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Online sustainability communication practices of European seaports

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ABSTRACT

Although ports have a direct and substantial impact on the social and physical environments in which they operate, studies on corporate sustainability focussing on ports are scant. This study investigates the under-researched topic of sustainability communication practices in the European seaport sector. Its purpose is to analyse to what extent, if any, are there differences in these practices. It seeks to capture the influence of national institutions and some port specific characteristics in sustainability reporting. Using content analysis, we analysed the extent and content of corporate sustainability information disclosed in the websites of 186 European seaports. We used an institutional theory framework, the Varieties of Capitalism approach, as lens of analysis. Multivariate ordinal regressions were used to analyse the influence of national institutions on disclosure. We found that sustainability communication varies from country to country not entirely in accordance with the Varieties of Capitalism framework. Despite the majority of ports identified by our study having already included corporate sustainability topics in their online communication practices, we conclude that there is still much work to be done.

1. Introduction

Corporate sustainability (CS) is one of the concepts most widely used to refer to firms' engagement with social and environmental issues in addition to their economic activities (Linnenluecke and Griffiths, 2013). Recent initiatives of international organizations such as the UN Global Compact (Perez-Batres et al., 2011), interest by large organizations in instruments such as sustainability reports (Marimon et al., 2012) and the increasing importance of socially responsible investing (Ortas et al., 2013) are evidence of a growth in the importance of CS. Noteworthy is also the exponential increase in the number of publications on CS that has occurred in recent decades, which is documented in the many literature reviews published recently (Hahn and Kühnen, 2013; Linnenluecke and Griffiths, 2013).

Notwithstanding, in spite of having a direct and significant impact on the social and physical environments in which they operate (Darbra et al., 2004, 2005; Kolk and van der Veen, 2002; Le et al., 2013), relatively few studies on CS focussing on ports have been published. Despite the growing importance of the seaport sector, its CS practices are still little known. In spite of the scarcity of social and environmental initiatives in the seaport sector when compared to other sectors, there is a growing involvement of ports' management with CS (Darbra et al., 2004). In general, the seaport sector faces an environment of great change, which requires a continuous effort to restructure and reassess its strategies. In Europe, in particular, main changes have been felt in terms of legal environment and social and ecological pressures (Verhoeven, 2009).

The location of ports and their growth and expansion are controversial issues, which may explain the growing social dialogue, whereby ports try to demonstrate willingness to engage actively with civil society, assuming responsibilities that had once been exclusive from the State (Kolk and van der Veen, 2002). Because CS remains largely voluntary most ports have learned to deal with new social challenges through “trial and error” and, in this way, social and environmental management became part of the management of ports. However, the communication strategy “still remains an underestimated factor of success” (Verhoeven, 2009, p. 80–81).

With the aim of contributing to the scarce literature on ports' sustainability practices, this paper analyses European ports online sustainability communication practices. So far as we are aware, this is the first study on this matter. Sustainability communication may be broadly defined as the communication of social and environmental issues by an organisation to its stakeholders (Lodhia, 2014).

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The Internet has been increasingly used in social and environmental disclosures (Morhardt, 2010; Pellegrino and Lodhia, 2012; Lodhia, 2014) making it one of the main channels for CSR communication (Wanderley et al., 2008). Even when there is no formal stand-alone sustainability report, organisations tend to use their websites to disclose social and environmental information (Morhardt, 2010).

The success of online reporting derives from the advantages offered by the Internet that fosters more dynamic and ongoing communications (Antal et al., 2002). It is timely, widely accessible, and enables interaction with stakeholders (Lodhia, 2014). It is flexible, versatile and fast in spreading an unlimited amount of information (Tagesson et al., 2009). Moreover, information is disclosed through the Internet at a lower cost compared to the traditional channels (Morhardt, 2010).

Previous literature review revealed an increasing involvement of ports in CS general practices (e.g., Darbra et al., 2004; Kolk and van der Veen, 2002; Verhoeven, 2009). Aligned with the European Commission, which asked for a social dialogue in this sector (COM, 2007), ports have adopted a more active communication strategy, focussing on their social approval (Kolk and van der Veen, 2002) and on their license to operate (Verhoeven, 2009).

