsewhere in the world (Bloor *et al.*, 2006).

In the absence of a strong institutional framework such as was evident in the particular case we examined in the container and car carrying sector, there is little in our findings to suggest that the market-based business interests that helped create supply chain leverage on OHS management would alone have been sufficient to significantly raise and maintain OHS management standards.

Conclusions: The limits of influence

Our findings demonstrate that while supply chain influences can be significant motivators for the adoption of arrangements for the health and safety of seafarers, they operate within a multi-layered wider institutional framework in which public regulation and its surveillance by state regulatory agencies remain paramount. They suggest that ideas concerning the central role of private regulation and that of the market in driving the implementation of arrangements for health and safety management aboard ships are reductive and incomplete explanations for the quality of arrangements for health and safety on board ships. Policy makers concerned with maritime health and safety might benefit from exploring ways in which these elements of private and public regulation could be integrated to achieve greater effect. There is a growing literature supporting the efficacy of such integration (see, for example, Weil, 2008; and, more recently, Locke *et al.*, 2013). Such integration, the findings of the present study suggest, might usefully be pursued by greater exploitation of the opportunities allowed by structural features of the business relations in some sectors of the industry for greater levels of external scrutiny of arrangements for health and safety, while at the same time giving increased attention to the elements of "smart regulation" that encourage companies to identify improved business benefits associated with their successful negotiation of both public and private inspection regimes.

That said, we acknowledge some significant limitations in our study. First, our field research was conducted in relation to companies that regarded themselves as situated at the "better end" of the industry. The implications of its findings may therefore have limited salience across the industry as a whole, especially with regard to perceptions of the importance of quality in business relations and their role in determining managerial behaviour.

Second, our study concerned the effectiveness of *the drivers* of arrangements for health and safety management on board ships. It did not concern measures of the effectiveness of these arrangements. There are some relevant areas of contention in this respect. This is especially so regarding the widening gap that some observers see between seafarers' sense of seamanship and their obligations to comply with the prescriptions of management systems (see, for example, Knudsen, 2009; Walters and Bailey, 2013)—as well as concerning the so-called "audit culture" more generally (see, for example, Bieder and Bourrer, eds, 2013; Hutter and Power, eds, 2005). Of particular relevance here are the increased levels of administrative work required by repeated inspection and audit and its possible limited connection with the practical realities of seamanship. In our study, seafarers complained about these additional administrative burdens and managers also suggested that buyers' demands

could be unreasonable in this respect. Whether compliance with such demands actually leads to measurably improved health and safety performance remains a subject for further study.

Arrangements for workplace trade union representation were conspicuous by their absence on the ships we studied, reflecting their limited presence on ships generally. The reasons for this are well known (see, for example, Lillie, 2006). However, the ways in which trade unions achieve representation in the maritime industry—for example through global industry agreements negotiated by the International Transport Workers Federation (ITF)—may have considerable potential to contribute to the kinds of supply chain leverage on OHS discussed in the present paper. This potential is supported by recent research in sectors such as construction, where labour supply chains are prominent (Wright and Brown, 2013). At present, these possibilities do not seem to be exploited in the maritime industry but the recent adoption of the Maritime Labour Convention (MLC)[3] in the industry may change this, making it an important topic for future further investigation, exploring the "upstream" strategies and actions of interest groups and regulators in this respect.

These caveats notwithstanding, the present study suggests that the regulatory challenge remains that of achieving a stronger, smarter and more consistent regulatory framework in which business and employment in the maritime industry operates globally. While our findings show that actors within supply chains can positively influence OHS management conditions in organizations with which they have relations, they also suggest that such effects are most likely to occur in contexts where surrounding institutional pressures serve to create supporting market contexts. That is, these effects are most likely in institutional contexts where market, and related inter-organizational, logics are shaped by supplemental regulatory and reputational risks. In pointing in this direction, our findings therefore both accord with conclusions reached in other analyses focused, for example, on the adoption of corporate social responsibility policies (Gjolberg, 2009), the facilitators of self-regulatory corporate behaviour (Short and Toffel, 2010), and the limits of forms of private governance (Mayer and Gereffi, 2010). In the maritime context, they further endorse the conclusion that while supply chain influences can be important sources of leverage towards improved OHS practices and a useful means of enhancing regulatory strategies, they are not a substitute for regulatory standards, nor for the development of stronger and smarter regulatory regimes by both Flag and Port States.

