



# THREE ESSAYS ON OPERATING SEGMENT DISCLOSURE

Rucsandra Moldovan

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# **THREE ESSAYS ON OPERATING SEGMENT DISCLOSURE**

A dissertation submitted in partial fulfillment of the requirements for the degree of

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and

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**ED 405**

**FROM ESSEC BUSINESS SCHOOL**

Presented and defended publicly on the 15<sup>th</sup> of June 2015 by

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*Rucsandra Moldovan  
Cergy, April 21, 2015*

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## **List of acronyms**

ESMA	European Securities and Markets Authority
FAF	Financial Accounting Foundation
FASB	Financial Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
MD&A	Management Discussion and Analysis
SEC	Securities and Exchange Commission
SFAS	Statement of Financial Accounting Standards

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## Résumé substantiel en français

Cette thèse contient trois essais distincts sur la publication d'information sectorielle que les entreprises européennes ayant plusieurs secteurs opérationnels effectuent en vertu des IFRS 8 Secteurs Opérationnels. Chaque essai vise à améliorer notre compréhension collective sur la politique de communication financière des cadres dirigeants en examinant diverses caractéristiques des informations sectorielles.

Le chapitre I s'intitule "*L'interaction entre la qualité et la quantité des publications sur l'information sectorielle*" et examine le choix des cadres dirigeants quant à deux caractéristiques d'information, notamment la qualité et la quantité de l'information ainsi que la question de déterminer si les analystes financiers sont en mesure de distinguer les entreprises selon ces critères. La littérature antérieure a tendance à examiner chaque caractéristique de publication d'information une à une (Beyer et al. 2010), alors que la politique de communication financière des cadres dirigeants comprends des décisions sur un ensemble de caractéristiques ainsi qu'un compromis potentiel entre ces caractéristiques. En examinant comment les entreprises se positionnent relatives et à la qualité et la quantité de l'information, cet essai vise à améliorer notre compréhension sur le mécanisme de décision des cadres dirigeants en tenant compte du volume d'information qu'ils fournissent sur le sujet des secteurs opérationnels, ainsi que la qualité de cette information.

Le reporting lié aux secteurs opérationnels établit le contexte dans lequel les cadres dirigeants disposent de différents degrés de discrétion sur la quantité de l'information, le nombre de renseignements comptables ligne par ligne contenue dans la note de reporting sectorielle et l'évaluation qualitative en utilisant la variation intersectorielle de la profitabilité (Ettredge et al. 2006; Lail et al. 2013; You 2014) comme remplacement pour le degré d'agrégation de secteurs opérationnels économiquement semblables dans des secteurs à

présenter. Je soutiens que les cadres dirigeants disposent de plus de discrétion quant à la qualité de l'information que sur la quantité de l'information d'une année à l'autre due aux différences en visibilité de ces deux caractéristiques. Ceci entraîne également un mécanisme de décision séquentiel sur la question dans quel secteur opérationnel la quantité de l'information sectorielle est déterminée avant la qualité de l'information sectorielle. Le nombre de renseignements comptables ligne par ligne contenue dans la note de reporting sectorielle est facilement identifiable par les utilisateurs et fixé en fonction d'une comparaison avec les suggestions de la norme comptable, l'information antérieure de la même entreprise (Einhorn & Ziv 2008; Graham et al. 2005) et le comportement d'entreprises homologues (Botosan & Harris 2000; McCarthy & Iannacconi 2010; Tarca et al. 2011).

Par conséquent, la discrétion des cadres dirigeants sur une partie volontaire de l'information sectorielle dans les notes aux états financiers est limitée par un nombre d'éléments qui découlent principalement de la visibilité des renseignements comptables ligne par ligne. La qualité du reporting sectoriel cependant est moins visible et reste plus exposée à la discrétion des cadres dirigeants que la quantité. Le changement de l'agrégation du secteur opérationnel d'un secteur à présenter à un autre ou le transfert de certains frais entre secteurs à présenter (Lail et al. 2013; You 2014) peut être accompli sans modifications apparentes aux secteurs à présenter.

Tout d'abord, j'examine les raisons des cadres dirigeants pour dévier de la moyenne ou des prévisions de quantité et de qualité d'information en regroupant des entreprises en *Under-disclosers/Box-tickers/Over-disclosers* basé sur la quantité d'information sectorielle, ainsi que le *LowQl/AvgQl/HighQl* basé sur la qualité d'information sectorielle. Les résultats informent que lorsque confrontés aux frais indirects et aux frais de représentation, les cadres dirigeants sont plus susceptibles de fournir moins de renseignements comptables ligne par ligne que recommandé en IFRS 8 (c.à.d. *Under-disclosers* vs. *Box-tickers*), alors que le plus

que le résultat financier est élevé au niveau consolidé, les cadres dirigeants ont plus tendance à fournir des informations de qualité élevée sur les secteurs opérationnels (c.à.d. *HighQI* vs. *AvgQI*). Ce qui est plus intéressant, je constate que les cadres dirigeants qui suivent la stratégie de renseignement ligne par ligne recommandée par la norme IFRS (c.à.d. *Box-tickers*) résolvent les préoccupations liées aux renseignements commerciaux de nature exclusive en réduisant la qualité de l'information des secteurs opérationnels à présenter. Ce résultat soulève des questions sur la valeur informative globales des informations sectorielles et correspond à l'impression des investisseurs et des analystes financiers qu'une quantité de l'information élevée constitue un rideau de fumée pour une qualité basse. Ces résultats contribuent en particulier à notre compréhension de l'information sectorielle selon la version révisée de la norme IFRS et plus généralement de notre compréhension de la politique de communication financière des cadres dirigeants.

Deuxièmement, je m'intéresse à la question comment l'exactitude des prévisions de résultat des analystes financiers varie en fonction de la qualité et la quantité de l'information. Je constate que les analystes sont moins exacts pour des entreprises dans les catégories *Under-disclosers* et *Over-disclosers*, notamment en comparaison avec les entreprises *Box-tickers*. Ce résultat est cohérent avec Lehavy et al. (2011) qui constatent que les prévisions de résultats pour des entreprises avec des rapports financiers 10-K plus longs sont moins exactes et soutiennent l'impression des régulateurs et des investisseurs sur les effets négatifs d'une politique de communication financière excessive sur les prises de décisions des investisseurs (p.ex. Thomas 2014). Les analystes sont plus exacts pour les entreprises dans la catégorie *HighQI* en comparaison avec les entreprises *AvgQI*, mais relativement moins inexacts pour les entreprises *LowQI*. Afin d'obtenir une introspection dans les effets de l'interaction entre la qualité et la quantité de l'information sur la qualité des précisions des analystes, j'essaie de créer une interaction entre les groupes qualitatifs et quantitatifs. Les résultats démontrent



qu'en comparaison avec les groupes de référence *Over-discloser & HighQl*, *Box-ticker & HighQl*, *Box-ticker & LowQl*, ainsi que *Box-ticker & AvgQl*, entraînent généralement une exactitude de prévisions améliorée. En général, les résultats suggèrent que trop de quantité de l'information peut être accablant à traiter et que même les utilisateurs avertis semblent incapables de reconnaître une agrégation sectorielle inadéquate. Tenant compte du fait que les normalisateurs semblent de plus en plus favoriser une approche des normes sur la base de l'approche du modèle économique (Leisenring et al. 2012), ces résultats devraient intéresser les normalisateurs ainsi que les utilisateurs.

Le deuxième essai s'intitule "*La non-conformité des informations sectorielles à travers les documents d'entreprise.*". Je qualifie l'incohérence de l'information à travers des documents d'entreprise comme la variation de ce qu'une entreprise publie sur le même sujet dans différents documents relatifs à la même période fiscale. Je me concentre sur la publication d'information liée aux secteurs opérationnels, due aux obligations IFRS8 qui alignent le reporting externe avec l'organisation interne de l'entreprise. Ainsi, il n'existe aucune raison *ex-ante* qui engendrait une attente vis-à-vis des cadres dirigeants de publier l'information liée aux différents secteurs opérationnels dans différents documents d'entreprises relatifs à la même période fiscale. J'examine si et de quelle mesure les entreprises à plusieurs secteurs opérationnels publient l'information liée aux secteurs opérationnels de manière incohérente à travers un nombre de différents documents d'entreprise et comment cette publication incohérente affecte l'exactitude des prévisions de résultat des analystes financiers. Les réponses à ces questions nous fourniront des introspections sur (1) la stratégie de communication pour le paquet de communication global, (2) l'utilisation de l'information contenue dans les différents documents de l'entreprise par les analystes financiers, ainsi que (3) la pratique des régulateurs de vérifier la conformité avec

le reporting sur les secteurs opérationnels selon l'approche retenue par la Direction, en comparant les secteurs opérationnels publiés dans divers documents et endroits.

En utilisant des données recueillies manuellement de quatre sortes de documents (1) notes aux états financiers, (2) les discussions de la Direction ainsi que l'analyse, (3) annonces de presse de résultat, ainsi que (4) la présentation préparé pour l'appel avec les analystes financiers, je catégorise les entreprises comme *Inconsistent* s'il existe une variation dans les secteurs opérationnels informés dans ces documents. Comme cette variation peut être le résultat d'une désagrégation de certains secteurs opérationnels dans certains documents de l'entreprise par les cadres dirigeants ou due au fait que les secteurs opérationnels communiqués dans certains documents sont radicalement différents de secteurs opérationnelles communiqués dans d'autres documents, je catégorise les entreprises davantage en deux catégories. *Inc\_AddDisclosure* (c.à.d. les secteurs opérationnels désagrégés sont communiqués de telle manière qu'ils sont facilement réconciliables avec les secteurs opérationnels communiqués dans d'autres documents) et *Inc\_DiffSegmentation* (c. à.d. les secteurs opérationnels sont communiqués de telle manière qu'ils ne sont pas facilement réconciliables avec les secteurs opérationnels communiqués dans d'autres documents. J'en conclus que, sur la base de mon échantillon de 400 entreprises à plusieurs secteurs opérationnels, presque 39% communiquent leurs secteurs opérationnels de manière incohérente à travers les divers documents considérés de l'entreprise. Les entreprises qui ont désagrégées certains des secteurs opérationnels dans certains documents représentent 11% de l'échantillon, tandis que les entreprises qui communiquent des segmentations différentes représentent 28% de l'échantillon.

Après avoir documenté le comportement de publication incohérent dans l'échantillon, je m'intéresse ensuite sur la question de savoir si le comportement de publication incohérent affecte les analystes en capital du côté acheteur, un groupe important et averti d'utilisateurs

d'informations comptables (Bradshaw 2009, 2011; Mangen, 2013). Les analystes sont également les plus inclinés à considérer la range de débouchées de publication considérée dans cet essai lorsqu'ils recueillent l'information sur les entreprises qu'ils couvrent. Ainsi, si l'incohérence affecte un groupe en particulier, les analystes financiers sont le candidat le plus probable. Leur objectif inclut le recueil d'information sur une entreprise en provenance d'un nombre de sources, afin de rassembler le "puzzle" qu'est l'entreprise, créer une image sur ses perspectives futures and de fournir des recommandations sur l'investissement dans cette entreprise. La question est si le recueil d'information incohérent (c.à.d. variable) de différentes sources se répercute négativement sur la faculté des analystes d'effectuer leur objectif correctement.

Mon attente est de découvrir un impact de l'incohérence de communication sur les prévisions des résultats des analystes due au cout d'extraction de données de documents publiques ainsi que du traitement d'information sur la base de ces données (l'hypothèse de Bloomfield 2002 sur la révélation incomplète). L'obtention d'information différente sur le même sujet qui devrait à priori être identique crée de la confusion. Par conséquent, l'incohérence agrandit le cout de traitement d'information, non seulement en ce qui concerne le temps mais également concernant l'effort, ce qui suggère une relation négative entre l'incohérence dans la communication et l'exactitude des prévisions de résultat. En revanche l'incohérence pourrait également signifier que plus d'information est disponible. La variation dans les secteurs opérationnels publiée dans plusieurs documents pourrait ainsi indiquer que les analystes reçoivent plus d'information sur l'organisation et le fonctionnement de l'entreprise ce qui devrait entraîner une exactitude améliorée des prévisions des résultats. Les résultats démontrent que la variation dans le paramètre de publication (*Inconsistent*) n'est pas considérablement relié à l'exactitude des prévisions des analystes. Cependant, des tests utilisant des catégories améliorées montrent que *Inc\_AddDisclosure* est positivement associée

alors que *Inc\_DiffSegmentation* est négativement associée avec l'exactitude des prévisions de résultat. En d'autres termes, l'incohérence qui résulte de certains secteurs opérationnels étant davantage désagrégées dans certains des documents, de telle manière qu'ils peuvent être réconciliées relativement facilement afin de fournir une image sur l'organisation interne de l'entreprise constitue plus d'information, facile à traiter sans générer des coûts considérables, est utile pour les analystes. Cependant, l'incohérence qui résulte de la publication des segmentations différentes qui sont impossibles ou difficiles à réconcilier à travers plusieurs documents afin de générer une image de l'entreprise semble contribuer à la confusion des analystes et affecte leur capacité d'évaluer les perspectives de l'entreprise globale. D'autres tests démontrent que la publication de différentes segmentations au sein du rapport annuel (c.à.d. les notes vis-à-vis de la discussion et l'analyse des cadres dirigeants) est associée avec des erreurs plus importantes sur les prévisions moyennes et la dispersion des prévisions pour la période d'avant jusqu'après la publication du rapport annuel.

En considérant les publications faites dans un ensemble de documents, cet essai tente de faciliter notre compréhension de la politique de communication financière retenue par la Direction ainsi que les effets de cette politique. En plus des états financiers, les cadres dirigeants utilisent un nombre de débouchés afin de communiquer l'information financière. Cet essai met en évidence le rôle qu'une caractéristique préalablement non-documentée de l'information financière publiée à travers plusieurs documents a sur les utilisateurs principaux, ce qui met également en relief les publications comptables ainsi que les caractéristiques qui rendent ces publications utiles. D'un point de vue pratique, comme les analystes financiers représentent un lien important entre l'entreprise et les marchés du capital, les cadres dirigeants s'intéressent à comprendre le meilleur choix de communication (Bradshaw 2011) et cet essai couvre notamment ce sujet. L'essai a également des implications pour les régulateurs ainsi que le débat actuel sur le disclosure framework

(Barker et al. 2013). Ces résultats complètent également certaines preuves de sondage qui mettent en évidence l'importance que les investisseurs et analystes rattachent à la cohérence de l'information publiée (CFA Institute 2013). Tenant compte de ces résultats, les régulateurs et normalisateurs devraient évaluer le besoin de considérer la cohérence de l'information à travers différents documents comme une caractéristique de la qualité de l'information que les entreprises devraient être encouragés à respecter.

Le troisième essai s'intitule "*Prévisions managériales au niveau sectoriel.*" Et complète la littérature sur les caractéristiques des prévisions managériales en examinant spécifiquement les prévisions managériales faites au niveau des secteurs opérationnels. Les cadres dirigeants accompagnent fréquemment leur prévisions avec des commentaires supplémentaires comme un moyen de contextualiser ces prévisions (Hutton et al. 2003), ou simplement afin de notifier les causes entraînant certaines prévisions (Baginski et al. 2000). Une large quantité de recherche constate que l'information historique sur les secteurs est utile pour les participants des marchés du capital (Behn et al. 2002; Berger & Hann 2003; Botosan & Stanford 2005; etc). Comparativement, nous disposons de peu d'informations sur les secteurs opérationnels quand l'information est prospective. Dans le contexte établi par ces courants de recherche, cet essai examine (1) les caractéristiques des entreprises fournissant les prévisions au niveau sectoriel, (2) si et comment ces prévisions au niveau sectoriel communiquent de l'information utile pour les analystes financiers, et (3) si les prévisions au niveau sectoriel contribuent à ou allègent la fixation de résultat par des cadres dirigeants (c.à.d. la tendance des cadres dirigeants de se concentrer excessivement sur la performance des résultats comptables court-terme plutôt que leur potentiel long terme) (Elliott et al. 2011).

Pour l'échantillon des entreprises utilisées dans cette thèse, j'ai lu et manuellement codé les communiqués de presse annonçant les résultats pour l'année fiscale 2009 afin de déterminer si les communiqués contenaient des prévisions managériales. Pour ceux qui

contenaient des prévisions managériales, j'ai codé (1) si celles-ci avaient des commentaires faisant référence aux secteurs opérationnels de l'entreprise, (2) le détail des prévisions sectorielles c.à.d. point, gamme, estimation minimale, ou simplement narratif, et (3) la désagrégation des prévisions sectorielles relatives au type d'information fourni, c.à.d. résultats sectoriels, revenus sectoriels, postes de dépense sectoriels, ou rapports non-financiers (similaire au coding du guide de revenus sectoriels dans Lansford et al. 2013).

J'explore tout d'abord les caractéristiques de l'entreprise associé à la probabilité de fournir des prévisions sectorielles. Les résultats suggèrent que les entreprises dans la haute technologie sont moins susceptibles de préparer des prévisions sectorielles, probablement du à leur modelé économique qui entraine des cash-flows incertains et une prévisibilité de résultats réduite (Barron et al. 2002).

Le deuxième groupe d'analyses se concentre spécifiquement sur la question si les prévisions de résultats des analystes financiers sont plus exactes quand les cadres dirigeants préparent des prévisions sectorielles, et plus généralement à fournir de la preuve sur la question si l'information sectorielle prospective sert aux utilisateurs de l'information comptable. Les résultats des équations de régression des firmes d'analystes indiquent que fournir des prévisions sectorielles est considérablement et positivement associé à l'exactitude des prévisions de résultat, le controlling des prévisions managériales au niveau consolidé et les caractéristiques des prévisions comme la désagrégation de postes (selon Lansford et al. 2013). Ainsi, fournir des prévisions désagrégées au niveau des secteurs opérationnels semble être marginalement plus utile aux analystes financiers, au delà des prévisions de résultats ou pour d'autres postes comptables préparés pour l'entreprise entière.

Troisièmement, je vérifie la relation entre les prévisions sectorielles et la gestion de résultat dans la période pour laquelle les prévisions sont préparées. Les résultats démontrent que fournir les prévisions sectorielles est positivement associé avec le comportement de

gestion de résultat, et que des prévisions plus précises intensifient cette relation. De plus ce résultat est cohérent avec des résultats antérieurs qui suggèrent que la gestion des résultat n'a pas seulement lieu au niveau du siège social, mais également au niveau des divisions lorsque les cadres dirigeants intermédiaires sont motivés de telle manière à produire une gestion de résultats.

En dehors de la contribution à la littérature comptable en complétant la preuve sur les informations supplémentaires dans les courants de recherche des prévisions managériales (c.à.d. Hutton et al. 2003) et en dépassant le point de vue historique sur l'information sectorielle de la littérature de reporting, cet essai a également un impact sur les parties impliqués dans le débat sur la question de savoir si les cadres dirigeants devraient fournir des prévisions du tout. Dans un contexte dans lequel les prévisions qualitatives, narratives et désagrégées sont considérées comme une solution pour prévenir la fixation de revenus et le short-termism, comprendre quelle caractéristiques de publication d'information contribuent à réaliser ce rôle et comment, est d'importance pour les cadres dirigeants, les investisseurs et les régulateurs similairement.

## **General introduction**

### **1. General overview and structure of the thesis**

Financial statements are a fundamental means of communication for companies with the capital markets (IASB, 2013b). Besides preparing the accounting numbers, managers also spend considerable time thinking about the ways in which to communicate information, either mandatory or voluntary, about their firms in the notes to financial statements and in other venues believing that their disclosure decisions have meaningful effects on capital market outcomes (Miller & Skinner, 2015). In recent years, users have signalled what is commonly referred to as “the disclosure problem” (IASB, 2013b). More specifically, the results of a forum and survey organized by the International Accounting Standards Board (IASB) reveal that users argue that companies’ annual reports have become longer over time but contain less useful information, more repetition (see also Li, 2013), and that disclosures are often boilerplate or generic without tackling the important aspects that have changed from one year to the next (IASB, 2013b). In this context, providing evidence on why managers make certain disclosure choices and how their disclosure strategy resonates with the users of accounting information could enrich our collective understanding of what makes disclosures useful for the capital markets, and potentially contribute to regulators and standard setters’ efforts to address “the disclosure problem” (e.g., IASB’s Disclosure Initiative project).

This thesis focuses on operating segment information as a topic of disclosure due to its importance for capital market participants (see Nichols, Street, & Tarca, 2013 for a literature review), and purely disclosure character, i.e., no recognition or measurement implications, which allows to more cleanly draw insights into the role of disclosure characteristics. In addition, standard setters’ interest in how companies disclose segment information extends beyond “the disclosure problem” to the way in which their segment



reporting standards perform (FAF, 2012; IASB, 2013d) given that this is the first standard introducing a business-model approach for external financial reporting (Leisenring, Linsmeier, Schipper, & Trott, 2012). Therefore, this thesis also has practical implications for standard setters' decisions as they work to extend the business model-based approach to other financial reporting standards.

Managers mainly disclose information to communicate with capital market participants and intermediaries. As sophisticated users of accounting information (Bradshaw, 2011; Brown, Call, Clement, & Sharp, 2015; Mangen, 2013) oftentimes covering large, diversified companies, financial analysts are a main audience for managers' accounting disclosures, in general (e.g., Hope, 2003a, 2003b), and operating segment disclosures, in particular (e.g., Herrmann & Thomas, 1997). Interviews conducted with financial analysts in the course of preparing this thesis confirm the importance of segment information for their work and point to the areas of managers' disclosure strategies that analysts find useful or troublesome. For these reasons, this thesis focuses on sell-side equity financial analysts' earnings forecast accuracy to gauge the role and usefulness of disclosure characteristics.

Based on issues raised by the interviews with financial analysts, on issues debated as part of the IASB's Disclosure Forum (IASB, 2013b), and building on prior literature in accounting disclosure and segment reporting, this thesis aims to provide evidence, broadly, on why managers make certain disclosure choices and the role that these choices have for users' decision-making. In the context chosen for this thesis, this broad research question translates into three specific questions. First, why managers choose to disclose a certain level of segment reporting quantity and quality and how the interplay between these two disclosure dimensions influences financial analysts' earnings accuracy (chapter I). Second, what the role of disclosing operating segments across a set of corporate documents is and how disclosing operating segments inconsistently influences financial analysts' earnings accuracy (chapter

II). And third, why and how managers disclose forward-looking information at the segment-level, its importance for financial analysts, and whether it influences managers' future earnings management behaviour (chapter III).

By providing evidence based on manually-collected data that addresses these research questions, this thesis contributes to the accounting disclosure literature by shedding additional light on our understanding of managers' disclosure and communication strategies (Miller & Skinner, 2015). I do this by identifying and examining disclosure dimensions new to the literature, i.e., inconsistency across corporate documents (chapter II) and segment-level forward-looking information (chapter III) and by looking at two disclosure characteristics, quantity and quality, at a time (chapter I). This thesis also contributes to the corporate finance literature on diversification by pointing out the discretion that managers have in disclosing operating segment information which may reflect on some of the results in this stream of literature (Villalonga, 2004). The findings in this thesis also have the potential to inform standard setters, regulators, managers, financial analysts, and investors.

This thesis begins with a general introduction, continues with three chapters that represent individual papers connected by their common broad topic and institutional setting, and ends with a general conclusion. The general introduction discusses the institutional background, financial analysts' interest in this particular topic, the research questions that this thesis aims to contribute to, the prior literature on segment reporting, the fit of this thesis into the accounting disclosure literature and its link to the corporate diversification literature in finance along with the contribution that it makes to these literatures. The introduction also contains a broad overview of the research questions, findings, and contributions for each of the three essays.

The three essays are presented in chapters I to III. Each of these three chapters has a stand-alone structure and ends with appendices that contain the corresponding empirical analyses. The essays are entitled:

- I. The Interplay between Segment Disclosure Quantity and Quality
- II. Inconsistent Segment Disclosure across Corporate Documents
- III. Management Guidance at the Segment Level.

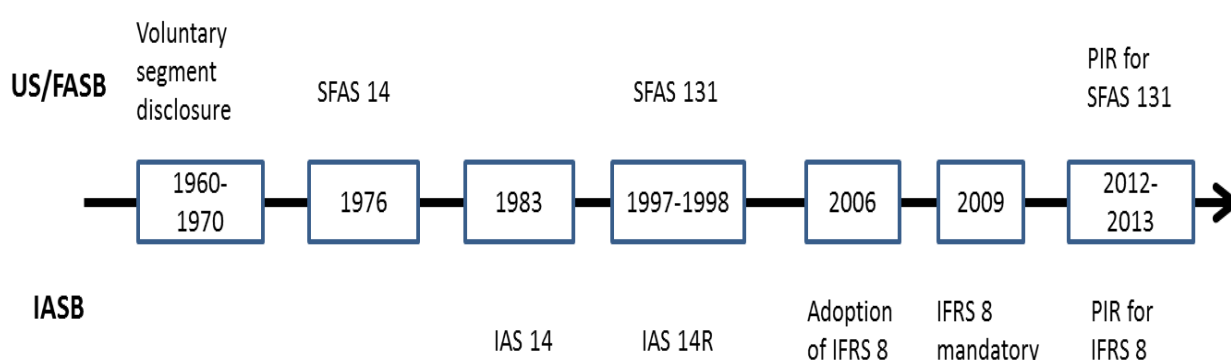
Finally, this thesis ends with a general concluding chapter that discusses the contribution and practical implications of this thesis, its limitations, and avenues for potential future research. This concluding chapter also presents a set of additional empirical analyses meant to bring together the three essays. The purpose of the general introduction and conclusion is to provide the reader with a comprehensive summary of the three essays.

## **2. Institutional background**

By examining the disclosures that managers of European multi-segment firms make on operating segments, the three essays in this thesis share the same institutional background. The focus is on segment information disclosed after the mandatory implementation of IASB's standard IFRS 8 *Operating Segments*. The most compelling evidence that segment reporting is useful information for the capital markets can be gleaned from the history of this disclosure: this information was first provided voluntarily by diversified companies. Even after successive changes to the requirements of the segment reporting standards following demands from users, segment reporting continues to be a topic of interest for both users of accounting information, and standard setters. This section discusses the evolution and requirements of the Financial Accounting Standards Board (FASB) and IASB's segment reporting standards.

## 2.1 The evolution of segment reporting regulation in the U.S. and Europe

Figure 1 provides an overview of the history of the segment reporting standards for both the FASB and the IASB, which highlights the importance that standard setters attach to the segment reporting standards as essential source of information for capital markets.



**Figure 1:** Historic perspective on the evolution of FASB and IASB segment reporting standards

In the US, the Securities and Exchange Commission (SEC) first formally required multi-segment firms to report segment revenue and income in their 10-K reports starting in the 1970s (Swaminathan, 1991). Regulation followed practice as some companies were already voluntarily providing this information (Collins, 1976; Foster, 1975; Kinney Jr., 1971; Ronen & Livnat, 1981). In 1976, the FASB issued SFAS 14 *Segment information*. SFAS 14 required disclosure of a number of items per segment and changed the definition of a reportable segment.

In 1997, after prolonged pressure from the investor and analyst community (Herrmann & Thomas, 2000), the FASB issued SFAS 131 *Disclosures about segments of an enterprise and related information* which superseded SFAS 14. By introducing the “management approach” to segment reporting, the new standard fundamentally changed the

manner in which firms provide segment information (Herrmann & Thomas, 2000). The management approach aligns external segment reporting with firms' internal organization for operating decision purposes. The basis of segmentation could be products and services, geographic area, legal entity, customer type, or another basis as long as it is consistent with the internal structure of the firm. Unlike SFAS 14 that required the disclosure of a two-tier segmentation (i.e., primary and secondary segments) based on line-of-business and geography, SFAS 131 does not require segment reporting on a secondary basis. Instead, SFAS 131 requires disclosures for the reportable operating segments of the company based on internal organization, and entity-wide disclosures comprising additional information about the company's products and services and about the company's geographic areas of operation (i.e., country of domicile and any country in which company operations generate a material portion of total sales or have allocated a material portion of total assets), if the reportable segment disclosures do not provide it (Nichols, Street, & Gray 2000).

Concurrent with the adoption of SFAS 131 in the US, the International Accounting Standards Committee (IASC) revised IAS 14 *Reporting financial information by segment* and issued IAS 14R *Segment reporting*. Under IAS 14R, companies had to follow the line of business and geographic disclosures for primary and secondary segments. The primary segments had to be identified based on the management approach modified by a risks and rewards qualification. In other words, if the primary segments identified through the management approach did not exhibit similar risks and rewards characteristics, the groupings had to be modified based on these characteristics (Nichols, Street, & Cereola, 2012). In an additional departure from the management approach, the information had to be consistent with the consolidated statements (Nichols et al., 2012), meaning that reporting non-GAAP measures was not allowed.

Among the companies that used International Accounting Standards in their financial statements for 1997-1999, large companies audited by Big 4 auditors, listed on multiple stock exchanges, and from Switzerland showed greater compliance with IAS 14R than other companies (Prather-Kinsey & Meek, 2004). Street & Nichols (2002) examine segment disclosures under IAS 14R and find that the switch led to many previously single-segment companies to report as multi-segment, more items of information being disclosed, increased consistency in segments disclosed in the notes and in other parts of the annual report, but that problems related to the disclosure of geographical groupings, to the consistency with the other parts of the annual report, and to the compliance with all the new disclosure guidelines still persisted in the way many firms disclosed their segments.

In 2006, the IASB issued a new standard, IFRS 8 *Operating Segments*, effective 2009, to replace IAS 14R. As part of the IASB-FASB convergence process (The Norwalk Agreement), the two standard setting bodies began working jointly on a set of short-term and long-term major projects meant to eliminate a variety of differences between IFRS and US GAAP. Work on segment reporting requirements made the object of such a short-term joint project, and resulted in the IASB adopting IFRS 8, a standard based closely on SFAS 131, except for minor differences and terminology changes to be consistent with the other IFRSs (IASB 2006), essentially replacing the “qualified” management approach in IAS 14R with the “pure” management approach of SFAS 131 that places no restrictions on segment format as long as the operating segments are based on the company’s organizational structure (Nichols, Street, & Tarca, 2013).

Academic research and practitioner reports examine firms’ segmental disclosures following the implementation of IFRS 8 and find generally consistent results (Nichols, Street, & Tarca, 2013 provide a detailed literature review). Specifically, and relevant for this thesis, for companies in the European Union, there seems to be, on average, an increase in the

number of reported operating segments (e.g., Nichols, Street, & Cereola (2012) for a sample of European blue chip companies, Crawford, Extance, Helliard, & Power (2012) for a sample of companies in FTSE 100 companies, but not significantly higher for companies in the FTSE 250), although most companies report the same number of operating segments under IAS 14R and IFRS 8 (also ESMA, 2011). Further, the number of information items disclosed per segment is, on average, lower under IFRS 8 than under IAS 14R (Bugeja, Czernekowski, & Moran, 2014; Crawford et al., 2012; Nichols et al., 2012) most likely due to the caveat contained in IFRS 8 that most items shall be disclosed if they are reported to the management. According to the European Securities Market Authority (ESMA), financial analysts and investors denounced the management approach to segment reporting (ESMA, 2011), but a majority of preparers and auditors interviewed in the UK by Crawford et al. (2012) welcomed the management approach underpinning IFRS 8.

In recent years, segment reporting has continued to be on standard setters' agendas as both SFAS 131 and IFRS 8 have been subject to post-implementation reviews (PIR) (FAF, 2012; IASB, 2013d).<sup>1</sup> Both post-implementation reviews have found issues with respect to segment identification and aggregation criteria, definition of the chief operating decision maker, line-items disclosed in the note, and other disclosure requirements such as reconciliations. Overall, one third of the Financial Accounting Foundation (FAF) survey respondents declare they are somewhat dissatisfied with the information provided under SFAS 131, while the PIR conducted by the IASB finds that IFRS 8 works generally well, with better enforcement improving disclosure (Moldovan, 2014).

In concluding these PIRs, the IASB and the FASB note that they will consider the importance of the issues uncovered and will tackle them as part of their future work (FAF,

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<sup>1</sup> Post-implementation reviews are additional mechanisms of standard assessment and oversight that the IASB and the Financial Accounting Foundation (FAF) introduced in 2007 and 2009, respectively (Blouin & Robinson, 2014; Moldovan, 2014). These complement other review mechanisms such as interpretations, annual improvements, and three-yearly consultations on the IASB work plan (IASB, 2013d).

2012; IASB, 2013d). For the IASB, the segment reporting requirements are also part of the Disclosure Initiative project (IASB, 2013d) which is currently still on its agenda. Bottom line, although “only” a matter of presentation, segment reporting is a hot topic of interest for standard setters and is expected to continue to be on their agendas.

## *2.2 The requirements of IFRS 8 Operating Segments*

As mentioned above, IFRS 8 *Operating Segments* requires the “pure” management approach to segment reporting which aligns reporting to external users with firms’ internal organization. Operating segments are defined as components of an enterprise (1) that engage in business activities earning revenues and incurring expenses, (2) that are regularly reviewed by management, and (3) for which discrete financial information is available (IASB, 2006a). The basis of segmentation could be products and services, geographic area, legal entity, customer type, or another basis as long as it is consistent with the internal structure of the firm. Unlike under IAS 14R, disclosure based on geographic areas is not required unless it is the main way in which operations are internally organized. IFRS 8 mandates a segment profit and loss measure and suggests a number of other accounting items that should be reported in the segment note if the chief operating decision maker uses those measures in the normal course of business to evaluate the performance of and/or allocate resources to the operating segment.

Although supposed to provide more decision-useful information, problems in the way these standards are applied continue to generate criticism from investors (ESMA, 2011). One of the main topics of debate is the aggregation of operating segments into reportable segments. According to the standard, operating segments that are economically similar can be aggregated into a single operating segment and reported as such. ESMA (2011) observed that



disclosures on aggregation of segments were explicitly mentioned by 29% of issuers only although IFRS 8.22(a) refers to this piece of information as an example that contributes to helping investors understand the entity's basis of organization, and concludes that the level of subjectivity in deciding how aggregation should be applied may lead to diversity in practice. Investors and analysts' views reported in the post-implementation review generally hold that the information provided under IFRS 8 is not meaningful as it is not reported at a sufficiently low level of granularity (ESMA, 2011; IASB, 2013d).

The standard specifies three plus one quantitative thresholds to guide managers' decisions on the materiality of operating segments. A standalone operating segment or one aggregated as specified should be reported if it meets the quantitative thresholds or if management considers this information is useful to financial statement users (IASB, 2006a). The three main quantitative thresholds are (1) at least 10% of combined internal and external revenue of all operating segments, (2) at least 10% of combined reported profit or loss of all operating segments, and (3) at least 10% of combined assets of all operating segments. In addition, if less than 75% of the consolidated revenue is allocated to reportable segments additional operating segments should be identified to be reported, even if they do not meet the three main quantitative thresholds (IASB, 2006a).

The standard requires that managers disclose in the notes the measures they use internally to evaluate performance and allocate resources. The standard mandates the disclosure of a profit or loss measure at the operating segment level and lists other accounting line items such as assets, liabilities, external revenue, internal revenue, interest revenue and/or expense, depreciation and amortization, interest in the profit or loss of associates and joint ventures, income tax expense and/or income, deferred income tax assets, investments in associates, post-employment benefit assets, rights arising under insurance contracts (IASB

(2006) paragraphs 8.23 and 8.24) that should be disclosed if the management reviews them regularly.

In short, investors should see the company “through the eyes of the management,” both in terms of the operating segments disclosed and in terms of the information disclosed at the operating segment level. With the management approach as the overarching guiding principle, IFRS 8 is IASB’s first standard that follows the business model approach for the purpose of financial reporting (Leisenring et al., 2012).

### *2.3 Business model-based financial reporting*

As discussed in the previous subsection, although there is no explicit reference to this in the standard, IASB’s business model-based approach to standard setting transpires from all the requirements of IFRS 8. From this point of view, the IASB’s interest in how companies report segment information and in conducting the post-implementation review for IFRS 8 should also be interpreted in light of the Discussion Paper “A Review of the Conceptual Framework for Financial Reporting” which explicitly proposes the use of the business model concept in financial reporting and which gives IFRS 8 as example of standard created with the business model approach in mind (IASB, 2013a). The IASB first explicitly referred to business model-based financial reporting in the case of IFRS 9 *Financial Instruments* but without defining the concept (IASB, 2013a, 2013c). The Discussion Paper on the Conceptual Framework still does not provide a definition of this concept, but clarifies that business model is different from management intent (issue pointed out in Leisenring et al., 2012a) and

that it is not a choice but rather a matter of fact observable from the way in which the company is managed and information is provided to the management (IASB, 2013a).<sup>2</sup>

The IASB's initial assessment is that considering how an entity conducts its business activity in the standard setting process will enhance the relevance of financial statements since it provides insights into how the business is managed (IASB, 2013a). The Discussion Paper, as well as prior literature, also discusses the disadvantages of using the business model concept for financial reporting. Besides the difficulty to define and apply consistently, the business model approach is also thought to reduce comparability because the same economic phenomena could be classified in different ways, and to encourage less neutral or strategic use in order to report the desired results (IASB, 2013a; Leisenring et al., 2012).

Another problematic aspect of business model-based standards is enforcement. IFRS 8, and its U.S. counterpart, is currently the only business model-based standard actually implemented, and the main area of concern is whether indeed the operating segments reported reflect the internal organization of the company (ESMA, 2011; Pippin, 2009). In Europe, ESMA follows the practices established by the SEC (BDO, 2011; ESMA, 2011, 2012). Part of the Staff's work is to compare the information that companies disclose in the financial statements with those disclosed elsewhere:

"The Staff in the Division of Corporation Finance routinely look outside the four corners of SEC filings and submissions in connection with SEC filing reviews, examining the content of various non-filed corporate communications – including company press releases and statements made by officials during company or third-party sponsored investor conferences conducted via telephone and/or the Internet – as well as analyst reports, news articles and blogs covering the company. The Staff's stated objective here is to assess the consistency of filed and non-filed communications being made by public companies, along with perceptions of those communications, with a view toward determining whether all required material information has been disclosed in SEC-mandated documents [...] and to ensure consistency between formal and informal presentations of the company's financial condition and results of operations." (Dixon, 2011)

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<sup>2</sup> This last clarification is particularly relevant for chapter II of this thesis where I argue that the internal organization reflected in the operating segments disclosed in the notes to financial statements is a matter of fact and there is no ex ante reason to expect it to change across published corporate documents that refer to the same accounting period.

From this point of view, the experience of reporting under IFRS 8 is all the more under scrutiny, as standard setters move more and more towards this approach, and regulators grapple to find ways to enforce such standards. Considering that the essays in this thesis provide evidence on the way in which companies disclose segment information under the business model approach and its usefulness for a sophisticated category of users, and that the IASB has still not made a definitive decision on what the revised Conceptual Framework will look like (according to the IASB website, an Exposure Draft is planned for the second quarter of 2015), this thesis has the potential to contribute to the current debate surrounding the adoption of the business model concept for financial reporting.<sup>3</sup>

In this section, I motivated my focus on segment reporting by discussing standard setters' interest in segment information based on the history and evolution of the standards and in light of the foreseeable future of standard setting at the international level. Next, I also motivate this thesis from the perspective of the usefulness of segment information for financial analysts, a sophisticated category of users of accounting information.

### **3. Do financial analysts care about segment information?**

For diversified companies, segment information is one of the most important pieces of information for those who aim to understand the prospects of the business as is the case with financial analysts and investors (Healy, Hutton, & Palepu, 1999; Ramnath, Rock, & Shane, 2008). Alongside investors in general, financial analysts' interest in segment reporting is demonstrated by their requests for standards that require more disaggregated and more informative segment information, which has led to changes in the segment reporting

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<sup>3</sup> The IASB's website was accessed on April 8<sup>th</sup>, 2015 at the following address: <http://www.ifrs.org/Current-Projects/IASB-Projects/Pages/IASB-Work-Plan.aspx>

standards from an industrial and geographical view on the risks and returns of the company, to the management approach to segment reporting (Herrmann & Thomas, 2000).

Financial analysts are sophisticated, financially-literate users of accounting information (Bradshaw, 2011; Brown et al., 2015; Mangan, 2013) that provide an information processing and monitoring role (Livnat & Zhang, 2012; Ramnath et al., 2008) to the capital markets. In their information processing role, analysts collect mainly public information on the company from the company itself and other various sources (e.g., business press, macroeconomic news etc.) and employ their financial expertise and industry and/or institutional knowledge to analyze and interpret the information (Brown et al., 2015; Livnat & Zhang, 2012). Their final, main output is a recommendation to capital market participants, i.e., sell/buy/hold etc. Earnings forecasts are an intermediary output, one that analysts then use to generate the recommendation and analyst report (Schipper, 1991).

In their work forecasting future earnings for diversified companies, analysts start by forecasting earnings for the operating segments of the company (You, 2014). This suggests that financial analysts regard segment reporting as a main source of information on diversified companies, and that they read and are interested in segment-related disclosure. Some, but not all, analysts are explicit about this work routine and include the intermediary, operating segment-level forecasts in their reports.

In order to further motivate the research questions investigated in this thesis and to add a richer content to the archival analyses, in early April 2014 I conducted interviews with a former French sell-side equity analyst who had worked for Morgan Stanley in London, UK (interviewee #1), and a credit analyst currently working for OFI Asset Management in Paris, France (interviewee #2), after having unsuccessfully contacted several other financial analysts in the Paris area. The main focus of these interviews was to get a better sense of how financial analysts use segment information and what they think about the way in which

managers disclose this information. The interviews were conducted in English in a semi-structured manner in order to allow the interviewee to lead the interviewer to the points he considered critical, and were recorded after obtaining the interviewee's permission. Although all accounts about these analysts' way of doing their job and their opinions on the topic discussed must be considered in the context of their individual experiences and are nowhere near representing a reasonable sample, their thoughts and experiences can nevertheless provide additional insights into the topic of this thesis.

The interviewees' account related to the way in which financial analysts use segment information confirms that when forecasting the earnings of a multi-segment firm, analysts start from forecasting earnings for each segment.

*"Because you make your forecast on the segment, you won't forecast it [the firm] directly, you would forecast companies by countries or by line of business, so therefore you need to know the primary reporting, the one on which you make the assumptions."* (Interviewee #1)

The interviewees also provided insights into the appropriateness of using certain measures as proxies for operating segment disclosure characteristics. Interviewee #1 specifically addresses this point.

*"[Interviewee #1] Sometimes you would have, I don't know, within the segment you would have something that is really profitable, that it's never reported on, but that would bring the margin up. For IT services companies (n.b., interviewee's stated industry specialization) generally they have a software base revenue and sometimes you don't see it, but you can see where they put it because sometimes for the same type of business you had a margin that is much higher at other companies than another one, so it's... you can't really trust what they tell you because you know that they hide something to, you know, make it look good..."*

*[Interviewer] So that's the expectation you're working with - they might hide something.*

*[Interviewee #1] Yes, yes, quite often... for IT services companies basically they hide, but they hide good things and bad things, and overall you know it's a lot of contracts so if one goes really bad, one could go really well so they don't tell you, they just offset each other."*

Interviewee #2 confirms this point by very bluntly saying: *"When we look at it [segmentation], by definition we don't trust"* and goes on to describing how he has seen

companies changing their segmentation which speaks directly to the issue of operating segment aggregation.

*“You’ve got such freedom to do that! So it’s a way of, it’s a communication tool. If I want to show that the economic environment is great, everything is performing well, so I need to show that I’m very aggressive and I can look for much more potential to my equity investor, and I don’t really care about the creditors because at the time it’s cheap money and I can have access to capital easily and I level my structure as I want. So I will define my segment as a segment, and emphasize on the segment which is very, how is it?... sexy. Thereafter, things change and obviously I need to communicate to investors that I am no longer a fantastic growing story because it’s no longer credible, so I will transform my segment from R&D growing side of new technologies into industrial technology which generates cash. I will sacrifice my equity financing, but I will show my creditors that I’m a very nice guy, I can reduce my cost of capital. [...] If you want to optimize your communication again, you will change your perimeter on a regular basis. [...] And you end up showing every time a bucket of your technology portfolio which is growing, so you can communicate on a thing that is growing every time, but once it’s no longer growing, you find another one which has collapsed and which is growing again and so you change your reporting. So that’s a way of communicating.” (Interviewee #2)*

*“In my sense, the change in perimeter of the segmentation should be more regulated if you like. It’s too much confusing for us. [...] Sometimes it’s justified, the company is no longer the same, but sometimes it may be not that justified.” (Interviewee #2).*

When asked about the line items that companies disclose in the segment note, interviewee #1 seems to suggest that there is an “optimal” level of information that analysts can use, and anything beyond that may not necessarily play a role in their forecast models.

*“[Interviewer] Does it help if they [the companies] disclose more line items, for example capex, cash flows and the sort?”*

*[Interviewee #1] So yes, so basically when you look at a company, they generally disclose what they disclose on revenues and operating profit or EBITDA.*

*[Interviewer] So that’s what most of them do?*

*[Interviewee #1] Exactly. And you would not really have, you know, cash flow elements or even balance sheet. They would not really disclose it. Sometimes they do, but they do it in a manner that you can’t use. So assets, liabilities by country... if you don’t know its cash, its working capital, its fixed assets, you don’t care. So yeah, this would mean also that from an analyst point of view this would imply that the segments are really different and you basically would need to value them separately. [...] In your model, the more data you have, the better it is, but basically you either use it or not... I used basically two types of data. I used data for forecasting and also had a tab where I would track a lot of the data I wouldn’t use to forecast, but just to get a sense of what’s happening in the business.*

*[Interviewer] Ok...*

*[Interviewee #1] So for IT services, they would report everything that is linked to others, so it’s future revenue, but is not already recognized and following the order*

*book would be really useful, you know, all these types of things. But when you go outside the P&L, at the order books, companies tend to report it relatively, you know, consistently, but sometimes you had holes in your data or nothing for a quarter where they didn't want to show what's happened and they don't show it sometimes so then you would have to call their PR and try to fill the holes and try to figure out what's happened."*

*"Sometimes you have CFOs that on the conference call they give a lot more information than you have in the press release... They would, you know, for each country they would do kind of a split in terms of growth rates and would analyze, they would tell you but orally, so you couldn't really make, you know, a consistent database. But for each country and each business line they would tell you the growth rates, the price is going up or down, they would tell you a lot, but not really consistently, so yeah, so that's also one thing that is done by a few companies, but they tell it orally and in a way that you can't really, you know, track it. It helps you on the spot, but..." (Interviewee #1)*

Still related to the amount of information that companies provide in relation to their financial reporting quality, interviewee #1 goes on to say:

*"You know, you should have a simple regression to regress the earnings volatility on the font and font size that companies use, or the amount of page per dollar of market capitalization, then the more page you have, the lower the quality of reporting is. Because it's either this or the company had reporting issues in the past and therefore to restore confidence..." (Interviewee #1)*

On the topic of operating segments disclosed across corporate documents such as the earnings announcement press release, presentation to analysts, and the annual report, interviewee #1 says he has not covered any companies that reported inconsistently their operating segments, and is of the opinion that, if it were the case, this would be additional information for the analyst to use.

*"I never noticed a difference between the press release and the accounts in terms of operating segments, and... I don't know, I think as an analyst you don't really care. You trust what they report and whether it is or it's not audited [doesn't really matter] and usually it's the same figure, so... [If this were the case,] you wouldn't question that, you would just say OK, that's additional information. Because once again, I think the fact that it's in the accounts, you don't really assign a lot of value to the fact that it's audited, at least I didn't and my team didn't." (Interviewee #1)*

The position of interviewee #2 is that although he has seen operating segments disclosed inconsistently between corporate documents, he focuses on only one of them - the



presentation to analysts - and discards pretty much everything that is disclosed in the other documents.