However, despite sustainability reporting evolution and the social and legal pressures they face, the behaviours of ports, as well as the reasons behind different behaviours, in what pertains to this matter are not known. Although an important part of extant literature has explored practices and determinants of reporting in this area (Morhardt, 2010), there are no references to the seaport sector. This creates an opportunity for research that this study explores.

The paper is organized as follows. The second section focuses on the theoretical lens of analysis used. After that, we present the empirical study, revealing the findings and discussing the results. Finally, conclusions are drawn.

2. Theoretical framework and hypotheses

CS practices tend to be more extensive in sectors with great impact upon stakeholders (Jackson and Apostolakou, 2010), because firms in such sectors are more visible and exposed to social judgement (Adams et al., 1998; Cho and Patten, 2007). Ports are very likely to adopt these practices, due to obvious reasons, such as location, type of operations and risk of incidents, making this sector quite visible (Kolk and van der Veen, 2002).

The individual behaviour of a firm can also affect the behaviour of other firms in its sector. When a firm engages in sustainability communication, it can influence others to adopt the same practices, and this may create a pattern of behaviour, because companies in the same industry tend to adopt similar practices and structures (D'Aunno et al., 1991), as institutional theory explains (Jackson and Apostolakou, 2010). According to Acciaro (2015), who claims to be the first to apply institutional theory to the study of the CS in seaports, this theory, through its focus on the legitimation, is very useful in this area, especially because "ports are strongly characterised by the culture of the country where the port is located" (Acciaro, 2015, p. 293).

Regarding isomorphic pressures, DiMaggio and Powell (1983) defined three types of isomorphism: (i) mimetic; (ii) normative; and (iii) coercive. Mimetic isomorphism concerns the ways in which organizations "mime" the actions of similar organizations that are perceived to be more legitimate or successful in the institutional environment. Normative isomorphism is derived from two key aspects: first, formal education and legitimation of the cognitive base by discipline specialists in universities; and second, through the elaboration of professional networks that span organizations and facilitate the rapid diffusion of new models and practices. Coercive isomorphism concerns the ways in which organizations are subject to external pressure, either from organizations they depend upon, or from more general cultural expectations (Carruthers, 1995; Rodrigues and Craig, 2007). Any of these isomorphic pressures leads to the homogenization of organisations and its practices, which are institutionalized through endorsement mechanisms (Rao et al., 2000).

According to mimetic isomorphism, ports are more likely to adopt similar CS practices, following the example of other ports such as the ones from Rotterdam and Amsterdam which are proactive in this area (Kolk and van der Veen, 2002). In this regard, the European Sea Ports Organisation (ESPO) has played an important role. ESPO's set of rules and codes of conduct that promote environmental and social efficiency amongst ports can be seen as a normative isomorphism mechanism.

Among ESPO's initiatives to promote sustainable development are the EcoPorts initiative and the ESPO Award on Societal Integration of Ports. The first initiative has been established "to create a level playing field on port environmental management in Europe through the sharing of knowledge and experience between port professionals" (ESPO, 2012, p. 18). The latter one was created in 2009 to promote innovative projects by port authorities that improve societal integration of ports. Its primary aim is to stimulate the sustainable development of European ports and the cities or communities in which they are located.

The same is the case with the Global Reporting Initiative (GRI) guidelines (Larrinaga-González, 2007). Coercive isomorphism can be revealed through European directives and recommendations, or through dependency relationships between a port and its stakeholders. Assuming that there is an interdependent relationship between ports and cities, the Commission proposed social dialogue strategies which can promote the understanding between the parties involved whilst improving the public image of ports (COM, 2007a).

The proximity between ports and cities affects organisational CS behaviours and practices (Darbra et al., 2004), because it creates conflicts when there is limited available space. This scenario compels ports to justify their existence, intensifying its social dialogue, through CS reporting practices, as a way to manage disagreements with their neighbourhood (Kolk and van der Veen, 2002).

