

From IAS 14 to IFRS 8:

The role of proprietary and agency costs in shaping financial reporting

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Abstract

The relevance of segment reporting has prompted regulatory bodies to place significant efforts in refining the existent segment reporting regulation. The introduction of the IFRS 8 '*management approach*' in the segment reporting regulation was anticipated to facilitate a better understanding of the company's diverse businesses and regions, providing an opportunity to improve segment reporting disclosures. However, the effectiveness of segment reporting regulation is heavily influenced by the country regulatory environment and the characteristics of the firms. We exploit the Spanish institutional setting to provide further evidence on the real impact of IFRS 8 adoption. Our findings support the notion that the adoption of IFRS 8 has yielded few benefits to segment reporting. Importantly, our research reveals that segment disclosures have not exhibited heightened responsiveness to proprietary costs and have shown only a moderate response to agency costs after the adoption of IFRS 8.

Keywords: segment reporting, agency theory, proprietary costs, management approach

1. Introduction

As companies are more global and diversified, operating in a wide range of businesses, segment reporting is without a doubt an indispensable disclosure factor in investor's decision making (Wang, 2016, Chen and Zhang, 2003). Segment reporting allows the company to provide a complete understanding of the business and its international operations, and permits investors and analysts to assess past, current, and potential future risks, or new opportunities, that may arise in any market or any business in which the company is settled. Segment reporting is "*vital, essential, fundamental and indispensable to the investment analysis process*" (Knutson, 1993) and previous empirical evidence demonstrates that segment reporting reduces information asymmetries (Bergen and Hann, 2007), facilitates the prediction of the future firm's performance, and affects the cost of capital (Blanco et al. 2015).

The relevance of segment reporting has led regulatory bodies to place significant efforts into refining the existent segment reporting regulation, incorporating new improvements in disclosures linked to the new regulatory developments. However, the literature has documented that segment disclosures are barely changeable over time (Kang and Gray, 2013, Nichols et al, 2012) and that firms are very reluctant to provide extensive segment information to accomplish the new regulatory requirements (Leung and Verriest, 2019). It can be stated that segment reporting is one of the most sensitive topics in financial information and one where managers can easily find incentives to conceal information with the aim of protecting the company's competitive position or to avoid monitoring (Aboud and Roberts, 2018; Berger and Han, 2007; Leuz, 2004). Despite the reluctance of companies to comply, regulatory refinements about segment reporting have continued, opening the debate about whether the regulatory costs pay off and have a substantial improvement in the relevance of information disclosed by these companies (Veron, 2007; André et al, 2016).

In the EU, the IFRS 8 due process caused significant political controversy (Wang, 2016 and Crawford et al., 2014; Veron, 2007) driven by the presumption of the IASB that the new segment reporting standard and the adoption of the '*management approach*' criteria would facilitate US GAAP convergence and provide a better picture of the different businesses and regions in which the company operates (IASB, 2013). Those who disagreed with the adoption of the new regulatory changes claimed that IFRS 8 would facilitate discretion in the segment definition and could potentially bias reporting practices and impair the relevance of segment disclosures. Additionally, concerns about the adoption of the new IFRS 8 focused on small and non-diversified companies or jurisdictions with smaller capital markets have been raised (Veron, 2007; IASB, 2013; Paul and Largay, 2005; Hodgdon et al., 2009). The costs of disclosing commercially sensitive information for SMEs and the need to incur in higher preparation costs, may prompt SMEs companies to wrongly believe that their smaller size justifies reporting fewer number of segments under IFRS 8 (Veron, 2007).

Previous empirical evidence indicates a strong influence of the country's regulatory environment on segment reporting (Nichols et al, 2013). This emphasizes the importance of understanding how the country-level regulatory setting and the firm-specific conditions affect reporting practices and compliance with a new financial reporting standard (Kvaal and Nobes, 2012). Focusing on Spain, our dual objective is to contribute to the existing literature by assessing the efficacy of adopting IFRS 8 in a country with a small capital market and high levels of ownership concentration. Simultaneously, we aim to explore the impact of distinct organizational characteristics on segment reporting decisions in both the pre- and post-IFRS 8 adoption periods. Through this approach, we aim to achieve a comprehensive understanding of how company-specific attributes in a specific setting, shape the effects of financial reporting regulatory changes. Previous literature across the EU has mainly focused on European blue chips characterised by substantial regulatory and capital markets scrutiny and therefore, the

results may not be generalizable to other EU firms (Farias and Rodríguez, 2014). Evidence for the Spanish setting is limited to the year 2009, right after the IFRS 8 adoption, and does not provide in-depth analysis of the impact of two key determinants of segment disclosure: agency and proprietary costs. We contribute to the literature extending the analysis of the IFRS 8 post-implementation period and providing evidence on the role of agency and proprietary costs on the IFRS 8 segment disclosures.

We have focused on the Spanish institutional setting as Spanish firms have traditionally acted in a reporting environment where segment reporting was omitted. Segment reporting was rare across listed Spanish firms in the pre-IAS reporting period where national regulators traditionally gave priority to the avoidance of potential competition costs, offsetting any other economic benefit associated with greater disclosures. In addition, private firms have never been subject to the segment reporting requirements of public companies. The competitors of Spanish public firms are not required to provide segment information and therefore, they can take advantage of the information released by the listed firms without incurring in any proprietary cost. Under these circumstances, we presumed that Spanish companies would be reluctant to accommodate further changes in segment reporting. The introduction of IAS 14 was already a tremendous challenge for Spanish listed companies. Furthermore, we also need to take into consideration that most of the Spanish companies are relatively small and have fewer options to use segment aggregation to conceal information for users. The IFRS 8 introduction in 2009, is presumably a challenge where Spanish firms had few incentives to accomplish significant reporting changes. Additionally, the significant presence of controlling shareholders and a robust banking creditors position, creates a scenario in which protective mechanisms, safeguarding the company's competitive position, may take precedence over the pursuit of enhanced transparency policies.

We use a sample of 76 non-financial Spanish firms to document the impact of adopting IFRS 8, and the effect of proprietary and agency costs in shaping segment reporting for the seven-year period between 2005-2011, which covers the pre and post IFRS 8 adoption. The hand-collected segment reporting data has facilitated the analysis of the evolution of segment information over the years, identifying the lack of changes in the amount and format of the data reported. Our evidence suggests that the adoption of IFRS 8 has resulted in scarce benefits to segment reporting, with limited changes in the amount of information disclosed. Additionally, the regression analysis supports this argument and shows that the regulator intention to improve and enhance segment reporting was not as expected, despite the efforts invested in the standard issuing process (He et al., 2012; Wilkins and Khoo, 2012; Weissenberger and Franzen, 2013; Kang and Gray 2013; Bugeja et al., 2015).

The regression analysis corroborates that companies with abnormal returns may withhold information to deter potential competitors from entering the market and are more reluctant to extend secondary segments disclosures. However, the relevance of proprietary costs in shaping segment reporting has not been heightened after the IFRS 8 adoption. Conversely, our results for agency costs slightly suggest that they have gained a modest relevance in influencing segment disclosures after the IFRS 8 adoption, particularly, regarding the number of financial statements' items.