*“[Interviewee #2] [We rely] more and more on the presentation than on the annual report... the press release, forget it!*

*[Interviewer] Really?!*

*[Interviewee #2] Forget it. You just hear about their stories, and explanations that the bad things are because of the weather. Annual report you show what is legal, what you have to report and on the presentation there is a competition between companies to show more and more, to be good provider of information to investors. [...] A good example, you used to disclose one very interesting information for investors - let's say how many cars are, say, in China. And suddenly you stop to disclose it. So the investors tend to ask - tell me about how many cars, why didn't you put it in the presentation, you used to put it and so on. So you've got more freedom instead of saying yeah, because it's standard and accounting etc., you have more freedom to ask and push companies to report in this presentation. So yes, investor presentation is becoming more and more useful and sometimes more useful than the annual report. [...] But that's a very good question [inconsistency] because indeed they show the product and they show the market. And indeed why do they do that? [...] That's a very good question and I should have asked the question when I... (laughs) [was covering this company]. But to be clear, what the analyst would do, they would mostly ignore the two [segments in the note] and they would look at this [segments disclosed in the presentation]. [...] So again it's a good transition to what we said before that in some cases the presentation is more useful than financial statement, the segmentation from it. Every analyst would tend to look at this one and to more or less use this one.”*

Based on these interviews, on the current debate surrounding IASB's Disclosure Initiative (Barker et al., 2013; EFRAG, 2012), and on existing accounting disclosure literature (e.g., Beyer, Cohen, Lys, & Walther, 2010), I identified the broad research questions that this thesis aims to contribute to, and the specific research questions in the context of the type of disclosure of focus, segment information, that can be reasonably tackled in the stand-alone research papers that compose this thesis.

#### **4. Research questions**

Companies disclose financial information to the capital markets in mandatory and voluntary settings in an attempt to alleviate issues related to moral hazard and adverse

selection (Core, 2001; Healy & Palepu, 2001). Broadly classified, research that looks at accounting disclosure aims to improve our understanding of (1) the reasons for which managers choose to disclose information in a certain way and (2) the effects these choices have for the users of accounting disclosures. Healy & Palepu (2001) and Beyer et al. (2010) review the disclosure literature and argue that there are still many aspects we need to understand, and especially that we lack a view on managers' disclosure strategy and its effects. More recently, Miller & Skinner (2015) acknowledge that "managers' financial reporting and disclosure decisions are likely to form part of an overall financial reporting strategy designed to convey managers' views about how well the firms' overall operating and business strategies are being achieved" and go on to remark that "it is clear from talking to CFOs and other practitioners that managers spend considerable time thinking about how to manage firms' disclosures and that managers believe their disclosure decisions have first order value implications."

My thesis aims to contribute to our understanding of managers' disclosure and communication strategies by asking the following **broad research questions**:

1. What choices do managers make as part of their strategy to disclose accounting information in the annual report and/or other corporate documents?
2. Why do managers make these choices as part of their disclosure strategy?
3. How do these choices that managers make influence the users of accounting information?

In order to narrow down these broad research questions, I took a number of steps in order to identify the disclosure characteristics that are important for users and standard setters. The interviews with financial analysts have significantly contributed in this respect, as well as reading about regulators' practices with respect to enforcing disclosure standards, and observing companies' disclosure practices by going through a number of annual reports.

These steps resulted in focusing on disclosure quantity and quality in chapter I, inconsistency across corporate documents in chapter II, and forward-looking information in chapter III. Further narrowing the scope of the research on the type of disclosure (operating segment information) and the category of users I focus on (sell-side equity financial analysts) translates into the following **specific research questions**:

- Chapter I
- (1) What explains managers' choices with respect to the quantity and quality of operating segment disclosure in the notes to financial statements?
  - (2) How does the interplay between segment reporting quantity and quality influence financial analysts' earnings forecast accuracy?
- Chapter II
- (1) To what extent do companies disclose operating segments inconsistently across corporate documents?
  - (2) How does the inconsistency in operating segments between the corporate documents influence financial analysts' earnings forecast accuracy?
- Chapter III
- (1) Why do managers choose to provide segment-level guidance?
  - (2) How does segment-level guidance influence financial analysts' earnings forecast accuracy and what role do the precision and disaggregation of segment-level guidance play?
  - (3) How does providing segment-level guidance influence managers' earnings fixation and what role do the precision and disaggregation of segment-level guidance play?

By focusing on these specific research questions and examining various characteristics of operating segment disclosure in settings where the focus is on two disclosure characteristics at a time (chapter I), a set of documents that are part of companies'

disclosure package (chapter II), or a refinement of the way in which management guidance is provided (chapter III), the goal of this thesis is to enrich our understanding of managers' overall disclosure strategy and its implications for capital market participants, above and beyond the findings in prior literature.

## **5. Segment reporting literature**

Segment information is generally regarded as an important source of useful information about the company's operations and prospects (see Nichols et al., 2013) as it details the sources of consolidated earnings and managers' diversification strategy. Prior research provides evidence on the reasons for the aggregation of segment information and the importance of segment reporting for analysts and investors. This research is mainly focused on the U.S. environment, but since IFRS 8 and SFAS 131 are converged, the findings also speak to the European environment. In fact, the IASB's hope at the time of adoption of IFRS 8 was that the same benefits as at the time of implementation of SFAS 131 would show up in an international context.

### *5.1 Determinants of segment information disclosure*

The two main reasons put forth for aggregating segment information are proprietary considerations and agency problems. Hayes & Lundholm (1996) show analytically that the decision involves trading off the benefits of informing the capital market about firm value against the cost of disclosing information that would potentially aid rivals and harm the firm.<sup>4</sup>

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<sup>4</sup> In equilibrium, they find that different activities are reported as separate segments when results are sufficiently similar, but activities are aggregated into one segment when results are sufficiently different.

Disentangling the two determinants has been the subject of most research on segment reporting.

#### *5.1.1 Proprietary cost hypothesis*

A number of findings lend support to the hypothesis that managers aggregate segment information to protect profits in less competitive industries. Under SFAS 14, operations in less competitive industries were less likely to be reported as industry segments (Harris 1998). Firms in industries with high concentration ratios or that were dependent on a few major customers engaged in more aggregation of segments under SFAS 14 (Ettredge, Kwon, & Smith, 2002a). Firms initiated multi-segment disclosure under SFAS 131 after previously reporting as single-segment were hiding profitable segments operating in less competitive industries than their primary operations (Botosan & Stanford, 2005). Ettredge, Kwon, Smith, & Stone (2006) find a continuing but decreased effect of proprietary costs on segment profitability disclosures post-SFAS 131. At the international level, Nichols & Street (2007) find a negative relation between disclosure of a business segment under IAS 14R and company ROA in excess of the industry average, supporting competitive harm arguments for aggregation and/or nondisclosure.

Using a more comprehensive sample of firms, Berger & Hann (2007) find mixed evidence regarding the proprietary cost hypothesis and point out that the assumption held in previous papers (Botosan & Stanford, 2005; Harris, 1998) that segment aggregation aims to hide the profitability of the industry that the segment operates in is unrealistic since industry-wide information, or indeed country-level information for geographical segments, is most likely already available to both competitors and the market. Consequently, there should be no proprietary cost of disclosing such information. However, segment profitability (Berger &

Hann 2007) and segment earnings growth (Wang, Ettredge, Huang, & Sun, 2011) are relevant measures that managers would want to hide.

#### *5.1.2 Agency cost hypothesis*

The agency cost hypothesis posits that segment-level information and results are withheld due to conflict of interest between managers and shareholders (Bens, Berger, & Monahan, 2011). Managers could be hiding the low profitability of some operations through aggregation in an attempt to mask moral hazard problems. Moreover, they could also be hiding the true level of diversification of the company. Prior literature shows that diversified firms' shares trade at a discount compared to single-segment firms (Berger & Ofek, 1995) and that this discount is due, at least partly, to agency problems (Berger & Ofek, 1999).

The literature provides mixed evidence with respect to the agency cost motives. On the one hand, Botosan & Stanford (2005) find no evidence that firms which initiated multi-segment disclosure under SFAS 131 were aggregating information under the old standard to mask poor performance. On the other hand, based on prior literature, Berger & Hann (2007) partition their sample into firms more likely to have agency cost issues, classified as agency cost sample, and the others, classified as proprietary cost sample. Their results are consistent with the agency cost motive for segment disclosure. Moreover, firms that presented more aggregated information pre-SFAS 131 as opposed to post-SFAS 131 faced a higher takeover probability (Berger & Hann 2002). Hope & Thomas (2008) provide evidence consistent with the hypothesis that the non-disclosure of geographical information after SFAS 131 is due to managers' empire building tendencies. In an attempt to disentangle between the agency and proprietary cost hypotheses, Bens et al. (2011) use confidential U.S. Census data from 1987, 1992, and 1997 to look at the motives behind discretionary disclosure of segment data, but cannot draw a clear-cut conclusion.

### *5.1.3 Other determinants*

Ettredge et al. (2002a) find that larger and more complex firms engage in more aggregation of segments under SFAS 14. Ettredge et al. (2006) sample specifically large, complex firms that reported multiple segments under both SFAS 14 and 131. They find that capital market disclosure incentives play a significant role in segment reporting post-SFAS 131. Similarly, firms that experience declines in liquidity (i.e., trading volume) and increases in information asymmetry (i.e., analyst forecast consensus) tend to increase the frequency of their segment reporting (Botosan & Harris, 2000). Moreover, the frequency with which a company's peers disclose segment reporting also influences the frequency with which the company itself reports (Botosan & Harris, 2000). A recent working paper also shows that reasons related to companies' use of tax havens increase the likelihood that managers aggregate geographic disclosures and, thus, provide lower quality disclosures (Akamah, Hope, & Thomas, 2014).

## *5.2 Effects associated with segment reporting*

### *5.2.1 Segment reporting and analysts' information environment*

Early evidence points to reduced forecast dispersion among analysts following the release of first-time mandated segment disclosures (Baldwin, 1984; Swaminathan, 1991) and to more accurate forecasts following the disclosure of segment information under SFAS 14 (Lobo, Kwon, & Ndubizu, 1998). Similarly, geographic segment disclosures help analysts make more accurate earnings forecasts (Balakrishnan, Harris, & Sen, 1990). Early papers also show that segment earnings have predictive power for future consolidated earnings (Collins,

1976; Kinney Jr., 1971) and segment revenue is useful for investors' evaluation of firms' growth prospects incremental to consolidated data (Tse, 1989).

While investors, analysts, and the capital markets had access to part of the new segment information upon the adoption of SFAS 131, the release of new segment data in the annual report still triggered a significant market reaction (Berger & Hann, 2003). The changes in segment reporting that followed the implementation of SFAS 131 in the U.S. have led to increased predictive ability of segment reporting for consolidated earnings (Behn, Nichols, & Street, 2002). Reporting more segments under SFAS 131 improves forecast consensus (Berger & Hann, 2003; Venkataraman, 2001), but reliance on publicly available segment information may in fact increase the uncertainty in analysts' forecasts (Botosan & Stanford, 2005). SFAS 131 has also improved geographic segment disclosure that reduced the mispricing of foreign earnings (Hope, Kang, Thomas, & Vasvari, 2008b), but for companies that no longer disclose geographic segment earnings after SFAS 131, analysts' forecasting abilities are not impaired (Hope, Thomas, & Winterbotham, 2006).

### *5.2.2 Stock market effects of segment reporting*

Analytical results suggest that increasing segment reporting requirements may induce firms to reduce their value-relevant disclosures by aggregating proprietary information with other value-relevant information to deter entry by rivals (Nagarajan & Sridhar, 1996). Work on the SEC segment regulations in the early 1970s, however, finds that the SFAS 14 mandated segment reporting led to higher price variability, proportional to the number of segments reported (Lobo et al., 1998; Swaminathan, 1991) and reduced information asymmetry between managers and shareholders (Greenstein & Sami, 1994).

Stock markets reacted positively when announcements were made related to SFAS 131 issuance (Ettredge et al., 2002b). Givoly, Hayn, & D'Souza (1999) use market tests to



evaluate the incremental information content of segment data and the cross-sectional relation between this content and the measurement error in segment reporting. Wysocki (1998) uses the real options theory and shows that segment-level profits and losses are valued differently by the market.

The usefulness of segment data above aggregate data relates to the heterogeneity of investment opportunities across segments, caused by divergences of segment profitability and growth potential (Chen & Zhang, 2003). Ettredge, Kwon, Smith, & Zarowin (2005) find that firms that changed their segment reporting upon adoption of SFAS 131 experienced a positive and significant increase in forward earnings response coefficient. Collins & Henning (2004) and Chen & Zhang (2007) provide evidence that the market recognizes high and low performing segments and reacts accordingly to their divestment.

As Denis, Denis, & Yost (2002) document an increase in global diversification between 1984 and 1997 complementing industrial diversification, geographic entity-wide disclosures are potentially at least as important to users of accounting information as operating segment disclosures. Several papers deal specifically with the security pricing effects of geographic disclosures (Boatsman, Behn, & Patz, 1994; Callen, Hope, & Segal, 2005; Hope, Kang, Thomas, & Vasvari, 2008a; Hope et al., 2008b; Thomas, 2000). Results are generally consistent with geographic disclosures influencing investors' pricing of foreign earnings.

### *5.2.3 Other effects of segment reporting*

A number of papers argue that segment information is also important because it fulfills a monitoring role. Berger & Hann (2003) use the diversification discount to show that changes in segment reporting have an impact on the shareholder monitoring of managers' actions. Bens & Monahan (2004) confirm Berger & Hann's (2003) finding by showing that a

measure of information disaggregation is positively associated with the excess value of diversification. Park & Shin (2009) find that post-SFAS 131, firms that increased the number of reported segments exhibit significant declines in insider profits relative to firms that did not increase their number of segments. This is consistent with Baiman & Verrecchia's (1996) finding that enhanced disclosure mitigates insiders' ability to earn abnormal profits.

When companies diversify into unrelated industries, the earnings streams from the different operating segments have low correlation. The coinsurance effect created as a result reduces the risk of default. Franco, Urcan, & Vasvari (2013) find that, due to this coinsurance effect, industrially diversified firms pay significantly lower bond-offering yields and this relation becomes stronger as the number of reported segments, controlling for the number of industries, increases. Blanco, Garcia Lara, & Tribo (2015) build an index of voluntary segment information and show that higher values of this index are associated with higher analyst forecast accuracy and reduced covariance between the firm's returns and the returns of all other firms in the same industry, consistent with reduced estimation risk and cost of capital.

As Ronen & Livnat (1981) very aptly put it, the overall take-away of the studies discussed in this section is that "segment information is both used and useful." The implementation of the management approach-based standards raises nevertheless additional questions. The adoption of SFAS 131 and IFRS 8 has led, on average, to an increase in the number of segments reported (e.g., Berger & Hann, 2003; Bugeja, Czernekowski, & Moran, 2014; Herrmann & Thomas, 2000; Leung & Verriest, 2014; Nichols et al., 2012). The number of line items, however, appears to have decreased under the management approach (Bugeja et al., 2014; Crawford et al., 2012; Leung & Verriest, 2014; Nichols et al., 2012), which raises questions on the overall informativeness of segment disclosure under the new standards and the need to understand the interplay between these two dimensions and the role

that other choices that managers make when disclosing segment information have. Therefore, this thesis contributes to the accounting literature by complementing the existing stream of segment reporting literature and by adding to the broader disclosure literature.

## **6. Contributions**

### *6.1 Fit and contribution to the accounting literature*

In broad terms, the financial accounting literature aims to understand why managers make certain financial reporting choices, and whether these choices have any sort of economic consequences. Again very broadly, the accounting literature can be classified into papers focusing on the accounting numbers provided on the face of the financial statements, and those focusing on the accounting information disclosed in the notes to financial statements and in other documents that companies publish, i.e., accounting disclosure literature.<sup>5</sup> The majority of papers in the first category examines features of the recognized accounting numbers, such as accruals quality, value relevance, conservatism, timeliness etc., while papers in the second category focus on various accounting disclosure characteristics, encompassing both the numbers and the narrative disclosed in the notes and elsewhere. My thesis fits in and contributes to this second stream of literature.

Intense interest in accounting disclosure research is more recent and brought about by advances in computer linguistic analysis and processing over the last two decades (Beattie, 2014; Miller & Skinner, 2015), although the first papers on such topics date back to around the same time as the seminal works of Ball & Brown (1968) and Beaver (1968). For example,

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<sup>5</sup> I use the term “disclosure” in its usual sense in the accounting literature to mean all financial communication provided by the management of the company in the notes to financial statements and outside the financial statements (Mayew, 2012). In contrast to the accounting literature, standard setters restrict this term to information provided in the notes to financial statements (Bratten, Choudhary, & Schipper, 2013).

as pointed out in Beattie (2014), Soper & Dolphin (1964) and Smith & Smith (1971) were among the first studies to provide some descriptive evidence on the readability of annual reports as a way to gauge understandability. Following Li (2008), readability has attracted renewed interest as a characteristic of the narrative in the annual report, alongside, for example, tone (e.g., Davis & Tama-Sweet, 2012; Hobson, Mayew, & Venkatachalam, 2012; Mayew, 2012).

Miller & Skinner (2015) classify the accounting disclosure literature into sub-categories that relate to (1) why firms voluntarily disclose information that is not mandated by regulators, i.e., papers in this category seek to understand the basic decision to disclose information, (2) where managers choose to disseminate the information, i.e., the venue or mechanism that managers use to release information about the firm, and whether dissemination affects capital market outcomes (e.g., Bamber & Cheon, 1998; Myers, Scholz, & Sharp, 2013), and (3) how managers disclose the information, i.e., the strategic aspects of disclosure and disclosure characteristics. The third sub-category encompasses studies looking at characteristics of accounting disclosure such as quantity, quality (defined in various ways), level of disaggregation (e.g., Lansford, Lev, & Tucker, 2013), consistency of disclosure behavior (Tang, 2014), repetition (Li, 2013), frequency of disclosure (Lang & Lundholm, 2000), timing of disclosure (Doyle & Magilke, 2009) etc., over which managers have some degree of discretion. Depending on the setting, these studies address mandatory disclosure, voluntary disclosure, or both.

My thesis particularly contributes to the third sub-stream of literature as classified above. Each of the essays takes a different view on operating segment disclosure, either in the note, or in other disclosure venues, to investigate a set of characteristics (quantity and quality in chapter I), or a particular disclosure characteristic (inconsistency in chapter II, disaggregation in chapter III).

Understanding the way managers disclose information about their segments also speaks to the literature on earnings quality, the first category in the broad classification above. In a survey reported in Dichev, Graham, Harvey, & Rajgopal (2013), managers admit to smoothing earnings more when their companies have more operating segments. When asked “What does the concept of earnings quality mean?” consistent profitability from core operating segments is the fourth top answer that CFOs give. In other words, the way in which managers report on operating segments flows into the main consolidated financial statements. Therefore, features of operating segment disclosure such as quality, quantity, or consistency across documents can potentially provide clues as to how faithfully the internal organization of the company is reported, and, eventually, to the quality of consolidated earnings.

## *6.2 Contribution to the corporate diversification literature*

The information users get from the segment note on the diversification of the company is influenced, first, by the financial reporting standards in place, and second, by manager’s disclosure incentives in connection with the firm’s economic reality. Understanding the characteristics of disclosure on this topic can potentially contribute to explaining some of the phenomena documented in prior literature in finance and accounting. Custódio (2014) remarks that “a large proportion of financial economics studies, from corporate finance to asset pricing, use accounting data to compute various measures and proxies [and that] when firms are exposed to different accounting treatments, these measures might be compromised by a lack of comparability across firms.” Low comparability which arises from accounting standards permitting the choice of different accounting methods is only one side to the story. Managers’ discretion over how the information is reported, i.e., the degree to which the information is faithfully representative, is the other side. A large body of

accounting literature investigates the firm characteristics and managerial incentives that motivate managers to make certain financial reporting choices. The overall take-away from this body of literature is that financial reporting choices are not made in a vacuum, but rather they are influenced by numerous factors, among which managerial incentives to portray the company in a certain light.

A few papers have considered the impact of accounting as explanation for the diversification discount. Custódio (2014) puts forth a measurement bias argument which purports that the diversification discount is due to the methods of accounting for mergers and acquisitions. Villalonga (2004) compares an alternative data source to Compustat and finds that the diversification discount is due to data and reporting issues. She summarizes the issues related to financial reporting for why judging firms' diversification based on segment reporting (usually, the number of segments) is problematic: (1) an (operating) segment as per the accounting standards is defined such that it can contain more than one activity; (2) due to the quantitative thresholds contained in the standards which are used to assess materiality, the extent of segment disaggregation is lower than the true extent of a firm's industrial diversification (also in Lichtenberg, 1991); (3) in many instances, changes in the number of segments are due to reporting issues rather than real instances of diversification or reorganization (also in Denis, Denis, & Sarin, 1997; Hyland & Diltz, 2002).

Since segment reporting provides users with a disaggregated view of the company's businesses, managers may be cautious regarding the picture that they are showing. Along with the segment reporting literature that discusses managers' discretion when aggregating operating segments for reporting purposes, this thesis contributes to the corporate diversification literature by pointing out that the disclosure of the firm's operating segments is part of an overall strategy also influenced by various incentives along with accounting standard requirements.

### *6.3 Practical implications for standard setters and regulators*

This thesis is motivated not just by calls in the disclosure literature for more research on the choices managers make when releasing information to capital markets in view of their overall disclosure strategy (Berger, 2011; Beyer et al., 2010; Core, 2001; Healy & Palepu, 2001; Miller & Skinner, 2015), but also by standard setters' interest in how the segment reporting standards are performing, and by regulators' practices of enforcement of segment reporting standards and observations on how companies disclose this information.

Standard setters could potentially benefit from the findings of this thesis on two levels, one that directly relates to segment reporting and the other that takes one step further towards business model-based standards. First, standard setters both in the U.S. and Europe have recently conducted post-implementation reviews on both segment reporting standards, SFAS 131 and IFRS 8 (FAF, 2012; IASB, 2013d). Standard setters' main interest was on how their standards perform and how companies disclose operating segment information under the management approach (Moldovan, 2014). The multiple-characteristics view on operating segment information disclosed in the annual report and in other documents released by the firm is relevant for standard setters since it provides them with insights into how and why managers make certain choices when disclosing segment information. Second, standard setters' recent move towards business model-based standards (Leisenring et al., 2012), as is the segment reporting standard, warrants an examination of how managers disclose under such requirements and the effects this has on users' decision-making. By providing evidence on the interplay between the quantity and quality of segment disclosure, this thesis contributes to our understanding of the overall informativeness of segment reporting under the management approach.

Additionally, enforcement of business model-based standards is not a straightforward matter. In the case of segment reporting, regulators in Europe and the U.S. claim that they compare the operating segments disclosed in various documents that companies publish in order to make sure that the disclosure in the note reflects indeed the internal organization of the company (Dixon, 2011; ESMA, 2011; Pippin, 2009). Chapter II in this thesis is motivated by and investigates precisely this enforcement practice. Therefore, regulators could potentially use the findings in this thesis to further motivate or adjust their enforcement practices.

## **7. Overview of the three research papers**

### *7.1 Chapter I*

The first essay is titled “*The Interplay between Segment Disclosure Quantity and Quality*” and investigates managers’ choices with respect to two disclosure characteristics, quantity and quality, and whether financial analysts are able to distinguish between companies along these dimensions. Prior literature tends to examine one disclosure characteristic at a time (Beyer et al., 2010), whereas managers’ disclosure strategy involves decisions about a set of characteristics and potential trade-offs between these. By examining how companies place themselves along both the quantity and quality dimensions of disclosure, this essay aims to improve our understanding of managers’ decision processes over the amount of information they provide on the topic of operating segments, and the quality of this information.

Segment reporting provides a context in which managers have varying degrees of discretion over disclosure quantity, the number of accounting line items disclosed in the



segment reporting note, and quality measured using the cross-segment profit variability (Ettredge et al., 2006; Lail, Thomas, & Winterbotham, 2014; You, 2014) as proxy for the degree of aggregation of economically similar operating segments into reportable segments. I argue that managers have more discretion on quality than on quantity from one year to the next due to differences in the visibility of these characteristics, which also leads to a sequential decision process in which segment reporting quantity is decided upon before segment reporting quality. The number of line items disclosed in the segment note is easy to perceive by users and benchmarked with standard suggestions, prior disclosure by the same company (Einhorn & Ziv, 2008; Graham, Harvey, & Rajgopal, 2005), and behavior of peer companies (Botosan & Harris, 2000; McCarthy & Iannacconi, 2010; Tarca, Street, & Aerts, 2011). Therefore, managers' discretion over a voluntary part of the segment reporting in the notes to financial statements is limited by a number of factors which primarily tie back to line-item disclosure visibility. Segment reporting quality, however, is less visible and, therefore, more prone to managerial discretion than quantity. Changing the aggregation of an operating segment from one reportable segment to another or transferring some expenses between reportable segments (Lail et al., 2014; You, 2014) can be achieved without any visible changes to the reported segments.

First, I investigate managers' reasons for deviating from average or expected quantity and quality by grouping companies into *Under-disclosers/Box-tickers/Over-disclosers* based on segment reporting quantity, and *LowQl/AvgQl/HighQl* based on segment reporting quality. Results suggest that faced with proprietary and agency costs, managers are more likely to provide fewer segment line items than suggested in IFRS 8 (i.e., *Under-disclosers* vs. *Box-tickers*), whereas the higher the financial performance at the consolidated level, the more likely it is that managers disclose high quality operating segments (i.e., *HighQl* vs. *AvgQl*). More interestingly, I find that managers that follow standard suggestions for the segment line

items (i.e., *Box-tickers*) solve proprietary concerns by decreasing the quality of reported operating segments. This finding raises questions on the overall informativeness of segment reporting, and is in line with investors and financial analysts' opinion that high disclosure quantity sometimes acts as a smokescreen for low quality. These results contribute specifically to our understanding of segment reporting under the revised version of the standard and, more generally, to our understanding of managers' disclosure strategy.

Second, I examine how financial analysts' earnings forecast accuracy varies with disclosure quantity and quality. I find that analysts are less accurate for companies that are in the *Under-disclosers* and *Over-disclosers* groups, compared to the *Box-tickers* group. This result is consistent with Lehavy, Li, & Merkley (2011) who find that earnings forecasts for firms with longer 10-K reports are less accurate and supports regulators and investors' views about the negative effects of disclosure overload on investors' decision-making (e.g., Thomas, 2014). Analysts are more accurate for companies in the *HighQl* group compared to the *AvgQl* group, but not significantly less accurate for companies in the *LowQl* group. In order to obtain insights into the effects of the interplay between disclosure quantity and quality on analysts' accuracy, I interact the quality and quantity groups. The results show that, compared to the *Under-disclosers & LowQl* benchmark group, being in the *Over-discloser & HighQl*, *Box-ticker & HighQl*, *Box-ticker & LowQl*, and *Box-ticker & AvgQl* group combinations is associated with higher forecast accuracy. Overall, these results suggest that too much quantity may be too overwhelming to process and that even sophisticated users seem to be unable to pick up improper segment aggregation. Considering that standard setters seemingly favor business model-based standards more and more (IASB, 2013a; Leisenring et al., 2012), these findings are of interest to standard setters and users alike.

## 7.2 Chapter II

The second essay is titled “*Inconsistent Segment Disclosure across Corporate Documents.*” I define inconsistent disclosure across corporate documents as variation in what one company reports on the same topic in different documents referring to the same fiscal period. I focus on operating segment disclosure because, given the IFRS 8 requirements that align external reporting with the internal organization of the company, there is no ex ante reason to expect managers to disclose different operating segments in different documents that refer to the same financial reporting period. I investigate whether and to what extent multi-segment companies disclose operating segments inconsistently across a set of corporate documents, and how inconsistent disclosure affects financial analysts’ earnings forecast accuracy. Answers to these research questions provide us with insights into (1) managers’ strategy for the overall disclosure package, (2) financial analysts’ use of information disclosed in different corporate documents, and (3) regulators’ practice of verifying compliance with the reporting of operating segments under the management approach by comparing the operating segments disclosed in various documents and venues.

Using manually collected data from four documents, (1) the notes to financial statements, (2) the management discussion and analysis, (3) the earnings announcement press release, and (4) the conference call presentation slides to financial analysts, I code companies as *Inconsistent* if there is variation in the operating segments disclosed in these documents. Since this variation can arise because managers further disaggregate some operating segments in some documents or because the operating segments they provide in some documents are entirely different compared to those provided in the other documents, I further classify companies into two categories, *Inc\_AddDisclosure* (i.e., the disaggregated operating segments are disclosed in such a way that it is straightforward to reconcile them with the

operating segments in the other documents) and *Inc\_DiffSegmentation* (i.e., the operating segments disclosed in some documents cannot be easily reconciled with those disclosed in the other documents). I find that, out of my sample of 400 multi-segment European companies, almost 39% disclose operating segments inconsistently across the documents considered. Companies that disaggregate some of the operating segments in some of the documents represent 11% of the sample, while those that disclose different segmentations represent 28% of the sample.

After documenting this inconsistent disclosure behavior in my sample, I next investigate whether inconsistent disclosure affects sell-side equity analysts, an important and sophisticated group of users of accounting information (Bradshaw, 2009, 2011; Brown et al., 2015; Mangan, 2013). Analysts are also the most likely to look at the range of disclosure outlets considered in this essay when they collect information about the companies they cover. Therefore, if inconsistency has an effect for anyone, then financial analysts are the most likely candidates. Their job involves collecting information about a company from various sources in order to piece together the “puzzle” that the company is, form an image about its future prospects, and provide recommendations on investing in that company. The question is whether getting inconsistent (i.e., varying) information from different sources reflects negatively on their ability to perform their job well.

I expect inconsistencies in disclosure to have an effect on analysts’ forecast accuracy due to the costs associated with extracting data from public documents and processing information based on that data (Bloomfield's (2002) incomplete revelation hypothesis). Obtaining different information on the same topic that should a priori be the same creates a sense of confusion. As a result, inconsistency increases information processing costs, both in terms of time and effort required, which suggests a negative relation between inconsistency in disclosures and earnings forecast accuracy. However, inconsistency could also mean that

more information is available. Variation in the operating segments disclosed in different documents could, therefore, mean that analysts receive more information on how the company is organized and functions which should reflect in more accurate earnings forecasts. Results show that the overall variation in disclosure variable (*Inconsistent*) is not significantly related to analysts' forecast accuracy. However, tests using the refined categories show that *Inc\_AddDisclosure* is positively associated, while *Inc\_DiffSegmentation* is negatively associated with forecast accuracy. In other words, inconsistency that arises from some operating segments being further disaggregated in some of the documents, but in such a way that it is relatively straightforward to piece them back together in order to understand the image of the internal organization of the company appears to be more information, easy to process or at no significant additional cost, that is useful for analysts. However, inconsistency that arises from disclosing different segmentations, that are impossible or relatively hard to reconcile across documents in order to piece back the image of the company, seems to confuse analysts and impairs their ability to accurately assess the prospects of the company as a whole. Further tests reveal that disclosing different segmentations inside the annual report (i.e., in the note compare to the management discussion and analysis) is associated with increased mean forecast error and forecast dispersion from before to after the issuance of the annual report.

By considering disclosures made in a set of documents, this essay takes us a step further in understanding managers' overall disclosure strategy and the effects that this strategy has. Besides the financial statements, managers use many other outlets to communicate financial information. This essay provides evidence on the role that a previously undocumented characteristic of financial information disclosed across multiple documents has for its main users, which sheds additional light on the role of accounting disclosures and the characteristics that make such disclosure useful. From a practical

perspective, since financial analysts are an important link between the firm and the capital markets, managers want to understand how to best communicate with them (Bradshaw, 2011) and this essay speaks precisely on this issue. This essay also has implications for regulators and the current debate on a disclosure framework (Barker et al., 2013; EFRAG, 2012). The findings supplement some existing survey evidence that points to the importance investors and analysts attach to consistency in disclosure (CFA Institute, 2013). Given these findings, regulators and standard setters may want to assess the need to consider the consistency of disclosure across documents as an attribute of disclosure quality that companies should be encouraged to adhere to.

### *7.3 Chapter III*

The third essay is titled “*Management Guidance at the Segment Level*” and complements the literature on the characteristics of management guidance by specifically examining management guidance made at the operating segment level. Managers often accompany their forecasts with supplementary statements as a way to add context to the forecast (Hutton, Miller, & Skinner, 2003), or to point to the causes that led to certain expectations (Baginski, Hassell, & Hillison, 2000). A large body of research finds that historical information on segments is useful for capital market participants (Behn et al., 2002; Berger & Hann, 2003; Botosan & Stanford, 2005). Comparatively, we know little about the role of segment information when it is forward-looking. In the context provided by these streams of prior research, this essay examines (1) the characteristics of the firms providing segment-level guidance, (2) whether and how segment-level guidance conveys useful information for financial analysts, and (3) whether segment-level guidance contributes to or alleviates managers’ earnings fixation, i.e., managers’ tendency to excessively focus on

companies' short-term accounting earnings performance instead of long-term potential (Elliott, Hobson, & Jackson, 2011).

For the sample of companies used throughout this thesis, I read and manually code whether the press releases announcing the 2009 fiscal year earnings contain a management guidance section. For those that have a guidance section, I code (1) whether there are statements that make reference to the firm's operating segments, (2) the precision of guidance at the segment level, i.e., point, range, low-precision estimate, or narrative, and (3) the disaggregation of segment-level guidance in terms of the type of information provided, i.e., segment earnings, segment revenues, segment expense items, or non-financial statements, similar to the coding of disaggregated earnings guidance in Lansford, Lev, & Tucker (2013).

I first investigate the firm characteristics associated with the likelihood of providing segment-level guidance. Findings suggest that companies in high tech industries are less likely to provide segment-level guidance potentially due to their business model leading to uncertain cash flows and low earnings predictability (Barron, Byard, Kile, & Riedl, 2002).

The second set of analyses aims specifically to reveal whether financial analysts forecast earnings more accurately when managers provide segment level guidance, and more generally to provide evidence on whether segment-level forward-looking disclosure matters for the users of accounting information. Analyst-firm regression results indicate that providing segment-level guidance is significantly and positively associated with earnings forecast accuracy, controlling for management guidance at the consolidated level and characteristics of this guidance such as item disaggregation. Therefore, providing guidance disaggregated at the operating segment level appears to be incrementally useful to financial analysts, above and beyond the guidance for earnings or for other accounting items provided for the company as a whole.

Third, I test the relation between segment-level guidance and earnings management in the period for which the guidance is provided. The results show that providing guidance at the segment level is positively associated with earnings management behavior, and that more precise guidance intensifies this relation. This result is in line with prior findings which suggest that earnings management does not happen only at the headquarter level, but also at the divisional level when mid-tier managers are incentivized in a manner conducive to earnings management (Guidry, Leone, & Rock, 1999).

Besides contributing to the accounting literature by complementing the evidence on supplementary statements in the management guidance stream of literature (e.g., Hutton et al., 2003) and moving beyond the historical view on segment information that the segment reporting literature holds, this essay also has implications for all the parties involved in the debate on whether managers should provide forecasts at all. In a context where qualitative, narrative, and disaggregated guidance is regarded as a solution to avoid earnings fixation and short-termism, understanding which characteristics of disclosure aid in achieving this role, and how, is relevant for managers, investors, and regulators, alike.



## **Chapter I**

### **The Interplay between Segment Disclosure Quantity and Quality**

#### **Abstract**

This paper investigates managers' choices with respect to both disclosure quantity and disclosure quality, and the usefulness of these two characteristics for financial analysts. Focusing on segment disclosures under the management approach, I measure quantity as the number of segment-level line items and quality as the cross-segment variation in profitability, and argue that greater managerial discretion can be exercised over quality than over quantity. I hypothesize and find that managers solve proprietary concerns either by deviating from the suggested line-item disclosure in the standard, or, if following standard guidance, by decreasing segment reporting quality. Moreover, financial analysts do not always understand the quality of segment disclosures, which suggests that a business-model type of standard creates difficulties even for sophisticated users. My results inform standard setters as they work on a disclosure framework and as they consider the business model approach to financial reporting for other issues besides segment reporting.

## Résumé

Cet essai examine le choix des cadres dirigeants à l'égard de la quantité et de la qualité des publications sur l'information sectorielle, ainsi que l'utilité de ces deux caractéristiques pour les analystes financiers. J'utilise le nombre de segments opérationnels publiés comme mesure quantitative et la variation inter-sectorielle de la profitabilité comme mesure qualitative et soutiens que plus de pouvoir discrétionnaire peut être exercé par les dirigeants sur la qualité que sur la quantité. Je trouve que les cadres dirigeants résolvent les préoccupations liées aux renseignements commerciaux de nature exclusive soit en déviant de la quantité recommandée par la norme, ou, lorsqu'ils suivent la norme, en réduisant la qualité de l'information sectorielle. Les analystes financiers n'apprécient pas toujours la qualité de l'information sectorielle, ce qui suggère que le modèle business crée des difficultés même pour des utilisateurs avertis. Mes résultats informent les normalisateurs lorsque ceux-ci initient le développement d'un nouveau cadre conceptuel et lorsqu'ils semblent envisager l'approche du modèle business pour le reporting.

## I.1 Introduction

This paper integrates two disclosure characteristics – quality and quantity – to contribute to an understanding of managers’ choices regarding corporate financial disclosures and of financial analysts’ ability to benefit from both the quantity and the quality of information disclosed. Focusing on multiple disclosure characteristics at a time brings us closer to understanding managers’ overall disclosure strategy (Beyer et al., 2010). Throughout the paper, I use the term disclosure quality to refer to the representational faithfulness of the information disclosed so as to reflect the underlying economics of the firm. Disclosure quantity is the amount of accounting information that managers provide on one topic.

Disclosure quality and quantity are currently on standard setters and regulators’ radars (Barker et al., 2013) as investors and financial analysts denounce a perceived increase in the number and length of financial disclosures without an increase in corresponding quality and usefulness for users (CFA Institute, 2007). From this point of view, increased disclosure quantity might appear as a smokescreen for low disclosure quality. As a result, national and European-level regulators have initiated public debates and issued discussion papers in an effort to encourage the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) to bring the length of financial reporting disclosures under control and to increase their quality (EFRAG, 2012; Financial Reporting Council, 2012). In response, the IASB has added a disclosure framework project to its agenda to complement the Conceptual Framework.<sup>1</sup>

Segment reporting under the management approach in IFRS 8 *Operating Segments* provides a setting where mandatory and voluntary disclosure with a strong discretionary

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<sup>1</sup> As of May 15<sup>th</sup>, 2014, IASB’s medium-term agenda includes a standards-level review of disclosure project and a disclosure framework project.

component interplay which allows (1) to measure disclosure quantity and quality as distinct dimensions, thus avoiding a mechanical correlation induced by the measurement process (Botosan, 2004), and (2) to make new predictions about managers' choices with respect to disclosure quality and quantity based on their relative discretionary appeal. The question of how disclosure quality is best defined and measured and its relation with disclosure level is yet to be answered (Beyer et al., 2010). Oftentimes, disclosure quality is either equated with or seen as a function of disclosure level (e.g., Lambert et al. 2007; Francis et al. 2008; Shalev 2009). Even when trying to capture other dimensions of disclosure that could be deemed "disclosure quality," accounting researchers still end up counting items (Beretta & Bozzolan, 2004; Botosan, 2004; Bozzolan, Trombetta, & Beretta, 2009). Therefore, disclosure quality appears positively related to quantity either as a consequence of the measurement process or as an implicit assumption. I do not per se disagree with the view that quantity could be regarded as a component of overall disclosure quality, but argue that in my particular setting I can disentangle between segment disclosure quality by measuring it as the quality of operating segment aggregation without relying on the number of segments disclosed or on any item or word count (Botosan, 2004). My interest is precisely to distinguish between the two in order to understand what role they serve, separately and together, from the manager's perspective, and how they impact analysts' forecasts.

There are two main decisions related to segment reporting that managers make: what and how many segment-level line items to disclose, and what operating segments to report. Under the "management approach" in IFRS 8 the segment reporting note to financial statements should reflect, – both in terms of line items and in terms of the reported segments – the internal organization of the company and the view management has on it.<sup>2</sup> The quantity dimension of segment reporting is the number of segment-level line items disclosed in the

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<sup>2</sup> IFRS 8 and SFAS 131 are converged, so IFRS 8 requirements are the same as those of its U.S. GAAP counterpart. Since I use a sample of European firms reporting under IFRS, I will mainly refer to IFRS 8 as "the standard" throughout the paper.

note. According to the standard, disclosing a measure of profit or loss at the segment level is mandatory. All other line items mentioned in the standard should be disclosed if the management reviews them regularly in the course of the entity's normal activity. Conditioning line-item disclosure in this way lends it a voluntary character and gives rise to three possible groups of firms – those that stick strictly to the standard's suggestions and disclose more or less the same number of line items as mentioned in the standard (*Box-tickers*), those that disclose fewer line items than mentioned in the standard (*Under-disclosers*), and those that disclose more line items than suggested (*Over-disclosers*).

The standard defines an operating segment as a regularly reviewed business component of an entity and allows the aggregation of economically similar components into reportable operating segments. The way in which IFRS 8 sets up the segment aggregation rules leads to “clusters” of similar operating segments that are very different from all the other operating segments of the company. Properly applied, the aggregation criteria should lead to variability in segment-level profitability (Ettredge et al., 2006). In order to measure the quality of operating segment aggregation, I follow Ettredge et al. (2006) who rely on the intention of the standard to “dissuade multiple segment firms from aggregating operating segments with different economic characteristics as indicated by different profit margins” in order to build a measure of diversity in operating segment results.

I use a sample of 270 multi-segment European firms in the STOXX Europe 600 index at the end of 2009 that report non-geographical operating segments. The mandatory switch to IFRS 8 in 2009 allows firms to re-evaluate their segment disclosures and potentially break from existing disclosure patterns, which makes the investigation of managers' disclosure decisions at this point in time all the more meaningful. I first investigate the determinants of the choice to be in the *Under-disclosers* and *Over-disclosers* group, compared to the benchmark (i.e., middle) *Box-tickers* group. Considering the “visibility” of segment reporting

quantity, I hypothesize that *Under-disclosers* have high proprietary and agency costs that lead them to provide fewer segment line-items, and that *Over-disclosers* have strong incentives to be transparent. Results from multinomial logistic models provide support for these hypotheses. Specifically, I find that companies with proprietary concerns related to increased market concentration and potential entry are more likely to disclose fewer segment line-items. Higher levels of management ownership, i.e., potential entrenchment, are also positively associated with the likelihood to be in the *Under-disclosers* group. Companies with an overall high disclosure policy proxied by the length of the annual report are more likely to disclose more line-items than suggested by the standard and to be part of the *Over-disclosers* group.

Using similar multilogit analyses, I also investigate the choice between high (*HighQl*), low (*LowQl*), or average (*AvgQl*) segment reporting quality, defined based on the top, bottom, and two middle quartiles, respectively, of the segment reporting quality (*SRQl*) measure that follows Ettredge et al. (2006). The results show that companies with overall good financial performance and those involved in mergers and acquisitions are more likely to be in the *HighQl* group rather than in the *AvgQl* group. The relation between proprietary costs and the likelihood to be in one of the extreme groups compared to the *AvgQl* group seems to be nonlinear as higher levels of market concentration are positively associated with being in the *LowQl* and in the *HighQl* groups, compared to the *AvgQl* group.

I further investigate the consequences of positioning the company in one of the groups along the quantity and quality dimensions for financial analysts' earnings forecasting accuracy. Forecast errors for both *Under-disclosers* and *Over-disclosers* are higher compared to the *Box-ticker* group of companies. This result can be explained either by a "disclosure overload" phenomenon where too much information is detrimental to financial analysts' information processing capabilities, or by analysts interpreting the extra information as a

smokescreen for low disclosure quality and discounting it too much. Looking at segment reporting quality, the *HighQL* companies have lower forecast errors compared to the companies in the *AvgQL* group, while the association between *LowQL* and forecast accuracy is not statistically significant.

In order to obtain insights into the effects of the interplay between disclosure quantity and quality on financial analysts' earnings forecast accuracy, I interact the quality and quantity groups. My results show that, compared to the *Under-disclosers & LowQL* benchmark group, being in the *Over-discloser & HighQL*, *Box-ticker & HighQL*, *Box-ticker & LowQL*, and *Box-ticker & AvgQL* group combinations leads to higher forecast accuracy.

The companies that disclose the suggested amount of segment line items, i.e., *Box-tickers*, may still face proprietary and agency concerns, but, unlike *Under-disclosers*, may choose to solve them differently. Expectations of consistent disclosure in time (Einhorn & Ziv, 2008; Graham et al., 2005; Tang, 2014) make changing the quantity, i.e., number of segment line items, much more visible to users than changing the quality of segment reporting. Discretion can presumably be exercised over the quality of operating segment aggregation from one year to the next without any “visible” changes in segmentation (Lail et al., 2014; You, 2014). By restricting the sample to the *Box-tickers* group and modeling the determinants of quality, I find that proprietary costs from product market competition and from innovation activities are associated with lower quality of operating segments disclosed. A test of the earnings forecast accuracy for the subsample of *Box-tickers* reveals that analysts do not distinguish high from average quality, although they are able to distinguish low from average quality.

This paper contributes to the literature on disclosure characteristics, more specifically to the literature on segment information, and to current debates about disclosure quantity and quality involving users and standard setters. I contribute to the literature by taking a step in

the direction of understanding the holistic nature of managers' disclosure strategies. As suggested by Beyer et al. (2010), by focusing on multiple disclosure characteristics at a time, I contribute to the literature with new results on the choice, and effects, of disclosure quality when disclosure quantity has been chosen previously. Our results also inform users and standard setters. I show that proprietary concerns are solved in different ways – either by not following the standard's suggestions for disclosure quantity, or, if following what the standard suggests, by applying discretion in operating segment aggregation. Moreover, financial analysts do not always understand the quality of segment disclosures which implies that a business-model type of standard creates difficulties even for sophisticated users in interpreting information.

The following section provides a discussion of the institutional background, prior research, and hypotheses development. Section 3 describes the variable measurement and research design. Section 4 discusses the empirical findings and section 5 concludes.

## **I.2 Prior research and hypotheses development**

### *I.2.1 Institutional background*

For a company with diversified operations and/or geographic spread, disaggregated segment disclosures contribute to investors' assessment of the various sources of the consolidated accounting numbers. A firm reports its segments in the notes to financial statements, regulated by the pertaining financial reporting standard, SFAS 131 under U.S. GAAP and IFRS 8 under IFRS. The overarching principle of these standards is the “management approach” to segment reporting which aligns external segment reporting with firms' internal organization for operating decision purposes. Managers should disclose the



internal structure and the measures they use internally to evaluate performance and allocate resources. In other words, segment reporting should reflect the way in which the company is organized and functions and provide users with the information the management uses internally. Although the standard goes on to detail a number of aspects related to segment reporting, the guiding principle can be summarized as “through the eyes of management.”

The two core aspects of segment reporting are the information given for each segment and the operating segments disclosed. For each reported segment, the manager discloses a number of accounting items in the segment note. The standard mandates the disclosure of a profit or loss measure at segment level and lists a number of other line items that should be disclosed if the management reviews them regularly.<sup>3</sup> This condition introduces a voluntary component to segment line-item disclosure since managers can use it as a pretext to avoid reporting certain segment-level line items. Other companies could strictly follow the standard and disclose only the line items suggested, although perhaps the management reviews more items, while others could disclose many other line items. Either way, all these companies are technically within the requirements of the standard.<sup>4</sup>

The operating segments are defined as components of an enterprise that (1) engage in business activities earning revenues and incurring expenses, (2) are regularly reviewed by management, and (3) for which discrete financial information is available (IASB 2006). The basis of segmentation could be products and services, geographic area, legal entity, customer type, or another basis as long as it is consistent with the internal structure of the firm. Operating segments can be aggregated if they have similar economic characteristics and are

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<sup>3</sup> Paragraph 8.23 suggests the following line items: assets, liabilities, external revenues, internal revenues, interest revenue, interest expense (or net interest), depreciation and amortization, other material items of income and expense, interest in profit or loss of associates and joint ventures accounted for using the equity method, income tax expense or income, material non-cash items other than depreciation and amortization. Paragraph 8.24 adds the amount of investment in associates, and the amounts of additions to non-current assets other than financial instruments, deferred tax assets, post-employment benefit assets, and rights arising under insurance contracts.