In general, all these determinants are present in the seaport sector and it is expected that they affect ports' sustainability reporting. Nevertheless, there are other factors, such as the size of ports, which may affect sustainability reporting in this sector. As emphasized by Kuznetsov et al. (2015) it is necessary to develop professional awareness towards sustainability in smaller ports to ensure more sustainable port management. Larger organisations are more visible and hence more likely to engage in CS practices (Jackson and Apostolakou, 2010) and sustainability reporting (Adams et al., 1998; Deegan and Gordon, 1996). Adapting it to the seaport sector, the following research hypothesis was developed:

H1. Larger ports are more likely to develop online sustainability communication.

According to the Varieties of Capitalism (VoC) perspective, two different types of market economies can be distinguished: (i) liberal (LMEs) versus (ii) coordinated (CMEs) (Jackson and Apostolakou, 2010; Midttun et al., 2006). On the one hand, national institutions from LMEs encourage individualism and liberalism, incentivizing responsive actors, whilst adopting some kind of policies that promote discretionary practices (Matten and Moon, 2008). Given this, organisations tend to develop high levels of CS practices (Midttun et al., 2006), assuming more explicit and arbitrary forms (Matten and Moon, 2008). On the other hand, national institutions from CMEs encourage collectivism, solidarity, partnership and

associations among several actors, as well as policies that define rules and obligations (Matten and Moon, 2008). Under the latter scenario, organisations tend to limit their CS practices (Midttun et al., 2006), and adopt more implicit forms prescribed by laws or by mandatory regulation (Matten and Moon, 2008). Thus, CS can vary with institutional context, which in turn has great dependence on political, financial, cultural, educational and labour systems, as well as on the nature of business and on the organisation, coordination and control of the market (Matten and Moon, 2008).

Knowing that Anglo-Saxon countries belong to LMEs and Continental countries belong to CMEs (Jackson and Apostolakou, 2010), the following research hypothesis was formulated:

H2. Anglo-Saxon European ports score higher on their online sustainability communication practices than their Continental counterparts.

Some authors do not totally agree with the assumptions of Matten and Moon (2008) and Midttun et al. (2006). From a direct association between CSR and globalization (Gjolberg, 2009, 2010; Wanderley et al., 2008), it is possible to explain the global spread of CS practices through technological transference (Wanderley et al., 2008). It reduces the influence of national dynamics, which may come to be seen as secondary or irrelevant (Gjolberg, 2009). Cormier and Magnan (2003) have concluded that corporate reporting strategies can be similar across countries, due to the impact of globalization on the convergence of corporate practices.

On the contrary, Gjolberg (2009) revealed variations on CS performance and practices across countries, even in a globalization era. This author's results are quite surprising and do not seem to be coherent with the VoC literature. American companies, for example, have the lowest score on an index that measures the performance and practices of CS. To test the consistency of these results, Gjolberg made a subdivision of the initial index based on different dimensions: the author considered, on the one hand, a set of practices developed regarding results and processes, and, on the other hand, a set of practices based on hard and soft requirements. In this sense, hard requirements are laws or any kind of mandatory regulation, while soft requirements are associated with voluntary regulation such as the GRI guidelines. According to the results of Gjolberg's study Spain, Finland, Sweden and Portugal (CMEs countries) obtained the best scores on the use of soft requirements, such as the GRI guidelines.

Koos (2012) also highlighted Portugal in a set of 17 countries, reaching the third highest position regarding civil involvement. This author also concluded that Portuguese and Spanish companies had the strongest tendency for philanthropy. After this, a new research hypothesis has been formulated as an alternative to H2:

H3. Online sustainability communication from ports varies across countries, independently of the type of market economies' classification in the VoC literature.

It is important to note that both H2 and H3 assume that organisations do not act in an institutional vacuum (Gjolberg, 2009), being expected variations among ports' reporting practices. What differs between these hypotheses that online sustainability communication is expected to vary in accordance with the VoC, in the case of H2, or in accordance with national contexts, in the case of H3. In this latter case, the national context may have greater power to influence sustainability reporting than the VoC. Thus, while under H2 we expect to observe a more extensive and developed pattern of reporting among Anglo-Saxon ports, under H3 we expect that the convergence of practices, promoted by phenomena such as globalization, will reduce the VoC effect, but without limiting variations between countries. In this case, it is expected that online sustainability communication varies in accordance with national peculiarities, but independently of the type of VoC.