Our results hold significance for regulators evaluating any potential future changes to IFRS 8, and for companies seeking to enhance disclosures and the amount of segment information for shareholders. Our evidence contributes to the debate about the scarce impact of the IFRS 8 adoption and provides additional evidence about segment reporting and the relevance of organizational factors in the release of highly sensitive financial information.

The remainder of this paper is organized as follows: section 2 looks at the international development of the accounting regulation for segment reporting, section 3 shows the theoretical framework and develops our hypotheses; section 4 explains the sample selection and the methodology and finally, section 5 reports the results and section 6 concludes.

2. From the IAS 14 to IFRS 8 management approach

During the last decades, European companies complying with international regulation have faced three different segment reporting regimes: IAS 14 issued in 1981, revised in 1997 (IAS 14R) and finally, superseded by IFRS 8, issued in 2006. At all times, the IASB regulation has been significantly influenced by its US counterpart to progressively achieve a similar accounting standard for segment reporting.

The first IAS 14 (1981) was issued in a similar way to SFAS 14 (1976), incorporating the ‘*industry*’ approach that required firms to report information by industry. IAS 14 required the identification of two sets of segments, business and geographical, by using the risks and rewards approach, and one of them was regarded as primary and the other as secondary. IFRS 8 introduces a ‘management approach’ to identifying and measuring the financial performance of a company’s operating segments. This new approach expects manager to align the identification and reporting of operating segments with internal management reporting, and segment disclosures are based on management information reported to the chief operating decision maker.

However, criticisms were linked to the alternative interpretations of the ‘*industry*’ segment disaggregation, the lack of prescriptive guidance, or the use of ill-defined language (Nichols and Street, 2007; Prather-Kinsey and Meek, 2004). Exploratory studies at the time revealed that the application of both IAS 14 and SFAS 14 had not significantly contributed to an increase in segment reporting (Troberg et al., 2010). SFAS 14 was finally superseded by SFAS 131 in

1997, and the new FASB standard led to an increase in the level of segment disaggregation, improving the level of disclosures for each reportable segment that were identified based on the firm's internal structure, the so called 'management approach'. Evidence reported on the adoption of SFAS 131, revealed an increase in the number of segments reported with fewer single-segment companies (Nichols et al., 2000; Hermann and Thomas, 2000; Nichols et al., 2013; Street et al. 2000; Botosan and Stanford, 2005; Berger and Hann, 2003).

The IASB followed a similar strategy with the revision of IAS 14 in the same year. However, in spite of the introduction of the 'management approach' concept (see: IAS 14 par. 31), the revised standard did not succeed in converging with the US standard or satisfying the claims and needs of the users (Nichols and Street 2002; Prather-Kinsey and Meek, 2004). Alternatively, the revised IAS 14 adopted the '*risk and rewards approach*', under which the accounting segments would correspond to a meaningful division of a company's operations in terms of the different levels of risk and potential of value creation (Veron, 2007).

The segment reporting convergence project was one of those added to the IASB agenda following the Norwalk agreement in September 2002 with the aim of shortening the differences between the IASB and the FASB financial reporting framework that still existed, and to achieve a common objective of full convergence between the two sets of standards. IFRS 8 was issued in 2008 and was almost identical to its US counterpart SFAS 131, except for some terminology issues that were necessary to align the IFRS 8 with the other IASB standards (Crawford et al., 2014). IFRS 8 was expected to introduce significant changes to segment information, allowing investors to see the company's operations from a '*management perspective*', and therefore, provides users with a better understanding of their overall performance based on the analysis of the risks and rewards of the company's operations and markets (IASB, 2013; Veron, 2007). However, despite the argued benefits of the adoption of the new approach to identify segments,

which included the reduced costs for preparing the information; higher levels of transparency; usefulness and relevance of reported segment information, throughout the long due process of IFRS 8, which started in early 2006, letters were received from preparers that raised concerns about: (a) a potential reduction of geographical segment disclosures (Nichols et al, 2013; Veron, 2007); (b) the lack of comparability across segments between companies from similar industrial sectors or (c) the lack of time-series comparability within the firm, due to changes in the internal organization (IASB, 2013).

IFRS 8 is a principle-based standard that allows managers much more discretion when compared with IAS 14R¹ and therefore, increases the chances of information being concealed (Aboud and Roberts, 2018). Notwithstanding the criticisms received during the IASB due process, both the IASB and the European Commission were highly confident that the benefits of the adoption would outweigh any potential costs (EU, 2007; ESMA, 2011).

Studies on the adoption of IFRS 8 did not find major changes in segment reporting after the IFRS 8 adoption (Cereola et al; 2017; Bugeja et al, 2015; Crawford et al. 2012; Weissenberger and Franzen, 2013; Kang and Gray, 2013; He et al. 2012; Wilkins and Khoo, 2012; Mardini et al, 2012). Nichols et al. (2013, p. 273) posit that “*based on the review of the academic research on SFAS 131, the IASB anticipated an increase in the number of reportable segments following the IFRS 8 adoption*”. However, evidence varies significantly across countries corroborating Kvaal and Nobes (2012) assertion that IFRS is applied with a “national flavour”.

¹ IAS 14R distinguished between business and geographical segments and emphasized the fact that for external reporting purposes the segments were those for which the information was reported to the key management personnel for current and future evaluation purposes (EU, 2007; IAS 14R). Under IFRS 8, operating segments are broadly defined as those components of the entity that engage in business activities, and whose operating results are reviewed regularly by the Chief Operating Decision Maker (CODM) (IFRS 8). Under IAS 14R, specific reported line items for each operating segment were required, while under IFRS 8 reportable line items are those reported internally to the CODM leading to the release of non-GAAP performance measures that may affect comparability potentially leading managers to conceal information about non-profitable segments (EU, 2007).

3. Related literature and hypothesis development

Segment disclosure and proprietary costs

Nagarajan and Sridhar (1996) suggest that corporate ‘responses’ to additional disclosures are determined by diverse and complex factors that will depend on the manager’s perceived costs and benefits of the increased disclosure. Segment disclosures are commercially sensitive (Wang, 2016) and managers face a trade-off between disclosing information that may help capital markets to assess the value of the firm correctly, or alternatively withholding information to avoid potential harm to the firm’s competitive position (Healy and Palepu, 2001; Depoers and Jeanjean, 2012). The notion that proprietary costs are significantly related to disclosure has been extensively discussed in the literature (Verrecchia, 1983, 1990), which demonstrated that companies with a higher exposure to potential proprietary costs have a higher interest and tendency to conceal information to avoid any potential competitive disadvantages. Prior research in the US demonstrated that avoiding potential competitive harm in concentrated industries implies reducing the level of detail provided in segment disclosures (Harris, 1998; Botosan and Harris, 2005; Botosan and Standford, 2005; Tsakumis, et al, 2006; Pisano and Landriani, 2012). Similarly, Aboud and Roberts (2018) have linked proprietary costs with the quality of segment disclosures, showing that firms with greater proprietary cost provide lower-quality segment disclosure under IFRS 8.

