

Exploring the influence of institutional factors on the segment disclosure practices of large European listed entities

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Abstract

Research Question: How do institutional pressures influence segment-related disclosures in the footnotes to financial statements and in the narrative part of the annual reports?

Motivation: Disclosure about operations of segments is important information for investors and other capital market participants.

Idea: I analyze occurrence, clarity and consistency of segment disclosures regarding segment identification and the measures reported by segment. I employ Oliver's (1991) framework to explore variations in segment disclosures across the sample and to examine the role of the institutional factors for different disclosure strategies.

Data: The sample is drawn from S&P Europe 350 entities, an index including the most liquid and investable markets in Europe. The final samples comprises 246 non-financial European listed companies.

Findings: The analysis suggests that different types of disclosure can be linked to specific institutional factors. Mandatory disclosure is explained mostly by Constituents (ie capital market variables) and Control factors (enforcement) while Clarity of disclosures is more likely to be affected by Constituents and Content (proxies for proprietary costs) factors. Companies are more likely to use compromise, avoidance and defiance strategies in determining their segment reporting disclosure behaviours. The differences in the disclosure strategy followed by companies is mostly driven by Constituents and Content.

Contribution: This study extends the way segment disclosures are analyzed. It contributes to the disclosure literature and to the literature on disclosure determinants. This evidence will be informative for practitioners, standard setters and regulators in particular as they seek to improve disclosure practices in financial reports.

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1. Introduction

The purpose of this study is to investigate how institutional pressures affect the segment disclosures of publicly listed companies. Disclosure about operations of segments is important information for investors and other capital market participants (Cereola & Dynowska, 2022; Johansen & Plenborg, 2013; Nichols *et al.*, 2013). Following adoption of IFRS 8 *Operating segments* in 2009 standard setters, regulators and others have questioned the quality of the information provided by listed companies (ESMA, 2011; FRC, 2011; IASB, 2013b). Scholars and practitioners recognize that the application of accounting standards is affected by the institutional setting in which financial reporting takes place (Ball, 2006; Leuz, 2010). Thus, to improve disclosure in financial statements, it is important to develop a better understanding of how institutional factors affect companies' presentation and disclosure choices. I study segment reporting because the information is commercially sensitive and subject to some extent to preparers' judgements and discretion. This means that segment disclosures are likely to be particularly affected by company and country factors in the institutional setting.

There is an extensive literature on segment reporting and some evidence of the importance of institutional factors for disclosure practices. This study applies the institutional framework of Oliver (1991) who proposes that the institutional context of a company, comprising company-level and country-level factors, creates pressures to which the company responds with various levels and strategies of disclosure (including acquiescence, compromise, avoidance, defiance and manipulation). Within this framework, the study explores the impact of a number of institutional factors on the quality of (a) segment identification and (b) the measures used in segment disclosures. Segment identification and segment measures have been identified as important for segment reporting but are not explored in depth in prior studies. Based on IFRS 8 disclosure requirements I collect data about: segment identification (factors used to identify operating segments, aggregation and products and services disclosed by segment) and measurement (the type of reported measures, explanations and reconciliations). Moreover, disclosure quantity and quality are important (e.g., Aboud & Helfaya, 2021; Cereola & Dynowska, 2022; Saleh *et al.*, 2023). I examine for both identification and measurement the following disclosure attributes: *occurrence* (if information is disclosed or not), *clarity* (if information is boilerplate or company-specific) and *consistency* of disclosure (if information reported in the footnotes and in the management commentary is congruous).

This study extends the way segment disclosures are analyzed. First, it contributes to the disclosure literature. Prior research focuses on compliance with the standard's requirements or on the numbers (values) disclosed (such as the number of segments or measures reported) (Aleksanyan & Danbolt, 2015; Crawford *et al.*, 2012; Demerens *et al.*, 2013; Nichols *et al.*, 2012, 2013; Pisano & Landriana, 2012). Research on IFRS acknowledges that quantity, quality and consistency of segment disclosures represent important issues, but investigate them in isolation and using relatively simple proxies (André *et al.*, 2016; Moldovan 2014, 2016) and focus more on the consequence than on determinants of disclosure. I investigate how companies report segment information from a disclosure perspective by looking at various proxies for disclosure quality (Aerts & Tarca, 2010; Beattie *et al.*, 2004; Holder-Webb, 2007; Lang & Stice-Lawrence, 2015). The three disclosure attributes I investigate (occurrence, clarity and consistency) reflect how companies respond to IFRS 8 mandatory and discretionary disclosures, and consistency expectations. I find higher values of occurrence and clarity and lower values of consistency for measurement disclosures than for segment identification. Since occurrence reflects in many cases the level of compliance with IFRS 8 requirements, the results indicate better compliance with the requirements regarding measures by segment (measures reported, definitions and reconciliations) than for the information about segment identification (factors used to identify segments, products and services by segments, and aggregation), that is, the more commercially sensitive information. I also find that companies cover only some of the disclosure expectations and they compensate for limited disclosure in some areas with more disclosures in others.

Second, the study contributes to the literature on disclosure determinants. Prior studies on level of segment disclosures find differences across countries, industries and types of segmentations (Demerens *et al.*, 2013), and bring evidence about the role of enforcement (Moldovan, 2014) and proprietary concerns (André *et al.*, 2016) for segment disclosure quantity. I investigate the role of a more diverse group of institutional factors for an extensive group of segment disclosure attributes. I extend prior literature on segment disclosure determinants which is framed around the proprietary cost and agency theories (Aboud & Roberts, 2018; André *et al.*, 2016; Bugeja *et al.*, 2015) by following an institutional framework (Oliver, 1991) to reflect the important role of the institutional setting for disclosure practices (Aerts & Tarca, 2010; Chalmers & Godfrey, 2004; Leuz, 2010, Glaum *et al.*, 2013) and for segment reporting (e.g., Aboud & Helfaya, 2021; Aboud & Roberts, 2018; Aboud *et al.*, 2023; Gisbert *et al.*, 2024). Oliver (1991) allows for a more in-depth discussion of disclosure practices and of their institutional determinants. As such, while most of the segment reporting literature follows a simple binary (disclosed or not disclosed, compliant or not compliant) analysis, Oliver (1991) provides five types of institutional responses for investigation. Moreover, while most of the disclosure literature under an institutional approach

groups the disclosure determinants as being company- or country-based, Oliver focuses on institutional factors.

In line with Oliver (1991) I predict that the five groups of factors (cause, constituents, content, control and context) influence companies' disclosure practices. I find most evidence for content and constituents, and some support for cause, control and context. Dependence on *constituents* is the most important institutional factor, at least two variables proxying for constituents being influential for each disclosure score. Moreover, dependency on constituents leads to different responses in various disclosure areas. For example, cross-listing has a positive influence on mandatory and clarity disclosures, a negative influence on discretionary disclosures and no influence on consistency. This example illustrates that institutional factors influence differently various attributes of segment disclosures. *Content* (including proxies for the proprietary costs) shows constraints for the clarity of disclosure and consistency of disclosures. I also find that *cause*, reflected by the legitimacy concerns, is a significant factor for discretionary disclosures, and *control*, proxied by the level of enforcement, is significant for mandatory disclosures. The *context*, proxied by industry, is significant in a few cases, suggesting that industry specific characteristics reflect the level of uncertainty in the environment and they influence how companies respond to institutional pressures.

Prior studies documented various levels of segment disclosures (Crawford *et al.*, 2012; Nichols *et al.* 2012, 2013; Demerens *et al.* 2013) without further investigation of potential clusters of companies according to disclosure practices. One exception is André *et al.* (2016) who cluster companies in three groups based on the number of segment lines disclosed. I cluster companies in three groups with various levels of disclosures, based on their mandatory and discretionary disclosures, and consistency of disclosures. The groups are connected with the Oliver's (1991) strategies based on the level of mandatory disclosures. Based on Oliver (1991), results suggest that companies with lower levels of compliance are more likely to be using compromise, avoidance and defiance strategies in determining their segment reporting disclosure behaviours. The difference in the disclosure strategy followed by companies appears to mostly reflect constituents (a strategy indicating a higher level of disclosure is associated with higher capital market development, more analysts' activity, cross-listing, and higher leverage), content (number of segments and type of segments), and context (industry).

The remainder of this paper is organized as follows. Section 2 presents the literature review and Section 3 explains the theoretical framework and hypotheses. The data and method are outlined in Section 4. Results are presented in Section 5 and Section 6 concludes the paper.

2. Literature review

Segment reporting is a key component in information disclosed for users, especially in the case of complex and heterogeneous entities. But the consistency, comparability, usefulness, and level of detail of reporting segment information have been questioned by standard setters and in the academic literature (Herrmann & Thomas, 2000; Nichols *et al.*, 2000; Street *et al.*, 2000). The IASB issued IFRS 8 in 2006, anticipating benefits from the management approach.¹ The Post-Implementation Review of IFRS 8 conducted by the IASB (IASB 2013b) reports that communication with investors has improved, but there are some concerns about the consistency of the information reported through various channels and managers' discretion in reporting segment information.

Existing research on IFRS 8 mainly covers the impact of transitioning from IAS 14 *Segment Reporting* to IFRS 8, especially the effect on the number and type of reported segments and information disclosed (Bugeja *et al.*, 2015; Crawford *et al.*, 2012; Demerens *et al.*, 2013; Nichols *et al.* 2012, 2013; Pisano & Landriana, 2012). Prior studies find that in some countries many companies have not changed the number of reported segments, and that on average the number of items disclosed by segment has not declined (Aboud *et al.*, 2023; IASB, 2013b). André *et al.* (2016) find that when the number of segments changed there was a decrease in the number of line items disclosed per segment. The literature suggests a need for additional research about disclosure practices and their determinants.