These two hypotheses may seem somewhat contradictory and incoherent, but that is not the case. We just consider that when sustainability reporting practices cannot be explained by the VoC, it can be better explained by other institutional factors, such as the national context. In fact, Koos (2012) pointed out the emergence of recent theoretical approaches, based on institutional perspectives that generate contradictory but valid hypotheses, almost creating theoretical and empirical puzzles: (i) a “mirror” hypothesis considering CS as a reflection of the institutional context; (ii) a “substitute” hypothesis considering that CS replaces existing institutions or its deficiencies.

The adherence to EcoPorts can also be seen as another determinant of CSR reporting. According to ESPO, EcoPorts initiative is a voluntary scheme for improving environmental ports performance through self-regulation. On the other hand, one legitimisation strategy reported in the literature is the association with symbols, values or institutions that confer legitimacy (Lindblom, 1994). This is the case of the EcoPorts initiative. Thus, a fourth research hypothesis was formulated:

H4. EcoPorts members tend to have more developed online sustainability communication.

3. Research method

3.1. Sample

A search was undertaken to identify European ports with a webpage. From that search we identified 186 ports from 14 European countries. These were then grouped by country or by 4 European VoC types, according to the classification used.

3.2. Data collection

A large number of studies analysed corporate websites through content analysis, recording the number of words or pages devoted to specific topics and documenting the presence or absence of these topics (e.g., Grosbois, 2012; Monteiro and Aibar-Guzmán, 2010; Tagesson et al., 2009). The research reported in this study used the same technique, observing the extent and content of online CSR reporting from 186 European ports, given a list of 24 predefined items (see Appendix 1, parts 1 and 2).

To measure the amount of sustainability disclosure per port, we adapted the technique used by Chaudri and Wang (2007): all paragraphs and lines, directly posted on corporate websites, with references to CS, excluding images and photos, have been copied and pasted into a document with a standardized format, which then enabled us to count the number of pages. After this, the technique of Chapple and Moon (2005) was adapted, classifying the number of pages into 4 levels: nothing (0 pages); minimal (up to 2 pages); medium (3–9 pages); extensive (10 or more pages). Through this technique, each port's sustainability communication assumed a value between 0 and 3.

To quantify the content of CS information communicated through ports' websites, an index of 23 items (see Appendix 1, part 2) has been created. We attributed a score of 1 when an item was addressed and 0 otherwise. In the wake of Frost et al. (2005), standalone reports provided online were excluded from the analysis. However, we registered the existence, or not, of this kind of reports and the inclusion, or not, of CS topics in the Annual Report. Data collection occurred between 9 June 2012 and 31 August 2012.

3.3. Statistical analysis

We resorted to a non-parametric multivariate statistical method to test the relationships between the independent and dependent variables: the ordinal regression analysis. This type of regression analysis does not assume linearity of relationship between the variables and homoscedasticity, does not require normally distributed variables, and is less sensitive to the existence of outliers.

The general form of the models examined was stated as:

$$Ext_i = ß_{0i} + ß_{1i}S_i + ß_{2i}M_i + ß_{3i}E_i + u_i$$

$$Cont_i = ß_{0i} + ß_{1i}S_i + ß_{2i}M_i + ß_{3i}E_i + u_i$$

where, for port i: Ext_i: disclosure extent; $Cont_i$: disclosure content; S_i: size; M_i: type of market economy; E_i: EcoPorts; u_i: error.

3.3.1. Dependent variables

The following ordinal variables were defined as dependent variables: (i) extent of online sustainability communication; and (ii) content of online sustainability communication.

3.3.2. Independent variables

The main independent variable is a nominal variable which assumes the value 1 if the seaport is from an Anglo-Saxon country, 2 if the port is from a Nordic country, 3 if the port is from a Mediterranean country and 4 if the port is from a Central European country. According to the geographical distribution of countries proposed by Gjolberg (2010), Jackson and Apostolakou (2010), Koos (2012) and Midttun et al. (2006), we defined the following distribution, noting that Anglo-Saxon countries belong to LMEs while the other European groups belong to CMEs (see Table 1).