Despite the manager’s concerns about the release of ‘*commercially sensitive information*’ the IASB considered that the new IFRS 8 was an opportunity to improve information about operating segments. The IASB was very reluctant to the inclusion of exemptions based on potential ‘*commercial costs*’ associated with the release of sensitive and strategic information. However, the IFRS 8 due process brought to light that larger firms were more likely to support IFRS 8 compared with smaller companies operating in fewer segments, or less competitive markets (Katselas et al., 2011; Pisano and Landriani, 2012) and the IASB was concerned about

the fact that despite the efforts of the due process, small listed entities operating in jurisdictions with smaller capital markets would be more sensitive and resented to adopt the new postulates of IFRS 8 (IASB, 2013a).

Before the IFRS adoption, Spanish companies would rarely disclose segment information (Cabedo and Tirado, 2002). Companies were allowed to withhold segment reporting if disclosing this information could be harmful to their strategic position. The adoption of IFRS introduced a new transparency-reporting scheme highly affected by potential pre-IFRS reporting disincentives such as proprietary costs (Gisbert et al., 2014). In addition, the Spanish capital market can be considered ‘small’ compared with the other EU markets. Most competitors of Spanish public companies are private firms, which are not required to release segment information. Therefore, balancing the segment reporting regulatory requirements and the need for transparency with potential proprietary costs is a delicate task for Spanish managers, who may be more sensitive to proprietary costs and therefore, reluctant to provide more information than their non-listed competitors. Therefore, Spanish managers have incentives to adopt a strategic approach of IFRS 8 that guarantees compliance while protecting their competitive interests.

Under this previously described setting and considering the discretion of the IFRS 8 ‘management approach’, we anticipate that proprietary costs will become more prominent as a firm-specific determinant of segment disclosures following the adoption of IFRS 8. Thus, examining potential differences in the impact of proprietary costs on segment disclosure after the adoption of IFRS 8 becomes an open question that we have explored, leading us to develop the following hypotheses:

H1: Ceteris paribus, the relevance of proprietary costs in shaping segment disclosures increased after the IFRS 8 adoption.

The agency relationship and the segment disclosure decision.

The traditional motivation offered by the literature to explain non-disclosure is that disclosure reveals proprietary information (Berger and Hann, 2007). However, the misalignment of interests between the agent (manager) and the principal (shareholder) postulated by Agency Theory, creates incentives for information asymmetries that may potentially permit a transfer of wealth from owners to managers. Under these circumstances, control mechanisms must be in place to realign both the managers' and shareholders' interests (Jensen and Meckling 1976) and financial information transparency is one of these mechanisms.

Previous studies have documented that high levels of ownership diffusion are associated with higher agency costs (Andre et al. 2016) and under these circumstances, disclosures are expected to increase (Raffournier, 1995). The presence of independent directors on the board also mitigates agency costs as they monitor the managers and promote additional disclosures (Amstrong et al. ,2014; Gisbert and Navallas, 2012; Lin et al, 2007). Conversely, in settings with highly concentrated ownership structures, the dominant shareholders or creditors possess direct and preferential access to internal corporate information, and they can leverage their power to appoint directors and influence managerial decisions (Shleifer & Vishny, 1997). As companies are more global, segment reporting is without a doubt an indispensable disclosure factor (Wang, 2016, Chen and Zhang, 2003) to reduce agency costs. However, under a context of high ownership concentration, the majority shareholders have incentives not only to conceal information to avoid potential proprietary costs, but also to avoid monitoring from minority shareholders, reducing the amount of publicly disclosed information.

The mandatory switch to IFRS 8 offers the opportunity to apply the 'management approach' to either enrich segment information and therefore reduce agency costs, or alternatively, use the higher embedded discretion to conceal segment information to minority shareholders. The

Spanish setting is characterised by the presence of a strong ownership concentration across listed firms and a high level of family-controlled companies (Faccio and Lang, 2002), which may lead to potential agency conflicts between minority and majority shareholders (Dyck and Zingales, 2004). Following the IFRS 8 implementation, we anticipate that Spanish managers may strategically employ the discretion provided by the regulation to reduce the extent of segment information disclosed. Thus, examining any differences in the impact of agency costs on segment disclosure after the adoption of IFRS 8 becomes an open question that we have explored, leading us to develop the following hypotheses:

H2: Ceteris paribus, the relevance of agency costs in shaping segment disclosures has increased after the IFRS 8 adoption.

Methodology

Data and sample selection

The initial sample included all non-financial listed Spanish companies for the period 2005-2011. Our aim was to understand the impact of a regulatory change and key firm-specific reporting determinants on segment disclosures. Therefore, we considered the years immediately before and after the adoption of IFRS 8 for the empirical analysis².

Annual Reports were obtained from the Spanish Securities and Exchange Commission Database (CNMV). The sample was restricted to those companies with data available for at least 6 out of the seven years of analysis, so that we could guarantee that changes in the segment reporting practices were not driven by changes in the composition of the sample.

² An exploratory analysis of the segment-reporting note to the financial statements in the latest annual reports (2020 and 2021) of the sample company provides a similar reporting picture across the sample companies, suggesting a significant stickiness in segment information.

The sample consisted of 76 Spanish listed companies (521 observations). Table 1 details the sample selection process. Excluding the outliers³ reduced the final sample to 74 companies and 447 observations.

Insert table 1 about here

Segment disclosures were collected from the notes to the financial statements. IAS 14R required the identification of a primary and secondary segment criteria, based on product or geographical distribution. We manually identified the primary and secondary reporting criteria based on the information reported in the Annual Reports. For each firm- year observation we collected data on the number of primary and secondary reported segments as well as the number of balance sheet and profit and loss items reported for each segment. During the IFRS 8 period and consistent with previous studies (Aleksanyan and Danbolt, 2015; Crawford et al., 2012), we considered the IFRS 8 ‘reportable’ segments equivalent to the IAS 14R ‘primary’ segments. Similarly, the IFRS 8 ‘entity-wide’ disclosures were treated as equivalent to the secondary segments under IAS 14R. As in previous studies (Aleksanyan and Danbolt, 2015), we observed that most of the sample companies reported as entity-wide disclosures the information that had been previously considered as secondary segment disclosures under IAS 14R.

Regression model and variable measurement

We relied our analysis on the following regression model:

$$\begin{aligned} Segments_{it} (Items_{it}) = & \alpha_0 + \beta_1 adjROA_{it} + \beta_2 Herfindahl_{it} + \beta_3 Ownership_{it} + \beta_4 Independence_{it} \\ & \beta_5 Size_{it} + \beta_6 Leverage_{it} + \beta_7 IFRS\ 8\ x\ adjROA_{it} + \beta_8 IFRS\ 8_{it} \times Herfindahl_{it} + \beta_9 IFRS\ 8_{it} \times \\ & Ownership_{it} + \beta_{10} IFRS\ 8_{it} \times Independence_{it} + Year\ FE + \varepsilon_{it} \end{aligned}$$

³ We excluded observations in the extreme 1 % tails of their respective distributions for all the explanatory and independent variables.

Where:

$Segments_{it}$ measures the total number of segments reported and $Items_{it}$ corresponds to the number of balance sheet and income statement line items for each reported segment.