Some studies investigate the association between segment reporting and country- or company-level variables; however, few are based on companies using IFRS 8. Many studies based on IFRS 8 are focused on one country (Lucchese & Di Carlo, 2012; Pisano & Landriana, 2012, for Italy and Gisbert *et al.*, 2024 and Pardal & Morais, 2012 for Spain, Crawford *et al.*, 2012 and Aleksanyan & Danbolt, 2015 for the UK). Notably André *et al.* (2016) analyze the quality and quantity of segment disclosures for a sample of 270 European listed companies from 17 countries. They find that the quantity of disclosures, measured as the number of segment line-items, is positively associated with the length of the annual report, the involvement of the company in mergers and acquisitions and the book-to-market ratio, and negatively associated with equity issuance and cross-listing in the US. At the same time, they find the quality of disclosure (measured as the cross-segment variation in profitability) to be significantly and positively associated with return on assets, Big 4 auditor and the involvement of the company in mergers and acquisitions. Results are interpreted only in the light of the company- and industry-level variables, without specifically taking into consideration the country-level institutional factors.²

Only a few studies investigate cross-country differences in segment reporting. One example is Demerens *et al.* (2013), who look at the differences in compliance levels with IFRS 8 disclosure requirements between types of business activity in four European countries (UK, France, Germany and Italy) for intermediate-size groups. They find variation between countries, industries and types of segmentation regarding the level of disclosure. They conclude that German companies have a higher rate of disclosure (compliance) for many items. The role of the country-level institutional factors in explaining variation in segment disclosures under IFRS 8 is seldom investigated. For example, Moldovan (2014) discusses the importance of enforcement for the segment disclosures. She finds that companies from countries with stronger enforcement mechanisms exhibit higher consistency when discussing the segment operations in various parts of the annual report (e.g. the narrative and footnotes) and provide more segment item definitions, but they report fewer line items and describe segments to a lesser extent.³

In summary, from a disclosure perspective, existing research on segment reporting under IFRS 8 provides mostly descriptive evidence about how companies disclose such information, and about the impact on disclosure of the switch from IAS 14 to IFRS 8. Few insights are available about the factors associated with disclosure and about the quality of the information disclosed. The study extends the existing research by examining these issues, which have been identified as critical in research (Nichols *et al.*, 2013) and in enforcers' reports (such as ESMA, 2011; IASB, 2013a,b,c).

3. Theoretical framework

3.1 Oliver's (1991) model

Most academic research on segment reporting is framed around the proprietary cost and agency theories (Aboud & Roberts, 2018; André *et al.*, 2016; Bugeja *et al.*, 2015). While these theories provide useful insights about disclosure practices and managers' choices, they focus on economic efficiency arguments and do not highlight the importance of the institutional context. Rahman *et al.* (2010) show that agency theory is useful in understanding accounting practices in settings with a strong agency orientation such as that of the United States, and they recommend the use of an institutional theory to investigate more diverse institutional settings. Institutional theory takes into consideration the institutional setting and it is useful to explain how organizations respond to pressures and requirements based on their specific needs and interests. According to this theory, organizations respond differently to regulatory requirements or voluntarily adopt practices because they face complex internal and external pressures and constraints. Many studies point to the important role of the institutional setting regarding disclosure practices (Aerts & Tarca 2010; Cannizzaro & Weiner, 2015; Chalmers & Godfrey, 2004; Glaum *et*

al., 2013; Leuz, 2010). Institutional theory underpins this study on segment disclosures and I make use of the approach of Oliver (1991).

Oliver (1991) proposes five strategies, ranging from passive conformity to active resistance, which companies employ in responding to institutional pressures (Table 1). First, the most passive type of response is acquiescence and involves compliance with the requirements in order to secure social legitimacy. Second, compromise or partial compliance occurs when organizations balance, pacify or bargain with external constituents. This response strategy involves the concept of balance. The third type of strategy is avoidance, a response that precludes conformity. Avoidance manifests through concealment, non-conformity or buffering from institutional pressures (also called decoupling). The fourth strategy is defiance. Organizations resisting institutional norms utilize the defiance strategy, which implies active resistance through dismissal, challenge or attack. Institutional rules and values are ignored in the dismissal approach, or are challenged or contested in the challenge or attack strategies. The fifth strategy is manipulation. In this active response strategy organizations not only do not comply, they may also persuade other constituents to work together to influence and change the rules.

Oliver (1991) proposes five institutional predictive factors that may explain the organization's strategic response: cause, constituents, content, control and context (Table 1). First, the cause of institutional pressures for conformity is related to the legitimacy and efficiency objectives. If the perceived legitimacy and/or efficiency obtained by complying are high, conformity (acquiescence) is more likely to occur. Second, constituents comprise any individuals or social groups who are capable of imposing regulations, norms or rules on the organization. Both the multiplicity of constituents and the degree of dependence of the organization on its constituents are important for this response strategy. Organizations are more likely to engage in less compliant strategies (defiance, manipulation) when they face incompatible demands from multiple constituents and/or the degree of dependence is low.

Third, the content of institutional pressures reflects their consistency with organizational goals and the loss of discretion that the pressures impose on the organization. When the institutional pressures are in line with organizational goals (consistency), organizations are more prone to conform. Fourth, control refers to the means by which pressures are imposed and include legal (coercive) and voluntary diffusion (voluntary acceptance) mechanisms. Organizations tend to use compliant strategies when higher and stronger control mechanisms (coercion, diffusion) are in place. Fifth, contextual factors, such as environmental uncertainty and the interconnectedness between organizations and their institutional environment, influence the response strategy. High uncertainty and interconnectedness are expected to lead to compliance strategies (acquiescence, compromise).

Table 1. Institutional antecedents and strategic responses (Oliver 1991)

Predictive factor	Strategic responses				
	Acquiescence	Compromise	Avoidance	Defiance	Manipulation
Cause					
Legitimacy	High	Low	Low	Low	Low
Efficiency	High	Low	Low	Low	Low
Constituents					
Multiplicity	Low	High	High	High	High
Dependence	High	High	Moderate	Low	Low
Content					
Consistency	High	Moderate	Moderate	Low	Low
Constraint	Low	Moderate	High	High	High
Control					
Coercion	High	Moderate	Moderate	Low	Low
Diffusion	High	High	Moderate	Low	Low
Context					
Uncertainty	High	High	High	Low	Low
Interconnectedness	High	High	Moderate	Low	Low

Note: This table presents how the variation in five institutional antecedents (cause, constituents, content, control, and context) is hypothesized by Oliver (1991) to determine a choice of strategy in the organizational response

Oliver's (1991) framework is used in prior studies to investigate the organizational response to regulations (Clemens & Douglas, 2005; Clemens *et al.*, 2008; Fareed *et al.*, 2015). Other studies explore the development of regulations or practices by standard setters, professional bodies or associations (Canning & O'Dwyer, 2013; Funnell & Wade, 2012). Disclosure studies explain organizational practices by mobilizing Oliver (1991) (Ji *et al.*, 2014 for CSR disclosure) or a more general institutional framework with references to Oliver (1991) (Chalmers & Godfrey, 2004 for financial instrument reporting; Shrives & Brennan, 2015 for corporate governance disclosures; Cannizzaro & Weiner, 2015 for investment disclosures).

The framework has been used in IFRS studies. The topics investigated through the lens of Oliver's (1991) framework include the IFRS voluntary adoption (Guerreiro *et al.*, 2012) and IFRS 8 adoption (Zelinschi *et al.*, 2012). Guerreiro *et al.* (2012) investigate empirically the role of the institutional factors, grouped in the five categories of predictors proposed by Oliver (1991), in influencing the voluntary adoption of IFRS in Portugal. Zelinschi *et al.* (2012) explore in a qualitative approach the institutional factors that explain one of the strategic responses of Oliver (1991) (i.e. decoupling) for a number of French groups applying IFRS 8. Both studies emphasize the potential of Oliver (1991) to investigate IFRS disclosure practices, given its flexibility in incorporating both country- and company-level variables.

3.2 Institutional pressures and strategic responses in segment reporting

In this section I outline how I operationalize Oliver's (1991) framework to study segment reporting disclosure. I discuss how attributes of disclosures reflect strategic responses to IFRS 8 and the institutional factors associated with these disclosures. Prior research on IFRS disclosures finds that companies respond differently to disclosure requirements (Glaum *et al.*, 2013; Guerreiro *et al.*, 2012; Zelinschi *et al.*, 2012). Different degrees of disclosures might be associated with different strategies (Fareed *et al.*, 2015).

Given the results of prior research on IFRS disclosures (Glaum *et al.*, 2013; Guerreiro *et al.*, 2012) and segment disclosures (André *et al.*, 2014; ESMA, 2011; IASB, 2013a,b; Nichols *et al.*, 2012; 2013; Moldovan, 2014; Zelinschi *et al.*, 2012), I focus on disclosure of segment information and the compromise, avoidance and defiance strategies from the Oliver's (1991) framework. I propose that unquestioned passive compliance (acquiescence) is less probable given the proprietary costs associated with segment reporting (Aboud & Roberts, 2018; André *et al.*, 2014). Moreover, active resistance manifested through manipulation and attempts to influence or control institutional pressures are also less probable. Capital market mechanisms and the auditing process would not allow a total lack of compliance with IFRS requirements. Zelinschi *et al.* (2012) also find in a study on segment reporting in France that decoupling and other strategies reflecting partial compliance abound in segment disclosure practices, given the difficulty of checking the level of compliance with the standard.

In Oliver's (1991) framework, *cause* represents why organizations are pressured to conform to institutional rules. Cause is mainly related to legitimacy needs and efficiency seeking. Managers legitimize themselves and their decisions through disclosures in the annual report. Consequently, legitimacy seeking may represent a cause for segment disclosure. Prior literature generally finds that larger and profitable companies have more pressures to maintain their legitimacy (Clemens *et al.*, 2008; Fareed *et al.*, 2015; Guerreiro *et al.*, 2013; Oliveira *et al.* 2011). Based on Oliver (1991) I predict that:

P1: The higher the degree of social legitimacy gained from disclosures, the greater is the likelihood of conforming to pressures for segment disclosures.

Constituents represent the parties exerting institutional pressures on the organization (Oliver, 1991). Large listed companies have numerous constituents exerting various pressures for segment disclosures (high multiplicity according to Oliver (1991)). An important constituent is the user of financial reporting, that is, investors and capital providers. Listed companies depend on shareholders for raising equity capital (Guerreiro *et al.*, 2012). Moreover, companies have creditors and debt-holders who may have significant power over the financial structure of a

company (Oliveira *et al.*, 2011). The development of the capital market and the sophistication of market participants is an indication of the demand for financial information (Francis *et al.*, 2011; Glaum *et al.*, 2013; Isidro & Marques 2015). More sophisticated users may expect better or more disclosure from companies. Cross-listing on other capital markets and especially in the US brings additional public scrutiny and more stakeholders (André *et al.*, 2016; Glaum *et al.*, 2013; Lang & Stice-Lawrence, 2015). Analysts represent another important constituent in the case of listed companies (Isidro & Marques, 2015; Lang & Stice-Lawrence, 2015; Shrivies & Brennan, 2015), with their scrutiny contributing to better disclosure. Based on Oliver (1991) I predict that:

P2: The more effective pressures⁴ from constituents, the greater is the likelihood of conforming to pressures for segment disclosures.