We also used total cargo measured in tonnes, handled during the year 2012, as a proxy for ports size, in a similar way to ESPO (2010). Data was obtained from Eurostat website. Finally, we used a dummy variable which assumes the value 1 if the seaport has adhered to EcoPorts initiative and 0 otherwise (this information was directly taken from the ports' websites).

4. Results

4.1. Descriptive analysis

From the content analysis performed on 186 webpages we found great variety of online reporting, regarding the extent and content of CSR disclosures (Table 2).

Data in Table 2 shows that only 64 ports did not disclosed any CS information. Regarding the remaining 122, there were ports that disclosed minimal amount of information (77 ports), others disclosed medium levels (26 ports) and others disclosed extensive levels (19 ports). Concerning the content of the information disclosed, the scores varied from the lowest value of 1 found in Denmark (Nordic) and Germany, Netherlands (both from Central Europe), to the highest value of 20 found in Spain (Mediterranean). These results show that the majority of ports engaged in sustainability communication. Notwithstanding, the tendency was to disclose a limited level of information (up to 2 pages).

Results also show that the information was mostly qualitative, with a clear predominance of environmental over social information. The latter only exceeded environmental information in the case of events held by ports, which mostly have a social nature. Most of the times the information appeared directly in the homepage and often there was a link that redirected the reader to other areas of the webpage. Finally, some ports had CS certifications or internal policies and the majority of them still have not included CS in their corporate mission.

4.2. Statistical analysis

It was necessary to transform the dependent variables for the regressions to have satisfactory results, namely in terms of the parallel lines test. Both transformed dependent variables (related to extent and content) had 3 categories. In the case of the variable pertaining to the extent of disclosure, category 1 corresponded to the level “nothing”, category 2 to the level “minimal”, and category 3 to the levels “medium” and “extensive”. Regarding the content of disclosure, category 1 corresponded to no disclosure, category 2 included disclosure of 1–6 items, and category 3 referred to disclosure of more than 7 items.

The results of the regression analyses are summarized in Table 3.

The model pertaining to the extent devoted to sustainability communication provides a predictive power using the Nagelkerke R^2 approximation of 25.4%, whereas the model regarding the content provides smaller predictive power (19.2%).

Further examination of the results indicates that independent variables are in the hypothesized direction. The results allow validation of the hypothesis H1, H2 and H4. In all models, the adherence to the EcoPorts initiative is found to be statistically significant. The variable size seems to be statistically significant only in the analysis of disclosure extent. Larger ports and EcoPorts members offered higher levels of disclosure extent, while EcoPorts members also offered higher levels of disclosure content. The variable type of market economy (VoC) is also significant in all models. The signals of the estimates offer some interesting insights and are in line with VoC literature (e.g., Jackson and Apostolakou, 2010; Matten and Moon, 2008; Midttun et al., 2006).

In the model regarding disclosure content, ports from Anglo-Saxon and Mediterranean countries present statistically significantly higher levels of disclosure than ports from Central European and Nordic countries. The differences of disclosure levels between these two latter groups are not statistically significant. Anglo-Saxon ports were the ones presenting higher levels of disclosure content. The situation is somewhat similar in the model regarding to disclosure extent. However, only the results for Anglo-Saxon ports are statistically significant.

Although these results are consistent with the VoC literature, we decided to analyse the relation between country of the port and

Table 1
Sample distribution by type of market economy (VoC).

European seaports (countries organized by VoC)							
(1) Anglo-Saxon	Ports (no.)	(2) Nordic	Ports (no.)	(3) Mediterranean	Ports (no.)	(4) Central	Ports (no.)
Ireland	7	Denmark	14	Greece	5	Belgium	4
United Kingdom	22	Finland	14	Italy	28	France	16
Total	**29**	Norway	7	Portugal	8	Germany	13
		Sweden	17	Spain	25	Netherlands	6
		Total	**52**	**Total**	**66**	**Total**	**39**
16%		*28%*		*35%*		*21%*	

Table 2
General analysis of the extent and content of online sustainability communication.