Industry competition is expected to affect the potential proprietary costs that a firm face when reporting on the performance of its different businesses. However, the relationship between proprietary costs and industry competition is a matter of debate. Most authors suggest that companies operating in industries with a significant number of competitors may face higher proprietary costs, leading them to curtail disclosures to avoid the potential loss of competitiveness (Gray 1981; Edwards and Smith 1996; Harris 1998). Alternatively, a scarcity of competitors may also dissuade firms from making additional disclosures to avoid the entrance of new competitors into the market (Harris, 1998; Botosan and Standford 2005; Pisano and Landriani, 2012). Like previous studies (Berger and Hann, 2007, 2003; Botosan and Stanford, 2005), we measured proprietary costs using two variables that proxy for industry competition: the Herfindahl index and the industry-adjusted ROA. All industry sectors were identified according to the primary two-digit NACE industry codes reported in the Orbis database. The industry financial information was collected from the Spanish Central Bank (Banco de España) database.

The Herfindahl index ($Herfindahl_{it}$) is widely used to measure the level of industry concentration and is computed as follows:

$$\sum_{i=1}^n [s_{ij}/S_j]^2$$

Where:

s_{ij} = business i 's sales in industry j , as defined by two-digit NACE codes.

S_j = the sum of sales for all businesses in industry j , as defined by two-digit NACE codes.

s_{ij}/S_j = the business i market share

n = the number of companies in industry j .

The greater the value of the Herfindahl index, the higher the level of industry concentration and therefore, the lower the industry competition. Similarly to previous studies, we consider that companies in high- concentrated industries are more affected by proprietary costs and therefore, managers will be reluctant to increase segment information (Andre et al, 2016; Berger and Hann, 2003). We therefore posit a negative relationship between the Herfindahl index and the amount of segment information.

The $adjROA_{it}$ is the second variable to proxy for proprietary costs. It is calculated as the difference between the company's ROA⁴ and the industry median ROA. Companies outperforming their competitors, and therefore with a positive $adjROA_{it}$, face greater risks to lose their competitive advantage relative to their current or potential competitors. Therefore, they face higher proprietary costs and managers have more incentives to limit segment disclosures (Wang, 2016; Berger and Hann, 2003; Leung and Verriest, 2019). We therefore posit a negative relationship between $adjROA_{it}$ and the amount of segment information.

The ownership structure of the company and the inclusion of independent directors on the board are regarded as influential factors in shaping the agency relationship within the firm. Consequently, they are often viewed as proxies for measuring agency costs. $Ownership_{it}$ is measured as the percentage of equity shares controlled by majority shareholders while $Independence_{it}$ measures the percentage of independent members in the board of directors.

⁴ Income before taxes divided by total assets.

Previous studies show that higher levels of ownership concentration are associated with lower levels of disclosure, whereas a substantial presence of independent directors has the opposite effect, leading to enhanced disclosures (Lim et al, 2007, Gisbert and Navallas, 2012). We therefore posit a negative relationship between ownership concentration and the amount of segment information. Conversely, we posit a positive relationship between the presence of independent directors and the amount of segment information.

In order to test our hypotheses we interact *Herfindahl_{it}*, *adjROA_{it}*, *Ownership_{it}*, and *Independence_{it}*, with the dummy variable IFRS 8_{it}. This variable takes the value 1 for the IFRS 8 period 2009-2011, 0 otherwise.

We included as control variables: Size (*Size_{it}*) and Leverage (*Leverage_{it}*). Based on previous literature we expected larger firms to disclose higher levels of segment information (Prencipe, 2004; Meek et al, 1995). Leverage implies more agency costs (Prencipe, 2004), and therefore may discipline managers towards more disclosures (Meek et al, 1995). However, the evidence is not always consistent with this positive relationship (Leuz, 1999). Alternative, evidence in other countries (Pisano and Landriani, 2012) indicate a negative relationship between leverage and segment disclosures. As these authors argue, companies with higher debt levels may be funded by banks that acquire private information directly from the firm. Consequently, such firms are inclined to disclose less public information, and the market may exhibit reduced demand for information concerning these companies.

Main results

Descriptive analysis on the segment reporting decision

Table 2 shows the number of sample firms using either the industry or geographical criteria for segment reporting. Across the total period of analysis (2005-2011) more than 80 % of the

sample companies used '*products*' as the primary segment disclosure criteria, whereas '*geographical area*' was used as the primary segmentation criteria in only 14 % of the sample firms. Geographical segmentation was chosen as '*entity wide disclosures*' (secondary segment criteria under IAS14R) in 71 % of the sample companies, whereas 20 % did not report any secondary segment.

Insert Table 2 about here

Table 3 provides the descriptive statistics for the dependent variables: $Segments_{it}$ and $Items_{it}$. These results are consistent with the IFRS 8 post-implementation literature that highlights that, despite the interest of investors expecting a higher number of reported segments, there have not been any significant changes either in the structure of the information or in the number of reported segments (IASB, 2013). Non-reported analysis revealed that only 19 firms increased the number of reported primary segments after adoption of the IFRS. Similarly, 16 companies in the sample decreased the number of reported primary segments after adoption of IFRS 8.

Insert Table 3 about here

IFRS 8 brings little variation in the number of primary reported segments both for '*products*' and '*geographical area*' segment disclosures. There was a small decrease in the number of primary reported segments that was not replicated across secondary segments (Table 3 Panel B) where the '*geographical area*' secondary segmentation, showed a modest increase in the number of segments reported.

Regarding the balance sheet and income statement items, IFRS 8 requires similar information compared with IAS 14 and adds other items to the list of potential disclosures, i.e. interest revenue, interest expense and tax expense. However, IFRS 8 disclosures are only required if reported to the CODM, and this condition raised concerns from the very beginning about a

potential decrease in the number of balance sheet or profit and loss items disclosed across segments (Nichols, et al. 2013). As Nichols et al (2013) explain, evidence from most European countries confirmed these criticisms and revealed a significant decrease in the number of items disclosed for operating segments (Crawford et al., 2012 and Nichols et al., 2012).

Evidence for our sample showed that the number of items disclosed across segments increased after the adoption of IFRS 8, particularly across ‘*products*’ primary segments (panel A Table 3). Both the number of balance sheet and income statement items showed a slight increase for the 2009-2011 period. However, this increasing tendency was not replicated across ‘*geographical*’ segments, where the number of items reported decreased along the IFRS 8 time-period. We observed similar results for the secondary segments (panel B Table 3). Therefore, our descriptive analysis suggests that the adoption of IFRS 8 has not increased the number of segments but has affected the number of items reported based on the ‘‘*products*’ segment disclosure criteria. Additionally, we observed that the number of items disclosed across ‘*products*’ secondary segments doubles the number of items disclosed across ‘*geographical*’ secondary segments, suggesting that companies are more sensitive to disclosing detailed secondary geographic disclosures.