Content reflects the norms identified as leading to pressure for conformance by the organization (Oliver, 1991). Consistency with organizational goals and the degree of discretionary constraints triggered by the institutional pressures affect the type of organizational response. For listed companies, disclosure has an important level of consistency with organizational objectives. On the other hand, companies face various degrees of discretionary constraints that could affect segment disclosures. Cross-country cultural differences may explain differences in transparency and reporting practices (Braun & Rodriquez, 2008; Glaum *et al.*, 2013; Gray, 1988; Licht *et al.*, 2007). Code-law countries are argued to have cultural values that are less consistent with IFRS and to represent an ‘unfavorable’ environment for their implementation (Karampinis & Hevas, 2011). Moreover, some segment disclosures may represent sensitive information (André *et al.*, 2016; Moldovan, 2014) acting as constraints for reporting. Based on Oliver (1991) I predict that:

P3: The fewer constraints leading to reduced discretion, the greater is the likelihood of conforming to pressures for segment disclosures.

Institutional control includes legal coercion (or enforcement) and voluntary diffusion of norms (Oliver, 1991). Since IFRS 8 is a mandatory standard for listed companies, legal coercion is the more relevant control factor to be investigated. All countries have some form of capital-market supervision to promote compliance with accounting standards. Disclosure studies provide evidence that better disclosure is associated with stronger enforcement in capital markets (; Brown *et al.*, 2014; Glaum *et al.*, 2013; Isidro & Marques, 2015). Both the existence and the efficiency of financial markets’ enforcement are important elements for control over corporate reporting (Brown *et al.*, 2014). The audit firm (e.g. Big 4) is identified as an important factor influencing disclosures (André *et al.*, 2016; Glaum *et al.*, 2013; Lang & Stice-Lawrence, 2015; Oliveira *et al.*, 2011;). Auditors and their activity represent a part of the financial reporting enforcement process (Brown *et al.*, 2014). Based on Oliver (1991) I predict that:

P4: The stronger the coercion, the greater is the likelihood of conforming to pressures for segment disclosures.

The *context* within which institutional pressures are being exerted refers to environmental uncertainty and interconnectedness (Oliver, 1991). Prior research on disclosure provides evidence about differences between industries in terms of political and public scrutiny, risks and opportunities (De Villiers & Marques, 2016; Oliveira *et al.*, 2011; Shrives & Brennan, 2015). Moreover, industry sector captures the complexity in the market and the variability of factors particular to each industry (such as additional regulations, technology, and scrutiny from customers, governments or non-government organisations). These industry specific characteristics reflect the level of uncertainty in the environment (Clemens *et al.*, 2008) and therefore influence how companies respond to institutional pressures. Based on Oliver (1991) I predict that:

P5: Companies from different industries have different level of conformity to pressures for segment disclosures.

4. Method

4.1 Sample

The sample is drawn from S&P Europe 350 entities, an index including the most liquid and investable markets in Europe, which covers approximately 70 per cent of the region's market capitalization. S&P Europe 350 companies come from the following industries (CDP, 2014): consumer discretionary, consumer staples, energy, financials, health care, industrials, information technology, materials, telecommunication services, and utilities. The financial industry (71 companies) is excluded because companies' activities lead to financial data not directly comparable with firms from other sectors. This is consistent with other studies on segment disclosures (André *et al.*, 2016; Moldovan, 2014). I further deleted companies reporting only one segment, those reporting under US GAAP, companies for which two types of shares are included in the index, and companies with combined financial statements or with two headquarters. The final sample comprises 246 companies (Table 2).

Table 2. Sample selection

Details	Number of companies
Top S&P Europe 350	350
Minus financial industry companies	(71)
Total nonfinancial institutions	279
Minus companies with one segment	(17)
Minus companies following US GAAP	(7)
Minus doubles (companies with two instruments)	(3)
Minus country unclear (two headquarters) or combined financial statements	(6)
Total sample	246

Note: This table describes the sampling procedure.

Table 3 illustrates the sample composition across countries and industries. Sample companies are based in 16 EU countries. More than half of the sample comes from three countries: 72 companies (29.27% of the sample) from the UK, 44 companies (17.89%) from France and 29 companies (11.79%) from Germany. Each of the remaining countries contributes less than 10 per cent to the sample. Companies are classified into nine industries. Four industries contribute more than 10 per cent to the sample: industrials (23.58%), consumer discretionary (18.29%), materials (15.45%) and consumer staples (11.38%).

Table 3. Sample by country and by industry

	Frequency	Percent
Panel A. Sample by country		
Austria	2	0.81
Belgium	6	2.44
Denmark	6	2.44
Finland	6	2.44
France	44	17.89
Germany	29	11.79
Greece	1	0.41
Ireland	2	0.81
Italy	11	4.47
Netherlands	12	4.88
Norway	6	2.44
Portugal	3	1.22
Spain	11	4.47
Sweden	21	8.54
Switzerland	14	5.69
UK	72	29.27
<i>Total</i>	<i>246</i>	<i>100.00</i>
Panel B. Sample by industry		
Consumer Discretionary	45	18.29
Consumer staples	28	11.38
Energy	16	6.50
Health care	14	5.69
Industrials	58	23.58
Information Technology	12	4.88
Materials	38	15.45
Telecom services	15	6.10
Utilities	20	8.13
<i>Total</i>	<i>246</i>	<i>100.00</i>

Note: This table shows the sample selection by country and by industry. The sample is selected from S&P Europe 350 excluding financial institutions, companies with one segment or reporting under US GAAP. Industry groups are based on CDP (2014).

4.2 Measuring segment disclosure

This study focuses on *segment identification and presentation*, and the *measures* disclosed by segment. In terms of segment identification and presentation, IFRS 8 Par. 22 requires that an entity shall disclose the following general information:

- (a) factors used to identify the entity's reportable segments, including the basis of organisation (for example, whether management has chosen to organise the entity around differences in products and services, geographical areas, regulatory environments, or a combination of factors and whether operating segments have been aggregated), and
- b) types of products and services from which each reportable segment derives its revenues.

Therefore, I investigate the following aspects relating to *occurrence* and *clarity*: the factors used to identify the segments; the types of products and services by segment; whether the operating segments have been aggregated; and the factors considered in applying the standard's aggregation criteria (IFRS 8, par. 12, 14). IFRS 8 mandates the disclosure of these aspects, and therefore in this case the occurrence score might be also viewed as a compliance score. *Consistency* is analyzed by considering the number of segments and the basis of organization reported in the footnotes and in the management commentary. This distinction between the segments reported and the basis of organization is useful to capture if companies report more detailed information in the management commentary.

The second disclosure element investigated is the *measure* disclosed, as per:

IFRS 8 par. 23: An entity shall report a measure of profit or loss for each reportable segment. An entity shall report a measure of total assets and liabilities for each reportable segment if such amounts are regularly provided to the chief operating decision maker. [...]

par. 27 An entity shall provide an explanation of the measurements of segment profit or loss, segment assets and segment liabilities for each reportable segment.

Par. 28 'An entity shall provide reconciliations [...]'.

I construct disclosure indices and investigate the association between these scores and factors that capture elements in the institutional setting, using research propositions derived from Oliver's (1991) framework. The disclosure indices are based on IFRS 8 requirements and capture three aspects related to disclosure, namely occurrence, clarity and consistency.

Occurrence of disclosures captures the number of checklist items for which information is disclosed (Joseph & Taplin, 2011). The amount of information provided by companies is important for several reasons. First, if the disclosure is mandatory, the index reflects compliance with the standard's requirements (Nichols *et al.*, 2013). Second, it offers an indication about the variety of disclosure (Kang & Gray, 2011) and about the level of informativeness, assuming that more disclosure (more items and more detail) is more informative (Lang & Stice-Lawrence, 2015).

Clarity of disclosures captures the extent to which the disclosed information is boilerplate or company-specific. Boilerplate disclosure in annual reports involves the use of wording which is standardized and unlikely to be informative (Lang & Stice-Lawrence, 2015). Concerns have been expressed that the explanations provided by companies in the reporting based on IFRS 8 are boilerplate and often repeat the wording used in the standard (ESMA, 2011: 11).

Consistency of disclosures captures the extent to which the information disclosed in the footnotes is consistent with the information disclosed in the narrative part of the annual report. The level of consistency influences the extent to which disclosures help investors and users to see the company through management's eyes. There are concerns that the segment information reported under IFRS 8 may not be consistent with the way managers view and organize the company in order to run the business (ESMA, 2011: 3). The narrative part should include details about the entity's structure and how it creates value (IASB, 2010: par. 26), and also details about the critical performance measures and indicators that management use to evaluate performance (par. 24). One would expect consistency in the segment disclosures between the footnotes and the management commentary. Most companies present critical performance measures (also referred to as key performance indicators or KPIs) separately in the management commentary (Dainelli *et al.*, 2013). Therefore, I also assess the consistency between the segment measures reported in the footnotes and those reported in the management commentary and KPIs.

I hand-collect data on the segment information disclosed in the 2012 annual reports for all sample companies. Hand-collected data for content analysis is common in studies analyzing the narrative part of annual reports (Aboud & Roberts, 2018; Cerbioni & Parbonetti, 2007; Götttsche *et al.*, 2021; Kang & Gray, 2011; Miihkinen, 2012, Wee *et al.*, 2014 among others). The data collected is not available in databases. Human-coding is necessary in this study because I seek to measure the quality of disclosures.

In order to measure *occurrence* (OCC), I assign 1 when information is disclosed (explicit or implicit) and 0 otherwise. I then compute an occurrence score, with values ranging from 0 (lack of disclosure) to 1 (disclosures in all investigated areas). To measure *clarity* (CLAR), I assign 2 to clear, company-specific, explicit disclosure, and 1 to general, boilerplate or implicit disclosure. Consistency (CONSIST) investigates the percentage of segments or measures disclosed in footnotes that are also disclosed in the management commentary. Additionally, the consistency score investigates the consistency of the measures used for segments in both the footnotes and management commentary with the key measures used to assess company's performance (KPIs). The score represents the proportion of measures reported in the two parts of the annual report. The coding checklist and

further details about the three disclosure scores are presented in Appendix A and examples of the coding procedure are presented in Appendix B.