European groups (VoC)	European countries (total no. of ports by country)	Extent level (no. ports)				Content level	
		Number of ports without any disclosure	Number of ports with some level of disclosure			(minimum and maximum score achieved in each country)	
		0 – nothing	1 – minimal	2 – medium	3 – extensive	min.	max.
1. Anglo-Saxon	Ireland (*7*)	3	1	2	1	7	18
	United Kingdom (*22*)	3	5	8	6	3	16
2. Nordic	Denmark[a] (*14*)	9	3	2	0	1	10
	Finland (*14*)	5	6	3	0	2	10
	Norway (*7*)	3	3	0	1	3	11
	Sweden (*17*)	4	10	2	1	2	8
3. Mediterranean	Spain (*25*)	3	15	3	4	2	20
	Greece (*5*)	1	4	0	0	3	12
	Italy[a] (*28*)	17	9	2	0	3	8
	Portugal (*8*)	1	7	0	0	3	17
4. Central	Germany[a] (*13*)	7	5	0	1	1	9
	Belgium (*4*)	0	2	1	1	4	14
	France[b] (*16*)	8	4	3	1	3	12
	Netherlands (*6*)	0	3	0	3	1	11
	Total	64 ports	77 ports	26 ports	19 ports		

[a] The number of ports that disclose is smaller than the number of ports that do not disclose any information.
[b] Half of ports disclose some information and half of ports does not disclose anything.

Table 3
Results of the ordinal regression analysis by type of market economy (VoC).

VoC	Panel A – disclosure extent			Panel B – disclosure content		
		Estimate	Sig.		Estimate	Sig.
Threshold	[Extent = 1]	−0.955	0.033	[Content = 1]	−1.420	0.001
	[Extent = 2]	1.214	0.007	[Content = 2]	0.043	0.921
Location	Size	3.119E-05	0.001	Size	8.320E-06	0.105
	[EcoPorts = 0: No]	−1.351	0.001	[EcoPorts = 0: No]	−1.690	0.000
	[EcoPorts = 1: Yes]	0[a]		[EcoPorts = 1: Yes]	0[a]	
	[VoC = 1: Anglo-Saxon	1.797	0.000	[VoC = 1: Anglo-Saxon	1.381	0.006
	[VoC = 2: Nordic]	0.597	0.176	[VoC = 2: Nordic]	0.377	0.385
	[VoC = 3: Mediterranean]	0.326	0.421	[VoC = 3: Mediterranean]	0.803	0.047
	[VoC = 4: Central]	0[a]		[VoC = 4: Central]	0[a]	
Statistical models	Chi-square	47.195		Chi-square	34.755	
	2 log likelihood	352.900		2 log likelihood	373.308	
	Sig.	0.000		Sig.	0.000	
	Nagelkerke R^2	0.254		Nagelkerke R^2	0.192	
	Cox and Snell	0.224		Cox and Snell	0.170	
	McFadden	0.118		McFadden	0.085	
Test of parallel lines	Chi-square	6.563		Chi-square	7.927	
	2 log likelihood	346.337		2 log likelihood	365.381	
	Sig.	0.255		Sig.	0.160	

[a] This parameter is set to zero because it is redundant.

sustainability communication. This decision was taken because during the process of data collection we had observed a great variety of reporting among countries as summarized in Table 1. Even in the same VoC category we found countries with different levels of extent and disclosure content, so there is no homogeneity reporting levels between them. In other words, high and low levels of disclosure may be being compensated among ports of countries within the same VoC group, fading out significant differences. The main purpose from the new statistical analysis was to test the consistency of the results obtained in the first analysis. That is, the results should demonstrate VoC influence over online CSR reporting (H2), reinforcing the first results, or they should reject it, concluding, in this latter case, that CSR reporting practices varies from country to country (H3). The results are summarized in Table 4.

The new models have greater predictive power using the Nagelkerke R^2 approximation (37.3% and 40.5% for extent of information and disclosure content, respectively). Size (in terms of disclosure extent) and adherence to the EcoPorts initiative remain statistically significant. Larger ports and EcoPorts members presented higher levels of sustainability communication, validating hypotheses H1 and H4.