The time-series data for the key independent variables, i.e. $Segments_{it}$ and $Items_{it}$ corroborates the previous analysis. Table 4 (panel A) indicates: (a) a subtle decrease in the number of reported primary segments during the time of analysis and (b) a moderate increase in the number of items reported in the primary business segments after the implementation of IFRS 8. Additionally, the time-series analysis shows that the geographical secondary segment disclosures increased moderately after the implementation of IFRS 8 (panel C Table 4)

Insert Table 4 about here

Table 5 provides descriptive statistics for the explanatory variables. This table shows the mean, median, standard deviation, and the 1st and 3rd quartile values for the variables used in the regression analysis. Panel B shows the descriptive statistics for the variables for the periods pre- and post- IFRS 8. The descriptive statistics for the sample firms remained stable across time.

Insert Table 5 about here

The average ownership concentration of the sample was 56,50 %. These results corroborate that the ownership structure of the Spanish listed companies is highly concentrated. There is a moderate presence of independent directors (31,91 %) in corporate boards. The adjusted ROA is negative on average, signalling a significant number of companies underperforming compared to the industry median. The values for the Herfindahl index exhibit wide variation, meaning that concentration levels vary significantly across industries.

Insert Table 6 about here

Table 6 presents the correlation matrices for the variables used in the regression model. The number of segments disclosed ($Segments_{it}$) is positively and significantly correlated with the proportion of independent directors, the Herfindahl Index, size and leverage. Conversely, the number of segments ($Segments_{it}$) is negatively correlated with AdjROA. The number of items ($Items_{it}$) is positively and significantly correlated with the Herfindahl Index, Size and leverage. However, it is negatively correlated with the proportion of independent directors. The highest correlation coefficients between the independent variables are between Size and Herfindahl (42%) and Size and Leverage (+37 %), all other correlation coefficients are lower. This suggests that large companies may belong to highly concentrated industries with therefore, low industry competition.

Regression results

We provide the results of the OLS and firm fixed-effects ⁵ results that are summarized in tables 7 and 8. Table 7 reports the results for the *Segments_{it}* and Table 8 for *Items_{it}*. dependent variable. Additionally, we break down each analysis in three panels in order to extend the regression analysis to the primary and secondary segments.

The OLS results for the *adjROA_{it}* variable in Table 7 are consistent with previous studies (Botosan and Standford, 2005; Berger and Hann, 2007) and corroborate the view that firms outperforming the industry, and therefore reporting a higher ROA, conceal segment information to maintain their competitive advantage. Consistent with expectations, the coefficient on the OLS regression for the *adjROA_{it}* variable is negative and significant in Table 7. However, the analysis for the primary and secondary segments reveals that this proprietary cost variable is only relevant for the secondary segments.

Surprisingly, the *adjROA_{it}* negative coefficient turns positive and statistically significant at 10% in the fixed-effects model. However, when considering the primary and secondary segments, the previously observed statistical significance disappears. Table 8 reports non-significant results for the *adjROA_{it}* variable, suggesting that this variable does not play a role in the number of items reported for each segment.

None of the OLS results for the *Herfindahl_{it}* variable in Table 7 are statistically significant. Similarly, the fixed effects regression analysis reveals non-significant results in Panels A and

⁵ The fixed effects approach has certain caveats and limitations in our research setting. It does not produce any estimate for the effects of variables that do not change over time and its estimates may be imprecise for explanatory variables that vary greatly across individuals but have little variation over time for each individual. Controlling for firm-fixed effects when explanatory variables have little variation within individuals leads to substantially larger standard errors, higher p-values and wider confidence intervals, that is, non-significant results. The best situation for a fixed effects analysis is when all of the variation on a time-varying predictor is within people (Allison, 2005). An ANOVA analysis allowed us to determine the within-firm variation for the different independent variables in our model. For these, most of the variation was between firms and within-firm variation was low: *Indepedent_{it}* = 35 %, *Ownership_{it}* = 35 %, *Herfindahl_{it}* = 24 %, *AdjROA_{it}* = 59 %, *Size_{it}* = 35 % *Leverage_{it}* = 46 %.

B. However, in Panel C, the regression results evidence a positive significant effect of the Herfindahl variable in the number of reported secondary segments. These results are also corroborated in Table 8. In contrast to findings from other studies (Pisano and Landriani, 2012), our analysis only partially supports the notion that the level of industry concentration, as measured by the Herfindahl index, influences the number of secondary reported segments (Table 7) and reported items (Table 8). Surprisingly, our results indicate that after controlling for firm-specific effects, companies operating in industries with more concentration and therefore, less competition, disclose a higher number of secondary segments and financial statement items in their segment information. This outcome suggests that as companies face less competition in highly concentrated industries, they may be less reluctant to share more detailed secondary segment information.

The coefficients on the interaction terms $IFRS\ 8_{it} \times adjROA_{it}$, and $IFRS\ 8_{it} \times Herfindahl_{it}$, are not statistically significant in any of the regression models reported in tables 7 and 8 and therefore, we are unable to provide support for H1. This lack of statistical significance suggests that companies characterized by high proprietary costs have not shown a heightened sensitivity or responsiveness to segment disclosures under the IFRS 8 "management approach." There is no indication of a discernible shift in the impact of proprietary costs on shaping segment reporting subsequent to the adoption of IFRS 8.

If we focus on the impact of governance variables on the segment disclosure decision, the OLS results reported in Table 7 corroborates the significant negative impact of the ownership structures (on the number of reported segments ($Segments_{it}$)). More precisely, the results corroborate that concentrated ownership deters managers from increasing the number of reporting segments. However, these results do not hold for the fixed-effects analysis.

The reported coefficient for the *Independent_{it}* variable in Table 7 is not significant. However, results in Table 8 indicate that independent directors influence the number of items disclosed. Contrary to expectations, the presence of independent directors negatively affects the number of reported items. This result suggests that companies with a higher percentage of independent directors may place a higher emphasis on avoiding the potential competitive harm of further disclosures and therefore, reduce the level of detailed information, focusing on the reduction of the number of items disclosed, particularly in primary segments. However, the statistical significance of the *Independent_{it}* variables in the OLS regression model does not extend to the results of the fixed-effects model.

Insert Table 7 about here

The analysis for the influence of the proxies for agency costs on IFRS 8 segment reporting supports H2. The coefficients on the interactions $IFRS\ 8_{it} \times Ownership_{it}$, and $IFRS\ 8_{it} \times Independent_{it}$, are statistically significant in the fixed-effects regression. Therefore, the fixed effect results suggests that ownership concentration and the presence of independent directors is gaining relevance after the IFRS 8 adoption. Evidence reported in table 8 suggest that ownership concentration has a negative impact on the number of reported items while the presence of independent directors has positively affected items disclosures under IFRS 8. However, these results partially dissipates when we look separately to primary and secondary sector' items.

Insert Table 8 about here

The results of the two control variables are worth noting. We found a positive and statistically significant coefficient estimate for the SIZE variable, which corroborates the relevance of the size of a company in the number of segments and items disclosed. Larger firms report more segments and more balance sheet and net income items. Regarding the leverage variable and consistent with previous studies, there is not a clear impact of this firm-specific characteristic on the segment disclosure decision. Leverage does not affect the number of reported segments. However, noteworthy is the OLS regression results for this variable, that shows a significant impact on the number of reported items, suggesting that highly leveraged firms increase detailed disclosures for each reported segment.