The coding procedure was developed and pre-tested by the author. After deciding the approach, it was consistently applied by one coder to the entire sample. This ensures the internal validity (Nielsen, 2008). Moreover, the application of a rigorous coding approach ensures a reasonable degree of reliability (Milne & Adler, 1999). Besides filling the coded data in an Excel spreadsheet, notes were taken for each company. Notes on how the coding procedure was applied in particular cases were detailed in order to apply the same coding principles if that particular case occurred again. Moreover, in order to check for reliability, after coding all the materials the coder again coded the information for the first 20 companies and compared the results with the initial coding and reconciled any differences. The second step to check the coding reliability was to give the coding procedure and the database with the annual reports to a second coder. Ten per cent of the sample was independently coded. The coefficient of agreement, measured as the ratio of the number of pairwise interjudge agreements to the total number of pairwise judgements (Aerts & Tarca, 2010), was 93 per cent.

4.3 Regression model

The main model is shown below (company subscripts omitted).

$$\begin{aligned} \text{INDEX} = & \alpha + \beta_1 \text{SIZE} + \beta_2 \text{PROFIT} + \beta_3 \text{SHARE} + \beta_4 \text{CAP_MK} + \beta_5 \text{LIST} \\ & + \beta_6 \text{ANALYST} + \beta_7 \text{SECRECY} + \beta_8 \text{KPI} + \beta_9 \text{MEAS} \\ & + \beta_{10} \text{SEG} + \beta_{11} \text{STYPE} + \beta_{12} \text{ENF} + \beta_{13} \text{INDUSTRY} + e \end{aligned}$$

Eq. 1

The dependent variables for INDEX are based on the six raw scores for *segment identification and presentation* and *measures* (see Table 5). The independent variables in the model include proxies for *cause*, *constituents*, *content*, *control* and *context* as described by Oliver's (1991) framework (Appendix C). *Cause* is proxied by company size and profitability to reflect legitimacy. I measure company size (SIZE) using natural logarithm of total assets, and profitability (PROFIT) as return-on-assets. For *Constituents* shareholders and debtors represent important constituents for listed companies, and their contributions represent complementary funds for companies. Their role (SHARE) is captured using the shareholders' equity ratio measured as shareholders' equity divided by total assets. The importance of the shareholders in the local environment is also reflected by the level of capital market development (CAP_MK) measured as market capitalization as a percentage of GDP. Cross-listing (LIST) is another proxy for the multiplicity of constituents. I assign a score of 2 if the company is cross-listed in the US, 1 if it is cross-listed on another capital market, and 0 otherwise. Analysts' activity

(ANALYST) is measured by number of analysts per country from I/B/E/S, using the proxy utilized by Isidro and Marques (2015) to reflect the country's analyst activity.

For *Content* the constraints for disclosure are derived from the findings of prior studies interpreting segment reporting in the light of proprietary cost theory. The number of segments (SEG) reported, the number of KPIs (KPI), the number of measures per segment (MEAS) and the type of segments (STYPE) reflect the potential constraints for disclosure. I add the cultural value to reflect the difference of the IFRS cultural background from the culture of the country of origin to reflect another aspect of constraints. Using Hofstede (1981), Gray (1988) links accounting to societal values and norms and proposes four accounting values. The proxy for culture is the secrecy (SECRECY) score from Gray (1988). Transparency versus secrecy dimension from Gray's (1988) framework reflects a cultural preference for transparent and public disclosure.⁵

Control is proxied by the level of accounting enforcement activity (ENF) developed by Brown *et al.* (2014). The measure was tested by Preiato *et al.* (2015) and Cascino and Gassen (2015) among others. *Context* is proxied by the industry (IND), namely the sectors put forward in the Global Industry Classification Standard as developed and used by S&P. This method is widely used for investment decisions and research (CDP, 2014). All independent variables and data sources are presented in Appendix C.

5. Results

5.1 Descriptive statistics

Table 4 presents the descriptive statistics for the independent variables and reports the mean, standard deviation, median, minimum and maximum values. Companies in the sample report on average 4.752 segments, 11.74 measures by segment and 10.598 KPIs. Type of segments is as follows: 157 companies (64%) report business segments, 43 companies (17%) report geographic segments, and 46 companies (19%) report mixed segments. Sample companies are large (mean total assets 31,110 Euro million) and profitable (mean profitability 14.7%), with a financing structure dominated on average by liabilities (mean proportion of shareholder equity to total assets is 38.2%). For the country-level institutional factors, Table 4 reports that the size of capital markets in the sample countries ranges from 18% to 185% of the country's GDP (with a mean value of 84.3%). Analyst following at the country-level is, on average, four per company. Enforcement is relatively high in sample countries, because the median is 45 (out of maximum 54). Median secrecy is 39 (minimum 26, maximum 75).

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Table 4. Descriptive statistics for the sample

Mean	Standard deviation
31110.767	45916.632
9.561	1.267
0.147	0.314
0.382	0.169
4.752	2.151
11.740	7.399
10.598	5.802
0.843	0.381
4.066	0.164
41.211	12.605
45.972	6.851
=0	=1
169	44
= Business	= Geographical
157	43

Note: This table shows descriptive statistics for the independent variables for the full sample. The sample contains 246 companies as described in Table 2. PROFIT is profitability measured as return on assets. SHARE is shareholders equity divided by total assets. SEG is number of segments. MEAS is the number of measures reported by segment. KPI is the number of KPIs reported. CAP_MK is market capitalization as percentage in GDP. ANALYST is the country's level of analyst activity. SECRECY is a cultural score. ENF is a measure of enforcement. All variables and sources of data are reported in Appendix C.

Table 5 Panel A reports the descriptive statistics for the *occurrence*, *clarity*, and *consistency* scores, for the (a) segment identification and (b) measurement. The mean value for *occurrence* of disclosures about segment identification (OCC_{SEG}) is 0.713 (median 0.670) and about measures (OCC_{MEAS}) is 0.896 (median 1). Most of the companies in the sample disclose information about the factors used to identify segments (mean value for occurrence 0.947; 233 companies, 94.72% of the sample) and about types of products and services by segment (mean value for occurrence 0.874; 215 companies representing 87.4%). The values for the *occurrence* scores for whether segments are aggregated (mean value 0.467; 115 companies representing 46.75%) and details about aggregation (mean value 0.402; 41 companies, 40.2%)⁶ indicate a low level of compliance with IFRS 8 requirements, since this disclosure is mandated by the standard. The data is consistent with concerns raised about the lack of disclosure about aggregation (ESMA, 2011; IASB, 2013b; Moldovan, 2014).

Table 5. Descriptive statistics for occurrence, clarity and consistency scores

	Mean	Std. dev.	Median	Min	Max	N
Panel A. Raw disclosure scores						
Segment disclosures						
<i>Occurrence of disclosures</i> (OCC_{SEG})	0.713	0.215	0.670	0.000	1.000	246
- factors used to identify segments	0.947	0.224	1.000	0.000	1.000	246

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	Mean	Std. dev.	Median	Min	Max	N
- types of products and services	0.874	0.333	1.000	0.000	1.000	246
- whether segments were aggregated	0.467	0.500	0.000	0.000	1.000	246
- factors for aggregation	0.402	0.493	0.000	0.000	1.000	102
<i>Clarity of disclosures</i> (CLAR _{SEG})	1.440	0.346	1.500	1.000	2.000	246
- factors used to identify segments	1.300	0.459	1.000	1.000	2.000	233
- types of products and services	1.736	0.442	2.000	1.000	2.000	216
- whether segments were aggregated	1.333	0.473	1.000	1.000	2.000	117
- factors for aggregation	1.268	0.449	1.000	1.000	2.000	41
<i>Consistency of disclosures</i> (CONSIST _{SEG})	0.822	0.291	1.000	0.000	1.000	246
- number of segments	0.925	0.258	1.000	0.000	1.000	246
- organizational structure	0.723	0.429	1.000	0.000	1.000	243
	Mean	Std. dev.	Median	Min	Max	N
Measures						
<i>Occurrence of disclosures</i> (OCC _{MEAS_TOTAL})	0.896	0.152	1.000	0.000	1.000	246
- measures (OCC _{MEAS})	0.896	0.201	1.000	0.333	1.000	246
- explanations (OCC _{MEAS_EXPL})	0.897	0.239	1.000	0.000	1.000	246
<i>Clarity of disclosures</i> (CLAR _{MEAS_TOTAL})	1.734	0.286	1.833	1.000	2.000	246
- measures (reconciliations) (CLAR _{MEAS})	1.852	0.333	2.000	1.000	2.000	246
- explanations (CLAR _{MEAS_EXPL})	1.606	0.420	1.667	1.000	2.000	246

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	Mean	Std. dev.	Median	Min	Max	N
Consistency of disclosures (CONSIST _{MEA} s)	0.389	0.156	0.375	0.047	0.889	246
- footnotes - MDA	0.320	0.209	0.286	0.000	1.000	246
- KPI - footnotes	0.387	0.193	0.354	0.000	1.000	246
- KPI - MDA	0.459	0.235	0.444	0.000	1.000	246
Panel B. Correlation analysis	OCC_{SEG}	CLAR_{SEG}	CONSIST_{SEG}	OCC_{MEAS_E}	CLAR_{MEAS_TOT}	CONSIST_{MEAS}
OCC _{SEG}	1					
CLAR _{SEG}	0.179***	1				
CONSIST _{SEG}	-0.002	0.132**	1			
OCC _{MEAS}	-0.087	-0.027	0.035	1		
OCC _{MEAS_EXPL}	0.081	0.157**	-0.004	-0.071	1	
CLAR _{MEAS_TOT}	0.101***	0.291***	0.002	-0.013	0.152***	1
AL						
CONSIST _{MEAS}	0.110*	0.034	0.157**	-0.043	-0.026	0.047
Panel C. Descriptive statistics for the aggregated scores	Mean	Std. dev.	Median	Min	Max	N
Mandatory disclosures	3.915	0.584	4.000	2.250	5.000	246
Clarity of disclosures	1.587	0.252	1.625	1.000	2.000	246
Discretionary disclosures	0.896	0.201	1.000	0.333	1.000	246
Consistency of disclosures	1.210	0.355	1.318	0.067	1.889	246

Note: This table presents the values for the three main scores for Segment Identification and Measures disclosed by segment (Panel A). Occurrence and consistency scores take values from 0 to 1, and clarity scores take values from 1 to 2. Details about coding are presented in Appendix A and Appendix B. Panel B reports the correlation analysis. ***, **, * denotes significance at the 1%, 5%, 10% level. Panel C presents the aggregated scores. Details about the scores are presented in Appendix A. The Mandatory disclosures score comprises OCC_{SEG}, CLAR_{SEG}, OCC_{MEAS-EXPL}, and CLAR_{MEAS_TOTAL} (scores 1, 2, 4.2 and 5 from Appendix A). The Clarity score comprises CLAR_{SEG} and CLAR_{MEAS_TOTAL} (scores 2 and 5 from Appendix A). The Discretionary disclosures score comprises OCC_{MEAS} (score 4.1 from Appendix A). The Consistency score comprises CONSIST_{SEG} and CONSIST_{MEAS} (scores 3 and 6 from Appendix A).