<sup>4</sup> For example, although IFRS 8.21 lists segment liabilities, many companies do not disclose it claiming that it is not a measure reviewed at the segment level and ESMA agrees with this interpretation (ESMA, 2012).

similar in terms of products, customers, distribution, production, and regulation applicable (IASB 2006).<sup>5</sup> By aligning segment reporting to the internal organization of the company (FASB, 1997; IASB, 2006a), the “management approach” gives managers a lot of freedom in disclosing segment information (Nichols et al., 2012).

The accounting literature has long recognized managers’ discretion in “cropping” segments for reporting purposes (e.g., Harris 1998; Berger & Hann 2003; Berger & Hann 2007). More recently, the post-implementation reviews conducted by the IASB and the FASB confirm that the quality of operating segments aggregation remains a major concern for users (FAF, 2013; IASB, 2013d; Moldovan, 2014). The way in which IFRS 8 sets up the segment aggregation rules leads to “clusters” of similar operating segments that are very different from all the other operating segments of the company, and that allow to differentiate between the businesses in which the company is involved (Ettredge et al., 2006; Nichols et al., 2013). Properly applied, the aggregation criteria would lead to higher variability in segment-level profitability, operating margins, and risk. Therefore, I view the quality of operating segment aggregation as segment reporting quality and, similar to the measure developed in (Ettredge et al., 2006), use the cross-segment variability in return on assets as a proxy.

## *1.2.2 Literature review*

### *1.2.2.1 Disclosure quantity and quality*

Accounting disclosures can be characterized from different perspectives that range from how much information is provided to the location inside a document, to the timing and choice of disclosure venue. Although managers set up a holistic disclosure policy, existing

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<sup>5</sup> Besides the aggregation criteria, the standard also contains a set of “three plus one” quantitative thresholds as indicative benchmark for when an operating segment should be disclosed: 10% of revenue, profit, and assets of the identified operating segments and 75% of the entity’s revenue. These quantitative criteria are meant to help managers strike a balance between the importance and granularity of the reported segments, but are still surpassed by what the management considers to be useful information for investors.

literature tends to examine one disclosure characteristic at a time (Beyer et al., 2010). There is a fairly large body of research on the quantity of information that companies provide in general in the annual report (Botosan, 1997; Hope, 2003b) or specific for certain disclosures such as accounting policies (Hope, 2003a) and risk disclosure (Beretta & Bozzolan, 2004; Bozzolan et al., 2009), the voluntary nature of disclosure (e.g., Chen et al. 2002; Zechman 2010; Blacconiere et al. 2011), and even non-disclosure (Depoers & Jeanjean, 2012; Hollander, Pronk, & Roelofsen, 2010). For the time periods when they were available, AIMR rankings (discontinued in 1997) were used as scores for disclosure quality (Lang & Lundholm, 1996; Lang & Lundholm, 1993). Another stream of literature examines the language for characteristics such as readability (e.g., Li, 2008; 2010), tone (e.g., Davis & Tama-Sweet, 2012), and repetitiveness (Li, 2013) to infer disclosure quality.

The question of how disclosure quality is best defined and measured and its relation with disclosure level is yet to be answered (Beyer et al., 2010). Disclosure quality is often either equated with or seen as a function of disclosure level (e.g., Francis et al., 2008; Lambert et al., 2007; Shalev, 2009).<sup>6</sup> Botosan (2004) remarks that even when trying to capture other dimensions of disclosure that could be deemed “disclosure quality,” accounting researchers still end up counting items. In light of prior research on disclosure characteristics and the discussion above, my aim is to take one step towards a holistic understanding of managers’ financial reporting and disclosure choices by integrating multiple characteristics. In order to do this, I specifically focus on the quantity and quality of segment reporting as a setting where I can distinctly identify and measure these characteristics.

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<sup>6</sup> The concepts of disclosure quality, quantity, and transparency are essentially intertwined and, therefore, hard to disentangle. Barth & Schipper (2008) define transparency as “the extent to which financial reports reveal an entity’s underlying economics in a way that is readily understandable by those using the financial reports” and list among the characteristics of financial reporting that foster transparency the disaggregation of unlike items, in which our interpretations of both quantity and quality fit. The use of “transparency” to refer jointly to reliability and relevance of financial reporting started from the idea of “see through” and “visibility” as opposed to “obfuscation” and “concealment” (Barth & Schipper, 2008). Our way of defining disclosure quality and quantity relates back to the same notion of visibility, so from this perspective, I see disclosure quality and quantity as characteristics of transparency rather than concepts that can be cleanly separated and operationalized.

#### *1.2.2.2 Measures of segment reporting quality and quantity*

The distinction between segment reporting quality and quantity is somewhat blurred in the literature. A few papers construct measures to assess segment disaggregation, while others infer quality from the number of segment-level line items. Givoly et al. (1999) assess the measurement error of segment reporting under SFAS 14 as the difference between the correlation in the performance of the segments with the industry and the average correlation of the performance of single line-of-business firms in the industry. Bens & Monahan (2004), Berger & Hann (2007), and Franco et al. (2013) use the ratio of the number of reported segments to the number of business units in which a firm operates (i.e., two-digit SIC codes, industry segments according to the Lexis/Nexis Directory of Corporate Affiliations database) to capture information disaggregation. These measures rely heavily on the assumption that reported segments reflect the industry lines in which the company operates, as was the case under IAS 14 and SFAS 14.

In order to assess the quality of segment disaggregation under the management approach, Ettredge et al. (2006) design a metric to capture the cross-segment variability of reported segment profits which represents diversity in operating results as the largest return on sales (ROS) minus the smallest ROS for the segments of the same company controlling for inherent cross-segment profit variability using the profitability of single-segment firms. They find that the cross-segment variability of reported segment profits increased after SFAS 131, consistent with the conjecture that, on average, firms applied the aggregation criteria as intended. Lail et al. (2014) and You (2014) use similar measures. I also opt for an adjusted version of this measure.

The adoption of SFAS 131 and IFRS 8 has led, on average, to an increase in the number of segments reported (e.g., Herrmann & Thomas 2000; Berger & Hann 2003; Nichols

et al. 2012; Bugeja et al. 2014; Leung & Verriest 2014), although most companies report the same number of segments as under SFAS 14 and IAS 14R, respectively (Crawford et al., 2012; Nichols et al., 2012; Nichols et al., 2013). The number of line items, however, appears to have decreased under the management approach (Bugeja et al., 2014; Crawford et al., 2012; Leung & Verriest, 2014; Nichols et al., 2012), which raises the issue of overall informativeness of segment disclosure under the new standards and the need to understand the interplay between these two dimensions.

### *1.2.2.3 Determinants of segment information*

The two main reasons put forth for aggregating segment information are proprietary considerations and agency problems.<sup>7</sup> Hayes & Lundholm (1996) show analytically that the decision involves trading off the benefits of informing the capital market about firm value against the cost of disclosing information that could potentially aid rivals and harm the firm. In equilibrium, they find that different activities are reported as separate segments when results are sufficiently similar, but activities are aggregated into one segment when results are sufficiently different.

Some of the empirical results support the hypothesis that managers aggregate segment information to protect profits in less competitive industries. Under SFAS 14, operations in less competitive industries were less likely to be reported as industry segments (Harris 1998). Additionally, firms that reported one segment under SFAS 14 and initiated multi-segment disclosure under SFAS 131 were hiding profitable segments in less competitive industries than their primary operations (Botosan & Stanford, 2005). Firms in industries with high concentration ratios or dependent on a few major customers engaged in more aggregation of segments under SFAS 14 (Ettredge et al. 2002). Nichols & Street (2007) find a negative

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<sup>7</sup> Nichols et al. (2013) provide a recent detailed review of the segment reporting literature.

relation between disclosure of a business segment under IAS 14R and company ROA in excess of the industry average, supporting competitive harm arguments for aggregation and/or non-disclosure. Managers want to hide segment profitability (Berger & Hann 2007) and segment earnings growth (Wang et al., 2011). Ettredge et al. (2006) find, however, a continuing but decreasing effect of proprietary costs on segment profitability disclosures post-SFAS 131.

It is not clear, however, whether the source of hiding segment profitability is proprietary costs or agency costs. The agency cost hypothesis posits that segment-level information and results are withheld due to conflict of interest between managers and shareholders (Bens et al. 2011). Managers may want to hide the low profitability of some operations through aggregation in an attempt to mask moral hazard problems. Moreover, they may also want to obfuscate the true level of diversification of the company. Prior literature shows that diversified firms' shares trade at a discount compared to single-segment firms (Berger & Ofek, 1995) and that this discount is due, at least partly, to agency problems (Berger & Ofek, 1999).

The literature provides mixed evidence with respect to the agency cost motives. On the one hand, Botosan & Stanford (2005) find no evidence that firms which initiated multi-segment disclosure under SFAS 131 aggregated information under the old standard to mask poor performance. On the other hand, Berger & Hann (2007) partition their sample into firms more likely to have agency cost issues, and the others likely to have high proprietary costs and their results are consistent with the agency cost motive. Bens et al. (2011) use confidential U.S. Census data to distinguish between the proprietary and agency cost hypotheses but they cannot draw clear-cut conclusions. Results show that the probability a pseudo-segment is disclosed separately relates negatively to inefficient transfers the pseudo-segment receives from the other segments of the firm, and positively to the speed of abnormal

profit adjustment exhibited by firms in the segment's industry. Additionally, if the pseudo-segments of a single-segment firm operate in industries with high concentration of private firms then the firm is less likely to identify them separately.

#### *1.2.2.4 Segment reporting and financial analysts' information environment*

Segment earnings have predictive power for future consolidated earnings (Collins, 1976; Kinney Jr., 1971) and segment revenue is useful for investors' evaluation of firm growth prospects incremental to consolidated data (Tse, 1989). Since analysts are the main advocates for more disaggregated segment information, their reactions to segment disclosures have long been under scrutiny. Research in this area aims to understand analysts' judgment-making with respect to segment information (e.g., Maines, McDaniel, & Harris, 1997 - experiment; Seese & Douppnik, 2003 - survey) and to assess the effects of segment data on analysts' forecast characteristics. Early evidence points to reduced forecast dispersion following release of first-time mandated segment disclosures (Baldwin, 1984; Swaminathan, 1991) and to more accurate forecasts following disclosure of SFAS 14 segment information, be it line-of-business (Lobo et al., 1998), or geographical (Balakrishnan et al., 1990).

The changes in segment reporting that followed the implementation of SFAS 131 in the U.S. have improved analysts' forecast accuracy (Berger & Hann, 2003; Venkataraman, 2001) but had no effect on analysts' idiosyncratic information (Venkataraman 2001). Reporting more segments under SFAS 131 improves forecast consensus (Berger & Hann, 2003; Venkataraman, 2001), but reliance on publicly available segment information may in fact increase the uncertainty in analysts' forecasts (Botosan & Stanford, 2005). Post-SFAS 131 segment reporting has more predictive ability for consolidated earnings (Behn et al., 2002), has improved geographic segment disclosure that reduced the mispricing of foreign

earnings (Hope et al., 2008a), and for companies that no longer disclose geographic segment earnings after SFAS 131 analysts' forecasting abilities are not impaired (Hope et al., 2006).

### *1.2.3 Hypotheses development*

The business-model orientation of the standard has turned segment reporting into a type of disclosure that is mandated but has strong discretionary and voluntary components. Managers decide on how much information to give at the segment level, i.e., segment reporting quantity, and what operating segments to disclose, i.e., segment reporting quality. I investigate what influences managers' choice of quantity and quality and how these choices influence individual financial analysts' forecast accuracy. In order to build my expectations, I draw from the determinants identified in the prior literature, from practical aspects related to reading and interpreting the segment note, and from considerations related to the relative stickiness of disclosure quantity versus quality.

#### *1.2.3.1 Determinants of the likelihood to deviate from line-item standard suggestions*

Apart from mandating a measure of profit and loss, the standard suggests certain line items to be disclosed in the segment note if the manager regularly reviews these items in the normal course of his activity. Therefore, to a large extent, the segment line items are provided on a voluntary basis but for which there exists some regulatory guidance. I aim to understand what drives some companies to "deviate" and disclose fewer or more line items while others more strictly stick to the guidance in the standard.

The quantity of information provided in the segment note is a visible characteristic of segment disclosure. It is rather straightforward to read a segment note, and assess the number of line items disclosed and compare to what is suggested in the standard which can be easily



interpreted as an indication of how much information management is willing to give. If managers understand this interpretation and want to decrease information asymmetry, they will provide at least the line-item information suggested in the standard. Deciding to disclose fewer segment line items may then be the result of high proprietary and agency costs that exceed any capital markets benefits attached to providing more information (Verrecchia, 1983), characteristics that, same as disclosure quantity, are also rather sticky.

*H1a. Compared to box-tickers, under-disclosers of segment reporting quantity have high proprietary and agency costs.*

*Over-disclosers* most likely have strong incentives to provide a lot of information to the capital markets. Such incentives could come from different sources. Having a high quality auditor that pays attention to the way in which companies disclose information in the notes (Hope, 2003a; Lang, Lins, & Maffett, 2012), cross-listing in the U.S. where the regulatory regime is generally interpreted as being of high quality (Coffee, 2002), having equity financing needs or an overall transparent disclosure policy (Healy & Palepu, 1993; Lang & Lundholm, 2000), potentially due to size and pressure from various stakeholders, create incentives to provide more information.

*H1b. Compared to box-tickers, over-disclosers of segment reporting quantity have incentives for transparent financial reporting.*

#### *1.2.3.2 Determinants of the likelihood to deviate from average segment reporting quality*

The quality of segment reporting, i.e., whether the operating segments are properly defined and aggregated, is less visible and harder to understand compared to quantity and there is no benchmark for what it should be. The lower visibility of changes in segment reporting quality also means that this disclosure characteristic is less sticky which leads me to expect that the nature of its main determinant is also less sticky. Prior literature has shown

that financial performance concerns shape managers' decisions on segment aggregation. Segment profitability (Berger & Hann 2007) and segment earnings growth (Wang et al. 2011) are the relevant pieces of segment information that managers want to obfuscate because they provide information on the sources of overall firm performance.

When financial performance is overall low, managers would want to hide their bad decisions by "smoothing" the performance of the reported segments. They can achieve this smooth pattern by improperly aggregating operating segments. When financial performance is overall high, managers have incentives to show that they have made good diversification decisions and are keener to show high quality segmentation. On the flip side, managers of firms with low overall firm performance may want their investors to be able to discriminate between the segments that perform well and those that do not, and so provide high segment reporting quality. Given these arguments, I test the following hypotheses for the determinants of the choice to be in a low or high quality group compared to the average group.

*H1c(d). Compared to the average quality group, companies in the low (high) quality group have worse (better) financial performance.*

#### *1.2.3.3 Quantity, quality, and financial analysts' forecast accuracy*

Considering all the options that managers have when disclosing information about reported segments, do users distinguish between the different groups of companies? I focus particularly on financial analysts because they are important and sophisticated users of accounting information for whom segment reporting provides useful information (Healy et al., 1999; Ramnath et al., 2008). The literature reviewed above highlights the importance of segment information for analysts' ability to forecast earnings. The analytical literature on voluntary disclosure finds that disclosing more accounting information decreases information asymmetry between managers and capital market participants (Lambert et al., 2007) and is

supported empirically in the context of, for example, accounting policies (Hope, 2003b) and risk disclosures (Bozzolan et al., 2009). Given the theoretical and empirical findings on the usefulness of larger quantities of accounting information, I expect analyst accuracy to improve with more segment reporting quantity.

*H2a(b). Compared to box-tickers, financial analysts' earnings forecast error for under-disclosers (over-disclosers) is higher (lower).*

Financial analysts' demand for high quality segment aggregations (ESMA, 2011; Herrmann & Thomas, 2000; Street, Nichols, & Gray, 2000) and their relation to the companies they cover places them in a good position to understand and distinguish between high and low quality segment disclosures leading me to predict higher accuracy for companies in the high quality group, relative to the average quality companies. If, however, analysts get most of their information from privately interacting with management (Soltes, 2014) and operating segment aggregation matters less because of that, then their forecast accuracy will not depend on the quality group to which the company belongs. Another alternative is, of course, that my assumption that analysts are able to pick up segment reporting quality is not supported by the data.

*H2c(d). Compared to the average quality group, financial analysts' earnings forecast error for the low (high) quality group is higher (lower).*

So far I have hypothesized the independent effect of quantity, and respectively, quality on financial analysts' forecast accuracy. Since these are both characteristics of the same type of disclosure, their effect on forecast accuracy is a joint one rather than an independent one. Therefore, I also investigate the effect of combined quantity and quality groups on analysts' forecast error. Without formally stating the hypotheses, I expect that, compared to the *Under-discloser & LowQl* group, being in a higher group on both dimensions allows analysts to do a better job at forecasting the company's earnings. This

prediction is based on the argument that the informativeness of segment disclosures comes not just from one of its dimensions, but from both. In order for the segment note to be informative, users must be given proper information to discriminate between the various businesses of the company *and* enough information at the segment level to understand the future prospects of the components of the entity.

#### *1.2.3.4 Segment disclosure quality when line-item disclosure follows standard suggestions*

As discussed above, I expect companies that choose to provide low disclosure quantity to have higher proprietary and agency costs compared to the companies that choose to provide the line items suggested in the standard. The latter are companies that might nevertheless face costs related to the product markets and the relation between managers and shareholders. However, rather than decreasing the number of segment line items disclosed, *Box-tickers* might decrease the quality of the segments they report. In this way, overall segment disclosure informativeness for competitors and shareholders is lower without this being “too visible” and in keeping with standard setters’ guidance.

This implies that managers follow a sequential decision process in which they first set segment reporting quantity and only afterwards think about segment reporting quality. The discretion that managers can exercise on quantity compared to quality provides the basis for this assumption. Besides the benchmark that the standard provides for segment line items, prior disclosure by the same company creates a second benchmark (Einhorn & Ziv, 2008; Graham et al., 2005). One line item shown this year but missing the next is bound to raise questions from financial analysts. For example, prior research finds that managers’ decision to issue guidance one year heavily relies on their prior behavior and on how they think the stock market is going to interpret guidance discontinuance (Tang, 2014). A third benchmark for segment line items is created by the behavior of peer companies since managers tend to

benchmark their disclosure to that of other companies (Botosan & Harris, 2000; McCarthy & Iannaconi, 2010; Tarca et al., 2011). Therefore, managers' discretion over their own voluntary disclosure is limited by a number of factors which primarily tie back to line-item disclosure being easy to "see" and compare.

Changing the aggregation of an operating segment from one reportable segment to another or transferring some expenses between reportable segments (Lail et al., 2014; You, 2014) can be done without any "visible" changes to the segments.<sup>8</sup> Decreased visibility, in turn, makes such a choice less likely to raise questions. From this perspective, segment reporting quality is more prone to managerial discretion on a year-to-year basis than segment reporting quantity. Therefore, I hypothesize that companies that closely follow the standard suggestions in terms of line-item disclosure use the discretion they have on segment reporting quality when they are subject to high proprietary and agency costs.

*H3a. Box-tickers solve their concerns about proprietary and agency costs by decreasing segment reporting quality.*

In line with my investigations above, I also examine whether disclosure quality matters for financial analysts in a "constant quantity" setting. To some extent, this is a cleaner test for whether analysts pick up on disclosure quality when they are provided with the level of information suggested in the standard. My expectation is that high (low) quality reporting is associated with lower (higher) forecast errors.

*H3b(c). Conditional on the company being a box-ticker, financial analysts' earnings forecast error is lower (higher) for the high (low) quality group compared to the average quality group.*

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<sup>8</sup> Changes in the composition of reported operating segments can occur for many other legitimate reasons, from mergers and acquisitions to formal internal reorganizations and divestitures, and these events may or may not lead to changes in segment names and descriptions. It is very hard, therefore, to pick up the "real" discretionary changes in operating segments in an empirical archival research setting.

### I.3 Research design

My measure of segment reporting quantity ( $SRQt$ ) is the number of accounting items disclosed per segment in the segment note. For example, if a firm has four segments and discloses the following accounting items: segment sales, profit, assets, liabilities, and capital expenditures for each of the four segments, then  $SRQt\_Raw$  is equal to five. I then compute  $SRQt$  by taking the natural logarithm of 1 plus  $SRQt\_Raw$ .

I measure segment reporting quality ( $SRQI$ ) as the quality of operating segment aggregation into reportable operating segments based on the cross-segment profit variability in Ettredge et al. (2006) meant to capture the extent to which the internal organization of the company is faithfully represented in external reporting. A more representationally faithful segmentation will also contribute towards better investment decisions by capital market participants.

Properly aggregating operating segments based on their economic similarity leads to differences in the profitability of the reported segments. In turn, managers' incentives to improperly aggregate operating segments lead them to disclose a smooth pattern of profitability across segments.<sup>9</sup> Ettredge et al. (2006) compute cross-segment profit variability as the largest return on sales ( $ROS$ ) minus the smallest  $ROS$  for the segments of the same company. I adjust their measure (1) by using return-on-assets ( $ROA$ ) instead of  $ROS$  since  $ROA$  is a more comprehensive measure of profitability and (2) by directly taking into account industry-level profitability weighted by the proportion of total assets allocated to each segment. The adjusting procedure is similar to the one used in Lail et al. (2014).

$$ROA_{s,i} = OperatingProfit_{s,i} / Assets_{s,i}$$

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<sup>9</sup> I conducted two interviews with a former sell-side equity research analyst with Morgan Stanley and a credit analyst with OFI Asset Management in Paris, France in April 2014. These financial analysts also confirm that cross-segment profit variability is a reasonably good proxy for the quality of reported operating segments.

$$AdjROA_{s,i} = (ROA_{s,i} - IndustryROA_s) \times \frac{Assets_{s,i}}{TotalAssets_i}$$

$$SRQl_i = Log(2 + \max AdjROA_{s,i} - \min AdjROA_{s,i})$$

Where  $s$  is an indicator going from 1 to  $k$ , and  $k$  is the number of firm  $i$ 's segments.<sup>10</sup>

I test the determinants of the continuous measures  $SRQt$  and  $SRQl$  using cross-sectional least-squares regressions. These tests allow us to understand what drives managers' decisions on the quantity of line items and the quality of operating segment aggregation in the full sample. I omit firm and time subscripts for ease of exposition.

$SRQt$  (or  $SRQl$ )

$$\begin{aligned} &= \beta_0 + \beta_1 Herf + \beta_2 R\&D + \beta_3 LnMgOwners + \beta_4 ROA + \beta_5 Loss + \beta_6 M\&A \\ &+ \beta_7 Big4 + \beta_8 LengthAR + \beta_9 ADR + \beta_{10} EqIssue + \beta_{11} BTM + \beta_{12} LnTA \\ &+ Industry FE + \varepsilon \end{aligned} \quad (1)$$

Following prior literature on segment information (Berger & Hann, 2007; Botosan & Stanford, 2005; Harris, 1998), I proxy for industry-, and product market-related proprietary costs using the Herfindahl industry concentration index ( $Herf$ ) computed as the sum of the squared market share of all firms at two digit SIC-level over the Thomson Reuters population of listed companies in the sample countries. High values of  $Herf$  reflect high concentration

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<sup>10</sup> I acknowledge two limitations related to this measure of  $SRQl$ . First, the segment operating profit item used to compute ROA is as reported. Since IFRS 8 does not define the segment result, different companies may have different definitions for this item. Ettredge et al. (2006) and Lail et al. (2013) also discuss this issue. In addition, Berger & Hann (2007) remark that it is not always clear whether segment assets as recorded in the databases comprise both non-current and current assets. Due to asset allocation policies, some companies allocate and disclose only non-current assets at segment level, but this line item gets recorded as segment assets in the databases. For a random set of 81 companies (30%) in our sample I have checked the denomination of the segment assets line-item disclosed in the note to financial statements. Although it might still be an issue, following this verification, I am reasonably confident that the companies in our sample tend to allocate both non-current and current assets at segment level, such that the segment assets line item is the equivalent of total assets. Second, capturing the discretionary aspect of operating segment aggregation means I have to control for the "natural" profit variability in a company's segments. I benchmark segment profitability to single-segment firms' profitability based on the industry code Worldscope assigns to the segment. While this is common in the literature (e.g., Lail et al. 2013; You 2013), I acknowledge that segments of conglomerates are not always comparable to single-segment firms due to systematic differences hard to control for (Graham et al. 2002), which means using single-segment profitability as benchmark may not always be meaningful.

and low levels of competition in that industry (Depoers & Jeanjean, 2012).<sup>11</sup> My second proxy for proprietary costs relates to innovation activities and is computed as the natural logarithm of 1 plus research and development expenditures divided by lagged total sales (*R&D*). Following prior literature (Ellis, Fee, & Thomas, 2012), I set the variable to 0 where R&D expenditures are missing. High investment in R&D activities increases the firm's proprietary costs due to innovation.

I proxy for agency conflicts with a measure of managerial ownership (*LnMgOwners*) computed following Lennox (2005) as the natural logarithm of the percent of outstanding shares owned by current executive directors. Although aimed at aligning managers and shareholders' interests, management ownership potentially leads to entrenchment when managers hold enough stock to control the company (Morck, Shleifer, & Vishny, 1988). Management-controlled firms have considerable discretion in guiding the affairs of the corporation, and this discretion could be used to divert some resources from corporate shareholders (Morck et al., 1988). In contrast, owner-controlled firms do not have the same incentives to divert resources, since owner-managers would suffer directly from reduced share value (Jensen & Meckling, 1976).

Three variables in my model are meant to capture firm performance. I use the return-on-assets (*ROA*), and an indicator variable for whether the company is making a loss in the current year (*Loss*) to capture firm profitability. I also use an indicator variable for whether the company was involved in mergers and acquisitions activity during the year (*M&A*) to capture firm performance because better performing firms have enough resources to engage in takeover activity.

Four variables proxy for firms' incentives to provide transparent disclosures. High quality auditors (*Big4*) are more likely to have their clients report high quality and high

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<sup>11</sup> According to Ali et al. (2014), high industry concentration could be interpreted as either low or high industry competition, leading to different predictions of the relation between industry concentration and proprietary costs. In developing our predictions, however, I rely on *Herf* as interpreted in prior work on segment reporting.



quantity of information.<sup>12</sup> Companies' overall disclosure policy measured using the natural logarithm of the number of pages in the annual report (*LengthAR*) also proxies for firms' incentives to provide a certain level of information. I include an indicator variable for the U.S. cross-listing status (*ADR*) to capture firms' incentives for increased transparency due to the bonding effect (Coffee, 2002; Raffournier, 1995). The amount of equity issued during the year divided by beginning-of-year market capitalization (*EqIssue*) proxies for firms' need to access the stock market for additional financing. Prior literature has shown that financing needs incentivize managers to increase the quantity of disclosures they make in order to reduce information asymmetry (Lang & Lundholm, 2000). The model also includes controls for firm growth (*BTM*) and size as the natural logarithm of total assets (*LnTA*). Industry fixed effects capture the similarity of segment disclosure quality and quantity in the same industry and any sort of benchmarking of disclosure characteristics with industry peers (Botosan & Harris, 2000). Adding country fixed effects to all the analyses (untabulated) leaves all the inferences unchanged.

In order to test what motivates managers to deviate from an expected (i.e., average) value of quantity and quality, I split the sample into three groups for each disclosure characteristic. To do this, I first create quartiles based on *SRQt\_Raw* and *SRQL*. Companies in the bottom quartile of *SRQt\_Raw* disclose fewer than 9 line items (*Under-disclosers*) while those in the top quartile disclose more than 14 line items (*Over-disclosers*). Companies in the two middle quartiles generally "tick" the number of line items suggested by the standard (*Box-tickers*). In a similar way, I obtain three groups based on *SRQL*. The bottom quartile is the *LowQL* group, the upper quartile is the *HighQL* group, and the two middle quartiles form the *AvgQL* group.

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<sup>12</sup> Since French regulations require joint audits (André, Broye, Pong, & Schatt, 2014; Francis, Richard, & Vanstraelen, 2009), *Big4* is coded 1 for French firms audited by two Big 4 auditors or by one Big 4 and a local auditor, and 0 for the French firms audited by two local auditors.

I run multinomial logistic regressions to test the determinants of the likelihood that managers will choose to be in a certain disclosure group. Results will show to what extent the hypothesized firm characteristics increase or decrease the probability that the company is an *Under-discloser* or an *Over-discloser* compared to the reference group of *Box-tickers*, and, respectively, has *LowQL* or *HighQL* disclosure, compared to the *AvgQL* group. As hypothesized in H1a, I expect the multinomial regression coefficients on *Herf*, *R&D*, and *LnMgOwners* in the “*Under-disclosers vs. Box-tickers*” model to be positive and significant, meaning that high values for proprietary costs arising from market competition, and from innovation activities, and agency costs due to managerial entrenchment increase the likelihood that the company moves from the *Box-tickers* reference group into the *Under-disclosers* group. Based on my prediction in H1b, I expect the coefficients on *Big4*, *LengthAR*, *ADR*, and *EqIssue* in the “*Over-disclosers vs. Box-tickers*” column to be positive and significant. High values for these variables reflect firms’ incentives to be transparent in their financial reporting which increase the likelihood that the company moves from the *Box-tickers* benchmark group into the *Over-disclosers* group. Confirming H1c and H1d rests on the coefficients for *ROA*, *Loss*, and *M&A* being negative and significant in the model predicting the likelihood of *LowQL* compared to *AvgQL*, and positive and significant in the model predicting the likelihood of *HighQL* compared to *AvgQL*.

I test my hypotheses for whether being in different disclosure characteristic groups makes a difference for financial analysts’ ability to accurately forecast earnings with two models of earnings forecast error.

$$FE_{it+1} = \beta_0 + \beta_1 \text{Under} - \text{disclosers}_{it} + \beta_2 \text{Over} - \text{disclosers}_{it} + \sum \text{Control variables} + \text{Industry FE} + \delta_{it+1} \quad (2)$$

$$FE_{it+1} = \gamma_0 + \gamma_1 \text{LowQL}_{it} + \gamma_2 \text{HighQL}_{it} + \sum \text{Control variables} + \text{Industry FE} + \theta_{it+1} \quad (3)$$

The magnitude of forecast error (*FE*) is the absolute value of the difference between actual and estimated earnings-per-share, scaled by the absolute value of actual earnings-per-share (e.g., Horton, Serafeim, & Serafeim, 2013). As Schipper (1991) points out, earnings forecasts are not a final product but rather an input into generating a final product, i.e., the stock recommendation and analyst report. If disclosure quality and quantity help analysts get this intermediary step right, then the final product is more likely to be a good one. I compute *FE* at the analyst-firm level since different individual analysts may have different ways of interpreting disclosure quality and quantity, information that is lost if I use consensus measures. Prior literature shows that analysts are heterogeneous in terms of, for example, effort, experience, or ability, and these characteristics are related to the accuracy of their forecasts and to how investors respond to their forecast revisions (Clement, 1999; Jacob, Lys, & Neale, 1999; O'Brien, 1990; Stickel, 1992). Recent evidence also shows that investors use individual analyst forecasts as additional benchmarks in evaluating reported earnings beyond the consensus number (Kirk, Reppenhagen, & Tucker, 2014).<sup>13</sup>

I control for variables shown in prior literature (e.g., Bradshaw, Miller, & Serafeim, 2009; Lang & Lundholm, 1996; O'Brien & Bhushan, 1990) to impact analysts' forecast accuracy and which have been previously used in international studies examining at the properties of analysts' earnings forecasts (e.g., Tan et al. 2011; Preiato et al. 2013). Namely, I control for the firm's earnings quality with the standard deviation of residuals from the Dechow & Dichev (2002) model of discretionary accruals (*EQ*) because analysts seem to take into account discretionary accruals when forecasting earnings (Givoly, Hayn, & Yoder, 2011). Complexity in firm organization makes it harder for analysts to forecast earnings (Dunn & Nathan, 2005), so I control for the reported number of segments (*Segments*). Larger companies are more likely to have high analyst coverage (Bhushan, 1989) and more coverage

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<sup>13</sup> Running the models on analyst-firm observations also increases the power of our tests.

from the business press (Kothari, Li, & Short, 2009), so I also control for firm size (*LnTA*).<sup>14</sup> Forecasting earnings for loss-making companies is harder (Das, 1998), so I control for whether the company made a loss in the previous year (*Loss*). Following prior literature, I use the number of financial analysts forecasting the earnings of the company in  $t+1$  (*LnAnalysts*) to control for the firm's overall information environment (Ashbaugh & Pincus, 2001).<sup>15</sup>

Companies that have turned to the capital market for financing during the previous year are more likely to have increased the frequency of their non-regulated disclosures and the amount of information they provide (Lang & Lundholm, 2000), so I control for the amount of equity issuance in year  $t$  as a percent of lagged total market capitalization (*EqIssue*). I include *LengthAR* and an indicator variable for whether management provides an outlook for the  $t+1$  earnings in year  $t$  earnings announcement press release (*Guidance*) based on hand-collected data to control for management's overall attitude towards disclosing information to capital markets, including forward-looking information, expected to improve forecast accuracy (Hassell, Jennings, & Lasser, 1988; Healy et al., 1999; Lang & Lundholm, 1996; Williams, 1996). I use stock return volatility (*ReturnVolatility*) to proxy for firm-related news in the market (Duffee, 1995; Lang & Lundholm, 1996), book-to-market ratio (*BTM*) to proxy for a firm's growth, and *ADR* to proxy for a firm's commitment to another regulatory regime that improves the firm's information environment (Lang, Lins, & Miller, 2003). In addition, I include industry fixed effects to account for differences in forecasting difficulty at the industry level. I run these models on cross-sectional firm-analyst observations to increase the power of the test, and cluster standard errors at the analyst level.

Since disclosing fewer line items in the segment note means providing less information about the firm's segments, I expect that compared to *Box-tickers*, financial

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<sup>14</sup> Using the number of distinct four-digit or two-digit industries in which the company operates instead of the number of reported operating segments does not significantly change the results.

<sup>15</sup> In this study, *LnAnalysts* and *LnTA* are correlated at 55%. In order to mitigate multicollinearity concerns, I also run the analyses using the orthogonalized value of *LnAnalysts* on *LnTA*. Results are very similar and inferences do not change.

analysts covering *Under-disclosers* are less accurate, i.e., I expect  $\beta_1$  to be positive and significant (H2a). At the same time, since *Over-disclosers* disclose higher quantities of information compared to *Box-tickers*, analysts can use that extra information to make better earnings predictions, i.e., I expect  $\beta_2$  to be negative and significant (H2b). If financial analysts are able to perceive the quality of operating segment aggregation, then their earnings forecast errors for *LowQl* companies are higher compared to the *AvgQl* group, i.e.,  $\gamma_1$  is positive and significant (H2c) and the forecast errors for *HighQl* companies are lower compared to the *AvgQl* group, i.e.,  $\gamma_2$  is negative and significant (H2d).

Up until now I have focused on the determinants and consequences of disclosure quantity and quality viewed as independent decisions. I now turn my focus to managers' decisions vis-à-vis disclosure quality given that they have already decided on being a *Box-ticker* in terms of disclosure quantity. In order to test H3a, I run model (1) on the sample of *Box-tickers*, with *SRQl* as dependent variable. *Box-tickers* follow the suggestions in the standard and disclose more or less the same number of items as exemplified there. They seem to treat that number of line items as mandatory disclosure, and provide it regardless of the proprietary and agency costs they may be incurring. I hypothesize, however, that these companies in turn solve their proprietary and agency costs by decreasing the quality of operating segment aggregation. Therefore, I expect positive coefficients for *Herf* and *LnMgOwners*, and a negative coefficient for *R&D*. To test hypotheses H3b and H3c for whether financial analysts are indeed able to differentiate segment reporting quality for the group of average *SRQt*, I run model (3) on the sample of *Box-tickers*. I predict that, compared to the reference group *Box-tickers & AvgQl*, companies in the *LowQl* group have higher forecast errors, i.e., the coefficient on *Box-tickers & LowQl* is positive and significant (H3b), while companies in the *HighQl* group have lower forecast errors, i.e., the coefficient on *Box-tickers & HighQl* is negative and significant (H3c).

## **I.4 Sample and results**

### *I.4.1 Sample*

Due to data collection requirements for segment reporting quantity, I start the sample construction from the companies included in the STOXX Europe 600 index at 31 December 2009. The mandatory switch to IFRS 8 in 2009 allows firms to re-evaluate their segment disclosures and potentially break from existing disclosure habits, which makes the investigation of managers' disclosure decisions at this point in time all the more meaningful.

I delete 143 companies activating primarily in the financial industry (i.e., ICB codes 8000-8999), along with companies that follow U.S. GAAP (10 companies), those without a segment footnote or that report a single segment (28 companies), companies for which two types of shares are included in the index (i.e., doubles; 4 companies) and companies that have been acquired and for which corporate documents are no longer available (14 companies). I further delete firms that do not report segment assets (62 companies) necessary for computing segment-level *ROA*, and companies whose main segmentation is geographical (69 companies) for lack of a profitability benchmark to use for adjusting segment-level *ROA*. The final sample comprises 270 companies with one year of data. Table I.1 panel A illustrates the sample construction procedure. Where analyses are based on analyst-firm level data, the sample contains 7929 observations.

Sample companies are listed on stock exchanges in 17 EU countries (table I.1 panel B). There are 74 UK companies (37%), 38 French companies (14%), and 33 German companies (12%). Each of the other countries contributes with less than 10% of the sample companies. This distribution is similar to the country distribution in the overall STOXX

Europe 600. Based on Industry Classification Benchmark (ICB) codes (panel C), there are 76 industrials (28%), 44 companies in the basic materials industry (16%), 37 consumer services companies (14%) and 35 consumer goods companies (13%). Each of the other industries contains less than 10% of the sample companies.

Table I.2 panel A reports descriptive statistics for the variables included in the analyses. The median (average) company discloses 11 (12) segment-level line items. The number of line items disclosed varies between 2 and 63. The median value of *SRQI* is 0.73 (mean value is 0.83). The values for the *Herf* exhibit a lot of variation, meaning that concentration levels vary among industries. The median company reports 4 segments, has *ROA* of 3.5%, has issued equity of 0.1% of its lagged market capitalization, has *BTM* of 0.44, 5 billion euros in assets, and around 180 pages in the annual report. The average company R&D expenditure is 1 euro for every 10 million euros in total sales. As expected for these relatively large listed companies, management ownership is relatively low, on average 0.7% of common shares outstanding. Of the sample companies, 84% have been involved in acquisitions and 15% made a loss in 2009, 15% are cross-listed in the US, 96% are audited by (at least) a Big4 auditor, and 69% disclose management guidance in the annual press release announcing the earnings for 2009. The median (mean) analyst-level forecast error for the sample companies is 7% (16%) of actual earnings.

Panel B in table I.2 presents the distribution of the sample companies into groups of *Under-disclosers/Box-tickers/Over-disclosers* and *Low/Avg/HighQI*. In the groups based on *SRQI*, there are 132 *Box-tickers*, 75 *Over-disclosers*, and 63 *Under-disclosers*. From a quality perspective, 135 companies have *AvgQI*, 68 have *HighQI*, while 67 have *LowQI*. The bulk of the analyses that follow aims to improve our understanding of why managers choose to be in one of these groups versus another and whether this has any implications for financial analysts' earnings forecasting abilities.

Table I.2 also presents the correlation matrices for the variables used in the determinants (panel C) and consequences (panel D) analyses. The nonparametric correlation coefficient between  $SRQt$  and  $SRQl$  is 4% and not significant at conventional levels. The highest correlations are between  $ROA$  and  $Loss$  (-61%), between  $ROA$  and  $BTM$  (58%), and between  $LnAnalysts$  and  $LnTA$  (55%). All other correlation coefficients are below 50%. The strongest correlation of  $SRQt$  is with  $LengthAR$  (29%, significant at 1%), while the strongest correlation of  $SRQl$  is with  $ROA$  (15%, significant at 1%). The correlation between  $FE$  and  $SRQl$  is -5%, significant at 1%, and between  $FE$  and  $SRQt$  is 12%, significant at 1%.

#### *1.4.2 Main results*

I begin by testing the determinants of the continuous measures for  $SRQt$  and  $SRQl$  in least-squares firm-level regressions (table I.3 panel A). Standard errors are adjusted for heteroskedasticity. Throughout the paper, even when I have a predicted sign, statistical significance of regression coefficients is based on two-sided t-tests. The dependent variable in model 1 is  $SRQt$ . The number of segment-level line items is positively associated with companies' overall disclosure policy proxied by  $LengthAR$  (coefficient 0.22, t-value 3.00), and with  $BTM$  (coefficient 0.21, t-stat 3.53). Involvement in  $M\&A$  is also positively associated with  $SRQt$  (coefficient 0.13, t-stat 2.03) perhaps because managers with a penchant for takeovers feel the need to give more information about their activity to investors. Cross-listing in the U.S. seems to decrease the number of reported segment line items (coefficient on  $ADR$  is -0.14, t-stat -2.37), consistent with the findings in Hope et al. (2013), who show that compared to matched U.S. firms, cross-listed firms disclose management earnings guidance less frequently and of lower quality. Accessing the capital markets during the year for additional financing ( $EqIssue$ ) is also negatively related to  $SRQt$



(coefficient -0.15, t-stat -2.01). My proxies for proprietary and agency costs are not significantly associated with the continuous measure for *SRQt*.

The dependent variable in model 2 is *SRQI*. Good firm performance as proxied by *ROA* (coefficient 0.51 t-stat 2.16) and *M&A* (coefficient 0.11, t-stat 2.67) is significantly positively associated with *SRQI*. Loss-making firms as captured by the dummy variable *Loss* report lower quality segments (coefficient -0.08, t-stat -1.96). This supports my arguments that better performing companies will also disclose high quality operating segments. Auditor quality is positively associated with *SRQI* at significance level 1% (coefficient on *Big4* is 0.11, t-stat 3.51). Adjusted  $R^2$  for the two models are 14%, and 18%, respectively, and the models are significant at 1%.<sup>16</sup>

Panel B in table I.3 reports the results from two multinomial logistic models used to test H1a-H1d. The likelihood ratio for both models is significant at 1%, and the values for the pseudo- $R^2$  are 23% and 29%, respectively. Columns 1 and 2 report the results of a multilogit model which examines the determinants of the choice to be an *Under-discloser* versus a *Box-ticker*, and an *Over-discloser* versus a *Box-ticker*. The coefficient on *Herf* is positive and marginally significant. Therefore, the higher the industry concentration, the more likely the company is an *Under-discloser*. If high industry concentration makes managers wary of disclosing information that could help potential new entrants gain a foot in the market, then proprietary costs related to new entry lead managers to be *Under-disclosers*. The coefficient on *LnMgOwners* is positive and significant at 5%. The higher the management stock ownership, so the closer it is to the intermediary ranges where the manager becomes entrenched, the more likely the company is an *Under-discloser*. The coefficient on *R&D* is positive, as expected, but not significant. Overall, I interpret this evidence cautiously as suggesting that certain proprietary and agency costs lead firms to report fewer items than

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<sup>16</sup> Since the sample contains companies from 17 European countries with an unequal distribution, I test the sensitivity of the results to using weighted least squares (WLS) instead of OLS. Results are qualitatively similar and inferences remain the same.

suggested by the standard. H1b predicts positive coefficients on the variables proxying for firms' incentives to be transparent (*Big4*, *LengthAR*, *ADR*, *EqIssue*). Only the coefficient on *LengthAR* is positive and significant at 1%, meaning that companies with a general policy of high level disclosure also disclose more segment-level line-items.

Columns 3 and 4 report the results of a multilogit model with *AvgQl* as reference group. I find no support for H1c, the variables proxying for firms' financial performance are not playing a significant role in managers' decision to provide *LowQl* segment reporting. This would suggest that there is no difference in financial performance between *LowQl* and *AvgQl* firms. The coefficients on *ROA* and *M&A* in the *HighQl* decision model are positive and significant at 1% and 5%, respectively, suggesting that, compared to *AvgQl* firms, better firm performance leads managers to disclose higher quality segment information. Proprietary costs seem to play a nonlinear role for the likelihood to be in one of the extreme groups as higher levels of market concentration are positively associated with being in the *LowQl* and in the *HighQl* groups, compared to the *AvgQl* group.

In order to test H2a-H2d, I run cross-sectional least-squares regressions on a sample of 7929 analyst-firm level observations, with analyst-firm earnings forecast error (*FE*) as dependent variable, and indicator variables for the groups to which a firm belongs as independent variables of interest. The models in table I.4 panel A include a range of control variables as discussed in the previous section, industry fixed effects, and standard errors are clustered at analyst level. The coefficient signs for the control variables are as expected based on prior literature. In model 1, compared to the *Box-tickers* group, the *Under-disclosers* group is associated with higher forecast error (coefficient 0.03, t-stat 4.16). Therefore, providing fewer segment line items makes it harder for financial analysts to accurately forecast next year's earnings. Going overboard, however, seems to have a similar effect. The coefficient on *Over-disclosers* is positive and significant at 1%. One possible explanation for

this result is that too much information at the segment level increases analysts' information processing costs, and this decreases their ability to forecast earnings. This result is consistent with Leheavy, Li, & Merkley (2011) who find that "earnings forecasts [for firms with less readable 10-K reports or longer 10-K reports] are more dispersed, less accurate, and associated with greater levels of uncertainty," with the views expressed by two the financial analysts I interviewed, and supports regulators and investors' views about the negative effects of disclosure overload on investors' decision-making (e.g., Thomas, 2014).

In model 2, the independent variables of interest are the groups based on *SRQL*. Compared to companies in the benchmark *AvgQL* group, companies in the *HighQL* group have lower forecast errors (coefficient -0.02, t-stat -2.89), providing support for hypothesis H2d. Forecast error for the companies in the *LowQL* group is not different from the mean forecast error for the benchmark group, lending no support for H1c. It seems, therefore, that being able to discriminate the entity's segments indeed helps analysts better forecast earnings, but that lower quality disclosures do not affect their accuracy. Either analysts cannot differentiate low quality from an average quality of segment reporting, or they have other ways to obtain information when they believe segment reporting is not helping them discriminate between the company's businesses.

In table I.4 panel B, I test how the interaction between quality and quantity contributes to financial analysts' forecasting accuracy. In order to do this, I interact the three groups based on *SRQt* with the three groups based on *SRQL*. The benchmark group is *Under-disclosers & LowQL* and I eliminate companies in the groups *Box-tickers & LowQL*, *Over-disclosers & LowQL*, *Under-disclosers & AvgQL*, and *Under-disclosers & HighQL* because I have no priors to predict their behavior (i.e., to understand why they chose to be at the extremes on the second diagonal in table I.2 panel B) or to predict how financial analysts deal

with these firms.<sup>17</sup> The sample thus drops to 172 companies, i.e., 4924 analyst-firm observations for this analysis. As expected, compared to the *Under-disclosers & LowQL* group, being in any other interaction group benefits financial analysts by improving their forecast accuracy (coefficients are negative and significant at 1%). The largest coefficient (in absolute value) is on *Box-tickers & HighQL*, followed by the ones on *Box-tickers & AvgQL*, *Box-tickers & LowQL*, and *Over-disclosers & HighQL*. Adjusted  $R^2$  for this model is 25%, and the model F-value is 40.16, significant at 1%. I also test the difference in coefficients across these variables of interest. The coefficient on *Box-tickers & HighQL* is not statistically different from the coefficient on *Box-tickers & AvgQL*. The coefficient on *Box-tickers & AvgQL* is significantly higher than the one on *Box-tickers & LowQL* ( $\chi^2=7.73$ , significant at 1%), while the coefficient on *Box-tickers & LowQL* is higher than the one on *Over-disclosers & HighQL* ( $\chi^2=3.25$ , significant at 10%). These results seem to suggest that providing the highest quantity and quality of segment disclosures has lower benefits than setting these characteristics in the middle ranges of what the other companies do.