Our descriptive results indicate that the implementation of IFRS 8 has yielded very limited advantages in the context of segment reporting. This aligns with existing literature from various institutional settings, which has consistently observed minimal alterations in segment reporting

practices across companies in Europe (He et al., 2012; Wilkins and Khoo, 2012; Weissenberg and Franzen, 2013; Kang and Gray, 2013; Bugeja et al., 2015). The regression analysis is not absent to several limitations related to the sample size, within company variations across the explanatory variables and the use of OLS and fixed-effects regression analysis. However, from our main results we can observe that there is no indication of a discernible shift in the impact of proprietary costs on shaping reportable segments subsequent to the adoption of IFRS 8. However, this is not the case for the number of reported items. Results provide weak evidence on a significant impact of or agency costs in shaping the number of financial statements' items after the IFRS 8 adoption, that partially suggests that agency costs have gained relevance in the configuration of segment disclosures after the IFRS 8 adoption.

Conclusions

Using a sample of 76 Spanish listed companies, we manually identified segment reporting disclosures for the period 2005-2011 to test whether the adoption of IFRS 8 implied a significant change in segment reporting practices across Spanish firms, and to document the effect of proprietary and agency costs in shaping segment reporting after the adoption of IFRS 8.

The relevance of segment reporting led regulatory bodies to place a significant effort into refining IAS 14 to introduce the 'management approach' under IFRS 8 and facilitate its convergence with US GAAP. However, the due process caused a significant political controversy within the EU raising concerns about whether the regulatory costs would effectively lead to significant improvements in segment reporting, particularly in those countries with smaller capital markets. Spain is one of those countries, where firms have traditionally acted in a reporting environment where segment reporting was omitted, and therefore, managers were reluctant to accept further changes in disclosure policies.

Our findings suggest that the adoption of IFRS 8 has resulted in scarce changes to segment reporting, reinforcing the previous literature in other institutional settings (He et al., 2012; Wilkins and Khoo, 2012; Weissenberg and Franzen, 2013; Kang and Gray, 2013; Bugeja et al., 2015). The descriptive evidence shows that on average, after the adoption of IFRS 8 firms decreased the number of reported primary segments and few increases were observed in the number of geographical secondary segments or the number of items disclosed across segments.

The regression results indicate that the adoption of the management approach in IFRS 8 has not heightened the significance of proprietary costs in shaping segment information. Conversely, our results suggest that ownership structures and the role of independent directors have played a role in influencing segment disclosures after IFRS 8 adoption particularly, in the level of profit and loss and balance sheet line items provided for each reported primary segment. Therefore, our regression analysis partially supports H2 and suggests that changes in the Spanish ownership structures coupled with the presence of independent directors during the period of study, have affected segment disclosures after the IFRS 8 adoption.

Notwithstanding the results, it is essential to acknowledge the limitations inherent in this study. Firstly, the research is constrained by its exclusive focus on a single institutional setting, limiting the generalizability of the results. Additionally, the study's temporal scope, encompassing only a few years post the adoption of IFRS 8, may constrain the ability to capture longer-term effects or changes that might emerge over an extended period. Despite the limitations, our study contributes to the debate about the impact of the IFRS 8 adoption, provides evidence on the main determinants of segment disclosures in a specific institutional setting and contributes to the debate on the need to impose greater mandatory disclosures to avoid information-concealing practices.

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Table 1 Final sample

Sample selection process	Companies	Obs
Non-financial firms listed in the Madrid Stock Exchange for the period 2005-2011	118	794
Less missing observations	(33)	(237)
Less companies with less than six years of full data	(9)	(36)
Total	76	521
Final Sample	74	449

Table 2 Segment reporting criteria (primary vs. secondary) across periods and sample firms**Panel A: Primary segment**

	2005-2008 IAS 14R		2009-2011 IFRS 8		2005-2011	
	Obs	%	Obs	%	Obs	%
Products	247	83,16%	186	83.04%	433	83.10%
Geographical areas	41	13,8%	34	15.18%	75	14.39%
Products & Geographical	-	-	3	1.34%	3	0.57%
Non-reported primary segments	9	3,03%	1	0,44%	10	1,91%
Total	297		224		521	

Panel B: Secondary segment

	2005-2008 IAS 14R		2009-2011 IFRS 8		2005-2011	
	Obs	%	Obs	%	Obs	%
Products	26	8,75%	15	6,69%	41	7.86%
Geographical areas	214	72,05%	158	70,54%	372	71.40%
Non-reported secondary segments	57	19,19%	51	22,76%	108	20.73%
Total	297		224		521	

This table reports the descriptive analysis of the segment information collected from financial statements. It reports the number of companies selecting either the: “products” or “geographical areas” criteria as their primary or secondary segment. Obs= firm-year observations; % refers to the percentage of observations in each category.

Table 3 Descriptive statistics of the segment disclosure variables*Panel A: Primary segment Descriptive statistics*

Primary segment						
2005-2008				2009-2011		
	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>
Mean	3.58	5.61	7.38	3.43	5.80	7.69
Median	3	4	7	3	4	7
Std	1.60	5.30	4.86	1.60	5.73	4.73
Max	8	26,00	25	8	26	25
Min.	1	0	0	0	0	1

Primary segment = Products						
2005-2008				2009-2011		
	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>
Mean	3.68	5.63	7.68	3.53	5.73	7.94
Median	4	4	7	3	4	7
Std	1.58	5.11	4.65	1.67	5.57	4.77
Max	8	26	25	8	26	25
Min.	1	0	0	0	0	1

Primary segment = Geographical Areas						
2005-2008				2009-2011		
	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>	<i>Segments₁</i>	<i>Items₁_BS</i>	<i>Items₁_P&L</i>
Mean	3.57	6.73	7.17	2.92	6.62	6.68
Median	3	5	6	3	4	6
Std	1.31	6.27	5.45	1.03	6.73	4.56
Max	7	23	22	7	23	18
Min.	2	1	0	2	1	3

Panel B: **Secondary segments** Descriptive statistics

Secondary segments						
	2005-2008			2009-2011		
	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>
Mean	2,98	1,79	1,39	3,09	1,62	1,31
Median	3	1	1	3,	1	1
Std	2,36	3,39	2,50	2,50	3,06	2,18
Max	13	24,00	21,00	11,00	23,00	17
Min.	0	0	0	1	0	0

Secondary segment = Products						
	2005-2008			2009-2011		
	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>
Mean	4	4.30	3.92	4	4.73	4.13
Median	3	2	1,5	3	0	1
Std	2.58	7.20	6.13	2.62	9.13	6.49
Max	10	24	21	9	23	17
Min.	2	0	0	2	0	1

Secondary segment = Geographical Areas						
	2005-2008			2009-2011		
	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>	<i>Segments₂</i>	<i>Items₂ BS</i>	<i>Items₂ P&L</i>
Mean	3.65	1.96	1.42	3.98	1.83	1.43
Median	3	2	1	4	2	1
Std	1.99	2.87	1.72	2.08	1.99	1.29
Max	13	23	17	11	21	11
Min.	0	0	0	1	0	0

This table reports the descriptive analysis of the segment information collected from the financial statements. It reports the number of segments and items reported in the identified primary and secondary segments.