Moreover, the *clarity* of the information disclosed (for the companies disclosing the information) is rather low: 1.440 (maximum 2) for the clarity of disclosures about segment identification (CLAR_{SEG}), of which 1.736 for products and services by segments, and 1.333 or lower for the information reported about segments identification and aggregation (the median value is 1). These results indicate that companies disclosing the information generally utilize boilerplate disclosures (66%

of the sample provide boilerplate information about segments identification and aggregation). *Consistency* of the reported segments in the footnotes with the segments reported in the management commentary is 0.925 (92.5%), but consistency of the segment footnotes with the basis of organization of the company as described in the management commentary is only 0.723. Some companies present the same number of segments in some parts of the management commentary as in the footnotes, but the analysis of performance by segment is more detailed (some segments are analyzed in more detail). This evidence supports the statement by ESMA (2011: 12) that ‘it is not uncommon for management reports (or MD&A) to provide detailed discussions on many different activities that are not presented as reportable segments in the financial statements.’

Companies exhibit higher *occurrence* (OCC_{MEAS_TOTAL}) and *clarity* scores ($CLAR_{MEAS_TOTAL}$) for the measures reported by segments than for segments identification (mean value for occurrence 0.896 and for clarity 1.734) (maximum 2). The *occurrence* score for measures by segment reflects managerial discretion because IFRS 8 requires the disclosure of some information only if it is internally reported to the CODM and this cannot be externally assessed. Moreover, some companies specifically mention that assets and liabilities are not reported to the CODM, but the information is disclosed by segments. All the companies disclose more than one profitability measure (related to the income statement), 201 companies (81.71%) disclose at least one balance sheet measure by segment and 214 companies (87%) disclose other measures (cash flow statement, ratios, and non-financial measures). Around 187 companies (76.02%) report measures relating to all these three checklist items and 18 companies (17.32%) report only profitability measures. Most companies (198 companies, 80.49%) disclose definitions of the measures.

The level of *consistency* between the measures reported in the footnotes and in the management commentary ($CONSIST_{MEAS}$) is rather low: on average, 32%⁷ of the measures reported in the footnotes are also reported by segment in the management commentary (consistency score 0.320), 38.7 per cent of the KPIs (consistency score 0.387) are presented by segment in the footnotes and 45.9 per cent of the KPIs (consistency score 0.459) are presented by segment in the management commentary.

In terms of the measures reported, a detailed analysis reveals that often ‘accounting’ numbers (such as depreciation or impairment) are disclosed in the footnotes to the financial statements but less so in the management commentary. Some companies provide detailed information by segments for all main line items of the Statement of Comprehensive Income. For example, Renault, BMW, Ferrovial or Acciona disclose 40 or more measures. Other companies provide fewer measures that are more consistent with the management commentary. For example, Casino, Coloplast and Drax report in the segment footnotes only two measures, which in the case of Casino and Drax are also used to comment on segment performance in the management commentary (leading to a consistency score of 1).

Table 5 Panel B shows that the six raw disclosure scores have a limited number of correlations, which means they capture different aspects of disclosure. Generally, the scores do not have significant correlations, the highest significant correlation is 29.1% between $CLAR_{SEG}$ and $CLAR_{MEAS}$. I construct aggregated scores by grouping the raw scores. First, OCC_{SEG} , $CLAR_{SEG}$, OCC_{MEAS_EXPL} , $CLAR_{MEAS}$ reflect disclosures mandated by IFRS 8 and they are, therefore, more verifiable and enforceable. I group them under the label ‘Mandatory disclosures’. Second, given that occurrence and clarity ($CLAR_{SEG}$ and $CLAR_{MEAS}$) reflect different aspects of disclosure, I also present separately the ‘Clarity of disclosures’. Third, OCC_{MEAS} reflects to a high extent the discretion of the company in reporting measures by segment, given the management approach included in IFRS 8. I label this score ‘Discretionary disclosures’. Finally, the two consistency scores ($CONSIST_{SEG}$ and $CONSIST_{MEAS}$) are grouped under the ‘Consistency’ score and reflect another attribute of disclosure pertaining to various parts of the annual report. Table 5 Panel C reports the descriptive statistics for the four aggregated scores.⁸ The highest mean 3.9 (median 4) is for Mandatory disclosures (maximum 5). Discretionary disclosure scores are also high with mean 0.896 (median 1) out of a maximum of 1. Clarity of disclosures have a mean 1.587 (median 1.625) out of a maximum of 2 and Consistency scores are the lowest (mean 1.21, median 1.317 out of a maximum 1.889).

5.2 Regression results

Table 6 Panel A presents the results for ordinary least square (OLS) regression models with each of the six segment disclosure raw scores as dependent variables (OCC_{SEG} , $CLAR_{SEG}$, $CONSIST_{SEG}$, $OCC_{MEAS-TOTAL}$, $CLAR_{MEAS-TOTAL}$, $CONSIST_{MEAS-TOTAL}$) and with proxies for Oliver’s (1991) institutional factors as independent variables. Each segment disclosure score reflects an organizational response to IFRS 8 requirements thus showing the relevant institutional factors for segment disclosures. The main results in these models are as follows. Regarding Cause (P1), this factor is influential for occurrence of disclosure of segment measures (Model 4 SIZE positive and significant $p > 0.05$) and consistency of disclosure in footnotes and management commentary (Model 6 SIZE and PROFIT positive and significant $p < 0.10$). Regarding Constituents (P2), this factor is most influential for clarity of disclosure about segment identification (Model 2 CAP_MK, LIST and ANALYST positive and significant $p < 0.10$, $p < 0.05$, $p < 0.10$ respectively). There is also evidence of the impact of analyst following on segment identification disclosure (Model 1 ANALYST positive and significant $p < 0.01$) and on the clarity of disclosures about measures (Model 5 ANALYST positive and significant $p < 0.01$). Constituents reflecting the financing of the companies have also an impact,⁹ with creditors being important for occurrence of segment disclosures (Model 1 SHARE negative and significant at $p < 0.05$), consistency of segment disclosures (Model 3 SHARE negative and significant at $p < 0.10$) and consistency of disclosures about measures (Model 6 SHARE negative and significant at $p < 0.05$). Shareholders have an impact on the occurrence of measures (Model 4 SHARE positive and significant at $p < 0.10$).

Table 6. Factors associated with segment disclosures

Institutional factors	Variable	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
		Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Cause	SIZE	0.122	1.391	0.035	0.412	0.020	0.226	0.168**	1.600	0.070	0.090	0.137*	1.624
	PROFIT	-0.006	-0.093	0.062	0.848	0.018	0.266	0.079	1.200	-0.017	-0.250	0.105*	1.636
Constituents	SHARE	-0.152**	-2.101	-0.090	-1.242	-0.134*	-1.835	0.128*	1.790	-0.072	-0.967	-0.146**	-2.098
	CAP_MK	0.096	1.178	0.121*	1.460	0.199**	2.420	0.075	0.933	0.035	0.421	-0.153*	-1.947
	LIST	0.032	0.399	0.164**	2.138	0.070	0.869	0.021	0.270	0.032	0.392	0.049	0.636
Content	ANALYST	0.386***	3.666	0.213*	1.826	0.086	0.805	0.162	1.556	0.286***	2.268	0.066	0.653
	SECRECY	0.166*	1.565	0.088	0.933	-0.080	-0.749	-0.121*	-1.158	0.106	0.967	-0.138*	-1.553
	KPI	0.035	0.500	-0.041	-0.580	-0.047	-0.653	0.015	0.218	-0.168**	-2.327	-0.397***	-5.821
	MEAS	-0.105*	-1.568	0.041	0.614	-0.031	-0.462	0.275***	4.136	-0.076	-0.097	-0.021	-0.319
Control Context	SEG	-0.163**	-2.294	-0.099*	-1.398	0.066	0.918	0.076	1.080	-0.119*	-1.621	0.001	0.018
	STYPE:												
	- Business	-0.093	-1.092	0.139*	1.689	0.179**	2.069	0.198**	2.350	0.074	0.844	-0.030	-0.361
	- Geographic	-0.021	-0.250	-0.162**	-1.973	0.055	0.643	0.183**	2.200	-0.013	-0.146	-0.080	-0.988
	ENF	0.090**	2.006	-0.176**	-2.136	-0.071	-0.530	0.020	0.156	0.529***	3.885	-0.120	-0.938
	INDUSTRY												
	Consumer	0.196**	1.808	-0.098	-0.906	-0.103	-0.933	0.078	0.728	0.044	0.396	0.197**	1.878
	Discretionary												
	Consumer	0.046	0.474	-0.133	-1.392	0.023	0.238	0.048	0.504	0.094	0.946	0.157*	1.681
	staples												
Energy	0.049	0.572	-0.104	-1.204	0.090	1.031	0.019	0.217	0.030	0.558	0.121	1.452	
Health care	0.116	1.297	-0.214**	-2.408	-0.111*	-1.426	0.008	0.087	0.084	0.911	0.176***	2.040	
Industrials	0.032	0.291	-0.084	-1.169	0.081	1.006	0.130*	1.149	0.188**	1.821	0.193**	1.832	
Information	0.116**	1.788	-0.011	-0.031	0.053	0.808	-0.018	0.785	0.131*	1.529	0.108	1.344	
Technology													
Materials	0.148*	1.467	-0.077	-0.720	0.116	1.058	0.024	0.227	0.096	0.862	0.238***	2.288	
Telecom	0.009	0.106	-0.055	-0.669	0.019	0.226	0.040	0.486	0.083	0.965	0.122*	1.527	
services													
N		244		243		244		244		244		244	
Adjusted R ²		0.170		0.189		0.129		0.190		0.116		0.227	
F		3.125***		3.249***		1.669**		3.747***		2.261**		3.814***	