#### *1.4.3 Additional analyses*

In table I.5, I restrict the analyses to the subsample of *Box-tickers* (132 firm observations). In panel A, I aim to understand what explains their choice of disclosure quality once they have decided to follow the standard suggestions in terms of the number of segment line items. I hypothesized that these companies choose to solve their proprietary and agency concerns by decreasing disclosure quality rather than decreasing the more “visible” disclosure quantity. Results confirm my predictions related to proprietary costs, but not to agency costs (i.e., partial support for H3a). I find a positive and significant coefficient on

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<sup>17</sup> I believe that in-depth, case-study-type of methodology could be useful to understand the disclosure behavior of these firms.

*Herf* (coefficient 0.49, t-stat 1.90), meaning that higher proprietary concerns due to the conditions in the product market drive companies who have already decided to provide the segment line items in the standard to decrease the quality of their segment disclosures. In the same vein, the coefficient on *R&D* is negative and significant (coefficient -0.66, t-stat -1.71) suggesting that increased proprietary concerns due to innovation lead managers to improperly aggregate operating segments and provide lower quality segment information. The coefficient on *LnMgOwners* is positive but not significant.

In panel B, I run the model with *FE* as dependent variable at analyst-firm level on the sample of *Box-tickers*, with the quality groups as independent variables of interest. The benchmark group is *Box-tickers & AvgQl*. The purpose of this test is to examine whether, financial analysts can differentiate between companies disclosing a constant (and similar) level of disclosure quantity but have differing disclosure quality. In other words, in this test the “visible” part of segment disclosures is kept constant and I investigate whether analysts are able to distinguish *High/LowQl* from *AvgQl*. Results suggest that financial analysts’ forecast errors are higher for *LowQl* firms compared to *AvgQl* firms (coefficient 0.02, t-stat 2.13), confirming H3b, but that analysts make no distinction between *HighQl* and *AvgQl* firms (coefficient is negative but not significant at conventional levels).

## **I.5. Conclusions and policy implications**

This paper aims to contribute to our understanding of the holistic nature of managers’ disclosure strategy by focusing on the interplay between two disclosure characteristics – quantity and quality. I focus on segment reporting under the management approach, where managers have different degrees of discretion over the two disclosure dimensions. My first set of results suggests that managers solve proprietary costs either by decreasing the quantity

of information below standard guidance, or, if following standard suggestions, by decreasing information quality. This finding has implications for how researchers and regulators rate overall disclosure informativeness and is in line with investors and financial analysts' opinion that high disclosure quantity may sometimes act as a smokescreen for low quality.

Our second set of results suggests that financial analysts do not always pick up segment reporting quality and too much quantity may increase information processing costs and impair their ability to accurately forecast earnings. In light of standard setters' increasing interest for business-model based standards (Leisenring et al., 2012), these results advocate a cautious approach since it appears that even sophisticated users have difficulties with the "management approach."

## Appendix I.A: Variable definitions and source

Disclosure variables	
<i>SRQt_Raw</i>	The number of accounting items disclosed per segment in the segment reporting note to financial statements for the fiscal year 2009. Data is hand-collected from firms' financial statements.
<i>SRQt</i>	Natural logarithm of 1 plus <i>SRQt_Raw</i> .
<i>Under-disclosers</i>	1 if <i>SRQt_Raw</i> is in the 25 <sup>th</sup> percentile, and 0 otherwise.
<i>Box-tickers</i>	1 if <i>SRQt_Raw</i> is between the 25 <sup>th</sup> and 75 <sup>th</sup> percentiles, and 0 otherwise.
<i>Over-disclosers</i>	1 if <i>SRQt_Raw</i> is above the 75 <sup>th</sup> percentile, and 0 otherwise.
<i>SRQI</i>	Natural logarithm of 2 plus the range of segment return-on-assets adjusted for mean industry return-on-assets weighted by segment assets to total assets at the end of 2009. Data comes from Thomson Reuters Worldscope. I use $\log(2+x)$ to bring the distribution closer to the normal distribution following Berry (1987) and Liu & Natarajan (2012). The variable is winsorized at 95% to mitigate the influence of extreme values.
<i>LowQI</i>	1 if <i>SRQI</i> is in the 25 <sup>th</sup> percentile, and 0 otherwise.
<i>AvgQI</i>	1 if <i>SRQI</i> is between the 25 <sup>th</sup> and 75 <sup>th</sup> percentiles, and 0 otherwise.
<i>HighQI</i>	1 if <i>SRQI</i> is above the 75 <sup>th</sup> percentile, and 0 otherwise.
Other variables used in the models	
<i>ADR</i>	1 if the company is also listed in the US, and 0 otherwise, based on data from Thomson Reuters.
<i>Big4</i>	1 if company <i>I</i> is audited by a Big 4 auditor (Ernst&Young, Deloitte, KPMG, PriceWaterhouseCoopers) in 2009, and 0 otherwise, based on data from S&P Capital IQ.
<i>BTM</i>	Book-to-market ratio in 2009, based on data from Thomson Reuters.
<i>EQ</i>	The negative of the absolute value of residuals from a Dechow-Dichev (2002) model computed in-sample at the industry level. Data comes from Thomson Reuters. Higher values mean higher earnings quality.
<i>EqIssue</i>	Amount of equity issued in 2009 divided by beginning of year market capitalization, based on data from S&P Capital IQ.
<i>FE</i>	Analyst-level earnings forecast error computed as the absolute value of the difference between the last yearly forecast estimate before the earnings announcement minus the actual earnings, deflated by absolute actual earnings. Data is for 2010 and comes from I/B/E/S. The variable is winsorized at 95% to mitigate the influence of extreme values.
<i>Guidance</i>	1 if the earnings announcement press release at the end of fiscal year 2009 contains an outlook/management forecast/guidance section, and 0 otherwise.

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<i>Herf</i>	Industry competition measure computed as the sum of squared market shares in 2009, based on data from Thomson Reuters.
<i>LengthAR</i>	Natural logarithm of the number of pages in company <i>i</i> 's 2009 annual report.
<i>LnAnalysts</i>	Natural logarithm of the number of analysts covering the company in 2010, based on data from I/B/E/S.
<i>LnMgOwners</i>	Following Lennox (2005), management ownership is computed as the natural logarithm of the percentage of ordinary shareholdings of current executive directors, and 0 otherwise; computed based on data from S&P Capital IQ at the end of fiscal year 2009, or the closest available date.
<i>LnTA</i>	Natural logarithm of total assets for company <i>I</i> at the end of 2009, based on data from Thomson Reuters.
<i>Loss</i>	1 if net income before extraordinary items is below 0, and 0 otherwise, based on data from Thomson Reuters.
<i>M&amp;A</i>	1 if the company was involved in mergers or acquisitions during 2009, and 0 otherwise. Data comes from Thomson Reuters Deal Scan.
<i>R&amp;D</i>	Natural logarithm of 1 plus research and development expenditures at the end of 2009, multiplied by one million to aid result exposition, divided by lagged total sales, based on data from Thomson Reuters. Where research and development expenditures are missing, the value is set to 0.
<i>ReturnVolatility</i>	Standard deviation of daily stock return during 2009. Data comes from Thomson Reuters Datastream.
<i>ROA</i>	Return-on-assets during 2009. Data comes from Thomson Reuters.
<i>Segments</i>	The number of segments reported by the company in its note to financial statements for the 2009 fiscal year. Data is hand-collected from the annual reports.

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## Appendix I.B: Tables for chapter I

**Table I.1: Sample**

Panel A: Sample construction

<b>STOXX Europe 600 at 31/12/2009</b>	<b>600</b>
(-) Financial institutions	-143
(-) Follow U.S. GAAP	-10
(-) No segment footnote/Single segment	-28
(-) Doubles	-4
(-) Taken over in/after 2010	-14
(-) Missing segment asset data	-62
(-) Main segmentation is geographical	-69
<b>(=) Total</b>	<b>270</b>

This table describes the sampling procedure.

Panel B: Distribution of sample by country

<b>Country</b>	<b>Freq.</b>	<b>Percent</b>
Austria	5	1.85
Belgium	3	1.11
Switzerland	19	7.04
Germany	33	12.22
Denmark	3	1.11
Spain	15	5.56
Finland	15	5.56
France	38	14.07
UK	74	27.41
Greece	2	0.74
Ireland	4	1.48
Italy	11	4.07
Luxembourg	2	0.74
Netherlands	14	5.19
Norway	8	2.96
Portugal	6	2.22
Sweden	18	6.67
<b>Total</b>	<b>270</b>	<b>100</b>

This table reports the country distribution of companies in the sample.

Panel C: Distribution of sample by industry

<b>Industry</b>	<b>Freq.</b>	<b>Percent</b>
Basic Materials	44	16.30
Consumer Goods	35	12.96
Consumer Services	37	13.70
Health Care	13	4.81
Industrials	76	28.15
Oil and Gas	25	9.26
Technology	11	4.07
Telecommunications	12	4.44
Utilities	17	6.30
<b>Total</b>	<b>270</b>	<b>100</b>

This table presents the industry distribution of the companies included in the sample, based on one-digit Industry Classification Benchmark (ICB) classification codes.

**Table I.2: Descriptive statistics**

Panel A: Descriptive statistics for the variables included in the main analyses

Variable	N	Mean	StdDev	Min	P25	Median	P75	Max
SRQt_Raw	270	12.400	6.739	2.000	9.000	11.000	14.000	63.000
SRQt	270	2.504	0.410	1.099	2.303	2.485	2.708	4.159
SRQl	270	0.832	0.271	0.693	0.711	0.738	0.803	1.820
Herf	270	0.119	0.096	0.028	0.056	0.079	0.161	0.801
R&D_raw	270	0.019	0.055	0.000	0.000	0.000	0.012	0.384
R&D	270	0.018	0.048	0.000	0.000	0.000	0.012	0.325
MgOwnership(%)	270	0.751	3.651	0.000	0.000	0.009	0.077	25.000
LnMgOwners	270	0.178	0.556	0.000	0.000	0.009	0.074	3.258
ROA	270	0.043	0.062	-0.153	0.014	0.035	0.068	0.456
Loss	270	0.148	0.356	0.000	0.000	0.000	0.000	1.000
M&A	270	0.844	0.363	0.000	1.000	1.000	1.000	1.000
Big4	270	0.956	0.206	0.000	1.000	1.000	1.000	1.000
AnalystsFollowing	270	17.215	7.751	1.000	13.000	18.000	24.000	45.000
LnAnalysts	270	2.902	0.440	0.693	2.639	2.944	3.219	3.829
EQ	270	0.071	0.050	0.010	0.045	0.060	0.082	0.434
LengthAR	270	5.186	0.383	4.419	4.868	5.124	5.481	6.687
ADR	270	0.152	0.360	0.000	0.000	0.000	0.000	1.000
EqIssue	270	0.057	0.278	0.000	0.000	0.001	0.005	3.901
BTM	270	0.539	0.392	-0.076	0.298	0.447	0.693	3.547
LnTA	270	22.763	1.298	20.119	21.754	22.554	23.745	25.867
Segments	270	4.056	1.850	2.000	3.000	4.000	5.000	12.000
ReturnVolatility	270	0.223	0.189	0.030	0.107	0.179	0.281	1.566
Guidance	270	0.685	0.465	0.000	0.000	1.000	1.000	1.000
FE	7929	0.163	0.221	0.000	0.028	0.076	0.184	0.876

This table presents descriptive statistics for the variables used in the empirical analyses. The sample contains 270 firm-observations and is described in table I.2. The sample for *FE* contains 7929 firm-analyst observations. See variable definitions in appendix I.A. *R&D\_raw*, *MgOwnership* (%) and *AnalystsFollowing* are the raw variables (i.e., non-log) of *R&D*, *LnMgOwners* and *LnAnalysts*, respectively.

Panel B: Distribution of sample into groups based on *SRQl* and *SRQt*

<i>SRQt</i>					
		<i>Over-disclosers</i>	<i>Box-Tickers</i>	<i>Under-disclosers</i>	<b>Total</b>
<b><i>SRQl</i></b>	<i>HighQl</i>	22 (8.15%)	31 (11.48%)	15 (5.56%)	<b>68 (25.19%)</b>
	<i>AvgQl</i>	39 (14.44%)	66 (24.44%)	30 (11.11%)	<b>135 (50.00%)</b>
	<i>LowQl</i>	14 (5.19%)	35 (12.96%)	18 (6.67%)	<b>67 (24.81%)</b>
	<b>Total</b>	<b>75 (27.78%)</b>	<b>132 (48.89%)</b>	<b>63 (23.33%)</b>	<b>270 (100%)</b>

This table presents the sample distribution into groups of *SRQt*, i.e., *Over-disclosers*, *Box-tickers*, and *Under-disclosers*, and *SRQl*, i.e., *High/Avg/LowQl* (percent of total sample in brackets). The sample contains 270 firm-observations and is described in table 1. Companies are split into groups based on whether their values for *SRQt* and *SRQl* in the bottom, upper, and two middle percentiles. See variable definitions in appendix I.A for more details.

Panel C: Correlation matrix for variables used in the determinants analyses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)SRQt	1	0.148**	-0.066	-0.124**	-0.081	-0.195***	0.083	0.185***	0.031	0.026	0.053	0.303***	-0.038	-0.064	0.255***	0.266***
(2)SRQI	0.040	1	-0.057	-0.070	0.033	0.073	-0.140**	0.074	0.063	-0.087	0.006	0.096	-0.049	-0.026	0.047	0.071
(3)Herf	0.014	0.004	1	-0.020	0.034	0.010	-0.026	-0.152**	-0.066	0.027	0.021	-0.044	0.052	0.008	0.035	0.081
(4)R&D	-0.127**	-0.061	-0.092	1	0.017	-0.018	0.064	0.081	0.038	-0.109*	0.039	-0.185***	0.008	-0.011	-0.098	-0.220***
(5)LnMgOwners	-0.180***	0.044	0.047	-0.009	1	0.018	-0.056	-0.063	-0.078	-0.073	0.038	0.051	0.019	-0.022	0.006	-0.048
(6)ROA	-0.192***	0.145**	-0.048	0.056	0.124**	1	-0.554***	-0.164***	-0.061	-0.040	-0.017	-0.200***	0.002	-0.202***	-0.433***	-0.288***
(7)Loss	0.105*	-0.086	0.061	0.029	-0.076	-0.615***	1	0.121**	-0.011	-0.032	0.119*	0.145**	-0.002	0.164***	0.365***	0.087
(8)M&A	0.167***	0.053	-0.139**	0.008	-0.121**	-0.179***	0.121**	1	0.007	0.087	-0.089	0.221***	0.096	0.039	0.091	0.144**
(9)Big4	0.018	0.012	-0.079	-0.035	0.011	0.022	-0.011	0.007	1	-0.023	0.009	-0.099	-0.009	0.023	-0.073	0.024
(10)LnAnalysts	0.057	-0.104*	0.059	-0.064	-0.202***	-0.083	-0.016	0.117	-0.016	1	-0.147**	0.377***	0.216***	-0.178***	0.035	0.516***
(11)EQ	0.083	0.140**	0.058	-0.073	0.082	-0.054	0.120	-0.129**	-0.013	-0.128**	1	-0.014	-0.018	0.052	-0.066	-0.208***
(12)LengthAR	0.287***	0.041	0.032	-0.155**	-0.159***	-0.299***	0.149**	0.269***	-0.098	0.397***	0.012	1	0.216***	-0.078	0.216***	0.569***
(13)ADR	-0.042	-0.053	0.043	-0.075	-0.012	-0.053	-0.002	0.096	-0.009	0.232***	-0.061	0.203***	1	-0.049	0.054	0.321***
(14)EqIssue	-0.093	0.008	0.070	-0.032	0.120**	0.055	-0.018	-0.084	-0.101*	-0.103*	-0.078	-0.028	-0.038	1	0.204***	-0.023
(15)BTM	0.248***	-0.126**	0.123**	-0.036	-0.059	-0.588***	0.300***	0.221***	-0.050	0.118*	-0.092	0.292***	0.041	0.045	1	0.348***
(16)LnTA	0.222***	-0.137**	0.105*	-0.176***	-0.165***	-0.351***	0.097	0.142**	0.031	0.554***	-0.210***	0.542***	0.287***	-0.038	0.455***	1

This table presents Pearson (above diagonal) and Spearman correlation coefficients (below diagonal) for the variables used in the determinants analyses. See variable definitions in appendix I.A. The sample contains 270 firm-observations and is described in table I.2. Statistical significance is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

Panel D: Correlation matrix for the variables used in the analyst earnings forecast accuracy analyses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)SRQI	1	0.133***	-0.029**	0.032***	0.114***	-0.017	-0.122***	-0.020*	0.093***	-0.133***	-0.008	-0.077***	0.058***
(2)SRQt	0.014	1	0.075***	0.058***	-0.037***	0.072***	-0.038***	-0.071***	0.298***	0.082***	-0.077***	-0.030***	0.265***
(3)FE	-0.052***	0.120***	1	0.098***	0.008	0.389***	0.010	-0.105***	0.102***	0.359***	0.109***	0.059***	0.012
(4)EQ	0.143***	0.072***	0.111***	1	-0.115***	0.031***	-0.057***	0.067***	-0.007	0.114***	0.048***	-0.039***	-0.188***
(5)Segments	0.047***	-0.024**	-0.013	-0.082***	1	-0.095***	-0.076***	-0.144***	0.162***	0.011	-0.045***	0.007	0.338***
(6)ReturnVolatility	-0.024**	0.118***	0.312***	0.074***	-0.032***	1	0.197***	-0.063***	0.095***	0.413***	0.319***	0.019*	-0.018
(7)LnAnalystsRes	-0.100***	0.008	0.064***	-0.008	-0.056***	0.221***	1	-0.120***	0.120***	0.078***	-0.085***	0.009	0.081***
(8)Guidance	-0.058***	-0.059***	-0.102***	0.019*	-0.140***	-0.012	-0.146***	1	-0.075***	-0.135***	0.042***	0.025**	0.005
(9)LengthAR	0.026**	0.288***	0.151***	-0.004	0.183***	0.149***	0.110***	-0.052***	1	0.096***	-0.074***	0.205***	0.569***
(10)Loss	-0.067***	0.108***	0.268***	0.105***	0.030***	0.352***	0.101***	-0.135***	0.098***	1	0.142***	-0.027**	0.038***
(11)EqIssue	0.045***	-0.130***	-0.033***	-0.084***	0.058***	-0.065***	-0.135***	0.084***	0.015	-0.044***	1	-0.065***	-0.027**
(12)ADR	-0.085***	-0.036***	0.057***	-0.081***	0.052***	-0.026**	0.005	0.025**	0.187***	-0.027**	-0.081***	1	0.357***
(13)LnTA	-0.129***	0.222***	0.066***	-0.210***	0.391***	0.039***	0.074***	0.001	0.557***	0.043***	0.008	0.341***	1

This table presents Pearson (above diagonal) and Spearman correlation coefficients (below diagonal) for the variables used in the analyst earnings forecast accuracy analyses. See variable definitions in appendix I.A. The sample contains 7929 firm-analyst observations. Statistical significance is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

**Table I.3: Tests of determinants of segment disclosure quantity ( $SRQt$ ) and segment disclosure quality ( $SRQI$ )**

Panel A: Least-squares analyses for continuous dependent variables

Variables	(1)		(2)	
	$SRQt$		$SRQI$	
	Coeff	t-stat	Coeff	t-stat
Herf	-0.202	(-0.88)	0.152	(1.55)
R&D	-0.455	(-0.87)	-0.215	(-1.01)
LnMgOwners	-0.058	(-1.03)	0.023	(0.82)
ROA	-0.494	(-1.08)	0.513**	(2.16)
Loss	-0.077	(-0.96)	-0.079*	(-1.96)
M&A	0.127**	(2.03)	0.107***	(2.67)
Big4	0.102	(0.93)	0.106***	(3.51)
LengthAR	0.222***	(3.00)	0.065	(1.16)
ADR	-0.138**	(-2.37)	-0.047	(-1.02)
EqIssue	-0.154**	(-2.01)	-0.028	(-0.86)
BTM	0.205***	(3.53)	0.095*	(1.93)
LnTA	0.022	(0.99)	-0.020	(-1.48)
Intercept	0.694	(1.25)	0.714**	(2.07)
Industry FE	YES		YES	
F-value	3.10***		3.94***	
Adj-R <sup>2</sup>	0.135		0.179	
N	270		270	

This table reports results from OLS cross-sectional multivariate models with  $SRQt$  as continuous dependent variable in model (1) and  $SRQI$  as continuous dependent variable in model (2). The models include industry fixed effects. Standard errors are adjusted for heteroskedasticity. The sample contains 270 firm-observations. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.

Panel B: Multinomial logistic analyses for deviations from average *SRQt* and from average *SRQI*

	(1)		(2)		(3)		(4)	
	<i>Under-disclosers vs. Box-tickers</i>		<i>Over-disclosers vs. Box-tickers</i>		<i>LowQI vs. AvgQI</i>		<i>HighQI vs. AvgQI</i>	
Variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Herf	3.135*	(3.11)	2.387	(1.49)	4.852**	(5.47)	4.834**	(4.79)
R&D	1.304	(0.12)	-1.621	(0.14)	3.991	(1.30)	-6.583	(1.21)
LnMgOwners	0.579**	(4.15)	0.099	(0.09)	0.402	(1.90)	0.267	(0.58)
ROA	2.421	(0.57)	-2.278	(0.30)	-5.812	(1.26)	12.362***	(8.75)
Loss	0.338	(0.30)	-0.126	(0.05)	-0.751	(1.58)	-0.828	(1.36)
M&A	-0.127	(0.08)	1.031*	(2.92)	0.240	(0.25)	1.260**	(5.04)
Big4	0.457	(0.31)	0.842	(1.03)	-0.284	(0.13)	0.568	(0.35)
LengthAR	0.573	(0.97)	1.831***	(11.18)	-0.344	(0.39)	0.898	(2.41)
ADR	0.290	(0.32)	-0.711	(1.88)	-0.199	(0.15)	-0.630	(1.27)
EqIssue	0.305	(0.29)	-0.304	(0.19)	0.843	(0.94)	1.152	(1.44)
BTM	-1.016	(2.22)	0.315	(0.45)	0.216	(0.22)	0.329	(0.31)
LnTA	-0.293	(2.38)	-0.239	(1.81)	0.261	(1.93)	-0.183	(0.89)
Intercept	0.126	(0.00)	-8.033	(4.85)	-4.930	(1.76)	-3.628	(0.79)
Industry FE	YES				YES			
Likelihood Ratio	70.406***				93.984***			
Pseudo R <sup>2</sup>	0.230				0.294			
N	270				270			

This table reports results from two multinomial logit regressions. For columns (1) and (2), the dependent variable is ordinal and based on whether the company belongs to one of the three groups of *SRQt*. Firms in the bottom quartile of *SRQt* are classified as *Under-disclosers*, those in the top quartile are classified as *Over-disclosers*, and those in the middle two quartiles are classified as the benchmark group (*Box-tickers*). Column (1) presents the results for a model predicting the likelihood that a company will be in the *Under-disclosers* group, while column (2) presents the results for a model predicting the likelihood that a company will be in the *Over-disclosers* group. For columns (3) and (4), the dependent variable is ordinal and based on whether the company belongs to one of the three groups of *SRQI*. Firms in the bottom quartile of *SRQI* are classified as *LowQI*, those in the top quartile are classified as *HighQI*, and those in the middle two quartiles are classified as the benchmark group (*AvgQI*). Column (3) presents the results for a model predicting the likelihood that a company will be in the *LowQI* group, while model (4) presents the results for a model predicting the likelihood that a company

will be in the *HighQl* group. The models include industry fixed effects. The sample contains 270 firm-observations. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.

**Table I.4: The importance of segment disclosure quality and quantity for financial analysts' earnings forecast accuracy**

Panel A: Analysts' earnings forecast accuracy across groups of *SRQt* and *SRQl*

Variables	(1)		(2)	
	Coeff	t-stat	Coeff	t-stat
<b>Under-disclosers</b>	<b>0.025***</b>	<b>(4.16)</b>		
<b>Over-disclosers</b>	<b>0.047***</b>	<b>(7.71)</b>		
<b>HighQl</b>			<b>-0.017***</b>	<b>(-2.89)</b>
<b>LowQl</b>			<b>0.007</b>	<b>(1.24)</b>
EQ	-0.373***	(-5.91)	-0.383***	(-5.94)
Segments	0.006***	(4.28)	0.006***	(4.25)
ReturnVolatility	0.317***	(19.11)	0.319***	(19.21)
LnAnalysts	-0.067***	(-8.55)	-0.073***	(-8.82)
Guidance	-0.022***	(-4.02)	-0.028***	(-5.30)
LengthAR	0.038***	(5.39)	0.053***	(7.48)
Loss	0.146***	(14.50)	0.143***	(13.92)
EqIssue	-0.015	(-1.13)	-0.019	(-1.44)
ADR	0.035***	(5.32)	0.029***	(4.39)
LnTA	-0.001	(-0.42)	-0.002	(-0.78)
Intercept	0.089*	(1.80)	0.069	(1.44)
Industry FE	YES		YES	
F-value	72.21***		71.50***	
Adj-R <sup>2</sup>	0.249		0.243	
Clusters	2628		2628	
N	7929		7929	

This table reports results from multivariate regression models with *FE* as dependent variable. In model (1), firms in the bottom quartile of *SRQt* are classified as *Under-disclosers*, those in the top quartile are classified as *Over-disclosers*, and those in the middle two quartiles are classified as the benchmark group (*Box-tickers*). In model (2), firms in the bottom quartile of *SRQl* are classified as *LowQl*, those in the top quartile are classified as *HighQl*, and those in the middle two quartiles are classified as the benchmark group (*AvgQl*). The model includes industry fixed effects. Standard errors are clustered at analyst level. The sample contains 7929 firm-analyst observations corresponding to the 270 companies included in the determinants analyses. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.



Panel B: Analysts' earnings forecast accuracy across groups of companies based on *High/Avg/LowQl* and *Under-disclosers/Box-tickers/Over-disclosers*

Variables	FE	
	Coeff	t-stat
<b>Box-tickers &amp; HighQl</b>	<b>-0.083***</b>	<b>(-7.23)</b>
<b>Box-tickers &amp; AvgQl</b>	<b>-0.076***</b>	<b>(-6.95)</b>
<b>Box-tickers &amp; LowQl</b>	<b>-0.055***</b>	<b>(-4.84)</b>
<b>Over-disclosers &amp; HighQl</b>	<b>-0.037***</b>	<b>(-2.76)</b>
EQ	-0.230***	(-3.31)
Segments	0.003**	(1.98)
ReturnVolatility	0.324***	(13.26)
LnAnalysts	-0.063***	(-7.61)
Guidance	-0.043***	(-6.48)
LengthAR	0.082***	(9.35)
Loss	0.122***	(10.10)
EqIssue	0.013	(1.01)
ADR	0.065***	(6.69)
LnTA	-0.009**	(-2.54)
Intercept	0.126*	(1.93)
Industry FE	YES	
F-value	40.16	
Adj-R <sup>2</sup>	0.248	
Clusters	2095	
N	4924	
<i>Tests of difference in coefficients</i>		
<i>Box-tickers &amp; HighQl = Box-tickers &amp; AvgQl</i>	$\chi^2 = 0.99$ p-value=0.320	
<i>Box-tickers &amp; AvgQl = Box-tickers &amp; LowQl</i>	$\chi^2 = 8.15$ p-value=0.004	
<i>Box-tickers &amp; LowQl = Over-disclosers &amp; HighQl</i>	$\chi^2 = 3.25$ p-value=0.070	

This table reports results from a multivariate regression model with *FE* as dependent variable. Firms in the bottom quartile of *SRQt* are classified as *Under-disclosers*, those in the top quartile are classified as *Over-disclosers*, and those in the middle two quartiles are classified as *Box-tickers*. Firms in the bottom quartile of *SRQl* are classified as *LowQl*, those in the top quartile are classified as *HighQl*, and those in the middle two quartiles are classified as *AvgQl*. '*Under-disclosers & LowQl*' is the benchmark group. The sample contains 4924 firm-analyst observations corresponding to 172 companies. I eliminate from the sample the companies that are *Over-disclosers* but have *LowQl* or *AvgQl*, and those that are *Under-disclosers* but have *HighQl* or *AvgQl*. The model includes industry fixed effects. Standard errors are clustered at analyst level. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.

**Table I.5: Tests on the sample of *Box-tickers***

Panel A: Determinants of segment disclosure quality (*SRQI*) conditional on the company being a *Box-ticker*

Variables	SRQI	
	Coeff	t-stat
<b>Herf</b>	<b>0.487*</b>	<b>(1.90)</b>
<b>R&amp;D</b>	<b>-0.661*</b>	<b>(-1.71)</b>
<b>LnMgOwners</b>	<b>0.007</b>	<b>(0.15)</b>
ROA	0.801*	(1.92)
Loss	-0.092	(-1.53)
M&A	0.181***	(2.82)
Big4	0.124**	(2.45)
LengthAR	0.013	(0.17)
ADR	-0.019	(-0.29)
EqIssue	-0.035	(-0.88)
BTM	0.147**	(2.01)
LnTA	-0.033	(-1.29)
Intercept	1.178*	(1.75)
Industry FE	YES	
F-value	1.92**	
Adj-R <sup>2</sup>	0.124	
N	132	

This table reports results from an OLS cross-sectional multivariate model with *SRQI* as dependent variable and hypothesized determinants as independent variables, conditional on the company being in the *Box-ticker* group of *SRQt*. The model includes industry fixed effects. Standard errors are adjusted for heteroskedasticity. The sample contains 132 firm-observations. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.

Panel B: Analysts' earnings forecast accuracy across groups of companies based on groups of *High/Avg/LowQI*, conditional on the company being in the *Box-tickers* group

Variables	FE	
	Coeff	t-stat
<b>Box-tickers &amp; HighQI</b>	<b>-0.006</b>	<b>(-0.86)</b>
<b>Box-tickers &amp; LowQI</b>	<b>0.016**</b>	<b>(2.13)</b>
EQ	-0.076	(-1.08)
Segments	-0.005***	(-2.84)
ReturnVolatility	0.283***	(11.38)
LnAnalysts	-0.040***	(-5.23)
Guidance	-0.054***	(-6.88)
LengthAR	0.080***	(9.11)
Loss	0.070***	(5.92)
EqIssue	0.051***	(3.51)
ADR	0.058***	(5.35)
LnTA	-0.009**	(-2.42)
Intercept	0.012	(0.16)
Industry FE	YES	
F-value	32.84	
Adj-R <sup>2</sup>	0.221	
Clusters	1859	
N	3843	

This table reports results from a multivariate regression model with *FE* as dependent variable. Firms in the bottom quartile of *SRQt* are classified as *Under-disclosers*, those in the top quartile are classified as *Over-disclosers*, and those in the middle two quartiles are classified as *Box-tickers*. Firms in the bottom quartile of *SRQI* are classified as *LowQI*, those in the top quartile are classified as *HighQI*, and those in the middle two quartiles are classified as *AvgQI*. '*Box-tickers & AvgQI*' is the benchmark group. The model includes industry fixed effects. Standard errors are clustered at analyst level. The sample contains only those companies classified as *Box-tickers*, adding up to a total of 3843 firm-analyst observations corresponding to 132 companies. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix I.A.

## **Chapter II**

### **Inconsistent Segment Disclosure across Corporate Documents**

#### **Abstract**

Market regulators in the U.S. and Europe investigate cases of inconsistent disclosures when a company provides different information on the same topic in different documents. Focusing on operating segments, this paper uses manually-collected data from four different corporate documents of multi-segment firms to analyze the impact of inconsistent disclosure on financial analysts' earnings forecast accuracy. Inconsistencies that arise from further disaggregation of operating segments in some documents seem to bring in new information and increase analysts' accuracy. However, when analysts must work with different, difficult-to-reconcile segmentations, their information processing capacity and forecasts are less accurate. These findings contribute to our understanding of the effects of managers' disclosure strategy across multiple documents and have implications for regulators and standard setters' work on a disclosure framework.

## Résumé

Les régulateurs de marché examinent des cas de présentations lorsqu'une entreprise fournit des informations différentes sur le même sujet dans différents documents. En mettant l'accent sur les secteurs opérationnels, cet essai utilise des données recueillies manuellement auprès de quatre documents d'entreprise afin d'analyser l'impact de la publication d'information non-conforme sur l'exactitude des prévisions de résultat des analystes financiers. La non-conformité qui découle de la déségrégation supplémentaire des secteurs semble introduire de nouveautés et contribue à l'exactitude des prévisions. La publication des segmentations difficilement réconciliables entraîne une exactitude réduite des prévisions. Ces résultats contribuent à notre compréhension des effets de la politique de communication des dirigeants à travers plusieurs documents et ont des répercussions sur le travail des régulateurs.

## II.1 Introduction

A company discloses inconsistently if in different public documents it reports different things on the same topic, i.e., if there is variation in what the company reports on the same topic in different documents that refer to the same fiscal period. This paper uses hand-collected data from four documents, (1) the notes to financial statements, (2) the management discussion and analysis (MD&A), (3) the earnings announcement press release, and (4) the conference call presentation slides to financial analysts, to investigate whether and to what extent multi-segment firms disclose operating segments inconsistently across corporate documents, i.e., there is variation in the operating segments disclosed across these documents, and to examine the consequences of inconsistent disclosure for financial analysts' earnings forecast accuracy.<sup>1</sup>

Investors and financial analysts emphasize that “principles of transparency, consistency and completeness, along with the intention to communicate clearly, must form the basis for disclosure elements wherever they are found” (CFA Institute, 2007, p. 40). Standard setters have also taken note of this issue. One of the findings in a survey conducted by the International Accounting Standards Board (IASB) as part of its preparation to revise the Conceptual Framework and existing disclosure requirements reveals that “in terms of poor communication, many respondents cited internal inconsistency [as one key problem]. For example, segment disclosures are not always consistent with information provided elsewhere” (IASB, 2013b).

Regulators' enforcement practices related to disclosure, in general, and the disclosure of operating segments, in particular, also motivate an examination of the effects of disclosure inconsistency. The management approach to segment reporting required under both SFAS

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<sup>1</sup> Throughout the essay, I use “operating segments” and “segments” interchangeably to refer to the operating segments that companies report in the notes to financial statements and which reflect the internal organization of the company, based on IFRS 8.

131 and IFRS 8 aligns external segment reporting with firms' internal organization for operating decision purposes (FASB, 1997; IASB, 2006a). This approach allows for considerable discretion in the way managers report operating segments (ESMA, 2011), with the improper aggregation of operating segments into reportable ones as the most problematic aspect of the standards (IASB, 2013d). When evaluating compliance with these business model-based standards (Leisenring et al., 2012), the Securities and Exchange Commission (SEC) and the European Securities and Markets Authority (ESMA) look for inconsistent disclosure of operating segments across a firm's disclosure outlets as a first step before requesting the firm's internal documents (Pippin, 2009; Johnson, 2010; Dixon, 2011; ESMA, 2012). Regulators' point of view is that inconsistent disclosures are opaque and make it hard for users to understand the internal organization of the company.<sup>2</sup> The focus of this paper is to evaluate the effect, if any, of inconsistent disclosures on financial analysts as an important category of users of accounting information.

In order to assess inconsistency, I hand-collect segment disclosures of 400 multi-segment European firms during one year (i.e., a cross-section of firms) from (1) the notes to financial statements, (2) the MD&A, (3) the earnings announcement press release, and (4) the presentation to financial analysts during the fiscal year-end conference call. These are the main documents containing financial information in a firm's overall disclosure package (Clarkson, Kao, & Richardson, 1999). I code a company as inconsistent discloser (*Inconsistent*) if the operating segments disclosed in these documents are not the same, i.e., there is variation in the operating segments disclosed in these documents. When one document is missing, I rely on the available documents to assess inconsistency.

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<sup>2</sup> The SEC and ESMA investigate inconsistencies across documents not just for segment reporting, but also for loss contingencies and non-GAAP financial measures (Dixon, 2011; ESMA, 2011). "The Staff issue comments on perceived inconsistencies between filed and non-filed communications to investors [...] to ensure consistency between formal (i.e., MD&A, financial statements) and informal presentations of the company's financial condition and results of operations" (Dixon, 2011). Non-filed communications can include anything from production reports and marketing materials to the information disclosed on the corporate website (Cormier & Magnan, 2004).

The incomplete revelation hypothesis (Bloomfield, 2002) is the theoretical framework that guides my predictions related to the role of inconsistent disclosure for financial analysts. Contrary to the efficient markets hypothesis, the incomplete revelation hypothesis acknowledges the costs to extracting data from public documents and processing information based on that data. This framework helps explain numerous empirical results on the effects of disclosure characteristics and regulators and standard setters' interest with regulation of informationally equivalent disclosures and reports (Bloomfield, 2002). There are two different views on the consequences that inconsistent disclosure could have on financial analysts' forecast accuracy. Analysts' claims with respect to inconsistency being an undesirable characteristic of disclosure (CFA Institute, 2013; Hoffmann & Fieseler, 2012) suggests that inconsistent information coming from different sources makes it hard for analysts to piece together the "puzzle" that the company is. Obtaining different information on the same topic that should a priori be the same creates a sense of confusion. As a result, inconsistency increases information processing costs, both in terms of time and effort required, which suggests a positive relation between inconsistent disclosures and forecast error. However, inconsistency could also mean that more information is available for analysts. Variation in the operating segments disclosed in different documents could mean that financial analysts receive more information on the organization of the company which should help them more accurately forecast future earnings.

While the reasons for why managers disclose inconsistently is not the direct focus of this paper, I acknowledge that inconsistent disclosure of operating segments could potentially be the product of managers' strategy to obfuscate the information on the company's internal organization, or, on the contrary, of their honest efforts to provide more information about the internal organization of the company in some documents. My focus is rather on testing



whether inconsistent disclosure has adverse effects for the users of accounting information, and should therefore be of concern to regulators and standard setters.

In order to test the two views on the effect of inconsistent disclosure, I identify different types of inconsistency depending on the easiness with which the variation in the disclosed operating segments can be reconciled. If the operating segments disclosed in some documents are disaggregated compared to those in other documents, and presented in such a way that makes it is clear that this is the case, and easy to understand how the operating segments fit together, i.e., it is easy to piece back the operating segments disclosed across documents in a coherent image of the internal organization of the firm then users should be able to easily understand the organization of the firm while having more information about its operating segments and the “sub-segments.” In other words, such variation in disclosure brings more information for financial analysts that is easy to process and make sense of. I code such firms as providing additional disclosure, i.e., further disaggregated operating segments, in some documents (*Inc\_AddDisclosure*). If further disaggregation in some of the documents brings new information (Verrecchia, 2001), then financial analysts will make more accurate forecasts.

If the operating segments disclosed in different documents cannot be easily put back together to get an image of the internal organization of the firm because different documents discuss different segmentations of the company without presenting any indication as to how these could be reconciled and pieced back together, then this information is potentially hard to process and creates confusion when an analyst tries to understand the image and results of the company. I code such firms as providing inconsistent disclosure that arises from presenting different segmentations across the set of documents considered (*Inc\_DiffSegmentation*). Although companies in both groups qualify as inconsistent

disclosers under the SEC and ESMA guidelines, grouping them in a more refined way allows more careful tests based on the type of variation in disclosure.

I first investigate whether and to what extent firms make inconsistent disclosures across corporate documents. I find that almost 39% of the sample companies disclose segments inconsistently across the four documents. Out of the full sample, 11% are inconsistent by providing further disaggregation of the operating segments reported in the note, while 28% seem to disclose a different segmentation of the company operations or operating segments that are not easily reconcilable with the ones reported in the note. I then examine whether disclosure inconsistency has consequences for financial analysts' earnings forecast accuracy. I choose to examine the effect of inconsistency on analysts' forecasts because analysts are important and sophisticated users of financial information and they are most likely to look at the range of disclosure outlets considered in this paper. Results show that overall inconsistency is not significantly related to forecast errors. However, tests using the refined grouping reveal that inconsistency arising from further disaggregation of operating segments in some documents compared to others significantly decreases forecast errors suggesting that such inconsistency brings more information that financial analysts can use. Inconsistency arising from the disclosure of different segmentations is significantly and positively related to forecast errors, which suggests that receiving difficult-to-reconcile, potentially contradicting, information from various sources confuses analysts and impair their ability to assess the prospects of the company as a whole and make accurate earnings forecasts.<sup>3</sup>

Further tests also show that even inconsistency solely inside the annual report, i.e., between the operating segments disclosed in the note to financial statements and the MD&A, affects analysts when it arises from disclosing different segmentations. When the operating

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<sup>3</sup> Making it harder for analysts to assess the prospects of the company as a whole is consistent with managers trying to obfuscate the internal organization of the company and, therefore, decreasing the transparency of communication with the investor community.

segments presented in the MD&A are different from those disclosed in the note to financial statements, mean forecast error as well as forecast dispersion increase from before to after the issuance of the annual report.

The set of four documents considered in this paper contains both mandatory and voluntary disclosure. The segment information presented in the note to financial statements is mandated under IFRS 8, while any segment information presented outside the financial statements is voluntary. As mentioned above, the overarching principle in IFRS 8 requires the disclosure of the internal organization of the company to external users of information. Therefore, a priori there is no reason to expect variation in the operating segments that management discusses in different documents since the internal organization does not change from one day to the next. Moreover, given the importance of segment information for capital market participants to understand the sources of consolidated earnings and the diversification strategy of the management, it is likely that managers include segment information in the voluntary disclosure they want to communicate to capital markets.<sup>4</sup> Additional analyses also suggest that, although not regulated, there is demand from analysts for companies to provide segment information in documents such as the earnings announcement press release and the presentation to analysts. Omitting this information significantly increases analysts' forecast errors. Therefore, since it is reasonable to expect segment information disclosure in these outlets and given the management approach principle of IFRS 8, it makes sense to include these documents in the set of documents I examine and to expect mandatory and voluntary disclosure of operating segments to be the same, which warrants their comparison.

In light of the current debates on the development of a disclosure framework to go together with the IASB and the Financial Accounting Standards Board's (FASB) Conceptual Frameworks (Barker et al., 2013; EFRAG, 2012), this paper contributes by providing

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<sup>4</sup> The fact that segment information was first voluntarily provided by U.S. companies in the 1960s before being regulated by the SEC and then the FASB in the 1970s also backs up this point.

evidence on the validity of arguments made by regulators and analysts with respect to inconsistent disclosures across corporate documents. More specifically, the results suggest that when managers provide additional information to capital market participants by further disaggregating the operating segments in some documents, analysts get more information that is easy to process and which allows them to more accurately forecast the earnings of the company. However, inconsistency that reveals different segmentations across documents confuses analysts and impairs their ability to accurately forecast earnings.

Besides its practical implications, this paper contributes to the accounting and financial disclosure literature. The paper investigates one disclosure characteristic that practitioners, standard setters, and regulators are interested in, but which has not been systematically examined so far. This paper complements existing evidence on the effects of inconsistency on corporate reputation (e.g., Hutton, Goodman, Alexander, & Genest, 2001) by testing the consequences of inconsistency for the tasks performed by a specific category of users – financial analysts.

By considering disclosures made in an array of documents, this paper takes a step forward towards improving our understanding of managers' overall disclosure strategy and the effects that this strategy has. Besides the financial statements, managers use multiple other outlets to communicate financial information to capital market participants. I provide evidence on the role that a characteristic of financial information disclosed across multiple documents has and how users assess it, which enhances our understanding of the role of accounting disclosures and the characteristics that make accounting disclosure useful.

The next section provides background information on segment reporting requirements under IFRS and U.S. GAAP and reviews the booming accounting disclosure characteristics literature. Section 3 develops the hypotheses. Section 4 describes the sample, research design,

and variable measurement. Section 5 discusses the main empirical results and additional analyses, while section 6 provides a discussion of the robustness tests. Section 7 concludes.

## **II.2 Institutional background and literature review**

Financial analysts and the investor community have expressed their dissatisfaction with segment reporting over and over again, on both sides of the Atlantic. In 1997, the FASB replaced SFAS 14 with SFAS 131 following pressures from U.S. financial analysts (Herrmann & Thomas 2000). Internationally, the IASB has converged segment reporting under IFRS with segment reporting under U.S. GAAP by issuing IFRS 8 in 2006 (IASB, 2006a). Both SFAS 131 and IFRS 8 require the management approach to segment reporting which aligns external segment reporting with firms' internal organization for operating decision purposes. Operating segments are defined as components of an enterprise (1) that engage in business activities earning revenues and incurring expenses, (2) that are regularly reviewed by management, and (3) for which discrete financial information is available. The basis of segmentation could be products and services, geographic area, legal entity, customer type, or another basis as long as it is consistent with the internal structure of the firm. Although supposed to provide more decision-useful information, problems in the way these standards are applied continue to generate criticism from investors (ESMA, 2011).

One of the main concerns is the aggregation of operating segments into reportable segments: "ESMA observed that disclosures on aggregation of segments were explicitly mentioned by 29% of issuers only, although IFRS 8.22(a) refers to this piece of information as an example that contributes to helping investors understand the entity's basis of organization. The level of subjectivity in deciding how aggregation should be applied may lead to diversity in practice" (ESMA 2011). Moreover, investors and analysts' views reflect

these problems in implementation of segment reporting standards: “the investor community is generally of the view that the information provided [under IFRS 8] does not provide meaningful information as it is not reported at a sufficiently low level of granularity” (ESMA 2011).

In this paper, I focus on a set of disclosure outlets and integrate the disclosure made across the documents considered.<sup>5</sup> Recent literature has examined accounting and financial information disclosure in various outlets from many perspectives. For example, Lang & Lundholm (2000) examine disclosure frequency as it relates to equity issuance; Doyle & Magilke (2009) investigate the strategic versus broad dissemination reasons behind earnings announcement timing; Tang (2014) looks at management guidance consistency over time. A closely related stream of literature examines the language used in annual reports and public corporate documents for characteristics such as readability (e.g., Li 2008; 2010) and tone – (e.g., Davis & Tama-Sweet 2012). Most often, however, disclosure outlets are examined in isolation from each other. There are a few notable exceptions. Li (2013) examines repetitive disclosures between the MD&A and the notes. Myers, Scholz & Sharp (2013) examine the choice of outlet for restatements.

Although regulators have long mentioned inconsistent disclosures as one of the signals they pick up in their review process, this particular characteristic of disclosure has received only limited attention in the accounting literature in a survey-based setting. Street, Nichols & Gray (2000) and Nichols, Street & Cereola (2012) compare the segment note to the MD&A and provide survey evidence that suggests improved consistency between the two parts of the annual report upon adoption of SFAS 131 and IFRS 8, respectively.

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<sup>5</sup> Davis & Tama-Sweet (2012) and Mayew (2012) define a disclosure outlet as “any medium of expression or publication through which a firm describes its economic condition.” There are many disclosure outlets firms use - press releases, presentations to analysts and investors, annual reports, marketing materials, corporate website, social media.