Table 4 Time series descriptive values of the segment disclosure variables

Panel A. Time-series descriptive statistics for primary and secondary segments

	Primary segment			Secondary segment		
	N_SEG ₁	N_ITEM ₁ BS	N_ITEM ₁ P&L	N_SEG ₂	N_ITEM ₂ BS	N_ITEM ₂ P&L
2005	3.74	5.07	6.88	2.80	1.49	1.22
2006	3.57	5.47	7.50	3.10	1.80	1.29
2007	3.65	5.62	7.68	3.09	1.87	1.33
2008	3.37	6.24	7.42	2.92	1.99	1.70
2009	3.48	5.83	7.82	2.96	1.73	1.43
2010	3.37	5.72	7.60	3.03	1.55	1.28
2011	3.45	5.86	7.64	3.29	1.60	1.24

Panel B. Time series analysis for products vs. geographical primary segments

	Primary segment			Primary segment		
	Products			Geographical		
	N_SEG ₁	N_ITEM ₁ BS	N_ITEM ₁ P&L	N_SEG ₁	N_ITEM ₁ BS	N_ITEM ₁ P&L
2005	3.87	5.15	7.27	3.83	6.83	6.33
2006	3.67	5.41	7.67	3.80	7.50	8.6
2007	3.73	5.54	7.84	3.63	7.09	8.09
2008	3.46	6.43	7.92	3.22	5.86	5.78
2009	3.57	5.75	8.18	3.25	7.08	6.75
2010	3.47	5.61	7.80	2.72	6.36	6.63
2011	3.54	5.84	7.85	2.72	6.36	6.63

Panel C. Time series analysis for products vs. geographical secondary segments

	Secondary segment			Secondary segment		
	Products			Geographical		
	N_SEG ₂	N_ITEM ₁ BS	N_ITEM ₁ P&L	N_SEG ₂	N_ITEM ₂ BS	N_ITEM ₂ P&L
2005	4.4	1.6	1.60	3.35	1.86	1.50
2006	4	5.14	4.28	3.78	1.84	1.24
2007	4	5.14	4.28	3.76	1.93	1.24
2008	3.71	4.57	4.86	3.70	2.24	1.74
2009	4	5	4	3.88	2.01	1.61
2010	4	4.60	4.20	3.89	1.76	1.35
2011	4	4.60	4.20	4.18	1.73	1.31

Table 5 Descriptive statistics

Panel A: Descriptive statistics 2005-2011

	n	mean	std.dev.	P25	median	P75
Total_Items	450	16.38	9.03	11	14	20
Total_Segments	450	6.52	2.90	4	6	8
Ownership	450	56.50	22.00	43.16	60.56	69.83
%_independent	450	31.91	16.95	21.05	30	42.00
Herfindahl	450	0.30	0.78	0.01	0.04	0.27
Adj_ROA	450	-0.01	0.07	-0.03	-0.01	0.02
Size	450	13.93	1.70	12.59	13.86	15.08
Leverage	450	1.93	1.60	0.85	1.38	2.76

Panel B: Separate descriptive statistics for period 1 (2005-2008) and period 2 (2009-2011):

	Period 1: 2005-2008			Period 2: 2009-2011		
	n	mean	median	n.	mean	median
Total_Items	262	16.30	14	188	16.48	15
Total_Segments	262	6.61	6	188	6.40	6
Ownership	262	55.55	60.56	188	57.92	60.55
%_independent	262	31.87	30	188	31.97	31
Herfindahl	262	0.23	0.03	188	0.39	0.04
Adj_ROA	262	-0.01	0.00	188	-0.01	-0.01
Size	262	13.88	13.76	188	14.03	14.00
Leverage	262	1.86	1.38	188	2.03	1.40

Table 6 Pearson and Spearman Correlation matrix

	ITEM	SEG	Ownership	%_independent	Herfindahl	Adj_ROA	ROA	Size	Leverage	IFRS8
ITEM	1	0.264	0.062	-0.116	0.117	-0.007	-0.092	0.349	0.234	0.010
<i>Sig. (2-tailed)</i>		<.0001	0.1894	0.0136	0.0136	0.8752	0.0513	<.0001	<.0001	0.8293
SEG	0.234	1.0000	-0.097	0.126	0.047	-0.041	-0.043	0.484	0.166	-0.035
	<.0001		0.0405	0.0076	0.3151	0.3894	0.3641	<.0001	0.0004	0.4571
Ownership	0.026	-0.093	1.0000	-0.358	0.109	0.208	0.063	0.129	0.147	0.055
	0.584	0.0488		<.0001	0.0204	<.0001	0.1791	0.0061	0.0018	0.2481
%_independent	-0.100	0.146	-0.284	1.0000	-0.008	0.002	0.028	0.071	-0.163	0.003
	0.0334	0.002	<.0001		0.8653	0.969	0.549	0.1316	0.0005	0.95
Herfindahl	0.125	0.232	0.020	0.023	1.0000	0.051	0.055	0.246	0.041	0.102
	0.0079	<.0001	0.6748	0.6299		0.2806	0.2474	<.0001	0.3885	0.307
Adj_ROA	-0.038	-0.083	0.190	0.017	0.132	1.0000	0.833	0.235	-0.086	-0.019
	0.4162	0.0776	<.0001	0.7168	0.0052		<.0001	<.0001	0.0684	0.6807
ROA	-0.217	-0.079	-0.031	0.062	0.029	0.617	1.0000	0.149	-0.156	-0.206
	<.0001	0.0941	0.5154	0.1857	0.5432	<.0001		0.0016	0.0009	<.0001
Size	0.223	0.427	0.183	0.037	0.423	0.228	0.082	1.0000	0.3101	0.0445
	<.0001	<.0001	<.0001	0.4364	<.0001	<.0001	0.0812		<.0001	0.3465
Leverage	0.203	0.134	0.131	-0.179	0.188	-0.063	-0.236	0.3754	1.0000	0.054
	<.0001	0.0044	0.0052	0.0001	<.0001	0.1819	<.0001	<.0001		0.2567
IFRS8	0.025	-0.034	0.046	0.009	0.057	0.014	-0.275	0.0532	0.0525	1
	0.5906	0.4729	0.3265	0.8408	0.2313	0.7596	<.0001	0.2600	0.02666	

Table 7: Segments_{it} OLS and FE regression Results*Panel A: Segments_{it}*

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-5.555***	-4.25	<.0001	-4.29	-1.11	0.267
Adj_ROA	-4.427***	-1.97	0.049	3.331*	1.74	0.083
Herfindahl	-0.233	-0.93	0.352	0.342	1.36	0.175
Own_con	-0.012	-1,58	0.115	-0.001	-0.07	0.947
Independent	0.010	1.17	0.241	0.006	0.66	0.511
Size	0.927***	11.71	<.0001	0.772***	2.79	0.006
Leverage	0.025	0.31	0.759	-0.059	-0.81	0.421
IFRS8 x Adj_ROA	-2.350	-0.72	0.470	-2.587	-1.24	0.216
IFRS8 x Herfindahl	0.036	0.12	0.908	-0.013	-0.1	0.948
IFRS8 x Own_con	-0.005	-0.45	0.650	-0.001	-0.17	0.869
IFRS8 x Independent	-0.005	-0.36	0.720	-0.004	-0.63	0.527
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects	-			Yes		
R- Sq	0.293			R- Sq	0.20	
Adj R- Sq	0.263					