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Institutional factors	Variable	Model 7			Model 8			Model 9			Model 10		
		Mandatory disclosures			Clarity			Discretionary disclosures			Consistency		
		Coefficient	t-stat	t-stat	Coefficient	t-stat	t-stat	Coefficient	t-stat	t-stat	Coefficient	t-stat	t-stat
Cause	SIZE	0.090	1.020	0.083	0.939	0.227***	2.721	0.077	0.877				
Constituents	PROFIT	0.016	0.243	-0.003	-0.046	0.067	1.061	0.061	0.916				
	SHARE	-0.112*	-1.538	-0.091	-1.245	0.171***	2.484	-0.175***	-2.417				
	CAP_MK	0.183**	2.246	0.145*	1.767	0.022	0.286	0.197*	1.987				
	LIST	0.162**	2.031	0.120*	1.594	-0.141**	-1.867	0.079	0.993				
	ANALYST	0.349***	4.307	0.246**	2.317	0.053	0.535	0.100	0.947				
Content	SECRECY	0.143*	1.844	0.122	1.144	-0.200**	-1.989	-0.127*	-1.997				
	KPI	-0.058	-0.815	-0.115*	-1.609	0.022	0.332	-0.213***	-3.014				
	MEAS	-0.011	-0.166	-0.031	-0.461	0.334***	5.235	-0.055	-0.520				
	SEG	-0.104*	-1.451	-0.147**	-2.050	-0.032	-0.476	0.055	0.771				
Control Context	STYPE:												
	- Business	0.131*	1.623	0.115	1.333	0.032	0.395	0.134*	1.568				
	- Geographic	-0.039	-0.438	-0.132*	-1.660	0.044	0.535	0.010	0.115				
	ENF	0.187**	1.805	0.136	1.019	-0.122	-0.971	-0.111	-0.839				
	INDUSTRY												
	Consumer	0.069	0.634	-0.042	-0.382	-0.002	-0.024	0.002	0.021				
	Discretionary												
	Consumer staples	-0.020	-0.211	-0.040	-0.406	-0.015	-0.159	0.098	0.912				
	Energy	-0.034	-0.392	-0.043	-0.489	0.048	0.590	0.188*	1.474				
	Health care	-0.025	0.276	-0.099*	-1.499	-0.092	-1.089	-0.021	-0.154				
Industrials	0.029	0.267	0.049	0.447	0.118	1.140	0.174*	1.340					
Information	0.091*	1.496	0.062	0.954	-0.127*	-1.432	0.437	1.213					
Technology													
Materials	0.015	0.142	0.002	0.014	0.089	0.868	0.198**	1.851					
Telecom	0.006	0.072	0.009	0.108	0.016	0.203	0.102	0.836					
services													
N		244		244		244		244					
Adjusted R ²		0.165		0.158		0.252		0.170					
F		2.891***		2.799**		4.225***		2.957***					

Note: Panel A presents the results from six OLS regression models with segment disclosure variables as dependent variables. Dependent variables are defined in Appendix A. Independent variables are defined in Appendix C. The total sample size is 246 and missing observations are removed. ***, **, * denotes significance at the 1%, 5%, 10% level. Panel B presents the results from four OLS regression models with segment disclosure variables as dependent variables. Dependent variables are based on the sub-scores defined in Appendix A. The Mandatory disclosures score comprises OCC_{SEG}, CLAR_{SEG}, OCC_{MEAS_TOTAL}, and CLAR_{MEAS_TOTAL} (scores 1, 2, 4.2, and 5 from Appendix A). The Clarity score comprises CLAR_{SEG} and CLAR_{MEAS_TOTAL} (scores 2 and 5 from Appendix A). The Discretionary disclosures score comprises OCC_{MEAS} (score 4.1 from Appendix A). The Consistency score comprises CONSIST_{SEG} and CONSIST_{MEAS} (scores 3 and 6 from Appendix A). Independent variables are defined in Appendix C. The total sample size is 246 and missing observations are removed. ***, **, * denotes significance at the 1%, 5%, 10% level.

Regarding Content (P3) I observed negative and significant variables in Models 1, 2, 5 and 6. This indicates that constraints on disclosure are affecting occurrence, clarity and consistency of disclosures. I observe positive and significant variables for occurrence of disclosure of segment measures (Model 4 MEASURES and STYPE positive and significant $p < 0.01$ and $p < 0.05$) which could be expected – it suggests richness of disclosure about segment measures is more likely for companies that disclose more segment measures overall¹⁰ and provide both business and geographic segment analysis.

Regarding Control (P4), this factor is most influential for segment identification disclosure (Model 1 ENF positive and significant $p < 0.05$) and clarity of disclosures about segment measures (Model 5 ENF positive and significant $p < 0.01$). Regarding Context (P5), this factor is most influential for consistency of items in the footnotes and management commentary. Six significant variables and two insignificant variables (compared to the omitted dummy industry variable Utilities) indicate that there are differences between industry sectors in consistency of these disclosures.

To extend the analysis of the disclosure scores and the influence of institutional variables, I test the four aggregated scores shown in Table 5 Panel C. Table 6 Panel B reports the regression results for these Models 7-10. Regarding Cause (P1), this factor is most influential for discretionary disclosures (Model 9 SIZE positive and significant $p < 0.01$). Regarding Constituents (P2), this factor is influential for mandatory disclosures (Model 7 CAP_MK, LIST and ANALYST positive and significant $p < 0.05$, $p < 0.05$, $p < 0.01$ respectively, and SHARE negative and significant $p < 0.10$) and for clarity of disclosures (Model 8 CAP_MK, LIST and ANALYST positive and significant $p < 0.10$, $p < 0.10$, $p < 0.05$ respectively). There is some evidence for P2 related to discretionary disclosures (Model 9 SHARE positive and significant $p < 0.01$) and to consistency of disclosures (Model 10 CAP_MK positive and significant $p < 0.10$ and SHARE negative and significant $p < 0.01$). In addition, in these models there are also negative significant variables suggesting particular variables may reduce disclosure (Model 9 LIST negative and significant $p < 0.05$).

Regarding Content (P3) the strongest evidence of the effects of constraints on disclosure is for clarity (Model 8 KPI, SEGMENT and STYPE-geographic are negative and significant $p < 0.10$, $p < 0.05$ and $p < 0.10$). As in the models presented in Panel A, MEAS is positive and significant for discretionary disclosure.¹¹ Culture has an impact on discretionary disclosures (Model 9 SECRECY negative and significant $p < 0.05$) and consistency (Model 10 SECRECY negative and significant $p < 0.05$). Regarding Control (P4), this factor is most influential for mandatory disclosure (Model 7 ENF positive and significant $p < 0.10$). Regarding Context (P5), this factor based on industry differences is most influential for consistency (Model

10). Generally, the evidence presented in Panel B is in line with the models presented in Panel A.

5.3 Cluster analysis

As previously noted, the descriptive statistics presented in Table 5 Panel B show there are low correlations between the disclosure scores. Moreover, the regression analysis suggests that companies make use of different types of disclosures, which are associated with specific institutional factors. To further analyse the data, I perform agglomerative clustering (AHC) to place observations (companies) into groups of companies displaying similarities in their segment disclosure patterns. Table 7 reports the results of the cluster analysis.

Table 7. Cluster analysis results

Scores	Mandatory disclosures	Discretionary disclosures	Consistency
Range	0 - 5	0 - 1	0 - 2
Min	2.250		0.333
Max	5.000		1.000
Mean	3.915		0.896
St. deviation	0.584		0.201
<hr/>			
Groups			
Group 1 (N=102) <i>Compromise</i>	4.397		0.866
Group 2 (N=29) <i>Avoidance</i>	4.158		0.897
Group 3 (N=115) <i>Defiance</i>	3.426		0.922

Note: This table reports descriptive statistics for the three disclosure scores utilized in cluster analysis. The scores are based on the raw scores defined Appendix A. The Mandatory disclosures score comprises OCC_{SEG}, CLAR_{SEG}, OCC_{MEAS-EXPL}, and CLAR_{MEAS_TOTAL} (scores 1, 2, 4.2 and 5 from Appendix A). The Discretionary disclosures score comprises OCC_{MEAS} (score 4.1 from Appendix A). The Consistency score comprises CONSIST_{SEG} and CONSIST_{MEAS} (scores 3 and 6 from Appendix A). Companies are classified with AHC in three groups, based on their segment disclosure scores. The total sample size for this test is 246. The group label reflects the Oliver's (1991) strategies.

The AHC reveals three groups: group 1 has 102 companies and exhibits the highest values for Mandatory disclosures and Consistency. Group 3 has 115 companies and presents the lowest values for Mandatory disclosures. The second group, having 29 companies, has the lowest values for Consistency.

In line with prior empirical studies on Oliver (1991) (Fareed *et al.*, 2015), based on compliance scores I interpret the low level of compliance as representing a defiance strategy, basic compliance as avoidance, and high compliance as compromise. Next, I map the scores of the three groups of companies to the strategic responses developed by Oliver (1991). I base the strategy choice mainly on the values for mandatory disclosures, since this is a defining feature of financial

reporting. Group 1 therefore reflects an overall compromise strategy, group 2 an avoidance strategy, and group 3 a defiance strategy. I use these categories to compare companies' responses to segment disclosure requirements. Nevertheless, I acknowledge that companies may pursue various strategies simultaneously, as indicated in other studies on segment disclosures (Zelinschi *et al.*, 2012). The nature of this quantitative study and of the data collected precludes from a more detailed identification of strategies, a limitation acknowledged in other empirical studies based on Oliver (1991) (Clemens & Douglas, 2005; Clemens *et al.*, 2008; Guerreiro *et al.*, 2012; Fareed *et al.*, 2015).

Next I use multinomial logistic regression analysis to compare the importance of the institutional factors for the strategic responses between the three groups. Given that I clustered companies into three strategies, I run three multinomial logistic regressions (in a two-by-two analysis).

Table 8 shows that particular institutional factors can provide insights into the differences between the three groups, which are assumed to follow a particular disclosure strategy. Comparing companies with a compromise strategy to those with an avoidance strategy (that is, high disclosers with moderate disclosers), Model 1 shows Constituents (SHARE negative and significant $p < 0.01$ and CAP_MK positive and significant $p < 0.05$) then Cause (PROFIT positive and significant $p < 0.10$) are the factors that best explain adoption of the strategy. Comparing companies with a compromise strategy to those with a defiance strategy (that is, high disclosers with poor disclosers), Model 3 shows Constituents (SHARE is negative and significant $p < 0.05$, CAP_MK is positive and significant $p < 0.10$, LIST is positive and significant $p < 0.05$ and ANALYST is positive and significant $p < 0.01$) is the strongest explanatory factor. Content also appears to be an influential factor (MEAS, SEG and STYPE (business, geographic) are negative and significant $p < 0.10$, $p < 0.10$, $p < 0.05$ and $p < 0.05$ respectively).