## II.3 Hypotheses development

Inconsistency across documents means that there is variation in disclosure on the same topic in different documents issued by the same firm and referring to the same fiscal period. Inconsistency as a characteristic of disclosures made by management has been studied previously from a time-series perspective. Tang (2014) examines the regularity, i.e., consistency, with which managers provide guidance across years. Differently, my paper investigates the irregularity, or variation, in information disclosed cross-sectionally, i.e., across documents issued by the *same* company during one fiscal period. I choose to examine operating segment disclosures since I must necessarily restrict the focus of my investigation to one topic and since this is primarily a disclosure issue for companies, rather than a recognition or measurement one (Nichols et al., 2012). Segment information is also important to capital market participants since it allows investors and financial analysts to understand the sources of consolidated earnings and the diversification strategy of the management. Moreover, given the management approach principle that regulates the disclosure of segment information in the financial statements and aligns external reporting with the internal organization of the firm, there is no a priori reason to expect variation in the operating segments disclosed across different documents that refer to the same fiscal period. In other words, operating segment disclosure should a priori be consistent across the set of documents considered.

Prior research suggests that receiving consistent information from various sources is important for investors. Li (2013) finds that repetitive, and thus consistent, disclosures in the financial statement notes and the MD&A are informative to investors. Her findings are explained by communication theories which suggest that using repetitive communication increases the credibility of the information transferred (e.g., Stephan, Stephan, & Gudykunst,

1999). Therefore, in light of the evidence and discussion in Li (2013) and based on the alignment between externally-reported operating segments and internal organization, I assume that consistency is the benchmark disclosure behavior.

There is ample evidence on the importance of segment reporting for analysts and investors' decision-making. Segment earnings have predictive power for future consolidated earnings (Collins, 1976; Kinney Jr., 1971) and segment revenue is useful for investors' evaluation of firms' growth prospects incremental to consolidated data (Tse, 1989). Post-SFAS 131 segment reporting has more predictive ability for consolidated earnings (Behn et al., 2002), has improved geographic segment disclosure that reduced the mispricing of foreign earnings (Hope et al., 2008a), and for companies that no longer disclose geographic segment earnings after SFAS 131 analysts' forecasting abilities are not impaired (Hope et al., 2006). Reporting more segments under SFAS 131 improves forecast consensus (Venkataraman, 2001; Berger & Hann, 2003), but reliance on publicly available segment information may in fact increase the uncertainty in analysts' forecasts (Botosan & Stanford, 2005).

Financial analysts are important and sophisticated users of financial information (Bradshaw, 2009, 2011). I choose them as subjects for testing the consequences of inconsistent disclosures for two main reasons. First, they are the users of accounting and financial information most likely to look at and pay attention to many, if not all, of the disclosure outlets that companies use, including the whole range of documents considered in this paper. Even more so since, for example, the presentation during the earnings announcement conference call is specifically designed for direct interaction between top management and analysts (Hollander et al., 2010). For each company covered, the analyst has access to numerous sources of information, including security prices, firm-specific financial and operating information, industry data, and macroeconomic factors (Bradshaw, 2011).



Firm-specific information also comes from various sources – public regulated or unregulated documents issued by the company, the business community and press, information disclosed by competitors, or private interactions with the management (Soltes, 2014). The analyst’s job is to analyze (Bradshaw, 2011) all that information, to put together the “puzzle” that a company is, and write a report detailing his conclusions. In the case of multi-segment firms, the “puzzle” is complicated by non-homogenous operations, e.g., across several industries and/or geographical regions, the performance, risks, and synergies of which the analyst must understand and assess before drawing conclusions. From this perspective, variation in the operating segments disclosed in different documents, i.e., sources of information, creates difficulties for analysts when they piece together the image of the company, requiring more effort and increased processing costs. In turn, these difficulties translate into lower forecasting accuracy.

Segment reporting under the management approach does little to confine the way in which operating segments can be reported. The standard contains quantitative threshold rules for reporting an operating segment (IASB, 2006a), and the interpretive guidelines mention an upper limit of ten reportable operating segments (IASB, 2006b). However, the standard explicitly allows management to disregard such guidelines in the interest of providing information that is useful to investors. Given this emphasis, regulators and users expect operating segments disclosed in the notes to financial statements to reflect the internal organization of the company and to be the same as segments disclosed elsewhere. For this reason, as part of their review process, the SEC and ESMA go through a range of disclosure outlets and issue comment letters when there is a mismatch or inconsistency between the operating segments reported in the notes and the information provided through other channels, along with requiring the internal reports of the firm (Dixon, 2011; ESMA, 2011; Johnson, 2010; Pippin, 2009).

Two theories provide competing arguments for *whether* inconsistent disclosure has an effect on financial analysts. The characteristics of disclosure are irrelevant under the efficient markets hypothesis. Under this hypothesis, the ways in which information is presented, its features, or location are irrelevant because there are no costs for users to obtain the data and extract relevant information. The incomplete revelation hypothesis (Bloomfield, 2002), however, takes into consideration that there are costs to obtaining data and processing information and, as a result, the statistics (i.e., useful facts) that are more costly to extract from public data are less likely to be revealed by market prices. According to this hypothesis, the costs to extracting and processing data comprise costs necessary to identify and collect relevant data, and costs generated by increased cognitive difficulty to extract information from collected data. The main result that flows from the incomplete revelation hypothesis is that disclosure characteristics or features indeed matter for the users of financial information because the way in which information is disclosed could make it easier or harder to collect, process, and interpret data.

Empirical research in experimental and archival settings finds supporting evidence. For example, using the readability measures introduced to the accounting literature in Li (2008), Lehavy, Li, & Merkley (2011) find that lower readability scores for the annual report are significantly associated with lower analyst earnings forecast accuracy. Maines & McDaniel (2000) use students to proxy for nonprofessional investors and find that disclosure presentation format matters for their investment decisions. Still in an experimental setting, Bloomfield, Hodge, Hopkins, & Rennekamp (2015) find that the decision-making of credit analysts, which are conceivably at least as sophisticated as equity analysts, is influenced by the disaggregation and location of disclosure in the financial statements.

Based on the incomplete revelation hypothesis, I predict that disclosure inconsistency has an effect on financial analysts' forecast accuracy.

*H1a. Inconsistent segment disclosure across documents affects the magnitude of analysts' forecast error.*

The direction in which inconsistent disclosure affects financial analysts' accuracy, i.e., *how* inconsistency affects analysts' accuracy, could depend, however, on the "source" of inconsistency in disclosure. On the one hand, inconsistency could arise because some of the operating segments are further disaggregated in some documents. In other words, there is variation in the operating segments disclosed across the set of documents that the company publishes, but the way in which the disclosure is made makes it clear how the operating segments disclosed in each document fit in with the operating segments disclosed in the other documents. As a result, although there is variation in the operating segments disclosed in the set of documents, constructing the image of the company from these sources of information is easy or comes at no additional costs. If the inconsistent disclosure of operating segments arises from a further disaggregation of the segments in some documents presented such that it is clear how the sets of disclosed operating segments map into each other, then this is more information, easy to process or at no significant additional cost which helps analysts forecast the earnings for that company and decreases their forecast error. If the disaggregated operating segments in some of the documents add to analysts' information set and the operating segments across the documents are easy to piece back together to understand the "puzzle" of the company, then this type of inconsistent disclosure brings additional information that is easy to process and interpret, and therefore, I predict to lower analysts' earnings forecast errors.

*H1b. Inconsistent segment disclosure across documents that provides further disaggregation of operating segments is negatively associated with the magnitude of analysts' forecast error.*

On the other hand, variation in the operating segments disclosed across documents could arise because the management discloses different sets of operating segments in different documents such that it is not clear how they fit together and map into each other. I expect such variation to increase processing and interpretation costs on the part of the analyst, and increase their forecast error because the different segmentations disclosed make it harder for the analyst to understand the internal organization of the company. Although the different segmentation could be more information, I hypothesize that the net effect is dominated by increased processing costs generated by more effort and time necessary to piece the information together to arrive at the image of the company's internal organization.

*H1c. Inconsistent segment disclosure across documents that suggests a different segmentation is positively associated with the magnitude of analysts' forecast error.*

## **II.4 Sample and research design**

### *II.4.1 Sample and main variable measurement*

This paper uses manually-collected data to assess inconsistencies in disclosures made in four corporate documents: (1) the notes to financial statements, (2) the MD&A, (3) the earnings announcement press release, and (4) the presentation to analysts during the earnings announcement conference call. I start from all the firms included in STOXX 600 Europe at 31 December 2009. Since 2009 is the first year of mandatory adoption of the new IFRS 8 for European companies there might be more inconsistent disclosure related to this year, which

makes testing my research questions using 2009 cross-sectional data all the more meaningful.<sup>6</sup>

I eliminate 143 financial institutions, 10 firms that follow U.S. GAAP, 28 single-segment firms, 14 firms that were acquired after 2010 and for which corporate documents are no longer available, 2 companies counted twice in the market index, and 3 companies that do not disclose segments except in the segment note.<sup>7</sup> The final sample contains a cross-section of 400 multi-segment European companies. Table II.1 details the sample construction (panel A) and composition by country and industry (panels B and C). As expected, firms from the UK and France together make up 45% of the sample. Based on their primary ICB code, 27.5% of the sample firms are industrials, followed by consumer services (15.25%) and consumer goods (15%).

I retrieve the annual reports, fiscal year-end earnings announcement press releases and presentations to financial analysts during earnings announcement conference call from each company's investor relations website. Where the press release and/or presentation are not available on the website, I contact the investor relations department disclosing the purpose of this research and asking for the missing document(s).<sup>8</sup> Panel D in table II.1 provides details on the distribution of the sample by available documents. For five firms (1.25%) and 28 firms (7%) the earnings announcement press release and the presentation to analysts, respectively, are missing. The set of documents is complete for 369 of the 400 sample firms (92.25%).

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<sup>6</sup> In the US, SFAS 131 was adopted in 1997 making it much harder to get access to corporate documents from that point in time and would involve using stale data.

<sup>7</sup> Out of the 28 companies that disclose as single-segment in the note to financial statement, three present disaggregations of their organization in at least one of the other documents that would qualify as operating segments. Coding the three companies with 1 for *Inconsistent* and *Inc\_DiffSegmentation* and the other 25 with 0 and adding them back to the sample leaves the results qualitatively unchanged. I do not tabulate this analysis since I prefer to show the results in a more homogenous, and therefore more stringent, setting in which all companies self-report as being diversified.

<sup>8</sup> I contacted the investor relations department either via e-mail or via the inquiry forms on their websites during October-November 2013. The rate of response is around 50%, with around 70% of the times actually receiving the missing document. The two most common reasons for not providing a document are either that the company does not keep a history of the documents older than a few years or that the company did not issue that document at all.

In order to code the main variables, I first go to the segment note in the financial statements and collect the number and names of the reported operating segments.<sup>9</sup> Next, I go through each of the other three documents to identify and collect the number and names of the operating segments disclosed there. I perform this step in the following way: (1) I look for the operating segments that are reported in the note, (2) I focus mainly on tables and graphs to avoid any subjective interpretation of management's narrative to the extent possible, and (3) I only count an operating segment as mentioned in a document if it is accompanied by an accounting number such as sales, operating profit, EBIT, capex etc. Considering that management tends to disclose many operating details – especially in the MD&A –, this last condition is meant to provide assurance that what I pick up from these documents are parts of the company that would indeed qualify as operating segments.<sup>10,11</sup>

The *Inconsistent* variable is an indicator taking the value 1 if the operating segments are disclosed inconsistently across the four documents and 0 otherwise. In other words, *Inconsistent* is 1 if there is variation in the operating segments disclosed in the four documents, and 0 if exactly the same operating segments are disclosed across the four documents.<sup>12</sup> Variation could, however, arise either because managers disclose different segmentations in such a way that makes it difficult, if not impossible, to reconcile the operating segments disclosed in different documents, or because they disaggregate the operating segments in some documents compared to the others but do so in a way that makes

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<sup>9</sup> Using the “old” vocabulary in IAR 14R, this is the “primary” segmentation that companies disclose. At this point, I also collect the “secondary” segmentation, if disclosed, and the entity-wide information provided based on IFRS 8 requirements in the note.

<sup>10</sup> Based on both IFRS 8 and SFAS 131, the main criteria for a part of the company to be recognized as an operating segment is whether the chief operating decision maker regularly reviews accounting numbers of that unit for resource allocation and performance evaluation purposes (FASB, 1997; IASB, 2006a).

<sup>11</sup> My coding methodology is very similar to the one used by Street et al. (2000) and Nichols et al. (2012).

<sup>12</sup> I also check whether the segments picked up from the MD&A, press release, and presentation and which are different from the reported operating segments are not in fact disclosed as “secondary” operating segments (in the lingering spirit of IAS 14R) or as entity-wide information in the segment reporting note. If this were the case, then the information disclosed outside the note would in fact be consistent with the information in the segment reporting note. However, this does not seem to be the case for any of the companies disclosing inconsistently.

it clear how the segments can be reconciled. In the first case, presenting difficult-to-reconcile segmentations in different documents increases the difficulty of putting the segments “puzzle” back together to arrive at a coherent image of the company. In the second case, however, the puzzle is easy to piece together and even though there is variation in the operating segments disclosed, reconciling the operating segments is clear and easy. Therefore, I refine the group of inconsistent disclosers based on whether inconsistency comes from disclosing a different segmentation of the company (*Inc\_DiffSegmentation*) or from further disaggregation of operating segments (*Inc\_AddDisclosure*). These two variables are also binary. If a document is missing or does not mention any operating segments, I code these variables based on the other existing documents. Appendix II.A provides two detailed examples of the coding procedure. A research assistant coded this information a second time following the instructions provided in advance. The agreement between the two sets of variables coded is 96%. All cases of mismatch were re-coded a third time.

For the additional tests that I conduct, I code two more sets of indicator variables. The first set of variables refers to whether segment information is missing from the press release (*MissingSegPressRelease*), from the presentation to analysts (*MissingSegPresentation*), or from both these documents (*MissingSegBoth*). The second set of variables captures the variation in operating segments disclosed across the note to financial statements and the MD&A, split based on whether this variation suggests a different segmentation (*Note\_MDA\_DiffSegmentation*) or further disaggregation (*Note\_MDA\_AddDisclosure*).<sup>13</sup>

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<sup>13</sup> If segment information is missing in the MD&A, these variables are set to missing.

#### II.4.2 Main model

In order to test the consequences of inconsistency in disclosures on financial analysts, I use a multivariate cross-sectional model that regresses the analyst-level forecast error separately on *Inconsistent*, *Inc\_AddDisclosure*, and *Inc\_DiffSegmentation*. The dependent variable is the in-sample range-adjusted earnings forecast error.<sup>14</sup> Forecast error is computed as the absolute difference between the last estimated value of one-year-ahead earnings before earnings announcement and the actual earnings deflated by the absolute value of actual earnings.<sup>15</sup> I use individual analyst forecasts since the theoretical framework for and experimental evidence on the relation between disclosure characteristics and users' decision-making is at the individual level. Perhaps some individuals are better able to cope with receiving inconsistent information from different sources while others may find it harder to do so. Analysts are heterogeneous in terms of, for example, effort, experience, or ability, and these characteristics are related to the quality of their forecasts and to how investors respond to their forecast revisions (Clement, 1999; Jacob, Lys, & Neale, 1999; O'Brien, 1990; Stickel, 1992). Recent evidence also shows that investors use individual analyst forecasts as additional benchmarks in evaluating reported earnings beyond the consensus number (Kirk, Reppenhagen, & Tucker, 2014). The sum of these arguments warrants using individual analyst forecasts as outcome variable.<sup>16</sup>

There are two companies in my sample that change their fiscal year end during 2010. In line with prior literature that eliminates companies with changes in their fiscal year ends from analyses of analyst forecasts, I eliminate these two companies from my sample.<sup>17</sup> In

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<sup>14</sup> Using the logarithmic transformation instead leaves the results and inferences qualitatively unchanged.

<sup>15</sup> Examples of recent papers that use the same computation for forecast error are Horton, Serafeim, & Serafeim (2013) and Cotter, Tarca, & Wee (2012).

<sup>16</sup> From a more pragmatic point of view, using analyst-firm observations increases the sample size and thus the power of the test.

<sup>17</sup> AirFrance-KLM and Porsche changed from a 31 March to a 31 December fiscal year end.



order to mitigate the influence of outliers, and consistent with prior literature, I truncate the sample at the 95% extreme of the forecast error variable.<sup>18</sup> The variable of interest for testing H1a is *Inconsistent*. In order to test H1b and H1c, I replace *Inconsistent* with *Inc\_DiffSegmentation* and *Inc\_AddDisclosure* as independent variables of interest.

$$\begin{aligned}
FE_{t+1} = & \beta_0 + \beta_1 \mathbf{Inconsistent}_t \\
& + \beta_2 \mathbf{AnalystEffort}_{t+1} + \beta_3 \mathbf{LnAnalysts}_t + \beta_4 \mathbf{ReturnVolatility}_t \\
& + \beta_5 \mathbf{Guidance}_t + \beta_6 \mathbf{LengthAR}_t + \beta_7 \mathbf{EqIssue}_t + \beta_8 \mathbf{Loss}_t + \beta_9 \mathbf{ADR}_t \\
& + \beta_{10} \mathbf{Segments}_t + \beta_{11} \mathbf{LnTA}_t + \mathbf{IndustryFE} + \varepsilon_{t+1}
\end{aligned}$$

#### II.4.3 Control variables

The model includes a number of control variables that have been shown in prior research to influence analysts' accuracy. Following prior research on analyst accuracy and dispersion at an international level (e.g., Hope 2003a; Hope 2003b; Lang et al. 2003; Bae et al. 2008; Tan et al. 2011), the model controls for a number of variables. These include each analysts' forecasting effort for that company computed as the number of yearly and quarterly forecasts made during the year (*AnalystsEffort*), stock return volatility (*ReturnVolatility*) computed as the standard deviation of weekly stock returns during the year prior to the forecasted one as a measure of firm risk; the number of analysts forecasting earnings for year  $t+1$  (*LnAnalysts*),<sup>19</sup> an indicator variable for whether the management provides guidance in the fiscal year-end earnings announcement press release for the next year (*Guidance*), the length of the annual report (*LengthAR*) as a proxy for a firm's overall disclosure policy (Loughran & McDonald, 2014), an indicator variable for whether a firm's net income is

<sup>18</sup> This causes the loss of two additional companies, further reducing the usable sample to 396 firms. While winsorizing does not significantly change the results, but I present the results based on truncated data since this is a "cleaner" method to deal with outliers (Leone, Minutti-Meza, & Wasley, 2014).

<sup>19</sup> I use the orthogonalized value of the number of analysts on beginning-of-year market capitalization to reduce multicollinearity between analyst coverage and firm size.

negative during the year prior to the forecast (*Loss*) because is it harder to value loss firms, the amount of equity issued during the year relative to lagged market capitalization (*EqIssue*), an indicator variable for whether the company is cross-listed in the U.S. (*ADR*), and firm complexity and size measured as the number of segments reported in the note (*Segments*) and the natural logarithm of lagged total assets (*LnTA*). An additional specification includes controls for the quality of operating segment aggregation (*SRQuality*) and the number of accounting line items reported in the segment note (*SRQuantity*). *SRQuality* is the natural logarithm of the industry-adjusted range of segment-level ROA (Ettredge et al., 2006). The sample decreases when controlling for this variable because not all companies report segment assets. Information for *SRQuantity* is hand-collected from the companies' financial statements. All variables are defined in Appendix II.B.

## II.5 Empirical results

### II.5.1 Descriptive statistics

Table II.2 reports descriptive statistics for the variables used in the empirical analyses. A percent of 38.8% of the sample discloses operating segments inconsistently across the four documents, and 28.3% disclose segments that indicate different internal organizations of the company. Out of the sample companies, 10.5% provide further disaggregation of operating segments in some documents. Panel B in table II.2 reports the descriptive statistics for the analyst-firm observations used in the main analyses.

In table II.3, I report the Pearson and Spearman correlation coefficients for the variables included in the analyses. The Pearson (Spearman) correlation between *Inconsistent* and *FE* is small, 0.015 (0.015), and insignificant at conventional levels, *Inc\_DiffSegmentation*

and *FE* are correlated at 0.032 (0.035), significant at 1%, while *Inc\_AddDisclosure* and *FE* are correlated at -0.023 (-0.026), significant at 1%. These raw correlations are a first-step, bivariate analysis confirmation of the predictions in H1b and c. In a sense, these results lend further support to the idea that the relations uncovered in the main analyses are not just an artificial outcome of the partial correlations structure between the variables included in the multivariate analyses. Regarding the other variables, the highest correlations are between *Segments* and *LnTA* (0.335 Pearson and 0.359 Spearman) and between *ADR* and *LnTA* (0.392 Pearson and 0.380 Spearman). All other correlation coefficients are below 30% which suggests that multicollinearity is not a particular concern in this setting.

#### *II.5.2 Main results*

Table II.4 presents the main analyses. The sample contains 10421 firm-analyst observations. Model 1 has *Inconsistent* as independent variable of interest. This model, therefore, compares all the companies for which there is variation in the way operating segments are disclosed across the four documents with those companies that disclose consistently. The coefficient estimate is not statistically significant, which suggests that inconsistency defined in this overall sense has no significant effect on analysts' forecast error, providing no support for H1a.

Model 2 shows that the effect of *Inc\_DiffSegmentation* on analysts' forecast error is positive and significant at 1% (t-stat 4.89), confirming H1b. Since *Inc\_DiffSegmentation* and *Inc\_AddDisclosure* are defined such that they are exclusive, the benchmark is the group of companies that discloses either consistently or further disaggregates operating segments, i.e., *Inc\_AddDisclosure* is 1. Therefore, compared to all the other companies, for those that disclose operating segments across documents in a way that suggests different organizations

of their operations financial analysts make larger forecast errors when predicting earnings for the next year. This result suggests that disclosing in different documents operating segments that cannot be easily pieced back together decreases analysts' accuracy, most likely because it means providing confusing information and increases their information processing costs.

Model 3 shows that the effect of *Inc\_AddDisclosure* on analysts' forecast error is negative and significant at 1% (t-stat -4.39), which confirms H1c. Since *Inc\_AddDisclosure* is included by itself, its coefficient represents the effect that providing further disaggregation of the firm's operating segments in some documents has compared to the group of consistent disclosers and those for which *Inc\_DiffSegmentation* is 1. In other words, compared to the disclosure of all these other companies, disclosing operating segments inconsistently across documents but in such a way that makes it easy to put the "pieces of the company" back together is helping financial analysts more accurately forecast earnings for the next year.

In model 4, I include both *Inc\_DiffSegmentation* and *Inc\_AddDisclosure* as predictor variables. The benchmark in this case is the group of consistent disclosers. Therefore, compared to the companies that disclose consistently, those for which *Inc\_DiffSegmentation* is 1 have significantly higher analyst forecast errors (t-stat 3.96), and those for which *Inc\_AddDisclosure* is 1 have significantly lower analyst forecast errors (t-stat -3.26).

Although not the focus of this paper, the results discussed above are consistent with the idea that disclosing different segmentations across documents could be related to managers' desire to obfuscate information, while providing further disaggregation arises from a desire to be more transparent. As desirable as having the "management approach" as principle for segment reporting under IFRS 8, it nevertheless allows for considerable discretion related to how managers report operating segments. Since the internal organization of the company is not readily visible to external users, managers could potentially show meaningless segmentations in the note to financial statements for which a segment profit or

loss measure is required and the “true” internal organization in other documents where the type of line items to disclose per segment is not mandated. While this also appears to be the regulators’ rationale when checking consistency between operating segments disclosed in the note and elsewhere, there are also arguments that could lead us to hypothesize that consistent disclosers are more likely to be obfuscating information by “sticking” to one, untruthful story that they repeat in all documents. My results seem to suggest the former, rather than the latter, but more direct tests for the determinants of inconsistent disclosure would be needed in order to disentangle between these arguments.

### *II.5.3 Additional analyses*

Considering that segment information disclosed outside the notes to financial statements is not mandated, is it reasonable to expect companies to disclose this information voluntarily in documents such as the press release and the presentation to analysts? The coding of the main variables is not influenced by non-disclosure of operating segments in some documents; if that is the case, I rely on the documents in which operating segments are disclosed to assess inconsistency. Nevertheless, the main research question of this paper rests to some extent on the assumption that users expect managers to disclose segment information in these documents. In order to evaluate the appropriateness of this assumption, I test the effect that missing segment information from the press release and the presentation has on analysts’ earnings forecast accuracy. Table II.5 reports the results. Since the dependent variable is the forecast error based on the last annual forecast per analyst, the models also include *SRQuantity* (model 1) and *SRQuality* (model 2) to control for the segment information disclosed in the financial statements. Compared to the companies that disclose operating segment information in both the press release and the presentation, not disclosing

this information increases financial analysts' forecast errors; the coefficients on *MissingSegPressRelease* and *MissingSegPresentation* are positive and significant at 1%. Missing segment information in both documents is negatively related to forecast errors, but only marginally significant. This result suggests that, to some extent, consistently not disclosing operating segments in the press release and presentation is better for financial analysts' accuracy than disclosing segments in only one of these two documents. Overall, these results also suggest that if segment information is not disclosed, financial analysts are less accurate. Since analysts aim to build a reputation for forecasting (Hong & Kubik, 2003), they most likely create a demand for segment information in these "early" documents. Therefore, although voluntary, it is indeed reasonable to expect operating segment disclosure in the press release and presentation due to the demand created by financial analysts.

Another related question is whether these documents really matter for financial analysts, and in particular whether the information in notes to financial statements and in the MD&A is still relevant considering how late the annual report is issued. If some of the documents considered are not used by analysts, inconsistent information should not be expected to have an effect. Models with the change in analyst forecast error and analyst forecast dispersion between the first and the second quarters regressed on the segment disclosure inconsistency between the notes and MD&A will tell whether analysts consider the annual report as information source and whether inconsistency inside the annual report affects them in any way.<sup>20</sup> If analysts read segment information in both the notes and the MD&A and this information is different across the two documents, I expect an increase in mean forecast errors and divergence of opinion because information that is hard to piece together could be interpreted in a multitude of ways. If, however, operating segments are

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<sup>20</sup> In essence, I compare the change in analyst disagreement triggered by the issuance of the annual report for inconsistent and consistent disclosers. Companies are interested to reduce analyst forecast dispersion since opinion divergence may lead to mispricing (Diether, Malloy, & Scherbina, 2002; Miller, 1977). Chief financial officers surveyed in Graham, Harvey, & Rajgopal (2005) also confirm that "reducing uncertainty about the firm's prospects is the most important motivation for making voluntary disclosures."

disclosed in the two documents in a way that makes it easy for analysts to piece them back together, then I expect this to decrease mean forecast errors and dispersion from before to after the issuance of the annual report.

I compute *ChFE* (*ChDisp*) as the difference between the absolute forecast error (dispersion) 14 days after the end of the second quarter and the absolute forecast error (dispersion) 14 days after the end of the first quarter. I assume that by the end of the first quarter in  $t+1$ , the earnings announcement press release and presentation for year  $t$  are available. Similarly, I assume that by the end of the second quarter in year  $t+1$  the annual report containing the financial statements and the MD&A is available.

In table II.6, the models are regressions of *ChFE* and *ChDisp* on segment disclosure inconsistency between the note to financial statements and the MD&A. The models are run at the firm level and the sample drops due to the unavailability of forecasts for all companies in the first two quarters. In order to mitigate the influence of extreme values, I truncate *ChFE* and *ChDisp* at 5 and 95%. I include controls for the number of analysts covering the firm (*LnAnalysts*), the return volatility during the second fiscal quarter (*ChReturnVolatility*), the length of the annual report (*LengthAR*), U.S. cross-listing status (*ADR*), and total assets (*LnTA*).<sup>21</sup> Consistent with expectations, *Note\_MDA\_DiffSegmentation* is positively and significantly associated with both *ChFE* and *ChDisp* meaning that different segmentation disclosed between the segment note and the MD&A is associated with higher mean analyst forecast error and dispersion after the annual report is issued (i.e., end of second quarter) than before (i.e., end of first quarter). *Note\_MDA\_AddDisclosure* is not significantly associated with either *ChFE* or *ChDisp* which suggests that further disaggregation of operating segments in the MD&A compared to the note does not seem to particularly help analysts. Since changes models are very stringent, these results lend additional support to the main results in

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<sup>21</sup> Controlling for the change in stock price between quarters one and two similar to Armstrong, Core, & Guay (2014) does not significantly change the coefficient estimates for the variables of interest.

table II.4 related to the effect of disclosing different segmentations across different documents.

These additional analyses have shown that all the documents considered are important for financial analysts, and that indeed they demand segment disclosures in these documents. It is therefore reasonable to examine the effect that inconsistency in the operating segments disclosed across the set of four documents chosen.

## **II.6 Robustness tests**

### *II.6.1 Endogeneity concerns*

In this setting, endogeneity could arise from unobserved correlated variable bias if there are unobservable characteristics that are correlated with both *Inc\_DiffSegmentation* and/or *Inc\_AddDisclosure* and *FE*.<sup>22</sup> If a variable exists that is either unobservable or has not been included in the set of control variables and determines both the inconsistent disclosure and analysts' forecast errors, then the coefficient estimates in the main analyses may be biased (Larcker & Rusticus, 2010). Since the model is run with industry fixed effects, as well as country fixed-effects in untabulated analyses, the fixed effects capture the unobservable characteristics that firms in an industry/country share. Therefore, it is less likely that this unobservable variable is an industry or country characteristic. Rather, it is more likely that the unobservable variable is a firm-level characteristic. Including firm fixed effects is not a solution since the model is a cross-sectional regression with predictor variables at the firm-level.

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<sup>22</sup> Simultaneity bias is not a concern since the decisions on disclosure and earnings forecasts are made by different actors (managers vs. financial analysts) at different times ( $t$  vs.  $t+1$ ).



Ideally, a truly exogenous variable that can be theoretically argued to determine inconsistency without being correlated with analysts' forecast errors could be used to instrument for the inconsistency variables. If the instrumental variable is even slightly endogenous, the estimates will be highly biased (Larcker & Rusticus, 2010). The exogenous assumption is hard to meet in accounting research which makes finding such variables almost impossible (Larcker & Rusticus, 2010; Nikolaev & van Lent, 2005). Although not a solution, existing methodological research on instrumental variables in accounting research proposes to accompany any attempts of dealing with unobservable correlated variable bias using instrumental variables by a sensitivity analysis of the model to such unobservable variables (Larcker & Rusticus, 2010).

Frank (2000) proposes a statistical approach to analyze the impact of unobservable confounding variables.<sup>23</sup> The main idea is to identify how large the endogeneity problem has to be in order to overturn the OLS estimates (Larcker & Rusticus, 2010). For a confounding variable to affect the results, it needs to be correlated with both the dependent variable (Y) and the independent variable of interest (X), controlling for other variables (Larcker & Rusticus, 2010). The approach relies on identifying the Impact Threshold for a Confounding Variable (ITCV) as the minimum correlation between CV and Y and between CV and X that would make the coefficient estimate on X statistically insignificant if CV were included in the model.<sup>24</sup> The ITCV is benchmarked against the distribution of the impact scores of the control variables already included in the model to assess whether the likelihood that such a CV that overturns the OLS estimate exists. The impact score of a control variable is

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<sup>23</sup> See section 7, pp. 202-203 in Larcker & Rusticus (2010) for details and an example of this approach.

<sup>24</sup> The ITCV is the result of the following formula based on Frank (2000):  $ITCV = \frac{t^2 + t\sqrt{d}}{-(n-q-1)} + \left[ \frac{-d - t\sqrt{d}}{-(n-q-1)} \right] \times r_{YX}$   
Where  $t$  is the t-value for the OLS estimate of the coefficient on X,  $n$  is the number of observations,  $q$  is the number of parameters (without the intercept) included in the model, i.e.,  $n-q-1$  is the number of degrees of freedom of the model,  $d=t^2+(n-q-1)$ , and  $r_{YX}$  is the sample correlation between the outcome and the predictor of interest.

computed by multiplying its raw (i.e., simple) correlation with Y to its raw correlation with X.<sup>25</sup>

Table II.7 panel A reports the results for the sensitivity analysis following Frank (2000). The threshold value for ITCV for *Inc\_DiffSegmentation* is -0.0039, implying that the correlations between *Inc\_DiffSegmentation* and *FE* with the unobserved confounding variable need to be around 0.062 ( $=\sqrt{0.0039}$ ) to overturn the OLS result. While this seems as a low correlation coefficient, it is nevertheless higher than most of the correlations between *Inc\_DiffSegmentation* and the other variables included in the analyses (table II.3 panel A). Since *Inc\_DiffSegmentation* is negatively related to *FE*, one of these two correlations needs to be negative, otherwise the confounding variable would strengthen rather than weaken the effect of *Inc\_DiffSegmentation* on *FE*. The value of ITCV for *Inc\_DiffSegmentation* is closest to the impact scores of *LengthAR* and *Loss*. The confounding variable would have to be similar in terms of type of relation and magnitude of effect to these two variables in order to render the effect of *Inc\_DiffSegmentation* on *FE* insignificant, but nevertheless different from them since the model already includes these as control variables.

The ITCV value for *Inc\_AddDisclosure* is 0.0421, meaning that the correlations between *Inc\_AddDisclosure* and *FE* with the confounding variable would have to be around 0.205 ( $=\sqrt{0.0421}$ ) to make the coefficient on *Inc\_AddDisclosure* insignificant at conventional levels and both correlations would have to be either positive or negative to weaken the OLS estimate. None of the raw impact scores is higher than the ITCV for *Inc\_AddDisclosure* which suggests that the confounding variable would have to be very different from any of the control variables.

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<sup>25</sup> Larcker & Rusticus (2010) note that the raw impact scores are a more conservative measure of impact, so comparing the ITCV to the raw impact scores instead of the partial correlation impact scores assumes that CV is relatively distinct from existing control variables and provides a more “negative” view on how sensitive the results are to endogeneity.

Overall, the sensitivity to endogeneity analyses following Frank (2000) suggest that the main results are reasonably robust to unobservable correlated variable bias, although such variables might still exist. The large set of controls and numerous other untabulated analyses with additional controls lend further confidence in the results.

### *II.6.2 Other robustness tests*

I conduct a set of supplementary analyses to check the robustness of the main results. These tests are presented in table II.8. In panel A, instead of clustering standard errors at the analyst level, I use clustering by firm since unobservable firm-level characteristics might cause analysts to consistently forecast in a certain way. In other words, earnings forecasts for the same firm are not independent observations. Since the model is used on a cross-section, the number of clusters becomes equal to the number of companies in the sample. The results suggest that *Inc\_DiffSegmentation* is positively and significantly associated with forecast error (t-stat 1.75). The coefficient for *Inc\_AddDisclosure* has the expected negative sign but is statistically weaker. Therefore, taking into account the non-independence (i.e., correlation) of forecast errors for the same company makes the results weaker which suggests that analysts covering a firm are similarly affected by the disclosure inconsistency of that company.

I also control for the influence of country-level institutions given prior evidence that home-country institutions matter for voluntary disclosure (Shi, Magnan, & Kim, 2012). Replacing the industry fixed effects with country fixed effects (panel B) leaves the tenor of the main results unchanged. *Inc\_DiffSegmentation* is positively and strongly associated with FE (t-stat 4.78), while *Inc\_AddDisclosure* is negatively associated with FE, with a coefficient significant at 5% (t-stat -2.23). When I include both variables of interest in the same regression with country fixed effects, *Inc\_AddDisclosure* is negative but no longer

statistically significant. This analysis suggests that, to some extent, how much additional disaggregation of information in different documents matters for analysts may be subsumed by country-level characteristics. If I include both industry and country fixed effects, both variables of interest are strongly significant in all models, i.e., included either separately or together (panel C).

In panel D, I expand the set of control variables by including *EQ* as a measure of earnings quality. *EQ* is computed as the absolute value of residuals from a Dechow & Dichev (2002) model computed in-sample at the industry level. Higher values of absolute residuals mean lower earnings quality. As expected based on prior evidence (Bradshaw, Richardson, & Sloan, 2001; Burgstahler & Eames, 2003), *EQ* is positively and significantly associated with *FE*, meaning that analysts' forecast errors are higher when there is more earnings management. The coefficient estimates on the variables of interest remain qualitatively unchanged even after controlling for *EQ*. Replacing *EQ* with measures of discretionary accruals based on Jones (1991) type of models does not have a different effect.

In panel E, I restrict the sample to only those companies that disclose segment information in all four documents. The dropped companies are those without segment disclosure in the press release and presentation (the variables *MissingSegPressRelease* and *MissingSegPresentation* describe the sample from this point of view) and one company that does not mention any segment-related information in the MD&A. All results remain qualitatively similar and significant at 1%.

I run two sensitivity tests to take into account companies' disclosure policy in the segment note. In panel F, I test the sensitivity of the results when controlling for the quality of operating segment aggregation in the notes to financial statements (*SRQuality*) and the number of accounting line items (*SRQuantity*) provided in the segment note. Controlling for these variables is meant to mitigate concerns that the inconsistency variables are correlated

with some of the characteristics of segment disclosure in the note, and since financial analysts potentially focus first and foremost on this regulated information, the coefficients of interest reflect analysts' processing of the segment information in the note. Including *SRQuality* as control variable reduces the sample due to data constraints for computing it. The main results hold when controlling for *SRQuality* and *SRQuantity*, although in model 4 when both *Inc\_DiffSegmentation* and *Inc\_AddDisclosure* are included, *Inc\_AddDisclosure* is significant at 5% instead of 1% when not controlling for *SRQuality* and *SRQuantity*. Across all four models, the coefficients for *SRQuality* are negative suggesting that higher quality of operating segment aggregation allows a better discrimination of the company's businesses and more accurate forecast of future prospects, but not significant at conventional levels. The coefficients on *SRQuantity* are positive and strongly significant meaning that the more line items provided in the segment note, the harder it is for analysts to be accurate in their earnings forecasts.<sup>26</sup>

In order to compare across companies with similar disclosure policies, a more "apples-to-apples" comparison, I also restrict the sample to those companies with available data to compute *SRQuality* and run the regressions on this restricted sample but without including *SRQuality* as control variable (panel G). The coefficients of interest have the expected signs and are significant at 1%. Therefore, overall, the robustness tests leave the tenor of the main results unchanged.

The complexity associated with a company's businesses may be a reason for which managers disclose operating segments inconsistently across documents and, at the same time, may be influencing analysts' accuracy when forecasting earnings. In other words, business complexity and uncertainty may be a correlated omitted variable from our model, and could be a source of endogeneity. In panel H, I use three variables to proxy for this concept. In

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<sup>26</sup> This result provides support to the disclosure overload arguments, is in line with prior research (Lehavy et al., 2011), and is consistent with the coefficient on *LengthAR* in all the models, which is similarly negative and significant.

model (1) I include the standard deviation of earnings for the last five years (*StdEarnings*), in model (2), the standard deviation of cash flows for the last five years (*StdCFO*), and in model (3) an indicator variable for whether the company has its main operations in a high tech industry known to have more uncertain cash flows (Barron et al., 2002). The coefficient on *StdEarnings* in model (1) is positive and strongly significant, which suggests that analysts covering firms with more volatile earnings are less accurate. The coefficients for *StdCFO* and *HighTech* in models (2) and (3), respectively, are not statistically significant. The variables of interest *Inc\_DiffSegmentation* and *Inc\_AddDisclosure* remain strongly significant and have the predicted signs. Therefore, business complexity and earnings stream uncertainty does not seem to be an omitted correlated variable that would significantly influence the main results.

## **II.7 Conclusion**

This paper uses hand-collected data on operating segments from four different corporate documents of 400 multi-segment European firms to analyze the consequences of inconsistent disclosures for financial analysts' forecast accuracy. The set of documents I consider contains (1) the notes to financial statements, (2) the MD&A, (3) the fiscal year-end earnings announcement press release and (4) the fiscal year-end presentation to analysts that is part of the earnings announcement conference call. Inconsistent disclosure is defined based on the Securities and Exchange Commission (SEC) and European Securities and Markets Authority's (ESMA) review process guidelines as variation in information disclosed on the same topic in different documents issued by the same firm, and further refined to account for potential additional information, i.e., disaggregation of operating segments in some documents, or hard-to-reconcile different segmentations disclosed in different documents.

I show that disclosing inconsistently across documents is a relatively pervasive practice – almost 39% of the companies in my sample do not disclose exactly the same operating segments in the four documents considered. Inconsistency that arises from further disaggregating operating segments seems to bring new information and lowers analysts' forecast errors. Disclosure of a different segmentation, however, impedes analysts' information processing such that their forecast errors are larger. These results have practical implications for managers and financial analysts. Since financial analysts are an important link between the firm and the capital markets, managers want to understand how to best communicate with them (Bradshaw, 2011). This paper shows the effects that inconsistency as a characteristic of disclosure across documents has on analysts' accuracy, so managers could use these results to adjust their disclosure strategy.

The results also have implications for regulators and the current debate on a disclosure framework. I supplement some existing survey evidence that points to the importance investors and analysts attach to consistency in disclosure with empirical results from a relatively large sample of firms. Given my findings, regulators and standard setters may want to assess the need to consider the consistency of disclosure across documents as an attribute of disclosure quality that companies should be encouraged to adhere to. My findings also back up regulators' existing practices of evaluating compliance with disclosure standards by comparing mandated disclosure with voluntary disclosure on the same topic but in different documents.

Last, but not least, this paper contributes to the accounting disclosure literature and this contribution stems from two main aspects. First, the paper identifies a dimension of corporate accounting disclosure that has not been previously examined and investigates the consequences of this disclosure characteristic for an important set of users of accounting information – the financial analysts. Second, by considering disclosures made in more than

one document, this paper takes a step forward towards improving our understanding of managers' overall disclosure strategy and the effects that this strategy has. The financial statements are one component of an array of disclosure "weapons" that managers use to communicate to capital market participants, although financial information is present in most of the other documents as well. Evidence on the role that financial information plays when disclosed outside the financial statements and whether and how users assess it in comparison to the financial statements enhances our understanding of the role of accounting disclosures and the characteristics that make accounting disclosure useful.



## Appendix II.A: Examples of coding inconsistency across corporate documents

### Alstom SA, France

#### *Extract from Note 5 Sector and geographical data*

At 31 March 2010

(in € million)	Power	Transport	Corporate & others	Eliminations	Total
Sales	13,918	5,751	-	(19)	19,650
Inter Sector eliminations	(17)	(2)	-	19	-
Total Sales	13,901	5,749	-	-	19,650
Income (loss) from operations	1,468	414	(103)	-	1,779
Earnings (loss) before interest and taxes	1,377	368	(116)	-	1,629
Financial income (expense)					(42)
Income tax					(385)
Share in net income of equity investments					3
Net profit					1,205

(1) Segment assets are defined as the sum of goodwill, intangible assets, property, plant and equipment, associates and other investments, other non current assets (other than those related to financial debt and to employee defined benefit plans), inventories, construction contracts in progress assets, trade receivables and other operating assets.

(2) Segment liabilities are defined as the sum of non-current and current provisions, construction contracts in progress liabilities, trade payables and other operating liabilities.

(3) Capital employed corresponds to segment assets minus segment liabilities.

## B. GEOGRAPHICAL DATA

### Sales by country of destination

Year ended 31 March (in € million)	2010	2009	2008
Euro zone <sup>(1)</sup>	6,550	6,594	5,432
<i>thereof France</i>	1,983	2,182	1,862
Rest of Europe	3,261	3,111	2,876
North America	2,736	2,943	3,109
<i>thereof USA</i>	2,176	2,508	2,608
South & Central America	952	1,088	881
Asia/Pacific	2,251	2,557	3,058
Middle East/Africa	3,900	2,446	1,552
<b>Total Group</b>	<b>19,650</b>	<b>18,739</b>	<b>16,908</b>

(1) For the periods ended 31 March 2009 and 31 March 2008 euro zone comprised Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Spain and Portugal. Slovakia and Slovenia have been added for the period ended 31 March 2010.

### Sales by country of origin

Year ended 31 March (in € million)	2010	2009	2008
Euro zone <sup>(1)</sup>	10,104	8,647	7,702
<i>thereof France</i>	5,151	4,046	3,774
Rest of Europe	3,679	4,486	3,860
North America	2,631	2,862	3,041
<i>thereof USA</i>	2,236	2,530	2,672
South & Central America	767	655	528
Asia/Pacific	1,433	1,650	1,511
Middle East/Africa	1,036	439	266
<b>Total Group</b>	<b>19,650</b>	<b>18,739</b>	<b>16,908</b>

### Other non current assets by country of origin <sup>(\*)</sup>

Year ended 31 March (in € million)	2010	2009	2008
Euro zone <sup>(1)</sup>	1,641	1,576	1,521
<i>thereof France</i>	762	735	714
Rest of Europe <sup>(2)</sup>	4,672	4,639	4,595
North America	541	412	261
<i>thereof USA</i>	462	350	220
South & Central America	66	48	52
Asia/Pacific	488	442	287
Middle East/Africa	50	41	10
<b>Total Group</b>	<b>7,458</b>	<b>7,158</b>	<b>6,726</b>

(\*) Other non current assets are defined as the sum of goodwill, intangible assets, property, plant and equipment, associates and other investments, other non current assets (other than those related to financial debt and to employee defined benefit plans).

(1) For the periods ended 31 March 2009 and 31 March 2008 euro zone comprised Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Spain and Portugal. Slovakia and Slovenia have been added for the period ended 31 March 2010.

(2) It mainly includes goodwill of Power Sector located in Switzerland.

The segment note does not contain other entity-wide disclosures.

***Extract from 2009/2010 Annual report MD&A – Sector information***

**Power sector**

“The Power Sector designs, manufactures, supplies and maintains a broad range of products in the power generation industry for coal, gas, oil and biomass power plants. It also supplies wind and hydro equipment as well as conventional islands for nuclear power plants.”

**Sales, actual figures**

Year ended 31 March (in € million)	2010	2009		
Thermal Systems & Products	7,746	7,038	10%	10%
Thermal Services	4,353	4,219	3%	3%
Renewables	1,802	1,797	0%	0%
<b>Power</b>	<b>13,901</b>			

**Transport sector**

“The Transport Sector serves the urban transit, regional/inter-city passenger travel markets and freight markets all over the world with rail transport products, systems and services. Alstom designs, develops, manufactures, commissions and maintains trains, and develops and implements system solutions for rail control. It also designs and manages the creation of new railway lines, and offers maintenance and renovation programmes to keep customers’ assets safe and productive. The Sector markets each of these as stand-alone offerings or combined within turnkey system solutions, according to each customer’s requirements.”

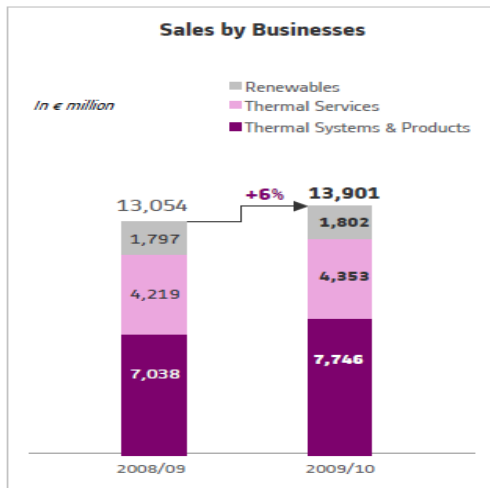
Year ended 31 March (in € million)	2010		2009			
Europe	3,778	66%	3,961	70%	(5%)	(4%)
North America	793	14%	755	13%	5%	5%
South and Central America	282	5%	289	5%	(2%)	(4%)
Asia/Pacific	525	9%	416	7%	26%	25%
Middle East/Africa	371	6%	264	5%	41%	42%
<b>Sales by destination</b>	<b>5,749</b>					

***Extract from press release 4 May 2010***

“In Power, Thermal Systems & Products received orders for a large gas power plant in the UK, coal power plants in Slovenia, Germany and India as well as plant management systems in South Africa. Thermal Services registered a flow of small and medium-sized orders, particularly in Europe and in the USA, for both retrofit and service and booked three operation and maintenance long-term contracts during the fourth quarter. In Renewables, the main orders recorded during the period were for hydro projects in Switzerland. In Transport, the main contracts recorded during the fiscal year included regional trains in France and Germany, suburban trains in France, metros in Brazil and the Netherlands, tramways in Brazil, Morocco and France, as well as various signalling systems and maintenance orders.”