Notes

1 Port State Control refers to national maritime regulatory inspection authorities. Under UNCLOS (Art 218 and 219) and subsequent maritime conventions, nation states have rights to inspect foreign vessels' compliance with the standards set out in these maritime conventions while ships are within their jurisdiction. They may, as a result, issue deficiency notices and detain ships until deficiencies are rectified.

2 There was one customer that was regarded as an unusual/exceptional case. It had undertaken a more general auditing of the conditions of life and work on board. This was described as useful by some seafarers and it was suggested that such practices sometimes picked up minor issues to be remedied. But it was remembered because of its exceptional nature rather than because it was in any way typical of the normal practices of customers. It appeared to have been the result of the particular global corporate social responsibility agenda pursued by a large multinational retail company.

3 The MLC entered into force in August 2013 and makes some provision for worker representation on health and safety matters on board ships.

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SUMMARY

Supply Chain Leverage and Regulating Health and Safety Management in Shipping

The aim of paper is to understand the role and significance of supply chain leverage in promoting health and safety management at sea, the institutional contexts in which it occurs and under which circumstances it is effective.

This is a qualitative research study that examined the views of seafarers and their managers on what drives the implementation of occupational health and safety (OHS) management arrangements in two shipping sectors, namely, the independent oil and chemical tanker trade and the container trade. It is based on interviews with seafarers working on board several of these vessels and with representatives of the companies managing and operating the ships.

As might be anticipated from previous theorizing of supply chain effects on OHS, the study found there to be strong evidence of its influence on OHS management arrangements on tankers. The most significant driver of this effect for both managers and seafarers appeared to be the surveillance of their OHS arrangements instituted by the heads of the supply chain—in this case the oil majors and their inspection systems. Perhaps more surprisingly, despite the more diffuse, transactional and arms-length supply arrangements in the container trade, in the one case study from this sector examined in the paper, supply chain influences on OHS were nevertheless discernable. However, it also demonstrated the positive role played by the framework for maritime regulation in determining the significance of these influences.

Essentially, the results indicate that, under certain conditions, supply chain relations are useful in helping to support implementation of arrangements for OHS management on merchant vessels. However, it also more broadly demonstrates that such leverage is most likely to be effective when it operates within a wider institutional framework in which public regulation and its surveillance by regulatory authorities remains a key element.

KEYWORDS: regulation, supply chains, shipping, health and safety, management.

RÉSUMÉ

Chaine d'approvisionnement et réglementation en matière de gestion de la santé et de la sécurité dans le transport maritime

Le but de cet article est de comprendre le rôle et la signification du levier que représente la chaîne d'approvisionnement dans la promotion de la gestion en matière de santé et de sécurité en mer, de cerner les contextes institutionnels dans lesquels cela se passe ainsi que dans quelles circonstances cela est efficace.

Sur le plan méthodologique, la présente recherche se veut qualitative. Elle examine les points de vue des marins et de leurs gestionnaires sur ce qui conduit à la mise en place de mesures en santé et sécurité (OHS pour *Occupational Health and Safety* en anglais) dans deux secteurs du transport maritime, soit celui du transport indépendant du pétrole et des produits chimiques ainsi que celui du transport de conteneurs. Elle repose sur des entrevues menées auprès de marins travaillant à bord de plusieurs de ces vaisseaux et de représentants des compagnies qui gèrent et opèrent ces vaisseaux.