In contrast, the evidence from the comparison of companies with an avoidance strategy and those with a defiance strategy (that is, moderate disclosers with poor disclosers) is not as strong or clear. Model 2 shows Cause (PROFIT negative and significant $p < 0.05$) and Constituents (LIST is positive and significant $p < 0.10$) may be important, as may Content (SEG is negative and significant $p < 0.10$). There are some industry differences in Model 3 as well. The factor Control (ENF) is not an explanatory factor in any of the three models.

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Table 8. Multinomial logistic analyses for various strategic responses to segment disclosures requirements

Institutional factors	Variable	Model 1 Compromise vs Avoidance		Model 2 Avoidance vs Defiance		Model 3 Compromise vs Defiance	
		Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Cause	SIZE	-0.042	0.054	0.067	0.143	0.025	0.044
	PROFIT	0.230*	1.601	-0.297**	2.529	-0.066	0.535
Constituents	SHARE	-0.344***	4.504	0.150	0.865	-0.194**	3.796
	CAP_MK	0.316**	3.142	-0.138	0.603	0.178*	2.711
	LIST	0.042	0.077	0.174*	1.322	0.216**	3.821
	ANALYST	0.132	0.394	0.204	1.027	0.337***	5.159
Content	SECRECY	-0.112	0.287	0.214	1.119	0.102	0.508
	KPI	-0.110	0.670	0.018	0.019	-0.092	0.902
	MEAS	-0.061	0.235	0.051	0.185	-0.112*	1.567
	SEG	0.084	0.244	-0.215*	1.710	-0.131*	1.875
	STYPE:						
	- Business	-0.180*	1.613	-0.036	0.076	0.189**	4.141
	- Geographic	-0.213*	2.146	0.024	0.029	-0.216**	5.522
Control Context	ENF	-0.025	0.008	0.192	0.533	0.168	0.846
	INDUSTRY						
	Consumer staples	-0.049	0.119	-0.160	1.455	-0.209**	3.755
	Energy	0.198*	1.516	-0.211*	1.667	-0.013	0.019
	Health care	-0.067	0.291	-0.027	0.049	-0.094	0.859
	Industrials	1.121	0.696	-0.183	1.085	-0.037	0.970
	Information	-0.022	0.041	-0.040	0.055	0.365	0.905
	Technology						
	Materials	0.154	0.843	-0.299***	3.267	-0.145*	1.709
	Telecom services	0.100	0.332	-0.216*	1.681	-0.116	1.370
	Utilities	0.027	0.038	-0.021	0.023	0.006	0.951
N	244						
Pseudo R ²	0.251						
Likelihood ratio	59.185***						

Note: This table presents the results of the multinomial logit regression. The dependent variable is ordinal and reflect the group to which the company belongs to. The groups are identified with AHC as reported in Table 2. Independent variables are defined in Appendix C. The total sample size is 246 and missing observations are removed. ***, **, * denotes significance at the 1%, 5%, 10% level.

In summary, the analysis suggests that different types disclosure can be linked to specific institutional factors. Mandatory disclosure is explained mostly by Constituents (ie capital market variables) and Control factors (enforcement) while Clarity of disclosures is more likely to be affected by Constituents and Content (proxies for proprietary costs) factors. Comparing high disclosing companies with poor disclosers, Constituents seems to be the factor that best explains the use of a different strategy. The factor Constituents seems most strongly associated with Mandatory disclosures and Clarity of segment disclosures and most weakly associated with the Discretionary disclosures. The factor Content appears to restrain the Clarity of segment disclosures and the Clarity and Consistency of measures reported but not the Occurrence of measures (Discretionary disclosures).

6. Conclusion

I investigate the IFRS 8 segment-related information disclosed in the footnotes to financial statements and in the narrative part of annual reports in 2012, and the factors associated with these disclosures. The sample includes 246 non-financial European listed companies from 16 countries included in S&P Europe 350 index. I calculate disclosure scores in a way that extends the approaches used in prior studies (Beattie *et al.*, 2004; Holder-Webb, 2007; Aerts & Tarca, 2010; Lang & Stice-Lawrence, 2015). Disclosures related to segment identification and to the measures reported by segments under IFRS 8 have been identified as being critical for implementation by practitioners, auditing and enforcement (ESMA, 2011; IASB, 2013b; Moldovan, 2014). The study focuses on the content of disclosure, following the lead of studies such as André *et al.* (2016), to arrive at measures that focus more on quality of disclosure than on compliance. I find higher values of occurrence and clarity and lower values of consistency for measurement disclosures than for segment identification disclosures.

The evidence about consistency is relevant to discussions about the quality of listed companies' financial reporting disclosures. Concerns have been expressed about the increasing length of annual reports, along with the proliferation of information that is boilerplate, repetitive or less useful for users (ESMA, 2011; IASB, 2013c; FRC, 2011). The evidence provides insights about the content of segment footnotes and management commentary reports and suggests there is scope to improve the consistency and conciseness of segment reporting. In some of the cases displaying low consistency scores, the information is available in the management commentary. For example, the structure of the company and the products and services generated by segments were detailed at the beginning of the annual report but not disclosed in the segment footnote (showing IFRS 8 non-compliance). On the other hand, other companies repeated the same information (regarding segment identification or definition of measures) in various parts of the annual report. Therefore, they scored highly on compliance (occurrence), consistency and eventually clarity, but some disclosures are redundant and make the annual report longer. These findings may inform the current discussions about the quality of financial disclosures and IASB projects on disclosure (IASB, 2018).

Moreover, I take a different theoretical perspective to provide further insights about managers' choices and disclosure practices. The study uses the institutional framework developed by Oliver (1991) to explore the factors associated with segment disclosures. The results provide evidence about the role of the institutional context, and particularly the factors of constituents and cause, in explaining the quality of segment disclosures. Of all the factors, content is particularly related to prior studies on segment reporting because it reflects the proprietary theory perspective. The findings add to the prior segment reporting research conducted

under this theoretical approach (Aboud & Roberts, 2018; André *et al.* 2016; Bugeja *et al.*, 2015), because the study shows how culture, the number of segments, the segment type, and measures and KPI disclosed represent constraints for various types of segment disclosure. For example, the results show that a culture characterized by secrecy represents a constraint for discretionary disclosures and for the consistency of disclosures, while the number of segments is a constraint for mandatory disclosures and for the clarity of disclosures.

Furthermore, I complement existing segment reporting research by emphasizing the role of constituents in segment reporting. Based on Oliver's (1991) predictions, I interpret the role of constituents as reflecting the importance of companies' dependence on various constituents for segment disclosure. Comparative studies investigating the role of constituents are scarce (Demerens *et al.* 2013). In this European sample, I find that companies with higher shareholders' equity ratios have, on average, a lower level of mandatory disclosures and consistency, but a higher level of discretionary disclosures. Moreover, companies based in countries with more developed capital markets and more analyst following have higher levels of mandatory disclosures and clarity.

This study is based on publicly available disclosures. Alternative data collection methods (such as interviews and surveys) can be used in future research to provide additional insights about the disclosure decisions made by companies. Moreover, since companies appear to use several types of organizational response in their disclosure decisions, the mechanism and reasons for doing so deserve additional investigation. While the effervescence in research following the first years of IFRS 8 adoption and further its Post Implementation Review is now decreasing, there is still recent research indicating that segment reporting under IFRS 8 deserves further reflection and analysis (Aboud & Roberts, 2018; Cereola & Dynowska, 2022; Gisbert *et al.*, 2024; Göttsche *et al.*, 2021; Saleh *et al.*, 2023), eventually under new angles in terms of information offered (e.g., Hsieh *et al.*, 2026).

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Appendix A. Coding checklist and scoring

Items	Details <i>The number of checklist disclosures provided divided by the number of applicable disclosures provided</i>
1. Occurrence of disclosures about segment identification in the footnotes (OCC_{SEG}) (Score minimum 0 maximum 1)	Total score as a proportion of 1
1.1 factors used to identify the entity’s reportable segments, including the basis of organization	1 if disclosed, 0 if not disclosed
1.2 products and services by segment	1 if disclosed, 0 if not disclosed
1.3 whether the operating segments have been aggregated	1 if disclosed, 0 if not disclosed
1.4 if aggregated, details about the aggregation	1 if disclosed, 0 if not disclosed
2. Clarity of disclosures about segment identification in the footnotes (CLAR_{SEG}) (Score minimum 1 maximum 2)	Total score as a proportion of 1
2.1 factors used to identify the entity’s reportable segments, including the basis of organization	2 if clear, company-specific information, 1 if general
2.2 products and services by segment	2 if clear, company-specific information, 1 if general
2.3 whether the operating segments have been aggregated	2 if clear, company-specific information, 1 if general
2.4 if aggregated, details about the aggregation	2 if clear, company-specific information, 1 if general
3. Consistency of disclosures related to segment identification (CONSIST_{SEG}) (Score minimum 0 maximum 1)	Total score as a proportion of 1

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Items	Details <i>The number of checklist disclosures provided divided by the number of applicable disclosures provided</i>
3.1 consistency between the number of segments reported in footnotes and in the management commentary	1 for consistency and 0 for the lack of consistency
3.2 consistency between the basis of organization for which performance is analyzed in footnotes and in the management commentary	1 for consistency and 0 for the lack of consistency
4. Occurrence of disclosures about measures reported by segments in the footnotes (OCC_{MEAS_TOTAL}) (Score minimum 0 maximum 1)	1 for consistency and 0 for the lack of consistency
4.1 Occurrence of disclosures about measures (OCC_{MEAS}) (Score minimum 0 maximum 2)	Total score as a proportion of 1
4.1.1 more than one item about segments' profitability	1 if disclosed, 0 if not disclosed
4.1.2 at least one item about assets or liabilities	1 if disclosed, 0 if not disclosed
4.1.3 at least one item besides profitability, assets or liabilities	1 if disclosed, 0 if not disclosed
4.2 Occurrence of disclosures about explanations about measures (OCC_{MEAS-EXPL})	Total score
4.2.1 items about segments' profitability	1 if disclosed, 0 if not disclosed
4.2.2 items about assets or liabilities	1 if disclosed, 0 if not disclosed
4.2.3 other measures	1 if disclosed, 0 if not disclosed
5. Clarity of disclosures about measures reported by segments (CLAR_{MEAS_TOTAL}) (Score minimum 1 maximum 2)	Total score as a proportion of 1
5.1 Clarity of disclosures about measures (reconciliations) (CLAR_{MEAS})	Total score
5.1.1 items about segments' profitability	2 if reconciliations are provided, 1 if in the reconciliation other segments, eliminations and unallocated items are aggregated
5.1.2 items about assets or liabilities	2 if reconciliations are provided, 1 if in the reconciliation other segments, eliminations and unallocated items are aggregated
5.1.3 other measures	2 if reconciliations are provided, 1 if in the reconciliation other segments, eliminations and unallocated items are aggregated
5.2 Clarity of disclosures about explanations about measures (CLAR_{MEAS-EXPL})	Total score
5.2.1 items about segments' profitability	2 if clear explanations are provided, 1 if boilerplate ('the same accounting policies as in the financial statements', but there are undefined measures
5.2.2 items about assets or liabilities	2 if clear explanations are provided, 1 if boilerplate ('the same accounting policies as in the financial statements', but there are undefined measures
5.2.3 other measures	2 if clear explanations are provided, 1 if boilerplate ('the same accounting policies as in