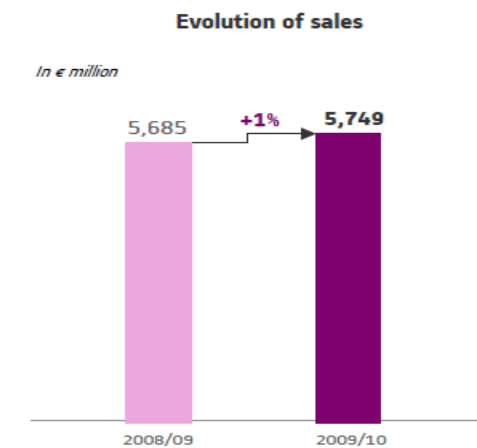
*Extract from presentation to analysts 4 May 2010*

## Power Sales



## Transport Sales

Continu



Data collected for Alstom SA:

Document	# operating segments	Name of operating segments disclosed
Note to financial statements	2	Transport; Power
MD&A	4	Power (Thermal systems & products; Thermal services; Renewables); Transport
Press release	2	Transport; Power
Presentation	4	Power (Thermal systems & products; Thermal services; Renewables); Transport

Inconsistency variables for Alstom SA:

Variable	Value
<i>Inconsistent</i>	1
<i>Inc_DiffSegmentation</i>	0
<i>Inc_AddDisclosure</i>	1

## Vallourec SA, France

### Extract from Note 32 Segment Reporting

#### Note 32 Segment information

##### Operating segments

The following tables provide, for each operating segment, information on the revenues and results as well as certain information on the assets, liabilities and capital expenditure for the financial years 2007, 2008 and 2009.

##### Information about profit or loss, assets and liabilities by operating segment

2009	Seamless tubes	Speciality Products	Holding companies & other <sup>(1)</sup>	Inter-segment transactions	Total
<b>INCOME STATEMENT</b>					
Sales to external customers	4,104,463	320,803	39,213	-	4,464,479
EBITDA	982,560	33,589	-37,407	1,865	980,607
Depreciation and amortization	-176,785	-9,728	-1,757	348	-187,922
Impairment of assets and goodwill	-8,188	-1,230	1,348	242	-7,828
Asset disposals and restructuring costs	-26,488	-1,792	30,242	-484	1,478
Operating profit	771,098	20,838	-7,852	2,251	786,335
Unallocated income					53,958
Unallocated charges					-58,600
Profit before tax					781.693

##### Geographical areas

The following tables provide, by geographical area, information on sales (by geographical location of the Group's customers) and capital expenditure as well as certain information on assets (by location in which the companies have a presence).

##### By geographical area

2009	Europe	North America and Mexico	South America	Asia	Rest of the world	Total
<b>Sales</b>						
Sales to external customers	1,411,525	1,007,818	780,420	869,989	394,727	4,464,479
<b>Balance sheet</b>						
Property, plant and equipment, intangible assets and goodwill (net)	897,453	831,125	1,058,489	222,122	5,934	3,015,123
<b>Cash flows</b>						
Capital expenditure: property, plant and equipment and intangible assets	186,289	46,307	436,753	7,860	5,008	682,217
<b>Other information</b>						
Average number of employees	9,407	2,344	5,747	866	17	18,381
Payroll costs	533,470	130,759	149,120	7,253	327	820,929

The segment note does not contain other entity-wide disclosures.

## *Extract from annual report*

### 3.1.6 MAIN MARKETS

At 31 December 2009, the Group's main markets were as follows:

Market	Sales (in € million)	Sales (in %)
Oil & Gas	2,239	50.1
Power generation	1,155	25.9
Petrochemicals	365	8.2
Mechanical engineering	326	7.3
Automotive industry	197	4.4
Other markets	183	4.1
<b>TOTAL</b>	<b>4,465</b>	<b>100</b>

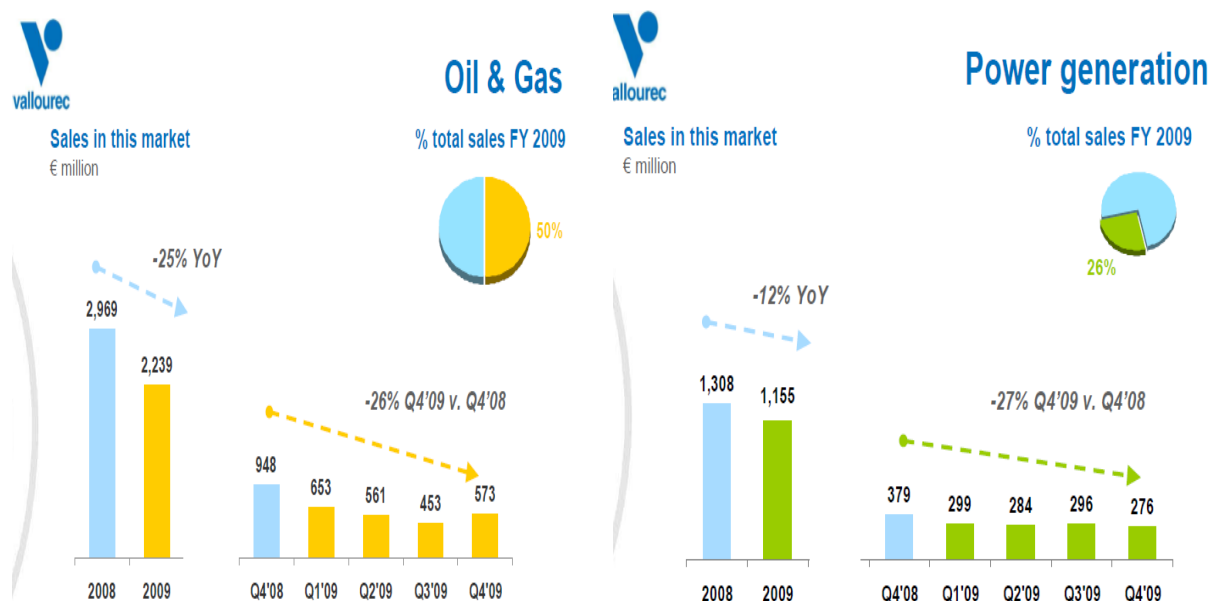
The annual report discusses the results of the operations of the company only in terms of the segmentation mentioned in the excerpt above and in terms of geography.

*Extract from press release*

in € million	Q4 2009	Q3 2009	Q4 09 / Q3 09	Q4 2008	Q4 09 / Q4 08	FY 2009	FY 2008	2009 / 2008
Oil & Gas	573	453	+26%	948	-40%	2,239	2,969	-25%
Power generation	276	296	-7%	379	-27%	1,155	1,308	-12%
Petrochemicals	67	70	-4%	188	-64%	365	691	-47%
<b>Total Energy</b>	<b>916</b>	<b>819</b>	<b>+12%</b>	<b>1,515</b>	<b>-40%</b>	<b>3,759</b>	<b>4,968</b>	<b>-24%</b>
% of total sales	84%	84%		83%		84%	77%	
Mechanical	62	61	+2%	144	-57%	325	713	-54%
Automotive	66	49	+35%	75	-12%	197	365	-46%
Other	46	50	-8%	86	-46%	183	391	-53%
<b>Total non-Energy</b>	<b>174</b>	<b>160</b>	<b>+9%</b>	<b>305</b>	<b>-43%</b>	<b>705</b>	<b>1,469</b>	<b>-52%</b>
% of total sales	16%	16%		17%		16%	23%	
<b>Total</b>	<b>1,090</b>	<b>979</b>	<b>+11%</b>	<b>1,820</b>	<b>-40%</b>	<b>4,465</b>	<b>6,437</b>	<b>-31%</b>

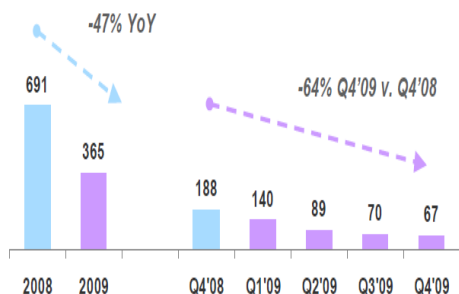
*Extract from presentation to analysts on February 24<sup>th</sup>, 2010*

Under the heading “3. Review by activity”





Sales in this market  
€ million

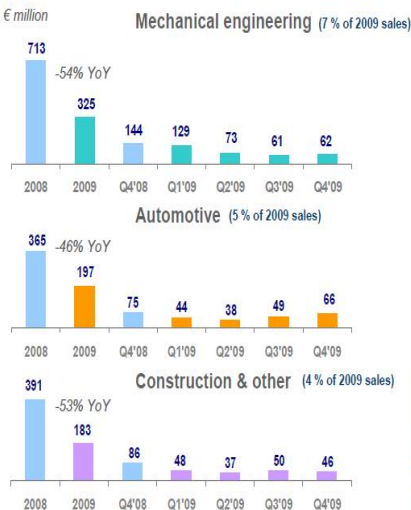


## Petrochemicals

% total sales FY 2009



Sales in € million



Data collected for Vallourec SA:

Document	# operating segments	Name of operating segments disclosed
Note to financial statements	2	Seamless tubes; Speciality products
MD&A	5	Oil&Gas; Power Generation; Petrochemicals; Mechanical Engineering; Automotive; Other
Press release	5	Oil&Gas; Power Generation; Petrochemicals; Mechanical Engineering; Automotive; Other
Presentation	5	Oil&Gas; Power Generation; Petrochemicals; Mechanical Engineering; Automotive; Construction & Other

Inconsistency variables for Vallourec SA:

Variable	Value
<i>Inconsistent</i>	1
<i>Inc_DiffSegmentation</i>	1
<i>Inc_AddDisclosure</i>	0



## Appendix II.B: Variable definitions

MAIN VARIABLES USED IN THE ANALYSES	
<i>Inconsistent</i>	1 if operating segments are disclosed inconsistently across the four documents (segment note to financial statements, MD&A, earnings announcement press release, presentation to analysts), and 0 otherwise. When a document is missing, the variable is coded based on existing documents.
<i>Inc_DiffSegmentation</i>	1 if operating segments are disclosed inconsistently across the four documents (segment note to financial statements, MD&A, earnings announcement press release, presentation to analysts) such that it suggests a different segmentation, and 0 otherwise. When a document is missing, the variable is coded based on existing documents.
<i>Inc_AddDisclosure</i>	1 if operating segments are disclosed inconsistently across the four documents (segment note to financial statements, MD&A, earnings announcement press release, presentation to analysts) such that it further disaggregates one or more of the operating segments, and 0 otherwise. When a document is missing, the variable is coded based on existing documents.
<i>Note_MDA_DiffSegmentation</i>	1 if operating segments are disclosed inconsistently across the segment note to financial statements and the MD&A such that it suggests different segmentation bases, and 0 otherwise. The variable is set to missing if the operating segments are not mentioned in the MD&A.
<i>Note_MDA_AddDisclosure</i>	1 if operating segments are disclosed inconsistently across the segment note to financial statements and the MD&A such that it suggests additional disaggregation of the segments, and 0 otherwise. The variable is set to missing if the operating segments are not mentioned in the MD&A.
<i>MissingSegPresentation</i>	1 if the presentation does not mention any information about the firm's segments, and 0 otherwise. The variable is set to missing if the presentation is not available.
<i>MissingSegPressRelease</i>	1 if the earnings announcement press release does not mention any information about the firm's segments, and 0 otherwise. The variable is set to missing if the press release is not available.
<i>MissingSegBoth</i>	1 if both the presentation and earnings announcement press release do not mention any information about the firm's segments, and 0 otherwise. The variable is set to missing if any of the two documents are not available.
VARIABLES FOR THE MAIN ANALYSES	
<i>ADR</i>	1 if the company is also listed in the U.S., and 0 otherwise, based on data from Thomson Reuters.
<i>AnalystEffort</i>	Range-adjusted number of yearly and quarterly earnings forecasts an analyst makes for a company before the 2010 earnings announcement date.
<i>EQ</i>	Measure of earnings quality computed as the absolute value of residuals from a (Dechow & Dichev, 2002) model computed in-

sample at the industry level. Higher values of absolute residuals mean lower earnings quality. Data comes from Thomson Reuters.

<i>EqIssue</i>	Amount of equity issued divided by beginning of year market capitalization, based on data from S&P Capital IQ.
<i>FE</i>	Analyst-level earnings forecast error computed as the absolute value of the difference between the last yearly forecast estimate before the earnings announcement minus the actual earnings, deflated by absolute actual earnings. Data is for 2010 and comes from I/B/E/S. The variable is truncated at 95% to mitigate the influence of extreme values. The variable is range-adjusted in-sample as $(ForecastError - \min ForecastError) / (\max ForecastError - \min ForecastError)$ .
<i>Guidance</i>	1 if the earnings announcement press release at the end of fiscal year 2009 contains an outlook section, and 0 otherwise.
<i>LengthAR</i>	Natural logarithm of the number of pages in company <i>i</i> 's 2009 annual report.
<i>LnAnalysts</i>	Natural logarithm of 1 plus the number of analysts covering the company in 2010 orthogonalized on the natural logarithm of market capitalization at the end of 2009, based on data from I/B/E/S.
<i>LnTA</i>	Natural logarithm of total assets for company <i>i</i> in 2009, based on data from Thomson Reuters.
<i>Loss</i>	1 if net income before extraordinary items is below 0, and 0 otherwise, based on data from Thomson Reuters.
<i>ReturnVolatility</i>	Standard deviation of weekly stock returns during 2009. Data comes from Datastream.
<i>Segments</i>	Number of operating segments as reported in the segment information footnote to the 2009 financial statements (without the "Other" segment). Data is hand-collected from the financial statements.
<i>SRQuality</i>	Natural logarithm of 2 plus the range of segment return-on-assets adjusted for mean industry return-on-assets weighted by segment assets to total assets at the end of 2009. Data comes from Thomson Reuters Worldscope. Industry is defined at the three-digit SIC code level. I use $\text{Log}(2+x)$ to make the distribution closer to the normal distribution following Berry (1987) and Liu & Natarajan (2012).
<i>SRQuantity</i>	The number of accounting items disclosed per segment in company <i>i</i> 's segment information footnote. Data is hand-collected from firms' financial statements.

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## Appendix II.C: Tables for chapter II

**Table II.1: Sample construction**

Panel A: Sampling

<b>STOXX Europe 600 at 31/12/2009</b>	<b>600</b>
(-) Financial institutions	-143
(-) Follow U.S. GAAP	-10
(-) No segment footnote/Single segment	-28
(-) Doubles	-2
(-) No disclosure about segments elsewhere	-3
(-) Taken over in/after 2010	-14
(=) Total	<b>400</b>

This table describes the sampling procedure.

Panel B: Distribution of sample by country

<b>Country</b>	<b>Frequency</b>	<b>Percent</b>
Austria	6	1.50
Belgium	8	2.00
Denmark	10	2.50
Finland	16	4.00
France	65	16.25
Germany	47	11.75
Greece	4	1.00
Ireland	4	1.00
Italy	17	4.25
Luxembourg	2	0.50
Netherlands	19	4.75
Norway	9	2.25
Portugal	8	2.00
Spain	18	4.50
Sweden	26	6.50
Switzerland	24	6.00
UK	117	29.25
<b>Total</b>	<b>400</b>	<b>100.00</b>

This table reports the country distribution of companies in the full sample.

Panel C: Distribution of sample by industry (Industry Classification Benchmark ICB codes)

Industry	Frequency	Percent
Basic Materials	48	12.00
Consumer Goods	60	15.00
Consumer Services	61	15.25
Health Care	25	6.25
Industrials	110	27.50
Oil and Gas	32	8.00
Technology	20	5.00
Telecommunications	20	5.00
Utilities	24	6.00
<b>Total</b>	<b>400</b>	<b>100.00</b>

This table presents the industry distribution of the companies included in the full sample, based on the ICB industry classification codes.

Panel D: Distribution of sample by available documents (press release and presentation)

Press release	Presentation		Total
	0	1	
0	2	3	5
	0.50%	0.75%	1.25%
1	26	369	395
	6.50%	92.25%	98.75%
Total	28	372	400
	7.00%	93.00%	100%

**Table II.2: Descriptive statistics**

Panel A: Descriptive statistics for the main variables

Variable	N	N Miss	Mean	Min	P50	Max
Inconsistent	400	0	0.388	0.000	0.000	1.000
Inc_DiffSegmentation	400	0	0.283	0.000	0.000	1.000
Inc_AddDisclosure	400	0	0.105	0.000	0.000	1.000
Note_MDA_DiffSegmentation	399	1	0.170	0.000	0.000	1.000
Note_MDA_AddDisclosure	399	1	0.113	0.000	0.000	1.000
MissingSegPressRelease	395	5	0.078	0.000	0.000	1.000
MissingSegPresentation	372	28	0.024	0.000	0.000	1.000
MissingSegBoth	369	31	0.011	0.000	0.000	1.000

This table reports descriptive statistics for the hand-collected inconsistency variables used in subsequent analyses. All variables are defined in Appendix II.B.

Panel C: Descriptive statistics for the other variables used in the main analyses

Variable	N	Mean	StdDev	Minimum	P50	Maximum
FE	10421	0.167	0.190	0.000	0.098	1.000
ChDisp	204	-0.023	0.098	-0.0484	-0.003	0.195
SRQuality	8053	0.840	0.378	0.693	0.730	4.039
SRQuantity	10421	11.472	6.602	1.000	10.000	63.000
AnalystEffort	10421	0.314	0.268	0.000	0.250	1.000
LnAnalysts (raw)	10421	3.048	0.389	0.693	3.091	3.829
LnAnalysts	10421	0.071	0.285	-1.678	0.117	0.657
ReturnVolatility	10421	0.193	0.158	0.030	0.154	1.651
Guidance	10421	0.688	0.463	0.000	1.000	1.000
LengthAR	10421	5.194	0.413	4.111	5.147	6.687
EqIssue	10421	0.037	0.159	0.000	0.001	3.901
Loss	10421	0.099	0.298	0.000	0.000	1.000
ADR	10421	0.196	0.397	0.000	0.000	1.000
Segments	10421	4.275	1.927	2.000	4.000	12.000
LnTA	10421	22.979	1.411	20.119	22.812	25.867

This table presents descriptive statistics for the variables used in the empirical analyses. The unit of analysis is firm-analyst. *SRQuality* can only be computed for the subsample of companies that report segment assets and have an industry code assigned to each of their segments in Thomson Reuters Worldscope. See variable definitions in Appendix II.B.

**Table II.3: Correlation matrix**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Inconsistent	1	0.759***	0.456***	0.015	0.000	-0.037***	0.023**	-0.075***	-0.058***	-0.032***	0.034***	0.011	-0.025***	0.092***	-0.068***	-0.011
(2) Inc_Diff Segmentation	0.759***	1	-0.233***	0.032***	-0.026**	-0.066***	0.012	0.030***	-0.048***	-0.041***	-0.034***	0.030***	-0.026***	0.074***	-0.058***	-0.012
(3) Inc_Add Disclosure	0.456***	-0.233***	1	-0.023**	0.034***	0.035***	0.017*	-0.153***	-0.020**	0.008	0.098***	-0.026***	-0.002	0.037***	-0.022**	0.001
(4) FE	0.015	0.035***	-0.026***	1	0.001	0.090***	-0.070***	0.041***	0.277***	-0.071***	0.128***	0.030***	0.180***	0.015	0.013	0.048***
(5) SRQuality	0.106***	0.074***	0.058***	0.014	1	0.204***	0.000	-0.125***	0.036***	-0.070***	0.095***	0.004	-0.092***	-0.076***	0.104***	0.075***
(6) SRQuantity	-0.041***	-0.061***	0.023**	0.127***	0.045***	1	-0.014	0.007	0.096***	-0.140***	0.255***	-0.038***	0.096***	-0.019*	-0.036***	0.267***
(7) AnalystEffort	0.024**	0.015	0.016	-0.096***	-0.040***	-0.018*	1	-0.042***	-0.015	0.024**	-0.066***	0.003	0.008	-0.053***	-0.054***	-0.101***
(8) LnAnalysts	-0.069***	0.046***	-0.166***	0.069***	-0.091***	0.011	-0.021**	1	0.165***	-0.071***	0.009	-0.014	0.055***	0.014	-0.103***	0.010
(9) Return Volatility	-0.105***	-0.089***	-0.035***	0.285***	0.066***	0.158***	-0.015	0.198***	1	0.020**	0.102***	0.372***	0.339***	-0.036***	-0.087***	0.011
(10) Guidance	-0.032***	-0.041***	0.008	-0.069***	-0.073***	-0.120***	0.023**	-0.090***	0.033***	1	-0.077***	0.029***	-0.099***	-0.025**	-0.144***	-0.090***
(11) LengthAR	0.030***	-0.033***	0.090***	0.141***	0.044***	0.207***	-0.064***	-0.006	0.138***	-0.048***	1	-0.041***	0.053***	0.188***	0.154***	0.539***
(12) EqIssue	0.006	0.044***	-0.051***	-0.030***	0.038***	-0.100***	-0.013	-0.128***	-0.055***	0.076***	0.022**	1	0.154***	-0.080***	-0.044***	-0.014
(13) Loss	-0.025**	-0.026***	-0.002	0.152***	-0.004	0.147***	0.006	0.071***	0.289***	-0.099***	0.058***	-0.044***	1	-0.066***	0.004	0.001
(14) ADR	0.092***	0.074***	0.037***	-0.001	-0.095***	-0.018*	-0.053***	0.005	-0.123***	-0.025**	0.175***	-0.047***	-0.066***	1	0.007	0.392***
(15) Segments	-0.096***	-0.074***	-0.042***	0.007	-0.001	-0.006	-0.063***	-0.101***	0.012	-0.138***	0.157***	0.066***	0.022**	0.032***	1	0.335***
(16) LnTA	-0.011	-0.007	-0.007	0.059***	-0.116***	0.255***	-0.102***	-0.009	0.013	-0.090***	0.527***	-0.001	0.005	0.380***	0.359***	1

This table presents Pearson (above diagonal) and Spearman correlation coefficients (below diagonal) for the variables used in the main analyses. See variable definitions in Appendix II.B. Statistical significance is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

**Table II.4: The role of inconsistent disclosure of operating segments across corporate documents for financial analysts' earnings forecast accuracy**

Variable	FE							
	(1)		(2)		(3)		(4)	
<b>Inconsistent</b>	<b>0.0062</b>							
	<b>(1.59)</b>							
<b>Inc_DiffSegmentation</b>			<b>0.0211 ***</b>				<b>0.0176 ***</b>	
			<b>(4.89)</b>				<b>(3.96)</b>	
<b>Inc_AddDisclosure</b>					<b>-0.0252 ***</b>		<b>-0.0193 ***</b>	
					<b>(-4.39)</b>		<b>(-3.26)</b>	
AnalystEffort	-0.0414 ***		-0.0414 ***		-0.0409 ***		-0.0410 ***	
	(-5.64)		(-5.65)		(-5.58)		(-5.62)	
LnAnalysts	-0.0139 *		-0.0147 ***		-0.0198 **		-0.0183 **	
	(-1.8)		(-1.94)		(-2.55)		(-2.38)	
ReturnVolatility	0.3207 ***		0.3209 **		0.3202 ***		0.3206 ***	
	(18.03)		(18.05)		(18.01)		(18.03)	
Guidance	-0.0227 ***		-0.0223 ***		-0.0228 ***		-0.0223 ***	
	(-5.36)		(-5.28)		(-5.41)		(-5.3)	
LengthAR	0.0470 ***		0.0479 ***		0.0509 ***		0.0503 ***	
	(8.65)		(8.88)		(9.28)		(9.21)	
EqIssue	-0.0830 ***		-0.0853 **		-0.0834 ***		-0.0855 ***	
	(-3.67)		(-3.74)		(-3.73)		(-3.77)	
Loss	0.0585 ***		0.0585 ***		0.0582 ***		0.0583 ***	
	(6.99)		(7.01)		(6.95)		(6.98)	
ADR	-0.0093 *		-0.0098 *		0.0582		-0.0091 *	
	(-1.72)		(-1.82)		(-1.51)		(-1.69)	
Segments	0.0009		0.0011		0.0005		0.0009	
	(0.72)		(0.92)		(0.40)		(0.72)	
LnTA	-0.0030		-0.0033		-0.0036 *		-0.0037 *	
	(-1.53)		(-1.67)		(-1.83)		(-1.86)	
Intercept	-0.0149		-0.0188		-0.0133		-0.0179	
	(-0.39)		(-0.5)		(-0.35)		(-0.47)	
Industry FE	YES		YES		YES		YES	
F-value	51.48 ***		52.28 ***		51.75 ***		49.87 ***	
Adj R <sup>2</sup>	0.122		0.124		0.124		0.125	
Number of clusters	2845		2845		2845		2845	
N	10421		10421		10421		10421	

This table reports results from regressions of analyst earnings forecast error on the inconsistency variables. The unit of analysis is at the firm-analyst level for a sample of multi-segment European companies part of the STOXX Europe 600 market index. Table 1 describes the sample construction and composition. The dependent variable is *FE* for all models, truncated at 95% to mitigate the influence of outliers. Standard errors are clustered at analyst level. The models also include industry fixed effects defined at the one-digit ICB code level. Statistical significance is based on two-sided t-tests (t-values presented in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in Appendix II.B.

**Table II.5: The importance of segment information in the press release and presentation**

Variable	FE			
	(1)		(2)	
<b>MissingSegPressRelease</b>	<b>0.0281</b>	<b>***</b>	<b>0.0487</b>	<b>***</b>
	(3.12)		(4.64)	
<b>MissingSegPresentation</b>	<b>0.0844</b>	<b>***</b>	<b>0.0816</b>	<b>***</b>
	(5.62)		(4.98)	
<b>MissingSegBoth</b>	<b>-0.0517</b>	<b>**</b>	<b>-0.0423</b>	<b>*</b>
	(-2.27)		(-1.72)	
SRQuality			-0.0136	*
			(-1.59)	
SRQuantity	0.0010	***	0.0012	***
	(3.13)		(3.20)	
AnalystEffort	-0.0415	***	-0.0409	***
	(-5.51)		(-4.75)	
LnAnalysts	-0.0317	***	-0.0251	***
	(-5.51)		(-3.33)	
ReturnVolatility	0.3056	***	0.3239	***
	(17.46)		(18.42)	
Guidance	-0.0251	***	-0.0259	***
	(-5.61)		(-4.85)	
LengthAR	0.0476	***	0.0450	***
	(8.44)		(6.28)	
EqIssue	-0.0800	***	-0.0602	***
	(-3.65)		(-2.73)	
Loss	0.0651	***	0.0553	***
	(6.90)		(5.71)	
ADR	-0.0078		0.0111	*
	(-1.41)		(1.66)	
Segments	0.0008		0.0000	
	(0.68)		(0.01)	
LnTA	0.0016	*	0.0020	
	(0.74)		(0.75)	
Intercept	-0.0360		-0.0650	
	(-0.93)		(-1.35)	
Industry FE	YES		YES	
F-value	48.89	***	42.10	***
Adj-R <sup>2</sup>	0.137		0.136	
Number of clusters	2769		2501	
N	9705		7559	

This table reports results from regressions of analyst earnings forecast error on variables that capture the missing segment information in available earnings announcement press releases and presentations to analysts. The second model also includes control for the quality of operating segment aggregation (*SRQuality*). The unit of analysis is at the firm-analyst level for a sample of multi-segment European companies part of the STOXX Europe 600 market index described in table 1. The sample here is restricted due to the availability of documents. The dependent variable is *FE* for all models, truncated at 95% to mitigate the influence of outliers. Standard errors are clustered at analyst level. The models also include industry fixed effects defined at the one-digit ICB



code level. Statistical significance is based on two-sided t-tests (t-values presented in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in Appendix II.B.

**Table II.6: The effect of inconsistency between the note and the MD&A**

Variable	(1) ChFE		(2) ChDisp	
<b>Note_MDA_DiffSegmentation</b>	<b>0.0294</b>	<b>**</b>	<b>0.0339</b>	<b>***</b>
	(1.76)		(2.76)	
<b>Note_MDA_AddDisclosure</b>	<b>0.0142</b>		<b>-0.0312</b>	
	(0.48)		(-0.98)	
LnAnalysts	-0.0395		0.0226	
	(-1.24)		(0.86)	
ChReturnVolatility	0.0014		0.0013	<b>**</b>
	(1.06)		(2.25)	
LengthAR	-0.0145		0.0128	
	(-0.63)		(0.59)	
ADR	-0.0038		-0.0358	<b>*</b>
	(-0.16)		(-1.76)	
LnTA	0.0077		-0.0068	
	(0.95)		(-1.30)	
Intercept	-0.0899		0.0080	
	(-0.73)		(0.06)	
Industry FE	YES		YES	
F-value	1.79	<b>**</b>	1.67	<b>*</b>
Adj-R <sup>2</sup>	0.048		0.048	
N	238		198	

This table reports results from regressions testing the importance of inconsistency in the annual report of the change in analyst forecast error (*ChFE*) and forecast dispersion (*ChDisp*) between the second and the first quarter on the inconsistency between the segments disclosed in the note and those disclosed in the MD&A. Only the last forecast per analyst is included to compute the forecast error and dispersion. The forecast could be either annual, or for the quarter in question. The unit of analysis is at the firm level for a sample of multi-segment European companies part of the STOXX Europe 600 market index described in table 1. The sample here is restricted due to the availability of analyst forecasts at the two quarter dates necessary to compute the dependent variables. *ChReturnVolatility* is the standard deviation of weekly stock returns during the second fiscal quarter. All the other variables are as defined in Appendix II.B. *ChFE* and *ChDisp* are truncated at 5% and 95% to mitigate the influence of outliers. Standard errors are robust adjusted for heteroskedasticity. The models also include industry fixed effects defined at the one-digit ICB code level. Statistical significance is based on two-sided t-tests (t-values presented in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

**Table II.7: Sensitivity analysis to endogeneity arising from unobservable correlated variable bias**

Variable	Inc_DiffSegmentation		Inc_AddDisclosure	
	ITCV	Impact <sub>Raw</sub>	ITCV	Impact <sub>Raw</sub>
<b>Inc_DiffSegmentation</b>	<b>-0.0039</b>			
<b>Inc_AddDisclosure</b>			<b>0.0421</b>	
AnalystEffort		-0.0014		-0.0015
LnAnalysts		0.0032		-0.0115
ReturnVolatility		0.0254		-0.0100
Guidance		0.0028		-0.0006
LengthAR		-0.0047		0.0127
EqIssue		-0.0013		0.0015
Loss		-0.0040		-0.0003
ADR		-0.0001		-0.0001
Segments		-0.0005		-0.0003
LnTA		-0.0004		-0.0004

This table reports the sensitivity analysis of the main results in table 4, models (2) and (3) to unobservable correlated variable bias following (Frank, 2000) and (Larcker & Rusticus, 2010). The *ITCV* is the Impact Threshold for a Confounding Variable defined as the minimum correlation between the dependent variable and a confounding variable, and between the independent variable of interest and a confounding variable that, if included in the regression, would make the OLS coefficient estimate statistically not significant, and is computed as described in section 7. *Impact<sub>Raw</sub>* is the product of the simple correlation between the dependent variable and the control variable and the simple correlation between the independent variable and the control variable. In all cases, the dependent variable is *FE*.

**Table II.8: Sensitivity analyses**

Panel A: Cluster standard errors by firm

Variable	FE		
	(1)	(2)	(3)
<b>Inc_DiffSegmentation</b>	<b>0.0211</b> *		<b>0.0176</b>
	<b>(1.75)</b>		<b>(1.41)</b>
<b>Inc_AddDisclosure</b>		<b>-0.0252</b>	<b>-0.0193</b>
		<b>(-1.46)</b>	<b>(-1.08)</b>
Control Variables	YES	YES	YES
Industry FE	YES	YES	YES
F-value	11.42 ***	10.90 ***	10.93 ***
Adj-R <sup>2</sup>	0.124	0.124	0.125
Number of clusters	396	396	396
N	10421	10421	10421

Panel B: Country fixed effects

Variable	FE		
	(1)	(2)	(3)
<b>Inc_DiffSegmentation</b>	<b>0.0202</b> ***		<b>0.0193</b> ***
	<b>(4.78)</b>		<b>(4.38)</b>
<b>Inc_AddDisclosure</b>		<b>-0.0122</b> **	<b>-0.0055</b>
		<b>(-2.23)</b>	<b>(-0.97)</b>
Control Variables	YES	YES	YES
Country FE	YES	YES	YES
F-value	41.76 ***	41.27 ***	40.44 ***
Adj-R <sup>2</sup>	0.133	0.132	0.134
Number of clusters	2845	2845	2845
N	10421	10421	10421

Panel C: Both industry and country fixed effects

Variable	FE					
	(1)		(2)		(3)	
<b>Inc_DiffSegmentation</b>	<b>0.0175</b>	<b>***</b>			<b>0.0146</b>	<b>***</b>
	<b>(4.00)</b>				<b>(3.23)</b>	
<b>Inc_AddDisclosure</b>			<b>-0.0206</b>	<b>**</b>	<b>-0.0154</b>	<b>**</b>
			<b>(-3.54)</b>		<b>(-2.55)</b>	
Control Variables	YES		YES		YES	
Country FE	YES		YES		YES	
Industry FE	YES		YES		YES	
F-value	35.59	<b>***</b>	35.31	<b>***</b>	34.75	<b>***</b>
Adj-R <sup>2</sup>	0.143		0.142		0.143	
Number of clusters	2845		2845		2845	
N	10421		10421		10421	

Panel D: Including *EQ* as control for earnings quality

Variable	FE					
	(1)		(2)		(3)	
<b>Inc_DiffSegmentation</b>	<b>0.0232</b>	<b>*</b>			<b>0.0193</b>	<b>***</b>
	<b>(5.35)</b>				<b>(4.35)</b>	
<b>Inc_AddDisclosure</b>			<b>-0.0280</b>	<b>***</b>	<b>-0.0217</b>	<b>***</b>
			<b>(-4.81)</b>		<b>(-3.63)</b>	
<i>EQ</i>	0.2147	<b>***</b>	0.2124	<b>***</b>	0.2280	<b>***</b>
	(4.55)		(4.60)		(4.90)	
Other control Variables	YES		YES		YES	
Industry FE	YES		YES		YES	
F-value	50.30	<b>***</b>	49.77	<b>***</b>	48.12	<b>***</b>
Adj-R <sup>2</sup>	0.127		0.126		0.128	
Number of clusters	2845		2845		2845	
N	10421		10421		10421	

*EQ* is a measure of earnings quality computed as the absolute value of residuals from a Dechow & Dichev (2002) model computed in-sample at the industry level. Higher values of absolute residuals mean lower earnings quality. Using instead measures of discretionary accruals computed based on Jones (1991) type of models does not significantly alter the results.

Panel E: Restrict sample to companies that have segment disclosure in all four documents

Variable	FE		
	(1)	(2)	(3)
<b>Inc_DiffSegmentation</b>	<b>0.0190 ***</b> <b>(4.24)</b>		<b>0.0159 ***</b> <b>(3.45)</b>
<b>Inc_AddDisclosure</b>		<b>-0.0211 ***</b> <b>(-3.62)</b>	<b>-0.0157 ***</b> <b>(-2.63)</b>
Control Variables	YES	YES	YES
Industry FE	YES	YES	YES
F-value	43.54 ***	42.97 ***	41.35 ***
Adj-R <sup>2</sup>	0.117	0.116	0.118
Number of clusters	2735	2735	2735
N	9458	9458	9458

Panel F: Restricted sample analyses to control for the quality of operating segment aggregation (*SRQuality*) and the number of accounting line items (*SRQuantity*) disclosed in the note to financial statements

Variable	FE		
	(1)	(2)	(3)
<b>Inc_DiffSegmentation</b>	<b>0.0184 ***</b> <b>(3.58)</b>		<b>0.0154 ***</b> <b>(2.92)</b>
<b>Inc_AddDisclosure</b>		<b>-0.0209 ***</b> <b>(-3.04)</b>	<b>-0.0161 **</b> <b>(-2.28)</b>
SRQuality	-0.0120 (-1.64)	-0.0106 (-1.45)	-0.0112 (-1.52)
SRQuantity	0.0013 *** (3.43)	0.0012 *** (3.12)	0.0012 *** (3.31)
Other Control Variables	YES	YES	YES
Industry FE	YES	YES	YES
F-value	41.8 ***	41.89 ***	40.24 ***
Adj-R <sup>2</sup>	0.124	0.124	0.125
Number of clusters	2599	2599	2599
N	8053	8053	8053

Panel G: Restrict sample to companies for which data is available to compute *SRQuality* and run the analyses without controlling for *SRQuality*

Variable	FE					
	(1)		(2)		(3)	
<b>Inc_DiffSegmentation</b>	<b>0.0181</b>	<b>***</b>			<b>0.0144</b>	<b>***</b>
	<b>(3.55)</b>				<b>2.74</b>	
<b>Inc_AddDisclosure</b>			<b>-0.0244</b>	<b>***</b>	<b>-0.0200</b>	<b>***</b>
			<b>(-3.60)</b>		<b>-2.86</b>	
Control Variables	YES		YES		YES	
Industry FE	YES		YES		YES	
F-value	45.71	<b>***</b>	45.91	<b>***</b>	43.90	<b>***</b>
Adj-R <sup>2</sup>	0.124		0.124		0.125	
Number of clusters	2599		2599		2599	
N	8053		8053		8053	

Panel H: Controlling for the complexity associated with forecasting a firm's earnings

Variable	FE					
	(1)		(2)		(3)	
<b>Inc_DiffSegmentation</b>	<b>0.0129</b>	<b>***</b>	<b>0.0154</b>	<b>***</b>	<b>0.0155</b>	<b>***</b>
	<b>(2.88)</b>		<b>(3.45)</b>		<b>(3.49)</b>	
<b>Inc_AddDisclosure</b>	<b>-0.0173</b>	<b>**</b>	<b>-0.0182</b>	<b>***</b>	<b>-0.0184</b>	<b>***</b>
	<b>(-2.93)</b>		<b>(-3.06)</b>		<b>(-3.10)</b>	
StdEarnings	0.5102	<b>***</b>				
	<b>(5.48)</b>					
StdCFO			0.0127			
			<b>(0.20)</b>			
HighTech					0.0088	
					<b>(1.20)</b>	
Other Control Variables	YES		YES		YES	
Industry FE	YES		YES		YES	
F-value	50.83	<b>***</b>	48.62	<b>***</b>	47.90	<b>***</b>
Adj-R <sup>2</sup>	0.132		0.128		0.128	
Number of clusters	2834		2834		2599	
N	10288		10288		10288	

*StdEarnings* is the standard deviation of yearly net income deflated by average total assets over the period 2004-2009 or the maximum number of years with data available after 2004. Data comes from Thomson Reuters. *StdCFO* is the standard deviation of yearly cash flow from operations deflated by average total assets over the period 2004-2009 or the maximum number of years with data available after 2004. Data comes from Thomson Reuters. *HighTech* is an indicator variable taking the value 1 if the company operates in a high-technology (including pharmaceuticals and healthcare) industry as defined by Francis & Schipper (1999) and consistent with André, Ben-Amar, & Saadi (2014).

## **Chapter III**

### **Management Guidance at the Segment Level**

#### **Abstract**

Managers add information to their earnings guidance to justify, explain, or contextualize their forecasts. I identify segment-level guidance (SLG) as a type of disaggregated information that multi-segment firms provide with their management guidance and investigate its usefulness for financial analysts' earnings forecasting accuracy, and the influence it has on managers' earnings fixation. I further characterize the level of precision (point and range, maximum or minimum estimate, or simply narrative) and of disaggregation of SLG. Results suggest that companies in high tech industries known for increased uncertainty in future performance are less likely to provide SLG, and that SLG is associated with better forecasting accuracy. However, while providing more item-disaggregated SLG improves accuracy, increased precision of SLG has no impact on forecast accuracy. From the manager's point of view, SLG creates incentives to engage in earnings management, and the more precise the SLG is, the greater the incentive. In contrast, more item-disaggregated SLG discourages earnings management, perhaps by improving monitoring. In a context where qualitative, narrative, and disaggregated guidance is regarded as a solution to avoid earnings fixation and short termism, understanding which types of information achieve this goal, and how, is relevant for managers, investors, and regulators alike.



## Résumé

Je considère les prévisions au niveau sectoriel (PNS) comme un type d'information désagrégé que les entreprises fournissent ensemble avec leur stratégie de gestion. J'examine l'utilité de cette information pour l'exactitude des prévisions de résultat par les analystes ainsi que l'impact de cette information sur la manipulation du résultat. Je constate que les entreprises de haute technologie réputées pour l'incertitude supplémentaire liée à profitabilité sont moins susceptibles de fournir des PNS et que le PNS est associé à une prévision améliorée. Cependant, alors que la communication de davantage de PNS désagrégé par secteur a tendance à améliorer la précision, plus de précision ne semble pas avoir d'importance. Du point de vue des cadres dirigeants, les PNS les incitent à manipuler le résultat comptable, mais le PNS désagrégé par poste semble décourager la manipulation, fort probablement due à une surveillance supplémentaire. Dans un contexte où une orientation narrative et désagrégée est considérée comme la solution pour empêcher la vision à court terme, comprendre quel type d'information permet d'atteindre cet objectif, et de quelle manière, est tout autant pertinent pour les cadres dirigeants, les investisseurs et les régulateurs.

### III.1 Introduction

Managers of listed companies issue guidance on the short or mid-term performance of their companies as part of their communications with investors. Management guidance takes the form of a forecast of the bottom-line profit measure, of various accounting items (Lansford et al., 2013), and/or other non-financial measures (Brazel, Lail, & Pagach, 2013) that could come in different forms (e.g., point, range, minimum, maximum, narrative). Prior literature documents that managers often accompany their forecasts with supplementary statements (Hutton et al., 2003) that could be used to provide a richer context for the forecast, or as a way to point to the causes that led to certain expectations (Baginski et al., 2000). I complement this literature by specifically examining the management guidance made at the segment-level. I investigate (1) the characteristics of firms that provide segment-level guidance (henceforth, SLG), (2) which characteristics of SLG, disaggregation and/or precision, matter more, and (3) whether segment-level guidance contributes to or alleviates managers' earnings fixation.

I focus on segment-related statements in the management guidance for two reasons. Segment information is essential for investors to understand the nature and diversification strategy of large companies and to assess the sources of consolidated earnings. For multi-segment companies, analysts first forecast segment-level earnings and then aggregate them at the entity level. This practice has been previously discussed in the literature (You, 2014) and confirmed by interviews with financial analysts, but is also apparent from the contents of analyst reports, some of which also contain the segment-level forecasts.<sup>1</sup> A large body of literature finds that historical information on segments is useful for predicting future consolidated earnings (e.g., Behn et al., 2002; Berger & Hann, 2003; Botosan & Stanford,

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<sup>1</sup> Interviews were conducted with a former Morgan Stanley equity financial analyst and with a credit analyst currently working for OFI Asset Management in Paris, France in April 2014. Transcripts are available upon request.

2005; Collins, 1976; Hope et al., 2008b, 2006; Kinney Jr., 1971; Tse, 1989). Comparatively, we know little about the role of segment information when it is forward-looking. Prior research has mainly focused on the segment information disclosed in the notes to financial statements which is essentially historical in nature. An exception is Hutton et al. (2003) who examine a range of supplementary disclosures that managers make together with the earnings forecasts, including those related to segment information which they classify as “soft talk disclosures.” Their goal is to distinguish the role of qualitative, soft-talk statements versus verifiable forward-looking statements for the credibility of good versus bad news forecasts. Our paper contributes to this literature by investigating in more detail the role of segment information when it is forward-looking and disclosed outside the notes to financial statements, in the management guidance section of the earnings announcement press release.

I also contribute to the literature on management guidance by more closely looking into European companies’ strategies for providing guidance. Anecdotal evidence and surveys of investor relations professionals suggest that European companies have a different approach to management guidance compared to U.S. firms. Roach (2013b) reports that “65% of UK companies in the FTSE 100 provide qualitative guidance in the form of commentaries on EPS, revenue, profit, or other operational metrics, and only 9% take the U.S. approach in providing quantitative EPS guidance.” The chairman of the IR Society remarked that UK companies are “a lot less prescriptive and specific [in their guidance] compared to U.S. firms and that directional and qualitative guidance is as effective as quantitative profit forecasts.” (Roach (2013b) citing John Dawson, chairman of the IR Society). There is very scarce evidence on management guidance outside the US. As the IR Society suggests, guidance strategies of European firms are different from those of U.S. firms, meaning that the generalizability of US-based management guidance research results to the European setting should be at least questioned.

For a sample of multi-segment European companies included in the STOXX Europe 600 I collect the 2009 earnings announcement press releases. By reading through the press release I identify the management guidance section and code whether it contains any statements related to the operating segments of the company, which I call SLG.<sup>2</sup> I also code the precision with which SLG is provided – point, range, estimate, or narrative –, and what segment-level accounting items are forecasted for the next fiscal year in order to obtain a measure of item disaggregation of SLG similar to the disaggregated earnings guidance in Lansford et al. (2013).

I first examine whether segment-level guidance is useful information for financial analysts beyond the forecasted accounting numbers. A large stream of literature starting with Penman (1980) shows that voluntary earnings forecasts have information content beyond the information contained in prior-year annual earnings. In addition, Sobel (1985) shows that the usefulness of information depends on its relevance, i.e., surprise, and credibility, i.e., believability. Managers can increase the credibility of their reports (1) by building a reputation through various choices such as forecast frequency, specificity (Bhojraj, Libby, & Yang, 2012), and consistency in time (Tang, 2014) or (2) by disclosing additional details supporting the contents (Dye, 1986) such as disaggregating earnings forecasts into other accounting items (Lansford et al., 2013). Somewhat similar to the item disaggregation of earnings guidance, SLG can be regarded as the disaggregation of management guidance along the segment dimension. I find that providing SLG helps analysts make more accurate forecasts, even after controlling for the item disaggregation of the earnings guidance as per Lansford et al. (2013). I also aim to understand under what conditions SLG is useful to analysts. I find that the precision of the SLG is not significantly associated with analysts’

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<sup>2</sup> The management guidance section could have a variety of names, such as outlook, prospects, or forecasts. I take all of these into consideration.

accuracy, but the higher the score for the item disaggregation of SLG, the more accurate analysts are.

The evidence in Lansford et al. (2013) also suggests that item disaggregation of earnings guidance reduces managers' fixation on earnings. I add to the long-standing debate of whether management forecasts encourage short-termism and what characteristics guidance should have to help avoid earnings fixation (Miller, 2009) by examining the relation between SLG and earnings management. Kasznik (1999) finds that managers are likely to manipulate earnings via accruals in order to meet the expectations set in yearly managerial earnings forecasts. For short-term forecasts, however, Call, Chen, Miao, & Tong (2014) find that quarterly guidance is associated with less earnings management. There are arguments for both a positive and a negative relation between SLG and managers' fixation on earnings. On the one hand, disaggregating the guidance at the segment-level could induce earnings fixation for the divisional managers.<sup>3</sup> On the other hand, disaggregating guidance at the segment level potentially makes it easier for monitors – shareholders or analysts (Liu, 2014; Lui, Young, & Zeng, 2011) – to verify ex-post how the earnings targets were achieved (Mercer, 2004). This ex-post verifiability could potentially commit the manager ex-ante to honest behavior. I find that companies that provide SLG engage in more earnings management compared to the companies that do not disaggregate their guidance at the segment level. Absolute discretionary accruals increase with increased precision of the SLG, consistent with the idea that more specific guidance induces fixation on the earnings target. Item disaggregation of SLG, however, is associated with less earnings management, most likely due to the fact that guidance disaggregation allows better monitoring (Mercer, 2004).