We found that ports from UK, Netherlands, Spain, Sweden and Finland presented higher levels of sustainability communication. This means that, although the results point to an Anglo-Saxon country in the leadership of disclosure extent (UK), there are other leading countries from the remaining three VoC groups. These results validate H3.

Regarding the model pertaining to disclosure content, we found that there are countries from all VoC European groups with high levels of disclosure. However, the results are quite surprising: the two leading countries in this models are Spain and Portugal (Mediterranean countries). H3 is validated instead of H2.

5. Discussion

Results are consistent with the conclusions of those who pointed out the growing interest of ports in sustainability matters (Darbra et al., 2004; Kolk and van der Veen, 2002) and the critical role of the Internet in contemporary sustainability reporting practices (Chaudri and Wang, 2007; KPMG, 2011; Lodhia, 2014). Findings reveal that larger ports tended to have higher levels of sustainability communication in terms of disclosure extent, and

Table 4
Results of the ordinal regression analysis by country.

Country	Panel C – disclosure extent			Panel D – disclosure content		
		Estimate	Sig.		Estimate	Sig.
Threshold	[Extent = 1]	−0.633	0.363	[Content = 1]	−1.573	0.022
	[Extent = 2]	1.809	0.011	[Content = 2]	0.259	0.701
Location	Size	2.984E-05	0.002	Size	6.492E-06	0.222
	[EcoPorts = 0: No]	−1.662	0.000	[EcoPorts = 0: No]	−2.340	0.000
	[EcoPorts = 1: Yes]	0[a]		[EcoPorts = 1: Yes]	0[a]	
	[Country = 1: United Kingdom]	2.968	0.000	[Country = 1: United Kingdom]	2.255	0.002
	[Country = 2: Ireland]	1.402	0.136	[Country = 2: Ireland]	1.044	0.268
	[Country = 3: Finland]	1.588	0.045	[Country = 3: Finland]	1.335	0.083
	[Country = 4: Norway]	1.033	0.272	[Country = 4: Norway]	0.909	0.322
	[Country = 5: Sweden]	1.788	0.019	[Country = 5: Sweden]	1.333	0.072
	[Country = 6: Denmark]	0.353	0.665	[Country = 6: Denmark]	−0.024	0.977
	[Country = 7: Spain]	2.068	0.004	[Country = 7: Spain]	3.246	0.000
	[Country = 8: Portugal]	1.484	0.099	[Country = 8: Portugal]	2.809	0.003
	[Country = 9: Greece]	−0.263	0.809	[Country = 9: Greece]	−0.738	0.488
	[Country = 10: Italy]	0.117	0.868	[Country = 10: Italy]	0.148	0.830
	[Country = 11: Netherlands]	1.987	0.062	[Country = 11: Netherlands]	1.138	0.275
	[Country = 12: Belgium]	1.592	0.214	[Country = 12: Belgium]	2.652	0.066
	[Country = 13: France]	0.430	0.573	[Country = 13: France]	0.177	0.814
	[Country = 14: Germany]	0[a]		[Country = 14: Germany]	0[a]	
Statistical models	Chi-square	74.329		Chi-square	83.034	
	2 log likelihood	325.766		2 log likelihood	325.028	
	Sig.	0.000		Sig.	0.000	
	Nagelkerke R^2	0.373		Nagelkerke R^2	0.405	
	Cox and Snell	0.329		Cox and Snell	0.360	
	McFadden	0.186		McFadden	0.203	
Test of parallel lines	Chi-square	23.243		Chi-square	22.161	
	2 log likelihood	302.522		2 log likelihood	302.867	
	Sig.	0.079		Sig.	0.104	

[a] This parameter is set to zero because it is redundant.

that EcoPorts members tended to have higher levels of sustainability communication both in terms of disclosure extent and completeness of content. These results validate research hypotheses H1 and H4 and are consistent with the results of extant literature (Adams et al., 1998; Deegan and Gordon, 1996; Kolk and van der Veen, 2002).