* 10% significant - two-tailed T-test; ** 5% significant - two-tailed T-test; *** 1% significant - two-tailed T-test

Panel B: Segments_{1it}

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-2.396***	-3.34	0.001	-5.471	-2.45	0.015
Adj_ROA	-1.276	-1.04	0.301	1.106	1.00	0.320
Herfindahl	0.088	0.64	0.520	-0.038	-0.26	0.792
Own_con	-0.003	-0.91	0.363	0.0003	0.06	0.953
Independent	0.006	1.20	0.231	-0.0002	-0.05	0.961
Size	0.370***	8.53	0.000	0.663***	4.13	0.000
Leverage	0.050	1.14	0.256	-0.080***	-1.89	0.060
IFRS8 x Proprietary Costs	Non-significant			Non-significant		
IFRS8 x Agency Costs	Non-significant			Non-significant		
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects				Yes		
R- Sq	0.230			R- Sq	0.175	
Adj R- Sq	0.201					

Panel C: Segments_{2it}

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-3.091	-2.84	0.005	1.223	0.43	0.671
Adj_ROA	-3.403*	-1.82	0.069	2.046	1.43	0.153
Herfindahl	-0.331	-1.59	0.112	0.382	2.04	0.042
Own_con	-0.006	-1.02	0.307	-0.004	-0.66	0.507
Independent	0.005	0.76	0.447	0.005	0.88	0.381
Size	0.565***	8.58	0.000	0.119	0.58	0.564
Leverage	-0.020	-0.30	0.764	0.035	0.65	0.517
IFRS8 x Proprietary Costs	Non-significant			Non-significant		
IFRS8 x Agency Costs	Non-significant			Non-significant		
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects				Yes		
R- Sq	0.1867			R- Sq	0.041	
Adj R- Sq	0.1566					

Table 8: Items_{it} OLS and FE regression Results*Panel A: Items_{it}*

Panel A: ROA_{it}

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-6.714	-1.52	0.129	-3.374	-0.33	0.740
Adj_ROA	-12.008	-1.58	0.114	-1.101	-0.22	0.827
Herfindahl	0.090	0.11	0.915	1.284**	1.94	0.053
Own_con	0.000	0.03	0.975	-0.022	-0.93	0.351
Independent	-0.083***	-2.63	0.009	0.0212	-0.92	0.357
Size	1.821***	6.81	0.000	1.434**	1.96	0.050
Leverage	0.573***	2.09	0.037	0.017	0.09	0.930
IFRS8 x Adj_ROA	6.127	0.56	0.578	-1.723	-0.31	0.754
IFRS8 x Herfindahl	0.541	0.51	0.612	-0.255	-0.49	0.626
IFRS8 x Own_con	-0.038	-0.92	0.357	-0.020*	-1.84	0.067
IFRS8 x Independent	0.028	0.53	0.597	0.032*	1.80	0.072
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects	-			Yes		
R- Sq	0.167			R- Sq	0.089	
Adj R- Sq	0.136					

* 10% significant - two-tailed T-test; ** 5% significant - two-tailed T-test; *** 1% significant - two-tailed T-test

Panel B: Items1_{it}

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-4.779	-1.17	0.241	-0.208	-0.02	0.980
Adj_ROA	-7.329	-1.05	0.295	2.742	0.65	0.517
Herfindahl	-0.142	-0.18	0.855	0.127	0.23	0.818
Own_con	0.0134	0.56	0.578	-0.026	-1.31	0.192
Independent	-0.066***	-2.28	0.023	0.030	1.57	0.118
Size	1.342***	5.45	0.000	0.969	1.59	0.114
Leverage	0.464*	1.84	0.067	-0.207	-0.13	0.897
IFRS8 x Proprietary Costs	Non-significant			Non-significant		
IFRS8 x Agency Costs	Non-significant			IFRS8 x Own_con (-0.015*)		
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects	-			Yes		
R- Sq	0.125			R- Sq	0.032	
Adj R- Sq	0.093					

Panel C: Items2_{it}

	OLS			Fixed-effects		
	Coef.	t-stat	Pr > t	Coef.	Z-stat	Pr > z
Constant	-1.195	-0.82	0.410	0.140	0.03	0.977
Adj_ROA	-2.436	-0.98	0.328	-3.779	-1.54	0.124
Herfindahl	0.445	1.60	0.110	1.00***	3.11	0.002
Own_con	-0.004	-0.48	0.628	-0.003	-0.32	0.749
Independent	-0.107	-1.04	0.300	-0.005	-0.50	0.619
Size	0.2921***	3.32	0.001	0.192	0.54	0.588
Leverage	0.034	0.38	0.705	0.006	0.07	0.944
IFRS8 x Proprietary Costs	Non-significant			Non-significant		
IFRS8 x Agency Costs	Non-significant			Non-significant		
Year Fixed-Effects	Yes			Yes		
Firm Fixed Effects	-			Yes		
R- Sq	0.054			R- Sq	0.030	

Adj R- Sq	0.019	
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Appendix A: Description and measurement of independent variables

	Variable	Description	Measurement
DEPENDENT VARIABLES			
<i>Reported Segments</i>			
	<i>Segments</i>	Total number of reported segments	Total number of segments reported (<i>Segments₁</i> + <i>Segments₂</i>)
	<i>Segments₁</i>	number of primary segments reported	number of segments reported on the primary segment criteria
	<i>Segments₂</i>	number of secondary segments reported	number of segments reported on the secondary segment criteria
<i>Reported Items</i>			
	<i>Items</i>	number of items	Number of profit and loss and balance sheet items reported on the primary and secondary segments
	<i>Item₁</i>	number of items reported in primary segments	number of balance sheet and P&L items reported on the primary segment criteria
	<i>Item₂</i>	number of items reported in secondary segments	Number of reported balance sheet and P&L items reported on the secondary segment criteria
INDEPENDENT VARIABLES			
<i>Proprietary costs</i>	<i>Herfindahl</i>		$\sum_{i=1}^n [s_{ij}/S_j]^2$
	<i>Adj_ROA</i>	Abnormal Profitability	Firm's industry adjusted ROA.
<i>Agency costs</i>	<i>Ownership</i>	Ownership concentration	% equity shares controlled by majority shareholders
	<i>Independent</i>	Board independence	% independence members in the board of directors
<i>Control variables</i>	<i>Size</i>	Size	Natural Logarithm of Firm Total Assets
	<i>Leverage</i>	Leverage	Debt to equity ratio
<i>Regulatory change</i>	<i>IFRS 8</i>	Adoption IFRS 8	Dummy variable that takes value 1 for the period 2009-2011