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<sup>3</sup> Under IFRS 8, operating segments reflect the internal organization of the company as seen by the management. As a result, most often the operating segments reflect the divisional organization, with divisional managers basically in charge of the results of the segments.

The paper proceeds as follows. Section 2 reviews prior research and builds up the hypotheses. Section 3 details the variable measurement and research design. Section 4 presents the results, and section 5 concludes.

## **III.2 Literature review and hypotheses development**

### *III.2.1 Determinants of management guidance*

I aim to understand what firm characteristics are associated with providing SLG. Lansford et al. (2013) find that demand-and-supply factors are more important for the decision to disaggregate, once the decision to provide guidance is taken, than strategic reasons. They also find that innovation-intensive firms and those with high earnings surprises are more likely to disaggregate, while those with a high earnings-returns correlation and high variation in sales are less likely to disaggregate. Baginski, Hassell, & Kimbrough (2004) and Baginski et al. (2000) find that larger firms and those in non-regulated industries are more likely to disclose attributions together with the management earnings forecast, and that the type of attribution is more likely to be external for bad news forecasts. US-based internationally diversified firms issued more guidance prior to Reg FD, and less and of lower quality post-Reg FD (Herrmann, Kang, & Kim, 2010).

Given the sensitive nature of segment information from a proprietary costs perspective (Bens et al., 2011; Berger & Hann, 2007), combined with the nature of management guidance that is sensitive to future uncertainty, I predict that companies in innovative industries are less likely to provide SLG. It could be either that it is hard for managers to be confident enough in the predictions for next year to formulate disaggregated managerial guidance at the segment level due to the high uncertainty in high tech industries.

It could also be, however, that managers do not provide SLG due to proprietary costs. When testing the following hypothesis, I try to distinguish between these two explanations by including controls for proprietary costs.

*H1. Companies in high tech industries are less likely to disclose segment-level guidance.*

### *III.2.2 Management guidance and financial analysts' forecasts*

Broadly speaking, prior literature examines the antecedents, characteristics, and consequences of management forecasts (Hirst, Koonce, & Venkataraman, 2008). Management guidance is generally regarded as a “necessary evil” (Graham et al., 2005). Although it may induce earnings fixation and short-termism (Miller, 2009) and be used by managers in a self-serving manner for insider trading purposes (Cheng, Luo, & Yue, 2013), the market views this type of voluntary disclosure as informative (e.g., Penman, 1980; Pownall, Wasley, & Waymire, 1993), penalizes companies who discontinue or suspend guidance (Chen, Matsumoto, & Rajgopal, 2011) which most often happens when there are difficulties associated with predicting earnings (Houston, Lev, & Tucker, 2010), and rewards managers' reputation for reliable forecasts (Yang 2012).

The information content of management guidance depends on its relevance and credibility (Sobel, 1985). Providing guidance for other accounting items to accompany the earnings forecast seems to increase the credibility of the forecast and be informative for financial analysts (Lansford et al., 2013). Hirst, Koonce, & Venkataraman (2007) run a set of experiments to test the mechanisms through which line-item disaggregation adds to the perceived credibility of management earnings forecasts. They find that managers who

disaggregate are perceived as having more precise beliefs, but also that disaggregation improves the clarity of the forecast and the perceived financial reporting quality of the firm.<sup>4</sup>

The upheld belief in management forecast research is that bad news forecasts are inherently credible, whereas good news ones are not. Hutton et al. (2003) find empirically that good news forecasts are informative for investors only when supplemented with forecasts on disaggregated accounting items and that when disaggregations accompany bad-news forecasts, this increases the information content (i.e., stock price reaction) to the forecast.<sup>5,6</sup> Merkley, Bamber, & Christensen (2012), however, find that analysts rely on both good and bad news forecasts, regardless of whether these are further disaggregated. Given this recent finding, I do not distinguish between good and bad news forecasts but rather focus on whether guidance disaggregated at the segment level is informative (i.e., both relevant and credible) on average for analysts.

Prior literature documents the economic consequences of management guidance characteristics. Baginski & Rakow (2011) find a negative association between the quality of management earnings forecast policy (i.e., frequency of quarterly guidance and precision) and the cost of equity capital. The association is stronger for companies that incur high disclosure costs (measured with current product market competition, capital intensity, expected litigation costs, and growth opportunities) and for those for which quarterly management earnings forecasts are more value relevant. Merkley et al. (2012) find that disaggregated earnings forecasts increase analysts' sensitivity (i.e., in terms of the magnitude of forecast revision) to the news in managers' earnings guidance, consistent with the idea that

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<sup>4</sup> More specifically, Hirst et al. (2007) identify three avenues by which disaggregation increases management forecast credibility: (1) specificity – disaggregation signals that managers have particularly precise beliefs, (2) analysts use detailed (i.e., at the segment level) analytical models to arrive at their forecasts, so disaggregation allows analysts to better justify their forecasts, and (3) forecasts of earnings components (and at the segment-level) pre-commit the manager to meeting bottom-line EPS forecasts in a particular way, and such pre-commitment increases the manager's credibility by increasing ex-post verifiability of disclosures (Mercer, 2004).

<sup>5</sup> Hutton et al. (2003) use the name “verifiable supplementary statements” for this type of forecast disaggregation.

<sup>6</sup> Soft-talk disclosures are more likely to accompany bad-news forecasts (Hutton et al., 2003).



analysts find disaggregated guidance more credible. Disaggregation reduces analyst forecast dispersion and improves forecast revision times (Lansford et al., 2013; Merkley et al., 2012).

A few papers code the supplementary statements that accompany management forecasts based on the attribution or causality effect that managers “assign” to them. Baginski et al. (2004) define attributions as the statements that link forecasted performance to managers’ internal actions and/or the actions of other parties external to the firm and find that stock market reaction to management forecasts accompanied by attributions is stronger.

Based on these prior findings and theoretical underpinnings, I predict that SLG increases the information content of managerial guidance and is negatively associated with analysts’ earnings forecast errors. Testing the usefulness of SLG for financial analysts is in fact a joint test of whether SLG is relevant and credible. I focus on analysts in particular since they directly use segment information to perform their job.

*H2a. Financial analysts’ earnings forecasts errors are smaller for companies that provide segment-level guidance.*

There are various choices that managers make to render credibility to their forecasts. For example, more frequent and more specific forecasts are more credible and help managers build a reputation for corporate disclosure quality (Bhojraj et al., 2012). Consistency in time, either as a guider or as a non-guider, also helps create guidance reputation and build market expectations (Tang, 2014). There is mixed empirical evidence with regards to the effects of some of these choices. Pownall et al. (1993) find no effect of guidance form on stock returns. Baginski, Conrad, & Hassell (1993) find that forecast precision improves the relation between unexpected earnings and unexpected returns. Hirst, Koonce, & Miller (1999) find experimentally that investors’ earnings predictions are responsive to management forecasts, but forecast form does not influence the earnings predictions. Libby, Tan, & Hunton (2006) take into consideration the whole sequence of corporate events – management forecast,

analyst forecasts, earnings announcement arguing that “the complete effect of earnings guidance cannot be observed until after the actual earnings announcement” and test experimentally whether the form of management earnings guidance (i.e., point, narrow range, wide range) affects analysts’ earnings forecasts. Their results show that guidance form has no effect on analysts’ forecasts made immediately after the guidance, but that subsequent to the actual earnings announcement, the interaction of guidance form and accuracy is significantly influencing analysts’ forecast errors. Still in an experimental setting, Fleming (2009) suggests that the benefits of guidance disaggregation are limited to precise guidance (i.e., point rather than range).<sup>7</sup>

I test two hypotheses related to the effect of SLG characteristics on analysts’ accuracy, one related to the precision of SLG, and the other to the item disaggregation of SLG.

*H2b. For companies that provide segment-level guidance, the precision of the segment-level guidance is negatively associated with financial analysts’ earnings forecast errors.*

*H2c. For companies that provide segment-level guidance, the accounting item-disaggregation at the segment-level guidance is negatively associated with financial analysts’ earnings forecast errors.*

### *III.2.3 Management guidance and earnings management*

The CFA Institute (2007) defines short-termism as the excessive focus that corporate leaders, investors, and analysts place on short-term earnings at the expense of long-term value creation, which translates into pressure on managers to engage in myopic behavior, including the use of accounting manipulations, to meet earnings expectations. The general

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<sup>7</sup> The experiment in Fleming (2009) refers to item disaggregation of earnings guidance.

perception is that providing management forecasts focuses managers on short-term results and induces earnings fixation (Miller, 2009). However, given the capital market benefits of providing management forecasts (Miller, 2009), regulators and practitioners are interested in whether the way in which management forecasts are provided could alleviate some of the costs, while still providing all the benefits.

It is not clear what the effect of guidance disaggregation should be on managers' earnings fixation. On the one hand, disaggregating the guidance at the segment-level could induce earnings fixation for the divisional managers.<sup>8</sup> Earnings targets that are set *internally* are conducive to earnings management behavior at the business-unit level (Guidry et al., 1999). Once an earnings target is *publicly* announced for a segment, we can easily expect the effect to be even stronger. Therefore, SLG might create incentives for divisional managers to engage in earnings management in order to meet or beat these publicly-announced targets.

On the other hand, similar to the argument in Mercer (2004), disaggregating guidance at the segment level potentially makes it easier for monitors – shareholders or analysts (Liu, 2014; Lui et al., 2011) – to verify ex-post how the earnings targets were achieved. This ex-post verifiability potentially commits the manager ex-ante to honest behavior. Experimental results suggest that accompanying earnings forecasts with forecasts for other items such as revenue, cash flows, capital expenditures etc. appears to reduce investor fixation on earnings (Elliott et al., 2011). Analytical results also support the notion that guidance allows monitoring and so deters earnings management (Dutta & Gigler, 2002). Furthermore, Ajinkya & Gift (1984) show that managers issue guidance to align market expectations with their own expectations. Therefore, there is less need to manage earnings if managers can already use guidance to influence the benchmarks.

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<sup>8</sup> Under IFRS 8, operating segments reflect the internal organization of the company as seen by the management. As a result, most often the segments reflect the divisional organization, with divisional managers basically in charge of the results of the segments.

I test the following three hypotheses on the relation between SLG and earnings management, including the precision and item-disaggregation characteristics of SLG.

*H3a. Companies that provide segment-level guidance are more likely to manage earnings in the following year.*

*H3b. For companies that provide segment-level guidance, the precision of the segment-level guidance is positively related to earnings management in the following year.*

*H3c. For companies that provide segment-level guidance, the accounting item-disaggregation of segment-level guidance is negatively related to earnings management in the following year.*

### **III.3 Sample and research design**

#### *III.3.1 Sample*

My sample contains multi-segment European companies. According to the 2012 IR Magazine Global Practice Report, the proportion of European companies providing guidance is comparable to that of U.S. companies (IR Magazine, 2012) but we know comparatively little regarding their guidance practices. Anecdotal evidence suggests that UK companies are providing more directional and qualitative rather than quantitative guidance compared to U.S. firms and that investor relations managers consider it “just as effective” (Roach, 2013b). Throughout Europe, investor relations specialists in large companies speak of a “trend of super transparency” that “U.S. managers would find shocking” (Roach, 2013a).<sup>9</sup> Differences in the regulatory environment could also be driving differences in guidance practices between

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<sup>9</sup> The “super transparency” translates into how companies maintain their investor relations websites, communicate with investors and financial analysts, including private communication which Reg FD prohibits in the US, provide guidance, and publish in-house consensus estimates, a practice so far confined to European firms (Human, 2013).

European and U.S. firms. In the US, regulations such as the Safe Harbour Law, the Private Securities Litigation Reform Act, and Reg FD provide guidelines on management guidance and the SEC is in charge of enforcing them, while in Europe there is no regulatory body explicitly covering this topic (Karageorgiou & Serafeim, 2014). For these reasons, examining guidance practices by European companies is warranted in and of itself.

There are various venues in which managers disclose guidance (Bamber & Cheon, 1998; King, Pownall, & Waymire, 1990). I use earnings announcement press releases as the venue of interest. Lansford et al. (2013) point out that “the overall number of firms providing guidance at the earnings announcement is far greater than the number providing guidance in special releases” i.e., guidance disclosed in press releases issued in between quarterly earnings announcements, and Rogers & Buskirk (2013) find that stand-alone guidance press releases are rare. To the extent that European firms use the same venues as U.S. firms to disclose guidance, I focus on the venue where I am more likely to find guidance.<sup>10</sup>

I start from a sample of multi-segment companies included in the STOXX Europe 600 index at the end of 2009 and retrieve the earnings announcement press releases from their corporate websites. I go through each press release and code whether the company provides guidance or not. For those that do, I extract the section containing the guidance and manually code (1) whether segments are discussed, (2) the form of guidance at the segment level, i.e., point, range, low-precision range estimate (henceforth “estimate”), or narrative, and (3) the type of information in the segment-level guidance, i.e., segment earnings, segment revenues, segment expense items, or non-financial statements.<sup>11</sup> I use this data to construct the main variables of interest.

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<sup>10</sup> I have no reason to expect European companies to differ from U.S. companies regarding the guidance disclosure venue.

<sup>11</sup> My coding of guidance form follows Lansford et al. (2013). An example of low-precision range estimate is “we expect mid- to high single-digit earnings growth.”

An indicator variable (*SLG*) takes the value 1 if the company provides segment-level guidance, and 0 otherwise, conditional on the company providing guidance (i.e., an indicator variable *Guidance* is 1 if this is the case, and 0 otherwise). I define indicator variables for whether the company provides segment-level guidance in the form of point and/or range estimates (*Point\_Range*), low-precision range estimates (*Estimate*), or in a qualitative/narrative form (*Narrative*) which comprises financial and/or non-financial statements. The variable *Precision* is meant to summarize the form of segment-level guidance. It takes integer values between 0 and 2, with higher values reflecting more precision of the segment guidance. For narrative guidance, *Precision* takes the value 0, for estimates it takes the value 1, and for point and/or range guidance it takes the value 2.

The last variable of interest is *SEG* which captures the disaggregation of segment-level guidance based on the type of information that is provided. *SEG* is 0 if only non-financial statements are provided in the segment-level guidance, 1 if only segment expense items and/or segment revenue are mentioned in the segment-level guidance, 2 if only segment earnings are forecasted, and 3 if segment earnings and at least one other accounting item (e.g., segment revenue, segment expense items) are mentioned.

The debate on the appropriateness of providing guidance (CFA Institute, 2013; Miller, 2009) is pushing managers to adopt a more general, qualitative way of expressing their expectations about future performance. Non-financial information such as number of stores, order backlog, number of patents etc. is an important input into management forecasts (Brazel et al., 2013). More than being just an input, however, survey evidence indicates that a large proportion of the qualitative guidance that UK managers provide relates to non-financial information such as operational metrics or other KPIs (Roach, 2013b). For these reasons, I also score non-financial information into the *SEG* measure.

Following Lansford et al. (2013) and Merkley et al. (2012) I also retain the components of guidance at the firm level, i.e., guidance on earnings, revenues, expense items, and cash flow items, to construct a measure of disaggregated earnings guidance (*DEG*). Appendix III.B provides further details on variable definitions.

### III.3.2 Model to test the determinants of segment-level guidance

The first model is a logistic regression that tests whether the main industry is a determinant of managers' decision to provide segment-level guidance.

$$\begin{aligned}
 SLG_{t+1} = & \beta_0 + \beta_1 \mathbf{HighTech}_t + \beta_2 \ln MgOwners_t + \beta_3 CHS_t + \beta_4 Herf_t + \beta_5 R\&D_t \\
 & + \beta_6 ROA_t + \beta_7 StdEarnings_t + \beta_8 BTM_t + \beta_9 Segments_t + \beta_{10} \ln TA_t \\
 & + \varepsilon_{t+1}
 \end{aligned}$$

The model is run on the sample of guiders, with *SLG* as dependent variable. The independent variable of interest is *HighTech* and equals 1 for companies in high-tech industries as defined by Francis & Schipper (1999) and including companies in the healthcare and pharmaceuticals industry, consistent with André, Ben-Amar, et al. (2014).<sup>12</sup>

Without formally hypothesizing their association to *SLG*, I include a number of variables that have been shown in prior literature to be related to managers' decision to issue guidance (Miller, 2009). Two variables relate to the firm's ownership structure – *LnMgOwners* is the natural logarithm of the proportion of management ownership, and *CHS* is the natural logarithm of the proportion of closely held shares. Two other variables relate to

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<sup>12</sup> The Francis & Schipper (1999) classification of high tech industries comprises the following three-digit SIC codes: 283 Drugs, 357 Computer and Office Equipment, 360 Electrical Machinery and Equipment, excluding Computers, 361 Electrical Transmissions and Distribution Equipment, 362 Electrical Industrial Apparatus, 363 Household Appliances, 34 Electrical Lighting and Wiring Equipment, 365 Household Audio, Video Equipment, Audio Receiving, 366 Communication Equipment, 367 Electronic Components, Semiconductors, 368 Computer Hardware, 481 Telephone Communications, 737 Computer Programming, Software, Data Processing, 873 Research, Development, Testing Services. I add the 384 and 800 three-digit codes for companies in the healthcare and pharmaceutical industry, consistent with André, Ben-Amar, & Saadi (2014).

the proprietary costs that the company may be facing by disclosing disaggregated guidance at the segment level: *Herf* is the Herfindahl industry concentration index, and *R&D* is the log of the ratio of research and development expenditures to total sales. I also include *ROA* and *StdEarnings* to account for firm profitability and earnings volatility. The book-to-market ratio (*BTM*) is an inverse proxy for firm growth opportunities and life cycle. Lastly, I include the number of reported operating segments (*Segments*) and lagged total assets (*LnTA*) to control for firm complexity and size. Appendix III.B provides definitions of all the variables included in the model.

### *III.3.3 Model to test the relation between segment-level guidance and analysts' earnings forecast errors*

In order to test the relation between segment-level guidance on financial analysts' accuracy, I use a multivariate cross-sectional model that regresses the individual analyst forecast error on the indicator variable *SLG*.<sup>13</sup> The dependent variable is the in-sample range-adjusted earnings forecast error. The forecast error (*FE*) is computed as the logarithm of one plus the absolute difference between the first estimated value of one-year-ahead earnings within 30 days after the earnings announcement and the actual earnings, deflated by the absolute value of actual earnings.<sup>14</sup> In order to mitigate the influence of outliers and measurement error, I winsorize the sample at the extreme 99<sup>th</sup> percentile of the *FE* variable. Since I run a cross-sectional model, year *t* is 2009, and *t*+1 is 2010.

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<sup>13</sup> Using analyst-firm observations as unit of analysis increases the power of our tests. Models using the firm-level observations as unit of analysis lack power, especially when the sample is restricted to guiders (288 observations) or providers of SLG (127 observations).

<sup>14</sup> Extending the period to 90 days after the earnings announcement leaves the inferences qualitatively similar. Restricting the period to 10 days after the earnings announcement significantly reduces the sample (1500 firm-analyst observations) which makes some results unstable.



$$\begin{aligned}
FE_{t+1} = & \beta_0 + \beta_1 SLG_{t+1} + \beta_2 LnFE_t + \beta_3 LnAnalysts_{t+1} + \beta_4 ReturnVolatility_t \\
& + \beta_5 LengthAR_t + \beta_6 Loss_t + \beta_7 ADR_{t+1} + \beta_8 Segments_t + \beta_9 LnTA_t \\
& + IndustryFE + \varepsilon_{t+1}
\end{aligned}$$

The variable of interest to test H2a is *SLG*. In order to test H2b and c, I replace *SLG* by *Point\_Range*, *Narrative* (*Estimate* is the benchmark) and *SEG*. Different versions of this model are supplemented with *Guidance* and/or *DEG* as additional independent variables to control for the company providing guidance (i.e., at the firm level) and the disaggregation of that guidance into accounting items other than earnings.

The model includes a set of control variables that have been shown in prior literature to influence analysts' accuracy, similar to the models used in prior research on analyst accuracy and dispersion at an international level (Bae, Tan, & Welker, 2008; Hope, 2003; Hope, 2003; Lang, Lins, & Miller, 2003; Tan, Wang, & Welker, 2011). I control for the prior forecast error ( $LnFE_t$ ) in an attempt to capture the news that the earnings announcement brings to financial analysts and to control for serial correlation among forecast errors. I also include stock return volatility (*ReturnVolatility*) computed as the standard deviation of weekly stock returns during year  $t$  to proxy for firm risk, the number of analysts covering the firm during year  $t+1$  (*LnAnalysts*), the length of the annual report (*LengthAR*) as a measure of overall firm disclosure policy (Loughran & McDonald, 2014) because a firm's disclosure policy influences analysts' information set and whether or not management provides guidance, an indicator variable which takes the value 1 if the company made a loss in year  $t$  and 0 otherwise (*Loss*), since future earnings for loss-making firms are harder to forecast, an indicator variable for whether the company is cross-listed in the U.S. (*ADR*), and firm complexity and size proxied by the number of reported operating segments (*Segments*) and the natural logarithm of lagged total assets (*LnTA*). All variables are defined in Appendix B.

In addition, the model includes industry fixed effects defined at the one-digit ICB code level. Untabulated specifications also include country fixed effects. I estimate the model cross-sectionally on analyst-firm observations and cluster standard errors by analyst to account for analysts' intrinsic (i.e., personal) ability to be more or less accurate since one analyst may be following more than one firm in the sample.

### *III.3.4 Model to test the relation between segment-level guidance and earnings management*

I test hypotheses H3a-H3c by running the following multivariate cross-sectional model at firm level.

$$\begin{aligned} EM_{t+1} = & \beta_0 + \beta_1 \mathbf{SLG}_{t+1} + \beta_2 \mathbf{LnTA}_t + \beta_3 \mathbf{Lev}_t + \beta_4 \mathbf{ROA}_t + \beta_5 \mathbf{CapIntensity}_t \\ & + \beta_6 \mathbf{OpCycle}_t + \beta_7 \mathbf{StdEarnings}_t + \beta_8 \mathbf{StdCFO}_t + \beta_9 \mathbf{BTM}_t \\ & + \mathbf{IndustryFE} + \varepsilon_{t+1} \end{aligned}$$

The dependent variable  $EM$  is one of three earnings management proxies:  $AbsDA1$  is a measure of discretionary accruals as used in Call et al. (2014) based on the Jones (1991) model after controlling for economic losses as in Ball & Shivakumar (2006),  $AbsDA2$  is a measure of discretionary accruals based on the performance-matched model in Kothari, Leone, & Wasley (2005),  $AbsDRev$  is a measure of absolute discretionary revenue based on the model by Stubben (2010) as used in Call et al. (2014). Larger absolute values indicate more earnings management. Appendix B describes in full the computation of these variables.

A number of papers that investigate the relation between management guidance and earnings management use a meet or beat measure as proxy for whether the company has engaged in earnings management. However, meeting or beating a benchmark could be achieved (1) by manipulating earnings, (2) by “adjusting” the benchmark with downward guidance throughout the year, or (3) by employing a combination of the first two strategies

(Athanasakou, Strong, & Walker, 2009). Prior literature uses the difference between the last and the first analyst forecast as proxy for downward guidance. I regard this measure rather as “implied” downward guidance since there could be other factors besides managers explicitly providing downward guidance during the year that could explain the revision of analyst forecasts. Analysts could be revising their forecasts during the year in response to a multitude of factors of which explicit, public downward guidance (Cotter, Tuna, & Wysocki, 2006) that could be observed by going through the companies’ press releases, is only one. Analysts could get information from other sources, get private information from management, which is not observable in a research setting, respond to macroeconomic events, or “walk-down” their forecasts at their own initiative in order to maintain good relations with the management. For example, Hutton (2005) compared guided and unguided analyst forecasts and found that over the entire year, analyst earnings forecasts experience a “walk-down” regardless of whether the company provides guidance or not.

Moreover, management forecasts during the year could be the result of either an expectations management strategy or simply a communications strategy (Kim & Park, 2011). Therefore, since meet-or-beat could be the result of other actions besides earnings manipulation that I cannot completely measure and/or control for, I choose to focus only on earnings management as proxied by discretionary accruals measures. Call et al. (2014) similarly argue that the critics of earnings guidance are particularly concerned with managers resorting to accounting shenanigans to manage earnings, regardless of the outcome, so discretionary accruals are a more appropriate measure to capture this behavior than meet or beat.

The variable of interest to test H2a is *SLG*. To test H2b and H2c, I replace *SLG* in the model above with *Precision* and *SEG* and run the model on the sample of companies that

provide segment-level guidance.<sup>15</sup> The model includes industry fixed effects defined at the one-digit ICB code level and a set of control variables to account for the possibility that the firm's operating environment is associated with both earnings management and manager's decision to provide segment-level guidance. The variables capturing firm fundamentals are size measured as the natural logarithm of lagged total assets (*LnTA*), the leverage ratio computed as the percent of total debt to total assets (*Lev*) (Defond & Jiambalvo, 1994), firm profitability (*ROA*), capital intensity computed as net property, plant, and equipment divided by average total assets (*CapIntensity*), the length of the firm's operating cycle computed as the natural logarithm of the number of days it takes for the turnover of accounts receivables and inventory (*OpCycle*) (Dechow & Dichev, 2002), the standard deviation of earnings (*StdEarnings*) and of operating cash flows (*StdCFO*) to control for operating volatility (Hribar & Nichols, 2007), and the book-to-market ratio (*BTM*) to account for the firm's growth opportunities since high growth firms have more incentives to manage earnings (Skinner & Sloan, 2002).

### **III.4 Results interpretation**

#### *III.4.1 Descriptive statistics*

I start from the companies included in the STOXX Europe 600 index at the end of 2009, and end up with a sample that contains 396 multi-segment non-financial European companies with press releases announcing 2009 earnings available on their websites. I have deleted companies that were taken over after 2009 for which financial data are no longer

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<sup>15</sup> I use the summary variable *Precision* instead of *Point\_Range*, *Narrative*, and *Estimate* in order to reduce the number of variables in the model given the small sample.

available in Thomson Reuters, and companies that follow U.S. GAAP.<sup>16</sup> Table III.1 panel A details the sample construction. The sample companies represent 17 European countries. The per-country distribution of the sample companies is similar to the distribution of the companies in the full STOXX Europe 600 index. UK companies represent 30% of the sample, followed by French (16%) and German companies (12%). All other countries represent less than 7% of the sample. Table III.1 panel B details the country distribution of the sample.

Table III.2 presents descriptive statistics for the main variables. Out of the sample companies, 73% disclose guidance in their earnings announcement press release. A survey conducted by the IR Magazine in 2012 reports that approximately 70% of U.S. and European companies provide guidance at least once a year (IR Magazine, 2012) which increases my confidence that the sample is representative of the population of large European firms. Guidance on the firm-level earnings number is provided by 54% of the guiding firms, 38% guide on sales and revenue, 10% guide on at least one expense item (e.g., cost of goods sold, amortization and depreciation expense, effective tax rate etc.), and 16% guide on at least a cash flow item, usually capital expenditures.<sup>17</sup> The proportions are similar to what Lansford et al. (2013) find when coding the guidance provided by a sample of S&P 500 firms.

Out of the 288 companies that provide guidance, 127 (44%) disclose segment information in the guidance section. Most of these firms provide guidance on the segments in a narrative, qualitative way (104 companies, 82%), and give only non-financial information (73 companies, 57%). The SEG distribution reveals that 13 companies (10%) provide guidance about segment revenues and/or expense items without guiding on a segment

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<sup>16</sup> For the analyst-firm level analyses, I lose two more companies that in 2010 (i.e., year  $t+1$ ) have changed their fiscal year end.

<sup>17</sup> Lansford et al. (2013) do not include a cash flow items category in their disaggregated earnings guidance scheme. While reading the guidance sections, however, I observed companies that guided on items such as capital expenditures or operating cash flow and as a result decided to enhance the scheme used by Lansford et al. (2013).

earnings number, 18 companies (14%) provide guidance only about segment earnings without further disaggregation, and 23 companies (18%) guide on segment earnings and at least one other accounting item.

Table III.2 panel F presents the industry distribution of sample companies, guiders, and segment-level guidance providers. Industry is defined at the one-digit Industry Classification Benchmark (ICB) level. Most companies are industrials and around 40% of them provide segment-level guidance ( $10.86/27.53=0.39$ ). The highest proportion of SLG providers per industry is for oil and gas companies ( $3.28/8.08=0.41$ ), and the lowest for utilities ( $0.76/6.06=0.13$ ). Companies in high tech industries provide segment-level guidance 25% of the time ( $3.54/14.39=0.25$ ), although they provide guidance 70% of the time which provides some initial support for hypothesis H1 that high tech firms are less likely to provide *SLG*.

Table III.3 panel A provides descriptive statistics for the other variables used in the analyses. The models used to test H1 and H3a-H3c are run cross-sectionally at the firm level on a sample of 396 observations. Models used to test H2a-H2c are run cross-sectionally at the firm-analyst level, on a sample of 4706 observations. Sample companies have on average 4 segments, 5 billion euros in total assets, 21 analysts following them, a *BTM* ratio of 0.5, *ROA* of 5%, debt to total assets ratio of 26%. Companies in high tech industries represent 14% of the sample. Companies that have made a loss in 2009 are 10% of the sample. A fifth of the sample is also listed in the US.

Table III.3 panels B to E report descriptive statistics on groups of guiders and non-guiders, and *SLG* and non-*SLG*, conditional on the firms providing guidance, along with t-tests for difference in means between groups. Compared to non-guiders, guiders are less closely held, have lower leverage, longer operating cycles and higher *ROA*. Guiding firms have, on average, lower forecast errors and fewer analysts following, but the analysts put in

more effort to forecast earnings. Compared to non-guiders, guiders are smaller, have fewer segments, and are less likely to have made a loss during the year. Conditional on providing guidance, companies that disclose segment information in their guidance section are less closely held, with less management ownership, higher absolute discretionary accruals and higher absolute discretionary revenues. They also have lower forecast errors, are smaller, and more likely to have made a loss during the year and to be cross-listed in the US.

Table III.4 presents the correlation matrices, Pearson above the diagonal and Spearman below. Our two measures of discretionary accruals are correlated at 38% meaning that, to some extent, they capture different aspects of earnings management. The standard deviations of cash flows and earnings are correlated at 57%. The size of the company measured as *LnTA* is correlated at 52% with the length of the annual report, since larger, more complex companies have more to disclose, and at 62% with the number of analysts covering the firm. Size is also correlated with the number of segments (35%) and cross-listing in the U.S. (37%). All other correlation coefficients are below 30%.

I now turn to the results of the main analyses of the paper.

#### *III.4.2 Determinants of segment-level guidance*

Table III.5 reports the results from a logistic model used to test the role of the firm's main industry in the manager's decision to provide segment-level guidance. The sample includes only companies that provide guidance and the likelihood ratio of the model is significant at 1%. Our model is able to predict 65% of the sample observations. The dependent variable is *SLG*, and the test variable is *HighTech*. As predicted, the coefficient on *HighTech* is negative and significant at 10%, indicating that companies in high tech industries are less likely to provide segment-level guidance. Due to their business model, companies in

high tech industries have more uncertain cash flows (Barron et al., 2002) which, as our results suggest, reflects into lower predictability of earnings even by those intimately familiar with the company. The proxies for proprietary costs – *Herf* and *R&D* – are not significant which does not support the proprietary cost explanation for high tech firms being less likely to disclose SLG.

Without formulating hypotheses per se, the logistic model includes a number of control variables that could potentially be determinants of *SLG*. The association between the percent of closely held shares (*CHS*) and *SLG* is negative and significant at 1% meaning that the more concentrated the ownership of the firm, the less likely it is to provide segment-level guidance. When ownership is more concentrated, shareholders can monitor managers more closely by private access. As such, this diminishes the external demand for guidance which explains why closely held firms in the sample are less likely to guide at the segment level. If managers hold more shares (*LnMgOwners*), they are again less likely to provide *SLG*, the coefficient is negative and significant at 10%. The book-to-market ratio (*BTM*) is also negatively and significantly related (at 10%) to *SLG*, which suggests that more mature, established companies are less likely to provide guidance at the segment level.

#### *III.4.3 Segment-level guidance and analysts' earnings forecast accuracy*

In table III.6, panel A I report results from multivariate cross-sectional regressions of analyst earnings forecast error (*FE*) on *SLG*. The models are run at the analyst-firm level and include industry fixed effects. Including country fixed effects does not significantly change the results. Standard errors are clustered at analyst level. Control variables generally have the expected sign or are insignificant. All models are significant at 1%.



Model 1 is run on the full sample with *SLG* and the standard set of control variables as independent variables. The negative coefficient on *SLG* suggests that, compared to all other sample companies, regardless of whether they provide guidance or not, for those companies that provide *SLG* analysts' earnings forecast error is lower (t-stat -9.95). Model 2 includes the indicator variable *Guidance* as independent variable for which the regression coefficient is negative but insignificant. The coefficient on *SLG* remains negative and strongly significant (t-stat -7.99) meaning that compared to all sample companies, the negative effect on forecast error for those that provide segment-level guidance is above and beyond the effect of providing management guidance.

In models 3 and 4, the sample is conditional on companies providing guidance. Therefore, I compare the companies that provide segment information in their guidance section to companies that provide management guidance without mentioning their segments. In this way, the comparison is cleaner than when segment-level guiders are compared to the whole sample. In model 3, the negative coefficient on *SLG* (t-stat -7.15) suggests that, within the sample of guiders, the companies that provide *SLG* have lower analyst forecast errors. In model 4, even after controlling for *DEG* (t-stat -9.34) as a characteristic of firm-level management guidance, the coefficient on *SLG* remains negative and strongly significant (t-stat -7.11). Therefore, disaggregation of guidance per segment appears as distinct from the guidance disaggregation into accounting items and is useful information for financial analysts above and beyond the firm-level information contained in the management guidance section.

Panel B in table III.5 tests the role of the form and disaggregation of the segment-related information in the guidance section for analysts' forecasting accuracy. I include variables for these two characteristics: *Point\_Range*, *Narrative*, *Estimate*, and *SEG*, respectively, in separate models, as well as together in one model. All models are run on analyst-firm observations conditional on the firm providing segment-level guidance, include

*DEG* as control variable, and are significant at 1%. The adjusted  $R^2$  is around 32% for all models. Model (1) includes only the variables related to the form of segment-level guidance, *Point\_Range*, *Narrative*, and *Estimate* as benchmark group. The regression coefficients are not significant for any of these variables of interest. Model (2) includes the *SEG* as variable of interest, and the coefficient is negative and marginally significant at 10%.

Model (3) includes all these variables. The coefficient on *Point\_Range* remains insignificant, which suggests that more precise guidance on operating segments compared to an *Estimate* does not particularly help financial analysts to be more accurate. The coefficient on *Narrative* is negative and becomes strongly significant (t-stat -2.72), meaning that financial analysts find qualitative guidance more informative than a low-precision estimate. This result confirms the interpretation of the coefficient on *Point\_Range* that the specificity of the segment-level guidance does not seem to be important for financial analysts' ability to forecast earnings. In other words, providing narrative, qualitative guidance on segments, which is the case for most of the companies in our sample, is no different from providing more specific guidance, which lends support to the opinion expressed by the IR Society in Europe that "[qualitative guidance] is just as effective [as numeric point or range guidance]" (Roach, 2013b). The item disaggregation of segment guidance (*SEG*) is negatively associated with forecast error at 1% significance level (t-stat -3.61), confirming H2c. The more accounting item information companies provide as guidance at the segment level, the more accurately are analysts able to forecast earnings. This result is in line with analysts' work procedures to forecast earnings for multi-segment companies. If managers disclose segment items guidance, then analysts can use these items as direct inputs into their segment-level forecasting spreadsheets or can use them to adjust their own segment-level forecasts based on historical data. Either way, companies benefit by guiding the analysts closer to their actual earnings.

#### III.4.4 Segment-level guidance and earnings management

In table III.7, I test H3a-H3c on the relation between providing segment-level guidance about year  $t+1$  and earnings management in year  $t+1$ . In panel A, the sample is restricted to companies providing guidance, and the variable of interest is *SLG*. I run three models with different proxies for earnings management as dependent variables. All models include industry fixed effects and are significant at 1%.<sup>18</sup> Standard errors are adjusted for heteroskedasticity. The adjusted- $R^2$  for model 2 is 37%, while for models 1 and 3 it is around 10%. Since in model 2 I use the performance-matched discretionary accruals (Kothari et al., 2005) as dependent variable, a proxy that is generally very popular in the earnings management literature, the difference in adj- $R^2$  is most likely arising from a better model calibration (i.e., choice of the set of control variables) based on prior literature.

The coefficient on *SLG* is positive and significant in models 2 and 3 where the dependent variables are *AbsDA2* (i.e., performance-matched discretionary accruals) and *AbsDRev* at 5% (t-stat 2.09) and 10% (t-stat 1.76), respectively.<sup>19</sup> These results confirm H3a and suggest that when managers guide at the segment level, the earnings management during that year is higher. This result is in line with the literature indicating that earnings management does not happen just at the headquarter level, but also at the divisional level when mid-tier managers are incentivized in a manner conducive to earnings management (Guidry et al., 1999).

In panel B of table III.6 I restrict the sample to the 127 firms that provide segment-level guidance to investigate the role that *Precision* and *SEG* have on earnings management behavior. Model 3 is not significant so I do not rely on it to draw conclusions about this

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<sup>18</sup> Including country fixed effects instead leaves the results qualitatively similar.

<sup>19</sup> In model 1, where the dependent variable is *AbsDA1*, the coefficient on *SLG* is positive but not significant at conventional levels.

relation. As expected, *Precision* is significantly positively associated with earnings management (t-stat 2.26 in model 1 and 2.14 in model 2). More specific benchmarks lead managers to fixate more on those numbers and aim to achieve them even by manipulating earnings. The coefficient on SEG is negative and significant at 1% (t-stat -2.64) in model 1 and negative but insignificant (t-stat -1.53) in model 2. These results lend some support to hypothesis H3c that more segment item disaggregation decreases managers' fixation on earnings and therefore is negatively related to earnings management.

### **III.5 Conclusions**

I identify instances when managers of multi-segment companies provide guidance disaggregated at the segment level and test the usefulness of this information for financial analysts and whether it curbs or encourages earnings management. My findings suggest that forward-looking information on segments improves analysts' earnings forecast accuracy regardless of its precision, and more so when the item-disaggregation per segment increases. Providing guidance on segments is positively related to earnings management, most likely because it creates benchmarks for divisional managers to meet or beat, and this effect is more pronounced when guidance is more precise, but decreases with segment item-disaggregation.

This paper contributes to prior literature on the characteristics of management guidance. On top of the evidence already provided in Hutton et al. (2003), I limit the sample to multi-segment firms for which providing SLG is a viable option which allows me to go into more details on how and what makes this type of information important in the guidance section. I also contribute to the literature on segment reporting that has an exclusively historical view on segment disclosures by examining forward-looking segment information in an unregulated, voluntary setting.

My findings also have implications for managers, financial analysts, and all other parties involved in the debate on whether companies should provide management forecasts at all. Guidance on segments is useful for financial analysts but at the same time encourages managers to engage in earnings management. At first view, the choice would seem a black and white one between providing this type of information in the guidance or not. However, by analyzing SLG in depth, I am able to qualify this and conclude that the precision of this information is conducive to earnings management while it is not significantly useful for analysts. The item-disaggregation of SLG, however, is both beneficial for analysts and is negatively related to earnings management. Therefore, companies could combine a low-precision, qualitative guidance with more items forecasted at the segment level to contribute to their reputation of truthfulness and credibility.

## Appendix III.A: Examples of segment-level guidance

### Alstom

**Power** remains focused on developing in high growth areas, keeping the lead in clean power and leveraging opportunities in the installed base. **Transport** aims to strengthen its positioning in mature markets, whilst targeting emerging ones with suitable solutions. Along with the integration of Transmission's activities into the Group, Alstom will seek to boost its growth through selective acquisitions if opportunities arise.

Alstom's operational priorities are geared towards leveraging its competitive advantages to get profitable orders as well as adapting to the load whilst maintaining flexibility. Focus remains centred on quality, project execution and strict cost control. In the current context, Alstom has set a new operating margin forecast between 7 and 8% over the next two years, based upon proper contract execution and gradual recovery of demand.

### BIC

Following the unprecedented 2009 downturn, we anticipate a more positive environment in 2010.

- In **Stationery Consumer**, we expect 2010 in the Office Products Channel to be the beginning of a slow recovery and Modern Mass Market to stabilize in mature markets. While consumer shopping habits have changed towards “best value”, BIC will continue to rely both on its brand equity and “Quality AND Value” offer. Emerging markets should continue to grow.
- In **Lighters**, we anticipate mature markets to decline slightly with the continued decrease in cigarette consumption and strengthened tobacco regulation. I will continue to rely on our comprehensive range of “best quality and safety” added-value lighters to further develop our market position.
- In **Shavers**, the overall mature market should remain flat with one-piece outperforming refillable. I anticipate a further acceleration of new product launches coupled with an increased share of value products and continued pressure on low-end products. In this context, we will leverage our value proposition through a complete range of products, Classic single-blade to three and four blades, one-piece and refillable.
- The overall performance of the Advertising and Promotional Products industry will continue to be strongly related to economic trends. The 1st Half of 2010 should remain soft and we anticipate a potential return to stability or slight growth in the 2nd Half of the year. In this environment, BIC APP will focus on the integration of Norwood Promotional Products while leveraging its new global branding strategy.

## Bouygues

Sales by business area (€ mil)	2009	2010 target	% change
Bouygues Construction	9,546	9,100	-5%
Bouygues Immobilier	2,989	2,100	-30%
Colas	11,581	11,500	-1%
TF1	2,365	2,410	+2%
Bouygues Telecom	5,368	5,370	=
Holding company and other	134	130	ns
Intra-Group elimination	(630)	(610)	ns
<b>TOTAL</b>	<b>31,353</b>	<b>30,000</b>	<b>-4%</b>
<i>o/w France</i>	<i>21,678</i>	<i>20,600</i>	<i>-5%</i>
<i>o/w International</i>	<i>9,675</i>	<i>9,400</i>	<i>-3%</i>

## SBM Offshore

The Company anticipates the following developments in 2010:

- Turnover to be in the same range as 2009;
- Average EBIT margin in the **Turnkey Systems** segment is expected to be solidly within the 5% - 10% range;
- **Turnkey Services** average EBIT margin expected around lower end of 15% – 20% range due to potentially lower utilisation rate for one installation vessel;
- The EBIT contribution from the **Lease and Operate** segment is expected to be below the level achieved in 2009 due to the end of certain lease contracts in 2009 and lower expected operating bonuses;
- Net interest charge will increase by up to 20% compared to 2009 due to start of operations on major lease contracts and low expected interest income on liquidities;
- Capital expenditure, excluding any new operating lease contracts to be obtained in 2010, is expected to amount to around US\$ 0.5 billion;
- Net gearing at year-end 2010 is expected to remain below 100%, with all financial ratios well within banking covenants.

## Appendix III.B: Variable definitions

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### MAIN VARIABLES

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<i>SLG</i>	1 if the company provides segment-level guidance in the earnings announcement press release at the end of fiscal year 2009, and 0 otherwise. Data is hand-collected from firms' press releases.
<i>Point_Range</i>	1 if the company provides segment-level guidance in the form of point and/or range estimates, and 0 otherwise. Data is hand-collected from firms' press releases.
<i>Estimate</i>	1 if the company provides segment-level guidance in the form of low-precision range guidance such as, for example, "expect mid to high single-digit profit growth," and 0 otherwise, as per Lansford et al. (2013). Data is hand-collected from firms' press releases.
<i>Narrative</i>	1 if the company provides segment-level guidance in a narrative, qualitative form such as, for example, "expect segment earnings to increase," and 0 otherwise. Data is hand-collected from firms' press releases.
<i>Precision</i>	Measure of the form of segment-level guidance that takes integer values between 0 and 2, where 0 means that management provides segment guidance mostly in a narrative form, 1 that management provides segment guidance in the form of low-precision range estimates, and 2 that management provides segment guidance as point and/or range.
<i>SEG</i>	Measure of segment-level guidance disaggregation that takes integer values between 0 and 3, where 0 means only non-financial statements (i.e., the outlook section does not contain forecasts of accounting items) are provided in the segment-level guidance, 1 means financial items other than <i>Segment Earnings</i> (i.e., <i>Segment Expense Items</i> , <i>Segment Revenue</i> ) are mentioned in the segment-level guidance, 2 means <i>Segment Earnings</i> are forecasted in the segment-level guidance, and 3 means the segment-level guidance section includes information on Segment Earnings and at least one other financial item (i.e., <i>Segment Expense Items</i> , <i>Segment Revenue</i> ). Data is hand-collected from firms' press releases.