Comme il pouvait être anticipé de la théorisation antérieure des effets de la chaîne d'approvisionnement sur la santé et la sécurité (OHS), l'étude conclut à une forte influence de celle-ci sur les mesures de santé et sécurité prises par la direction dans le secteur du transport des conteneurs. Le facteur le plus significatif de cet effet, à la fois pour les gestionnaires et les marins, semble être celui de la surveillance de leurs mesures en santé et sécurité de la part des directions de la chaîne d'approvisionnement — dans ce cas les géants du pétrole et leurs systèmes d'inspection. De manière plus surprenante, malgré des mesures d'approvisionnement plus diffuses, transactionnelles et musclées dans le secteur du transport de conteneurs, dans l'un des cas étudiés dans le cadre de cette recherche, les influences de la chaîne d'approvisionnement se sont avérées réelles. Au surplus, notre recherche a montré le rôle positif joué par le cadre de la réglementation maritime dans la détermination de la signification de ces influences.

En conclusion, les résultats indiquent essentiellement que, sous certaines conditions, les relations dans la chaîne d'approvisionnement sont utiles pour appuyer la mise-en-œuvre de mesures en matière de santé et sécurité sur les vaisseaux marchands. De plus, nos résultats démontrent généralement que ce type de levier ou de support a plus de chances d'être efficace lorsqu'il opère dans un cadre institutionnel plus large où la réglementation publique et sa surveillance par des organismes réglementaires sont un élément-clé.

MOTS-CLÉS : chaînes d'approvisionnement, santé et sécurité, transport maritime, gestion.

RESUMEN

Cadena de suministro y regulación de la gestión de la salud y la seguridad en el transporte marítimo

El objetivo de este artículo es comprender el rol influente y la importancia de la cadena de suministro en la promoción de la gestión de la salud y la seguridad en el mar, los contextos institucionales respectivos y las circunstancias facilitadoras.

Se trata de una investigación cualitativa que estudia los puntos de vista de los marineros y de sus superiores sobre lo que conduce a la implementación de disposiciones de dirección respecto a la salud y seguridad ocupacional (SSO) en dos sectores del transporte marítimo, el transporte independiente de petróleo y productos quí-

micos y el sector de transporte de contenedores. Las entrevistas se realizaron con marinos que trabajaban a bordo de varias embarcaciones y con representantes de compañías responsables de la gestión y de la operación de dichas embarcaciones.

Tal como fue anticipado a partir de estudios previos sobre los efectos de la cadena de suministro sobre la SSO, los resultados muestran evidencias solidas de dicha influencia sobre las directivas de salud y seguridad ocupacional en el sector de contenedores. El factor más significativo de este efecto, según los directivos y los marinos, fue la vigilancia de la aplicación de dichas directivas de salud y seguridad ocupacional de parte de las direcciones de la cadena de suministro, en este caso, las grandes compañías petroleras y sus respectivos sistemas de inspección. Lo más sorprendente fue que en uno de los casos del sector estudiado en este artículo, a pesar del carácter difuso, transaccional y equitativo de los acuerdos de suministro en el comercio de contenedores, las influencias de la cadena de suministro sobre la SSO fueron aun así perceptibles. Sin embargo, se demostró también el rol positivo que juega el marco normativo de regulación marítima para determinar la importancia de dichas influencias.

En conclusión, los resultados indican esencialmente que bajo ciertas condiciones, las relaciones de la cadena de suministro son útiles para sostener la implantación de las directivas de SSO en las embarcaciones mercantiles. Sin embargo, fue también ampliamente demostrado que tal influencia es más susceptible de ser eficaz cuando ella opera dentro de un cuadro institucional más amplio dentro del cual la reglamentación pública y su supervisión por las autoridades normativas constituyen un elemento clave.

PALABRAS CLAVES: cadenas de suministro, salud y seguridad, transporte marítimo, gestión.