**Exploring the influence of institutional factors
on the segment disclosure practices of large European listed entities**

Items	Details <i>The number of checklist disclosures provided divided by the number of applicable disclosures provided</i>
	the financial statements', but there are undefined measures
6. Consistency of the type of items disclosed in the footnotes and the management commentary (CONSIST_{MEAS})	Total score as a proportion of 1
6.1 Consistency of the type of items disclosed by segments in the footnotes and management commentary (CONSIST_{FS-MC})	Total score
6.1.1 items about segments' profitability	Proportion of items disclosed in the footnotes which are also disclosed in the MC
6.1.2 items about assets or liabilities	Proportion of items disclosed in the footnotes which are also disclosed in the MC
6.1.3 other measures	Proportion of items disclosed in the footnotes which are also disclosed in the MC
6.2 Consistency of the type of items disclosed by segment in the footnotes and KPIs (CONSIST_{FS-KPI})	Total score
6.2.1 items about segments' profitability	Proportion of KPIs disclosed in the footnotes
6.2.2 items about assets or liabilities	Proportion of KPIs disclosed in the footnotes
6.2.3 other measures	Proportion of KPIs disclosed in the footnotes
6.3 Consistency of the type of items disclosed by segment in the management commentary and KPIs (CONSIST_{MC-KPI})	Total score
6.3.1 items about segments' profitability	Proportion of KPIs disclosed in the management commentary
6.3.2 items about assets or liabilities	Proportion of KPIs disclosed in the management commentary
6.3.3 other measures	Proportion of KPIs disclosed in the management commentary

Appendix B. Coding examples

Case 1 – Nestle

p. 53 Note 1. Operating segments reflect the Group's management structure and the way financial information is regularly reviewed by the Group's chief operating decision maker (CODM), which is defined as the Executive Board. The CODM considers the business from both a geographic and product perspective, through three geographic Zones and several Globally Managed Businesses (GMB). [...] Therefore, the Group's reportable operating segments are: Zone Europe, Zone Americas, Zone Asia, Oceania and Africa, Nestle Waters, Nestle Nutrition, Other. Zones as GMB that meet the quantitative threshold of 10% of sales, trading operating profit or assets, are presented on a stand-alone basis as reportable segments. Other business activities and operating segments, including GMB that do

not meet the threshold, like Nestle Professional, Nespresso, Nestle Health Service and the Joint Ventures in the Food and Beverages and Pharmaceutical activities are combined and presented in Other.”

1.1 OCC_{factors} = 1 [explicit presentation of the basis of organisation]

2.1 CLAR_{factors} = 2 [explicit presentation of the basis of organisation, with specific details]

1.2 OCC_{aggreg} = 1

2.3 CLAR_{aggreg} = 2

1.3 OCC_{factors aggreg} = 1

2.4 CLAR_{factors aggreg} = 2 [explanation that segments that do not meet the threshold are aggregated in Other; examples are provided for the sources of revenue]

Case 2 – Alstom

p. 82 Alstom (“the Group”) serves the power generation and transmission markets through its Thermal Power, Renewable Power and Grid Sectors, and the rail transport market through its Transport Sector. [...] The operational activities of the Group [...] are now organized in four sectors.

p. 85 Operating segments used to present segment information are identified on the basis of internal reports used by the Chief Executive Officer (CEO) to allocate resources to the segments and assess their performance.

MC: p. 5 – four segments, the same type of organization and description of products and services

1.1 OCC_{factors} = 1 [from the group’s presentation it is implicit that the group is organized by products]

2.1 CLAR_{factors} = 1 [boilerplate, no specific details]

1.2 OCC_{products} = 1

2.2 CLAR_{products} = 2

3.1 CONSIST_{segm.} = 1

3.2 CONSIST_{struct.} = 1

Case 3 – Wolseley

p. 105 Wolseley’s reportable segments are the operating businesses overseen by distinct divisional management teams responsible for their performance. All reportable segments derive their revenue from a single business activity, the distribution of plumbing and heating products and building materials.

p. 105 reportable segments for which the information is presented are: USA, Canada, UK, Nordic, France, Central Europe

1.1 OCC_{factors} = 0 [there is no explanation for the reportable segments actually reported; the presentation of activity excludes somehow the organization by products, but it does not present how it is made]

Case 4 – Danone

p. 65 “[...] the group’s four divisions: Fresh Dairy Products, Waters, Baby Nutrition and Medical Nutrition.” (no other information is provided about products).

1.2 OCC_{products} = 0

Case 5 – BMW

FS: p. 145 – 3 segments

MC: p. 24 – 40 – review of operations and details for the three segments plus other activities

3.1 CONSIST_{segm.} = 1 [same number of segments]

3.2 CONSIST_{struct.} = 0 [different structure for analysis]

Case 6 - Alstom

p. 85 The methods used to measure the key performance indicators of the segments for internal reporting purposes are the same as those used to prepare the consolidated financial statements.

p. 94 Measures reported by segments: sales, income (loss from operations), EBIT, segments assets, segment liabilities, capital employed, capital expenditure, depreciation and amortization in EBIT

There are definitions under tables for segment assets, liabilities and capital employed; EBIT is not defined

There are reconciliations for all measures, with separate columns for corporate and others and eliminations (there are no ‘other segments’)

4.1.1 OCC_{PL} = 1

4.1.2 OCC_{BS} = 1

4.1.3 OCC_{others} = 1

4.2.1 OCC_{expl PL} = 1

4.2.2 OCC_{expl BS} = 1

4.2.3 OCC_{expl other} = 1

5.1.1 CLAR_{PL} = 2

5.1.2 CLAR_{BS} = 2

5.1.2 CLAR_{other} = 2

5.2.1 CLAR_{expl PL} = 1 [boilerplate, no definition for EBIT]

5.2.2 CLAR_{expl BS} = 2 [assets, liabilities, capital employed are defined]

5.2.3 CLAR_{expl other} = 1 [capital expenditure is a line in CF statements, but is not defined, and in CF statements and other parts of the Annual Report it is mentioned that includes or excludes specific items]

Appendix C. Independent variable definitions and data sources

Institutional factors (Oliver, 1991)	Variable	Details	Source of data
Cause	SIZE	Size of the company (ln of total assets)	2012 Balance sheet
	PROFIT	Profitability measured as return on assets (ROA) (net profit attributable to shareholders divided by total assets)	2012 Financial statements
Constituents	SHARE	Total shareholders' equity divided by total assets	2012 Balance sheet
	CAP_MK	Capital market development measured as capital market's capitalization as a percentage in GDP in 2012	World Bank
	LIST	If the company is cross-listed – 2 if cross-listed in the US, 1 – if cross-listed on other markets, 0 otherwise	2012 Annual report, company's website
	ANALYST	The country's level of analyst activity measured as the mean number of analysts following listed firms in the country	Isidro and Marques (2015)
Content	SECRECY	Cultural preference for confidentiality and restraint of disclosure	Gray (1988)
	KPI	Number of KPIs disclosed by a company that can also be reported by segment (KPIs obtainable only at company level, such as share price, earnings per share are excluded)	2012 Annual report
	MEAS	Number of measures disclosed by a company by segment	Segment footnote
	SEG	Number of segments reported by a company	2012 Annual report
	STYPE	Type of segments disclosed (business, geographical or mixed)	2012 Annual report
Control	ENF	Enforcement measure reflecting the level of accounting enforcement activity by independent bodies	Brown <i>et al.</i> (2014)
Context	INDUSTRY	Industry	iShares Europe ETF

¹ Expected benefits were: improvements in the relevance and reliability of the segment information; investors will be able to see the business through management's eyes; and there will be more consistency between various sections of the annual report (ESMA, 2011; IASB, 2013a).

² The models include country fixed effects but do not include country-level variables.

³ The study is based on a sample of 400 European firms from 17 countries for the 2009 fiscal year. Firms are selected from the STOXX600 index. Enforcement is measured using a prior version of Brown *et al.* (2014).

- ⁴ Not only the number or existence of constituents is important for compliance, but their effectiveness in terms of financial communication pressures.
- ⁵ I acknowledge criticisms of Hofstede's work. However, Gray's (1988) framework and other measures derived from Hofstede are still widely employed to explain differences in accounting practices (Braun & Rodriguez, 2008; Hope, 2003).
- ⁶ This score is only computed for the companies that make a disclosure to state that they do not aggregate segments (102 companies).
- ⁷ The score reflects a weighted value for the three categories of measures (income statement measures, balance sheet measures and other measures) analyzed.
- ⁸ The grouping is validated by the correlation analysis presented in Table 5 Panel B. An additional Principal Component Analysis test was run. The individual scores cluster into the PCA factors under the same groupings. I choose to utilize in the analysis the aggregated scores because the three main factors generated by the PCA explain only 54.454% of the total variance.
- ⁹ The variable SHARE reflects the importance of both shareholders and creditors as sources of finance for companies (SHARE reflects the proportion of shareholder equity in total assets, the remaining part representing the creditors' contribution).
- ¹⁰ The OCC_{MEAS_TOTAL} score refers to both the number of measures and explanations about measures. Moreover, OCC_{MEAS} reflects the extent to which the disclosure of measures by segment is balanced between the financial statements, and not the number of measures reported (so association between OCC_{MEAS} and MEAS should not be presumed). For example, as per the coding explained in Appendix A, if a company reports 20 measures, all of them about profitability, the value of the OCC_{MEAS} will be 0.33 (lower than the mean or median as per Table 5), while MEAS will be 20 (higher than the mean or median as per Table 4).
- ¹¹ This should be interpreted as the total number of measures disclosed not representing a constraint for presenting them in a balanced manner.