Our findings suggest that online sustainability communication varied among ports from different countries. The leaders in terms of the content of disclosure in this ranking were Mediterranean ports from Portugal and Spain. These countries concentrated the largest number of ports that included quantitative data and CS performance indicators. Portugal also stands out by concentrating the largest number of ports that included CS topics in their corporate mission statements, followed by Belgium, Spain, the Netherlands and Denmark. Moreover, Portugal and Spain were the only countries with ports that had stand-alone sustainability reports in accordance with the GRI guidelines. They are also among the leaders in terms of forms of contact for stakeholders, allowing their feedback, which makes this reporting process more dynamic and a real form of dialogue.

These findings are not entirely consistent with the VoC literature. In general, the results show that the majority of European ports, regardless of the VoC category in which they are included, adopted online sustainability communication practices. These results validate H3, and are in line with Gjolberg (2009), whose findings revealed that CS varies from country to country regardless of the VoC. They lend support to this author's view and suggest that sustainability reporting is influenced by national dynamics.

We found that online sustainability communication varied greatly from country to country, regardless of its classification into LMEs (Anglo-Saxon) or CMEs (Mediterranean, Nordic and Central Europe). This leads us to conclude, as Cormier and Magnan (2003) and Gjolberg (2009) did, that this type of reporting depends more on the national context of ports.

6. Conclusions

This paper shows that the majority of European ports identified by our study, regardless of the VoC category in which they are included, adopted online sustainability communication practices. This is in line with the growing interest of ports on sustainability matters and the critical role of the Internet in contemporary sustainability reporting practices. As far as we are aware, this study is the first to apply institutional theory to CS communication and its determinants in the seaport sector. It contributes to the literature since it suggests that institutional context and institutional pressures (exerted by society and by cities where ports are located) are important to justify sustainability communication by ports. Coercive, normative and mimetic pressures can explain the good performance observed in the cases of Portugal and Spain. However, despite the majority of ports having already included CS topics in their online communication practices, we conclude that there is still much work to be done.

Our findings should be read considering the criteria used to select the ports that composed the sample: European ports with a webpage were included. However this criteria limits generalizability of the findings since it is possible that ports without a website have considerable CSR activities.

Our findings on the leading roles of some Mediterranean countries in terms of sustainability communication encourage to follow a line of investigation that leads to a consolidation of knowledge about sustainability communication practices in non-Anglo-Saxon contexts. It also encourages the pursuance of a line of investigation in an important, albeit somewhat neglected sector, the seaport sector.

A longitudinal analysis of online sustainability communication in the seaport sector would be an interesting avenue for further research. The analysis of other forms of reporting is also important to understand the full picture of seaports' sustainability reporting. We also deem important the analysis of other factors which are

likely to influence sustainability reporting that were not taken into account in this paper due to the lack of information. This is the case of financial performance and ownership structure. The port sector is notable for the lack of financial information, so these data were not available in most European ports websites. Information on the ownership structure was also not available, which prevented us from testing these determinants that we recommend to explore in future studies.

Appendix 1. Content analysis (index items)

Part 1	
Extent analysis of online sustainability communication	Score
	0 – nothing
	1 – minimum
	2 – medium
	3 – extensive
1.1	Extent of online sustainability communication

Part 2	
Content analysis of online sustainability communication	Score
	0 – absence
	1 – presence
2.1	Social matters in corporate mission/vision/values
2.2	Environmental matters in mission/vision/values
2.3	Social certifications
2.4	Environmental certifications
2.5	Social policies
2.6	Environmental policies
2.7	Engagement with social events
2.8	Engagement with environmental events
2.9	Membership of social organizations
2.10	Membership of environmental organizations
2.11	Reference to social matters (in the homepage)
2.12	Reference to environmental matters (in the homepage)
2.13	Autonomous section on social matters
2.14	Autonomous section on environmental matters
2.15	Online standalone social report
2.16	Online standalone environmental report
2.17	Online annual report with a section devoted to social matters
2.18	Online annual report with a section devoted to environmental matters
2.19	Social development indicators
2.20	Environmental development indicators
2.21	Images, graphs or another visual elements
2.22	The website includes qualitative information
2.23	The website includes quantitative information

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