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### DETERMINANTS AND CONSEQUENCES VARIABLES

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<i>AbsDAI</i>	<p>Absolute value of discretionary accruals based on the Jones (1991) model after controlling for economic losses as in Ball &amp; Shivakumar (2006) as used in Call et al. (2014). The following regression model is estimated out-of-sample (i.e., all listed companies from the 17 European countries represented in the full sample with necessary data available on Thomson Reuters) for each industry (two-digit SIC codes):</p> $ACC_{i,2010} = \beta_0 + \beta_1 \Delta REV_{i,2010} + \beta_2 NPPE_{i,2010} + \beta_3 IndAdjCFO_{i,2010} + \beta_4 DIN D_{i,2010} + \beta_5 DIND_{i,2010} * IndAdjCFO_{i,2010} + \varepsilon_{i,2010}$ <p>where <i>ACC</i> is total accruals computed as net income before extraordinary items minus cash flows from operations scaled by average total assets; <math>\Delta REV</math> is change in revenue scaled by average total assets; <i>NPPE</i> is net property, plant, and equipment scaled by average total assets;</p>
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	<p><i>IndAdjCFO</i> is cash flow from operations minus the median cash flow from operations for all firms in the same industry (two-digit SIC codes), all deflated by average total assets; <i>DIND</i> is a dummy variable set to 1 if <i>IndAdjCFO</i> is less than 0, and 0 otherwise. All continuous variables are winsorized at the 1% and 99% level. The absolute value of the regression residuals from this model is our first measure of discretionary accruals. Larger values of <i>AbsDA1</i> indicate more earnings management.</p>
<i>AbsDA2</i>	<p>Absolute value of discretionary accruals based on the Kothari et al. (2005) performance-matched model. The following regression model is estimated out-of-sample (i.e., all listed companies from the 17 European countries represented in the full sample with necessary data available on Thomson Reuters) for each industry (two-digit SIC codes):</p> $ACC_{i,2010} = \beta_0 + \beta_1(1/AvgTA_{i,2010}) + \beta_2\Delta REV_{i,2010} + \beta_3NPPE_{i,2010} + \beta_4ROA_{i,2009} + \varepsilon_{i,2010}$ <p>where <i>ACC</i> is total accruals computed as net income before extraordinary items minus cash flows from operations scaled by average total assets; <i>AvgTA</i> is average total assets, <i>ΔREV</i> is change in revenue scaled by average total assets; <i>NPPE</i> is net property, plant, and equipment scaled by average total assets; <i>ROA</i> is return on assets. All continuous variables are winsorized at the 1% and 99% level. The absolute value of the regression residuals from this model is our second measure of discretionary accruals. Larger values of <i>AbsDA2</i> indicate more earnings management.</p>
<i>AbsDRev</i>	<p>Absolute value of the residuals based on the Stubben (2010) model as used in Call et al. (2014). The following regression model is estimated out-of-sample (i.e., all listed companies from the 17 European countries represented in the full sample with necessary data available on Thomson Reuters) for each industry (two-digit SIC codes):</p> $\Delta AR_{i,2010} = \beta_0 + \beta_1(1/TA_{i,2010}) + \beta_2\Delta REV_{i,2010} + \varepsilon_{i,2010}$ <p>where <i>ΔAR</i> is the yearly change in accounts receivables scaled by average total assets, <i>TA</i> is total assets, and <i>ΔREV</i> is the yearly change in revenue scaled by average total assets. All variables are winsorized at the 1% and 99% level. The absolute value of the regression residuals is the measure of discretionary revenues. Larger values of <i>AbsDRev</i> indicate more earnings management.</p>
<i>ADR</i>	<p>1 if the company is also listed in the US, and 0 otherwise, based on data from Thomson Reuters.</p>
<i>BTM</i>	<p>Book-to-market ratio in 2009, based on data from Thomson Reuters.</p>
<i>CapIntensity</i>	<p>Capital intensity calculated as net property, plant, and equipment divided by average total assets in 2009. Data comes from Thomson Reuters.</p>
<i>CHS</i>	<p>Natural logarithm of 1 plus the number of closely held shares divided by total common shares outstanding at the end of 2009, based on data from Thomson Reuters. The variable is set to 0 when this information is missing.</p>
<i>DEG</i>	<p>Measure of management forecast earnings disaggregation based on Lansford et al. (2013) that takes integer values between 0 and 4, where 0 means the company provides only non-financial guidance,</p>

	and 1, 2, 3, and 4 depending on how many of the following categories of financial items the company provides guidance for: <i>Earnings, Expense Items, Revenue, Cash Flow Items</i> .
<i>FE</i>	Analyst-level earnings forecast error computed as the logarithm of 1 plus the absolute value of the difference between the first yearly forecast within 30 days after the earnings announcement of 2009 earnings minus the actual earnings, deflated by absolute actual earnings. Data is for 2010 and comes from I/B/E/S. The variable is winsorized at 99% to mitigate the influence of extreme values.
<i>Guidance</i>	1 if the earnings announcement press release at the end of fiscal year 2009 contains an outlook section, and 0 otherwise.
<i>Herf</i>	Industry competition measure computed as the sum of squared market shares in 2009, based on data from Thomson Reuters.
<i>HighTech</i>	Indicator variable taking the value 1 if the company operates in a high-technology (including pharmaceuticals and healthcare) industry as defined by Francis & Schipper (1999) and consistent with André, Ben-Amar, et al. (2014).
<i>LengthAR</i>	Natural logarithm of the number of pages in company <i>i</i> 's 2009 annual report.
<i>Lev</i>	Proportion of total debt to total assets in 2009. Data comes from Thomson Reuters.
<i>LnAnalysts</i>	Natural logarithm of 1 plus the number of analysts covering the company in 2010, based on data from I/B/E/S.
<i>LnFE<sub>t</sub></i>	Analyst-level earnings forecast error for the previous year (i.e., 2009) computed as the logarithm of 1 plus the absolute value of the difference between the last yearly forecast before the earnings announcement of 2009 earnings minus the actual earnings, deflated by absolute actual earnings. Data comes from I/B/E/S. The variable is winsorized at 99% to mitigate the influence of extreme values.
<i>LnMgOwners</i>	Following Lennox (2005), management ownership is computed as the natural logarithm of the percentage of ordinary shareholdings of current executive directors, and 0 otherwise; computed based on data from S&P Capital IQ at the end of fiscal year 2009, or the closest available date.
<i>LnTA</i>	Natural logarithm of total assets for company <i>i</i> at the end of 2009, based on data from Thomson Reuters.
<i>Loss</i>	1 if net income before extraordinary items at the end of 2009 is below 0, and 0 otherwise, based on data from Thomson Reuters.
<i>OpCycle</i>	Natural log of the firm's operating cycle measured in days, based on turnover in accounts receivable and inventory computed as: $180 * ((AR_{2009} + AR_{2008}) / SALES_{2009} + (INV_{2009} + INV_{2008}) / COGS_{2009})$ , where AR is accounts receivable, SALES is net sales revenue, INV is inventory, and COGS is cost of goods sold. Data comes from Thomson Reuters.
<i>R&amp;D</i>	Natural logarithm of 1 plus research and development expenditures during 2009, multiplied by one million to aid result exposition, divided by lagged total sales, based on data from Thomson Reuters. Where research and development expenditures are missing, the value is set to 0.

<i>ReturnVolatility</i>	Standard deviation of daily stock return during 2009. Data comes from Datastream.
<i>ROA</i>	Return-on-assets during 2009. Data comes from Thomson Reuters.
<i>Segments</i>	Number of operating segments as reported in the segment information footnote to the 2009 financial statements (without the “Other” segment). Data is hand-collected from the financial statements.
<i>StdCFO</i>	Standard deviation of yearly cash flow from operations deflated by average total assets over the period 2004-2009 or the maximum number of years with data available after 2004. Data comes from Thomson Reuters.
<i>StdEarnings</i>	Standard deviation of yearly net income deflated by average total assets over the period 2004-2009 or the maximum number of years with data available after 2004. Data comes from Thomson Reuters.

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### Appendix III.C: Tables for chapter III

**Table III.1: Sample construction**

Panel A: Sampling

<b>STOXX Europe 600 at 31/12/2009</b>	<b>600</b>
(-) Financial institutions	-143
(-) Follow U.S. GAAP	-10
(-) No segment footnote/Single segment	-28
(-) Doubles	-2
(-) No disclosure about segments elsewhere	-3
(-) Taken over in/after 2010	-14
(-) No earnings announcement press release	-4
(=) Total	<b>396</b>

This table describes the sampling procedure.

Panel B: Distribution of sample by country

<b>Country</b>	<b>Frequency</b>	<b>Percent</b>
Austria	6	1.52
Belgium	8	2.02
Denmark	9	2.27
Finland	16	4.04
France	64	16.16
Germany	46	11.62
Greece	4	1.01
Ireland	4	1.01
Italy	17	4.29
Luxembourg	2	0.51
Netherlands	19	4.80
Norway	9	2.27
Portugal	8	2.02
Spain	18	4.55
Sweden	26	6.57
Switzerland	24	6.06
UK	116	29.29
<b>Total</b>	<b>396</b>	<b>100.00</b>

This table reports the country distribution of companies in the full sample.

**Table III.2: Descriptive statistics for the main variables**

Panel A: Descriptive statistics on the firms providing management guidance

Category	Type of Guidance	Frequency	% In total sample	% Conditional on Guidance
Guidance		288	72.73%	
	Earnings	155	39.14%	53.82%
	Expense Items	30	7.58%	10.42%
	Revenue	110	27.78%	38.19%
	Cash Flow Items	45	11.36%	15.63%
	Only Narrative	105	26.52%	36.46%
	Segment-level Guidance	127	32.07%	44.10%

Panel B: Descriptive statistics on the firms providing segment-level guidance

Segment-level guidance		Frequency	% Conditional on Segment-level Guidance
Precision of guidance	Point_Range	20	15.75%
	Estimate	15	11.81%
	Narrative	92	72.44%
Guidance components	Segment Earnings	41	32.28%
	Segment Expense Items	2	1.57%
	Segment Revenue	35	27.56%
	Only Non-financial Statements	73	57.48%

Panel C: Frequencies of management guidance disaggregation groups (DEG)

Number of guidance components	Frequency	% Conditional on Guidance
0 (Only Narrative)	105	36.46%
1	69	23.69%
2	78	27.08%
3	31	10.76%
4 (Disaggregating firms)	5	1.74%
<b>Total</b>	<b>288</b>	<b>100%</b>

Panel D: Frequencies of segment-level guidance disaggregation groups (SEG)

<b>SEG</b>	<b>Frequency</b>	<b>% Conditional on Segment-level Guidance</b>
0	73	57.48%
1	13	10.24%
2	18	14.17%
3	23	18.11%
<b>Total</b>	<b>127</b>	<b>100%</b>

Panel E: Descriptive statistics for *Point\_Range*, *Narrative*, *Estimate*, *Precision*, *SEG*, and *DEG*

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>StdDev</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>
Point_Range	127	0.157	0.366	0	0	1
Estimate	127	0.118	0.324	0	0	1
Narrative	127	0.724	0.449	0	0	1
Precision	127	0.291	0.656	0	0	2
SEG	127	0.929	1.203	0	0	3
DEG	288	1.174	1.094	0	1	4

Panel F: Industry distribution of Guidance and Segment-level Guidance (SLG)

<b>Industry</b>	<b>Total</b>	<b>Guidance</b>	<b>SLG</b>
Basic Materials	48 (12.12%)	38 (9.60%)	14 (3.54%)
Consumer Goods	59 (14.90%)	46 (11.62%)	19 (4.80%)
Consumer Services	61 (15.40%)	39 (9.85%)	21 (5.30%)
Health Care	25 (6.31%)	22 (5.56%)	7 (1.77%)
Industrials	109 (27.53%)	81 (20.45%)	43 (10.86%)
Oil and Gas	32 (8.08%)	23 (5.81%)	13 (3.28%)
Technology	19 (4.80%)	13 (3.28%)	4 (1.01%)
Telecommunications	19 (4.80%)	12 (3.03%)	3 (0.76%)
Utilities	24 (6.06%)	14 (3.54%)	3 (0.76%)
<b>Total</b>	<b>396</b> <b>(100%)</b>	<b>288</b> <b>(72.73%)</b>	<b>127</b> <b>(32.07%)</b>
Of which: HighTech	57 (14.39%)	41 (10.35%)	14 (3.54%)

This table presents the industry distribution of the companies included in the sample, based on the ICB industry classification codes. *HighTech* is an indicator variable taking the value 1 if the company operates in a high-technology (including pharmaceuticals and healthcare) industry as defined by Francis & Schipper (1999), and 0 otherwise.

**Table III.3: Descriptive statistics for the other variables used in the analyses**

Panel A: Full sample

Variable	Mean	StdDev	Min	Median	Max
<b>Variables used in the firm-level analyses (N=396)</b>					
AbsDA1	0.034	0.033	0.000	0.023	0.181
AbsDA2	0.036	0.042	0.000	0.025	0.502
AbsDRev	0.020	0.018	0.000	0.015	0.141
BTM	0.512	0.371	-1.010	0.433	3.547
CapIntensity	0.274	0.201	0.000	0.227	1.061
CHS	0.221	0.215	0.000	0.189	1.493
Herf	0.124	0.104	0.028	0.081	0.801
HighTech	0.144	0.351	0.000	0.000	1.000
Lev	0.261	0.150	0.000	0.250	0.655
LnMgOwners	0.177	0.539	0.000	0.009	3.258
OpCycle	4.805	1.229	0.708	4.808	24.600
R&D	0.021	0.067	0.000	0.000	0.607
ROA	0.049	0.063	-0.153	0.042	0.456
StdCFO	0.036	0.033	0.000	0.027	0.418
StdEarnings	0.034	0.030	0.001	0.024	0.268
<b>Variables used in the firm-analyst level analyses (N=4706)</b>					
FE	0.287	0.458	0.000	0.151	3.276
LnFE <sub>t</sub>	0.173	0.281	0.000	0.076	1.771
NumberAnalysts	21.775	8.063	1.000	21.000	45.000
LnAnalysts	3.126	0.399	0.693	3.091	3.828
ReturnVolatility	0.215	0.184	0.030	0.166	1.651
LengthAR	5.192	0.388	4.111	5.165	6.687
Loss	0.130	0.337	0.000	0.000	1.000
ADR	0.221	0.415	0.000	0.000	1.000
Segments	4.222	1.865	2.000	4.000	12.000
LnTA	22.981	1.389	20.119	22.809	25.867

This table presents descriptive statistics for the variables used in the empirical analyses. All variables are as defined in appendix III.B.



Panel B: Comparison of variables at the firm-level split based on *Guidance*

Variable	Guidance=0 (N=108)					Guidance=1 (N=288)					Diff in means (1-0)
	Mean	StdDev	Min	Median	Max	Mean	StdDev	Min	Median	Max	
AbsDA1	0.032	0.029	0.000	0.021	0.139	0.034	0.035	0.000	0.024	0.181	0.002
AbsDA2	0.033	0.032	0.000	0.022	0.166	0.037	0.045	0.000	0.025	0.502	0.004
AbsDRev	0.021	0.019	0.000	0.016	0.112	0.020	0.018	0.000	0.015	0.141	-0.002
BTM	0.557	0.364	0.036	0.447	2.247	0.495	0.373	-1.010	0.428	3.547	-0.062
CapIntensity	0.300	0.213	0.019	0.275	0.850	0.265	0.196	0.000	0.221	1.061	-0.035
CHS	0.250	0.202	0.000	0.254	0.781	0.210	0.219	0.000	0.159	1.493	-0.040 *
Herf	0.126	0.115	0.028	0.082	0.801	0.123	0.100	0.028	0.079	0.619	-0.003
HighTech	0.148	0.357	0.000	0.000	1.000	0.142	0.350	0.000	0.000	1.000	0.029
Lev	0.299	0.152	0.000	0.281	0.655	0.246	0.148	0.000	0.235	0.655	-0.052 ***
LnMgOwners	0.212	0.616	0.000	0.008	3.258	0.164	0.508	0.000	0.009	3.258	-0.048
OpCycle	4.657	0.820	0.708	4.723	6.079	4.860	1.348	1.135	4.833	24.600	0.204 *
R&D	0.023	0.077	0.000	0.000	0.607	0.021	0.063	0.000	0.000	0.556	-0.002
ROA	0.038	0.072	-0.153	0.031	0.456	0.053	0.060	-0.153	0.045	0.336	0.015 *
StdCFO	0.032	0.026	0.001	0.026	0.161	0.037	0.035	0.000	0.029	0.418	0.005
StdEarnings	0.035	0.032	0.001	0.026	0.207	0.033	0.030	0.001	0.024	0.268	-0.002

The significance of the difference in means is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. The assumption of equal or unequal variance is tested in each case. See variable definitions in Appendix III.B.

Panel C: Comparison of variables at the analyst-firm level split based on *Guidance*

Variable	Guidance=0 (N=1312)					Guidance=1 (N=3394)					Diff in means (1-0)
	Mean	StdDev	Min	Median	Max	Mean	StdDev	Min	Median	Max	
FE	0.371	0.564	0.000	0.190	3.276	0.255	0.405	0.000	0.139	3.276	-0.117 ***
LnFE <sub>t</sub>	0.210	0.314	0.000	0.111	1.771	0.159	0.265	0.000	0.067	1.771	-0.052 ***
LnAnalysts	3.513	0.383	1.386	3.611	4.025	3.438	0.404	1.386	3.497	4.190	-0.075 ***
ReturnVolatility	0.239	0.245	0.046	0.173	1.566	0.206	0.153	0.030	0.159	1.651	-0.033 ***
LengthAR	5.187	0.410	4.111	5.147	6.261	5.194	0.379	4.159	5.193	6.687	0.007
Loss	0.204	0.403	0.000	0.000	1.000	0.102	0.303	0.000	0.000	1.000	-0.101 ***
ADR	0.211	0.408	0.000	0.000	1.000	0.225	0.417	0.000	0.000	1.000	0.013
Segments	4.634	2.217	2.000	4.000	12.000	4.062	1.683	2.000	4.000	11.000	-0.572 ***
LnTA	23.159	1.282	20.182	23.148	25.867	22.913	1.423	20.119	22.719	25.867	-0.246 ***

The significance of the difference in means is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. The assumption of equal or unequal variance is tested in each case. See variable definitions in Appendix III.B.

Panel D: Comparison of variables at the firm-level split based on *SLG*, conditional on the company providing *Guidance*

Variable	SLG=0 (N=161)					SLG=1 (N=127)					Diff in means (1-0)
	Mean	StdDev	Min	Median	Max	Mean	StdDev	Min	Median	Max	
AbsDA1	0.032	0.032	0.000	0.023	0.177	0.037	0.038	0.000	0.024	0.181	0.005
AbsDA2	0.032	0.033	0.000	0.024	0.258	0.044	0.056	0.000	0.029	0.502	0.012 **
AbsDRev	0.018	0.018	0.000	0.012	0.141	0.022	0.018	0.000	0.018	0.092	0.004 *
BTM	0.512	0.402	-1.010	0.435	3.547	0.475	0.334	-0.181	0.408	2.223	0.037
CapIntensity	0.266	0.195	0.002	0.226	0.874	0.263	0.198	0.000	0.214	1.061	-0.003
CHS	0.241	0.237	0.000	0.218	1.493	0.171	0.187	0.000	0.121	1.174	-0.070 ***
Herf	0.127	0.105	0.028	0.082	0.619	0.119	0.093	0.028	0.078	0.461	-0.008
HighTech	0.168	0.375	0.000	0.000	1.000	0.110	0.314	0.000	0.000	1.000	-0.058
Lev	0.250	0.149	0.000	0.253	0.655	0.242	0.147	0.000	0.228	0.655	-0.009
LnMgOwners	0.224	0.637	0.000	0.008	3.258	0.089	0.247	0.000	0.012	2.018	-0.135 **
OpCycle	4.803	0.623	2.963	4.824	6.605	4.933	1.907	1.135	4.835	24.600	0.130
R&D	0.026	0.076	0.000	0.000	0.556	0.015	0.040	0.000	0.000	0.325	-0.011
ROA	0.056	0.064	-0.108	0.048	0.336	0.048	0.054	-0.153	0.043	0.224	-0.008
StdCFO	0.036	0.025	0.006	0.031	0.148	0.039	0.045	0.000	0.027	0.418	0.003
StdEarnings	0.032	0.025	0.001	0.024	0.130	0.034	0.035	0.002	0.023	0.268	0.003

The significance of the difference in means is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. The assumption of equal or unequal variance is tested in each case. See variable definitions in Appendix III.B.

Panel E: Comparison of variables at the analyst-firm level split based on *SLG*, conditional on the company providing *Guidance*

Variable	SLG=0 (N=1881)					SLG=1 (N=1513)					Diff in means (1-0)
	Mean	StdDev	Min	Median	Max	Mean	StdDev	Min	Median	Max	
FE	0.299	0.509	0.000	0.138	3.276	0.199	0.201	0.000	0.141	1.599	-0.100 ***
LnFE <sub>t</sub>	0.155	0.268	0.000	0.065	1.771	0.164	0.262	0.000	0.069	1.771	0.010
LnAnalysts	3.430	0.391	1.386	3.497	4.060	3.448	0.419	1.609	3.526	4.190	0.018
ReturnVolatility	0.206	0.157	0.032	0.162	1.651	0.205	0.149	0.030	0.159	1.279	-0.002
LengthAR	5.202	0.393	4.159	5.193	6.687	5.184	0.361	4.277	5.159	5.956	-0.018
Loss	0.090	0.287	0.000	0.000	1.000	0.117	0.322	0.000	0.000	1.000	0.027 ***
ADR	0.186	0.389	0.000	0.000	1.000	0.273	0.446	0.000	0.000	1.000	0.087 ***
Segments	4.067	1.734	2.000	4.000	11.000	4.056	1.618	2.000	4.000	10.000	-0.011
LnTA	22.824	1.413	20.119	22.626	25.867	23.023	1.427	20.119	22.872	25.826	-0.199 ***

The significance of the difference in means is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. The assumption of equal or unequal variance is tested in each case. See variable definitions in Appendix III.B.

**Table III. 4: Correlation matrices**

Panel A: Correlation matrix for the variables at firm-level

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)AbsDA1	1	0.500***	0.071	-0.056	-0.001	-0.011	-0.058	-0.009	0.000	-0.032	0.132***	0.063	0.023	0.187***	0.186***
(2)AbsDA2	0.378***	1	0.098*	-0.098*	-0.126**	-0.014	-0.051	0.110**	-0.111**	0.074	0.062	0.017	0.115**	0.537***	0.291***
(3)AbsDRev	0.084*	0.117**	1	-0.106**	-0.165***	-0.011	-0.077	0.135***	-0.090*	0.034	-0.042	0.097*	0.038	0.030	-0.011
(4)BTM	-0.023	-0.093*	-0.069	1	0.065	0.014	-0.037	-0.129**	-0.016	-0.004	0.059	-0.109**	-0.473***	-0.120**	-0.014
(5)CapIntensity	0.033	-0.102**	-0.131***	0.119**	1	0.180***	0.155***	-0.156***	0.240***	-0.046	-0.107**	-0.133***	-0.114**	-0.013	-0.047
(6)CHS	0.076	0.019	0.016	0.081	0.212***	1	-0.012	-0.015	0.061	0.151***	0.060	0.051	-0.006	-0.042	-0.033
(7)Herf	-0.110**	-0.044	-0.089*	0.075	0.284***	0.068	1	-0.113**	-0.031	0.107**	0.034	0.056	0.036	0.024	0.106**
(8)HighTech	-0.026	0.161***	0.142***	-0.172***	-0.147***	-0.027	-0.110**	1	0.034	0.056	0.057	0.323***	0.111**	0.011	0.064
(9)Lev	0.004	-0.159***	-0.095*	0.015	0.261***	0.062	0.002	0.025	1	-0.053	-0.122**	0.010	-0.205***	-0.203***	-0.138***
(10)LnMgOwners	-0.105**	0.024	-0.017	-0.093*	-0.111***	-0.140***	0.051	-0.017	-0.003	1	0.036	0.079	0.025	0.109**	0.086*
(11)OpCycle	0.095*	0.024	-0.064	0.060	-0.134***	0.095*	-0.045	0.150***	-0.095*	-0.032	1	0.066	-0.114**	-0.035	0.049
(12)R&D	-0.006	-0.029	-0.035	-0.065	-0.071	-0.072	-0.063	0.200***	-0.067	-0.040	0.214***	1	0.068	0.020	0.040
(13)ROA	-0.099**	0.032	0.067	-0.593***	-0.090*	-0.073	-0.046	0.152***	-0.210***	0.038	-0.069	0.102**	1	0.217***	-0.086*
(14)StdCFO	0.135***	0.293***	0.050	-0.161***	0.068	-0.029	0.035	0.066	-0.185***	0.023	0.109**	0.112**	0.137***	1	0.425***
(15)StdEarnings	0.095*	0.252***	-0.061	-0.071	-0.023	-0.043	0.099**	0.081	-0.207***	0.045	0.120**	0.059	-0.023	0.570***	1

This table presents Pearson (above diagonal) and Spearman correlation coefficients (below diagonal) for the variables used at firm level. The sample contains 396 observations. See variable definitions in Appendix III.B. Statistical significance is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

Panel B: Correlation matrix for the variables at analyst-firm level

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)FE	1	0.293***	-0.011	0.237***	-0.056***	0.288***	-0.058***	-0.061***	-0.104***
(2)LnFE <sub>t</sub>	0.381***	1	0.050***	0.306***	0.037**	0.333***	-0.043***	-0.006	-0.021
(3)LnAnalysts	-0.035**	-0.010	1	0.068***	0.237***	-0.008	0.281***	0.106***	0.496***
(4)ReturnVolatility	0.411***	0.376***	-0.007	1	0.060***	0.421***	-0.047***	-0.076***	-0.050***
(5)LnAR	0.014	0.081***	0.266***	0.074***	1	0.076***	0.141***	0.081***	0.519***
(6)Loss	0.376***	0.306***	-0.013	0.350***	0.071***	1	-0.037**	0.017	-0.003
(7)ADR	-0.041***	-0.054***	0.325***	-0.137***	0.141***	-0.037**	1	-0.056***	0.401***
(8)Segments	-0.064***	-0.002	0.143***	0.011	0.112***	0.040***	-0.020	1	0.246***
(9)LnTA	-0.074***	0.005	0.586***	-0.032**	0.512***	-0.003	0.391***	0.291***	1

This table presents Pearson (above diagonal) and Spearman correlation coefficients (below diagonal) for the variables used at analyst-firm level. The sample contains 4706 observations. See variable definitions in Appendix III.B. Statistical significance is based on two-sided t-tests and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

**Table III.5: Determinants of the decision to provide segment-level guidance**

Variable	SLG
<b>HighTech</b>	<b>-0.6905 *</b> <b>(3.572)</b>
LnMgOwners	-0.7131 * (3.170)
CHS	-1.7344 *** (6.887)
Herf	-0.6707 (0.253)
R&D	-2.8209 (0.994)
ROA	-3.511 (1.684)
StdEarnings	5.2749 (1.297)
BTM	-0.8790 * (3.721)
Segments	-0.0228 (0.083)
LnTA	0.0464 (0.168)
Intercept	-0.0590 (0.001)
Likelihood Ratio	24.26 ***
Percent Concordant	65.0
Percent Discordant	34.5
N	288

This table reports results from a logistic model with *SLG* as dependent variable (the modeled value is *SLG*=1) which examines the determinants of the decision to provide segment-level guidance. The unit of analysis is at the firm level. The sample is conditional on companies providing management guidance. Statistical significance is based on two-sided chi-square tests (Wald chi-square values presented in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in Appendix III.B.

**Table III.6: Segment-level guidance and financial analysts' earnings forecast accuracy**

Panel A: The role of providing segment-level guidance

Variable	(1) FE	(2) FE	(3) FE	(4) FE
<b>SLG</b>	<b>-0.1396 ***</b>	<b>-0.1320 ***</b>	<b>-0.1186 ***</b>	<b>-0.1145 ***</b>
	(-9.95)	(-7.99)	(-7.15)	(-7.11)
Guidance		-0.0188 (-1.04)		
DEG				-0.0576 *** (-9.34)
LnFE <sub>t</sub>	0.2573 *** 6.44	0.2565 *** (6.37)	0.3847 *** (6.84)	0.3803 *** (7.01)
LnAnalysts	-0.0290 * (-1.80)	-0.0301 * (-1.83)	0.0290 * (1.68)	0.0398 ** (2.25)
ReturnVolatility	0.0266 (0.52)	0.0261 (0.51)	0.2578 *** (5.31)	0.2767 *** (5.73)
LengthAR	-0.0488 *** (-2.65)	-0.0466 ** (-2.56)	0.0071 (0.46)	0.0084 (0.55)
Loss	0.2882 *** (12.30)	0.2852 *** (12.39)	0.1933 *** (8.40)	0.1978 *** (8.81)
ADR	-0.0112 (-0.82)	-0.0114 (-0.83)	0.0250 ** (2.07)	0.0417 *** (3.55)
Segments	-0.0018 (-0.72)	-0.0022 (-0.83)	-0.0021 (-0.93)	-0.0031 *** (-1.37)
LnTA	-0.0202 *** (-2.87)	-0.0209 *** (-3.11)	-0.0506 *** (-7.31)	-0.0497 *** (-7.43)
Intercept	1.0283 *** (7.14)	1.0486 *** (7.65)	1.1757 *** (7.95)	1.2093 *** (8.21)
Industry FE	YES	YES	YES	YES
F-value	45.46 ***	42.78 ***	35.21 ***	34.98 ***
Adj R <sup>2</sup>	0.233	0.233	0.256	0.281
Number of clusters	1859	1859	1559	1559
N	4706	4706	3394	3394

This table reports results from multivariate cross-sectional regression models with *FE* as dependent variable and *SLG* as independent variable of interest. Models (1) and (2) are run on the full sample of companies. Models (3) and (4) are conditional on the company providing guidance. The unit of analysis is at the firm-analyst level. The model includes industry fixed effects defined at the one-digit ICB code level. Including country fixed effects does not significantly change the results. Standard errors are clustered at the analyst level. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix III.B.



Panel B: The role of segment-level guidance characteristics

Variable	(1) FE	(2) FE	(3) FE
<b>Point_Range</b>	<b>0.0177</b> <b>(1.12)</b>		<b>0.0181</b> <b>(1.15)</b>
<b>Narrative</b>	<b>-0.0098</b> <b>(-0.87)</b>		<b>-0.0351</b> *** <b>(-2.72)</b>
<b>SEG</b>		<b>-0.0068</b> * <b>(-1.80)</b>	<b>-0.0168</b> *** <b>(-3.61)</b>
DEG	-0.0318 *** (-7.50)	-0.0271 *** (-6.58)	-0.0277 *** (-6.78)
LnFE <sub>t</sub>	0.1596 *** (6.36)	0.1588 *** (6.53)	0.1593 *** (6.53)
LnAnalysts	-0.0712 *** (-4.12)	-0.0671 *** (-3.87)	-0.0704 *** (-4.10)
ReturnVolatility	0.3768 *** (6.31)	0.3782 *** (6.58)	0.3778 *** (6.31)
LengthAR	-0.0025 (-0.18)	-0.0017 (-0.12)	0.0016 (0.12)
Loss	0.1185 *** (7.32)	0.1204 *** (7.50)	0.1199 *** (7.41)
ADR	0.0296 ** (2.50)	0.0334 *** (2.90)	0.0251 ** (2.12)
Segments	0.0027 (1.15)	0.0012 (0.49)	0.0013 (0.54)
LnTA	0.0051 (1.27)	0.0056 (1.42)	0.0046 (0.54)
Intercept	0.2729 *** (2.85)	0.2534 *** (2.81)	0.2817 *** (2.94)
Industry FE	YES	YES	YES
F-value	27.70 ***	28.87 ***	27.72 ***
Adj R <sup>2</sup>	0.323	0.322	0.328
Number of clusters	993	993	993
N	1513	1513	1513

This table reports results from multivariate cross-sectional regression models with *FE* as dependent variable and *Point\_Range*, *Narrative* and *SEG* as independent variables of interest. *Estimate* is the benchmark category for *Point\_Range* and *Narrative*. For all models, the sample is conditional on companies providing segment-level guidance. The unit of analysis is at the firm-analyst level. All models include industry fixed effects defined at the one-digit ICB code level. Including country fixed effects does not significantly change the results. Standard errors are clustered at the analyst level. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix III.B.

**Table III.7: Segment-level guidance and earnings management**

Panel A: The role of providing segment-level guidance

Variable	(1) AbsDA1	(2) AbsDA2	(3) AbsDRev
SLG	<b>0.0037</b> (0.88)	<b>0.0090</b> ** (2.09)	<b>0.0038</b> * (1.76)
LnTA	-0.0035 ** (-2.12)	-0.0038 * (-1.94)	-0.0011 (-1.49)
Lev	0.0139 (0.77)	0.0225 (1.19)	-0.0238 *** (-3.19)
ROA	-0.0501 (-0.79)	-0.0393 (-0.65)	-0.0214 (-0.91)
CapIntensity	-0.0084 (-0.68)	-0.0237 ** (-2.17)	-0.0071 (-1.17)
OpCycle	0.0034 *** (2.98)	0.0030 *** (2.82)	-0.0013 ** (-2.08)
StdEarnings	0.1980 * (1.69)	0.0673 (0.46)	-0.0867 * (-1.76)
StdCFO	0.1602 ** (2.27)	0.7294 *** (2.90)	-0.0417 (-1.60)
BTM	-0.0040 (-0.72)	0.0000 (0.00)	-0.0059 * (-1.83)
Intercept	0.0705 * (1.77)	0.0786 (1.49)	0.0690 *** (3.51)
Industry FE	YES	YES	YES
F-Value	2.74 ***	11.08 ***	2.87 ***
Adj-R <sup>2</sup>	0.093	0.374	0.100
N	288	288	288

This table reports results from multivariate cross-sectional regression models to examine the role of providing segment-level guidance on year  $t+1$  for managers' earnings management behavior in year  $t+1$ . The dependent variables are *AbsDA1* in model (1), *AbsDA2* in model (2) and *AbsDRev* in model (3). The independent variable of interest is *SLG*. The sample is conditional on companies providing management guidance. The unit of analysis is at the firm level. The model includes industry fixed effects defined at the one-digit ICB code level. Including country fixed effects does not significantly change the results. Standard errors are robust adjusted for heteroskedasticity. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix III.B.

Panel B: The role of segment-level guidance characteristics

Variable	(1)	(2)	(3)
	AbsDA1	AbsDA2	AbsDRev
<b>Precision</b>	<b>0.0129 **</b> (2.26)	<b>0.0123 **</b> (2.14)	<b>0.0002</b> (0.07)
<b>SEG</b>	<b>-0.0069 ***</b> (-2.64)	<b>-0.0047</b> (-1.53)	<b>0.0031 *</b> (1.83)
LnTA	-0.0022 (-0.92)	-0.0030 (-1.28)	-0.0012 (-0.83)
Lev	-0.0412 (-1.49)	0.0178 (0.57)	-0.0230 (-1.64)
ROA	-0.1031 (-1.18)	-0.2214 ** (-2.24)	-0.0033 (-0.09)
CapIntensity	-0.0008 (-0.04)	-0.0044 (-0.25)	-0.0022 (-0.19)
OpCycle	0.0021 (1.42)	0.0041 *** (3.16)	-0.0019 *** (-2.78)
StdEarnings	0.3122 *** (2.76)	0.0892 (0.60)	-0.0754 (-1.18)
StdCFO	0.0818 (1.49)	0.8916 *** (3.67)	-0.0419 (-1.37)
BTM	-0.0121 (-1.11)	-0.0239 ** (-2.16)	-0.0101 * (-1.84)
Intercept	0.0652 (1.08)	0.0432 (0.62)	0.0624 * (1.79)
Industry FE	YES	YES	YES
F-Value	2.11 **	8.19 ***	1.46
Adj-R <sup>2</sup>	0.130	0.507	0.062
N	127	127	127

This table reports results from multivariate cross-sectional regression models to examine the role of segment-level guidance characteristics on year  $t+1$  for managers' earnings management behavior in year  $t+1$ . The dependent variables are *AbsDA1* in model (1), *AbsDA2* in model (2) and *AbsDRev* in model (3). The independent variables of interest are *Precision* and *SEG*. The sample is conditional on companies providing segment-level guidance. The unit of analysis is at the firm level. The model includes industry fixed effects defined at the one-digit ICB code level. Including country fixed effects does not significantly change the results. Standard errors are robust adjusted for heteroskedasticity. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1. See variable definitions in appendix III.B.

## **Conclusion**

This thesis contains three stand-alone essays on the operating segment disclosures that European multi-segment companies make under IFRS 8. Each essay aims to improve our collective understanding about managers' overall disclosure and communication strategy by examining various characteristics of operating segment disclosure. Information about companies' operating segments is important because it allows capital market participants to have a view over the company's activities and their contributions to total earnings, and over managers' diversification policy. From the standard setters' perspective, segment reporting is a standard of particular interest not just due to the importance of segment information for capital markets, but also due to the business-model orientation first implemented with this standard which the IASB is beginning to adopt more widely (Leisenring et al., 2012). Therefore, understanding the role of managers' choices when disclosing this type of information potentially contributes (1) towards standard setters and regulators' decisions and practices, (2) towards investors and financial analysts' attitudes related to, and insights into, companies' disclosure, and (3) towards managers' considerations over their future disclosure strategies. The next section summarizes the main findings of this thesis and its contribution and practical implications.

### **1. Summary of findings and practical implications**

In chapter I, I find that managers disclose fewer accounting line-items in the segment reporting note, than what the standard suggests, due to proprietary concerns, and that high financial performance is associated with higher than average quality of disclosed operating segments. When the management does follow standard suggestions in terms of the quantity of

information, they solve proprietary concerns by disclosing lower quality operating segments. Financial analysts are less accurate when managers over-disclose in terms of segment line-items, and do not seem to pick up high quality operating segments from average quality.

The first set of findings raises questions on and has implications for overall disclosure informativeness, i.e., for the combination between quantity and quality as disclosure characteristics and their contribution to disclosure informativeness. The findings are also in line with investors and financial analysts' opinion that high disclosure quantity may be used as a smokescreen for low disclosure quality, one of the core arguments in the disclosure overload debate (Barker et al., 2013).

The second set of findings suggests that financial analysts do not always pick up segment reporting quality and too much quantity may increase information processing costs and impair their ability to accurately forecast earnings. In light of standard setters' increasing interest for business-model based standards (Leisenring et al., 2012), these results advocate a cautious approach since it appears that even sophisticated users have difficulties with disclosure based on the management approach.

In chapter II, I find that earnings forecasts made for companies that disclose different operating segments in different corporate documents are less accurate, and that earnings forecasts made for companies that disaggregate their operating segments in some corporate documents are more accurate. Forecast errors and forecast dispersion increase from before to after the issuance of the annual report if the management discloses different segments in the management discussion and analysis compared to the operating segments disclosed in the note to financial statements.

These results have practical implications for managers and financial analysts. The financial statements are one component of an array of disclosure "weapons" that managers use to communicate to capital market participants, although financial information is present

in most of the other documents as well. Evidence on the role that financial information plays when disclosed outside the financial statements and whether and how users assess it in comparison to the financial statements enhances our understanding of the role of accounting disclosures and the characteristics that make accounting disclosure useful. Since financial analysts are an important link between the firm and the capital markets, managers want to understand how to best communicate with them (Bradshaw, 2011). This paper shows the effects that inconsistency as a characteristic of disclosure across documents has on analysts' accuracy, so managers could use these results to adjust their disclosure strategy.

These findings also have implications for regulators and the current debate on a disclosure framework. I supplement some existing survey evidence that points to the importance investors and analysts attach to consistency in disclosure with empirical results from a relatively large sample of firms. Given my findings, regulators and standard setters may want to assess the need to consider the consistency of disclosure across documents as an attribute of disclosure quality that companies should be encouraged to adhere to. My findings also back up regulators' existing practices of evaluating compliance with disclosure standards by comparing mandated disclosure with voluntary disclosure on the same topic but in different documents.

In chapter III, I find that providing management guidance at the segment level increases analysts' earnings forecast accuracy. Providing segment-level guidance is associated with higher absolute discretionary accruals in the following year, and more so when the segment-level guidance is more precise.

These findings have implications for the debate on whether companies should provide management forecasts. Managers, financial analysts, investors, and regulators are all part of this debate that has been ongoing for the best part of the last two decades. My findings suggest that guidance on segments is useful for financial analysts, but at the same time

encourages managers' earnings fixation and is associated with increases in earnings management. At first view, the choice would seem a black-and-white one between providing this type of information in the guidance or not. However, by examining the form and disaggregation of segment-level guidance, I find that the precision of this information is conducive to earnings management while it is not significantly useful for analysts. The item-disaggregation of segment-level guidance, however, is both beneficial for analysts and is negatively related to earnings management, most likely because it allows better monitoring of how managers achieve certain results. Therefore, companies could combine a low-precision, qualitative guidance with more items forecasted at the segment level to contribute to their reputation of high quality disclosure and credibility.

To sum up, this thesis contributes to a richer understanding of the role of managers' financial disclosure strategy by showing (1) that the relation between how much disclosure is provided and its quality is not necessarily positive, but rather sometimes high quantity hides low quality disclosures, (2) that disclosing different information on the same topic across different venues introduces confusion for financial analysts, and (3) that forward-looking information at the operating segment level is important for financial analysts without inducing short-termism as long as it is presented in a qualitative, narrative manner. Although each of the three essays is constructed as a stand-alone paper and discusses separately the disclosure characteristic(s) of focus, since the disclosure topic is common, I also run additional analyses that bring together the three essays.

## **2. Unifying analyses**

Investigating different disclosure characteristics across the three research papers raises the question of whether these characteristics are correlated, and whether perhaps they

are expressions of the same disclosure choice. To test and eliminate this concern, I run a set of additional analyses that focus on financial analyst earnings forecast accuracy as the dependent variable and include the variables for the disclosure characteristics examined throughout this thesis as independent variables. A secondary purpose of these analyses is also to provide a unifying view of the three essays.

The first set of unifying analyses brings together chapters I and II. The goal is to assess whether inconsistency is merely an expression of segment disclosure quantity or quality. In other words, I test whether *SRQt* and *SRQl* are correlated omitted variables in chapter II. In table C1, I run the main analyses in chapter II where the inconsistency variables (*Inc\_DiffSegmentation* and *Inc\_AddDisclosure*) are the variables of interest, while controlling for segment disclosure quantity and quality as defined in chapter I.

Model (1) is the baseline model as it restates the main results obtained in chapter II, with *Inc\_DiffSegmentation* positively and significantly related to earnings forecast errors (*FE*), and *Inc\_AddDisclosure* negatively and significantly related to *FE*. In model (2), after controlling for the continuous variables of segment reporting quantity (*SRQt*) and quality (*SRQl*), the sign and significance of the inconsistency variables remains unchanged. In other words, even after controlling for the quantity and quality of information in the segment reporting note, the relation between the inconsistency variables and forecast accuracy still holds. The coefficient on *SRQt* is not significant, while the coefficient on *SRQl* is negative and significant at 1%, meaning that higher segment reporting quality decreases forecast errors. The insignificant coefficient on *SRQt* is explained in model (3) where I include variables for the groups to which the company belongs rather than the continuous variables for *SRQt* and *SRQl*. Being in the *Under-disclosers* or in the *Over-disclosers* group, compared to the *Box-tickers* group, is associated with higher forecast errors. Most likely these results are due to too little information provided to analysts by *Under-disclosers* to allow them to



**Table C1: The role of inconsistency across corporate documents for financial analysts' earnings forecast accuracy (chapter II), controlling for segment reporting quantity and quality (chapter I)**

Variables	(From ch. II)				
	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE
<b>Inc_DiffSegmentation</b>	<b>0.0176 ***</b> (3.96)	<b>0.0200 ***</b> (3.45)	<b>0.0207 ***</b> (3.58)	<b>0.0241 ***</b> (4.12)	<b>0.0255 ***</b> (4.39)
<b>Inc_AddDisclosure</b>	<b>-0.0193 ***</b> (-3.26)	<b>-0.0205 ***</b> (-2.64)	<b>-0.0206 ***</b> (-2.65)	<b>-0.0216 **</b> (-2.78)	<b>-0.0203 ***</b> (-2.63)
<b>SRQt</b>		<b>0.0063</b> (0.91)			
<b>SRQl</b>		<b>-0.0227 ***</b> (-2.85)			
<b>Under-disclosers</b>			<b>0.0151 **</b> (2.42)		<b>0.0152 **</b> (2.45)
<b>Over-disclosers</b>			<b>0.0335 ***</b> (5.54)		<b>0.0367 ***</b> (6.05)
<b>LowQl</b>				<b>0.0137 **</b> (2.32)	<b>0.0137 **</b> (2.30)
<b>HighQl</b>				<b>-0.0301 ***</b> (-5.21)	<b>-0.0332 ***</b> (-5.70)
Other controls	YES	YES	YES	YES	YES
Intercept	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
F-value	49.87 ***	34.71 ***	34.73 ***	37.47 ***	35.13 ***
Adj-R <sup>2</sup>	0.125	0.132	0.135	0.136	0.141
Number of clusters	2845	2445	2445	2445	2445
N	10421	7004	7004	7004	7004

This table reports results from regressions of financial analysts' earnings forecast errors on the inconsistency of operating segments disclosed across corporate documents as detailed in chapter II (variables of interest are *Inc\_DiffSegmentation* and *Inc\_AddDisclosure*) and including variables for the groups of companies based on the measures of segment reporting quantity and quality as defined in chapter I as control variables. Model (1) is the baseline model from chapter II. Model (2) includes the continuous variables of segment reporting quantity (*SRQt*) and segment reporting quality (*SRQl*) as controls. Model (3) includes the variables controlling for the group in which the company is based on segment reporting quantity, i.e., *Under-disclosers* and *Over-disclosers*; the benchmark group is *Box-tickers*. Model (4) includes the variables controlling for the group in which the company is based on segment reporting quality, i.e., *LowQl* and *HighQl*; the benchmark group is *AvgQl*. Model (5) includes controls for the groups in which the company is based on both segment reporting quantity and quality. The unit of analysis is at the firm-analyst level for a sample of multi-segment European companies part of the STOXX Europe 600 market index described in chapter II. The sample here is restricted due to the availability of data necessary to compute *SRQl*. All other variables are as defined in chapter II. Standard errors are clustered at analyst level. The models also include industry fixed effects defined at the one-digit ICB code level. Statistical significance is based on two-sided t-tests (t-values presented in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

forecast accurately, and an information overload that impairs analysts' accuracy in the case of *Over-disclosers*. In model (4), when holding the inconsistency across corporate documents constant, I find significant coefficients on both *LowQl* and *HighQl*, compared to *AvgQl*, in the expected direction. Lower segment reporting quality is associated with higher forecast errors (in chapter I, the coefficient on *LowQl* was positive but insignificant), while higher quality is associated with lower forecast errors. Including the groups based on both disclosure quantity and quality in model (5) results in similar inferences. The conclusion of this table is that including *SRQt* or *SRQl* either as continuous variables or as indicator variables based on the group to which the company belongs on for these two dimensions (*Under-disclosers/Box-tickers/Over-disclosers* and *LowQl/AvgQl/HighQl*), the quantity, quality, and inconsistency dimensions do not subsume each other.

In table C2, I use a determinants model similar to the one in chapter I to test whether inconsistency across corporate documents is associated with *SRQl* for the group of *Box-tickers*. I find no significant relations between either *Inc\_DiffSegmentation* or *Inc\_AddDisclosure*, and *SRQl*, which suggests that managers' choice to disclose inconsistently across corporate documents does not play a significant role for their choice of aggregating operating segments into reportable segments.

**Table C2: Test of the inconsistency variables (chapter II) as determinants of segment reporting quality (*SRQI*) conditional on the company being a *Box-ticker* (chapter I)**

Variables	(From ch. I)	
	(1) SRQI	(2) SRQI
<b>Inc_DiffSegmentation</b>		<b>0.0251</b> <b>(0.51)</b>
<b>Inc_AddDisclosure</b>		<b>0.0422</b> <b>(0.58)</b>
Herf	0.487 * (1.90)	0.4691 * (1.81)
R&D	-0.661 * (-1.71)	-0.7146 (-1.65)
LnMgOwners	0.007 (0.15)	0.0084 (0.17)
ROA	0.801 * (1.92)	0.9207 ** (2.22)
Loss	-0.092 (-1.53)	-0.0917 (-1.50)
M&A	0.181 *** (2.82)	0.1767 *** (2.66)
Big4	0.124 ** (2.45)	0.1330 * (2.39)
LengthAR	0.013 (0.17)	-0.0131 (-0.17)
ADR	-0.019 (-0.29)	-0.0256 (-0.35)
EqIssue	-0.035 (-0.88)	-0.0211 (-0.58)
BTM	0.147 *** (2.01)	0.1321 * (1.86)
LnTA	-0.033 (-1.29)	-0.0256 (-1.00)
Intercept	1.178 * (1.75)	1.1276 (1.57)
Industry FE	YES	YES
F-value	1.92 **	1.42
Adj-R <sup>2</sup>	0.124	0.067
N	132	132

This table reports results from an OLS cross-sectional multivariate model discussed in chapter I, with *SRQI* as dependent variable and hypothesized determinants as independent variables, conditional on the company being in the *Box-ticker* group of *SRQt*. Additionally, the model includes the inconsistency variables (*Inc\_DiffSegmentation* and *Inc\_AddDisclosure*) defined in chapter II as independent variables in the model. All other variables are as defined in chapter I. The model includes industry fixed effects. Standard errors are adjusted for heteroskedasticity. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

The second set of unifying analyses brings together chapters II and III. In chapter III, the focus is on forward-looking operating segment disclosure made in the earnings announcement press release and one set of tests there examines financial analysts' earnings forecast accuracy after managers release this information. Immediately after (either in the same day or the next day) issuing the press release, managers usually hold a conference call with financial analysts and investors to discuss the company's financial performance and future prospects. One research question that arises in the context of chapters II and III is whether the usefulness of segment-level guidance is influenced by the consistency, or inconsistency, of the operating segments disclosed in the press release and presentation slides. To test this, in table C3, I run the analyst-firm level analyses in chapter III while controlling for the inconsistency of operating segments arising from either different segmentation (*DiffSeg\_Press\_Present*) or from the further disaggregation (*AddDiscl\_Press\_Present*) of some operating segments disclosed across these two documents.

Models (1) and (2) in table C3 are the baseline models, re-stating the results obtained in chapter III based on the full sample and on sample conditional on companies providing guidance, respectively, with segment-level guidance (*SLG*) as independent variable of interest. Models (3) and (4) mirror the previous two models but also include *DiffSeg\_Press\_Present* and *AddDiscl\_Press\_Present* as control variables. The results show that, even after taking into account the inconsistency of operating segments disclosed across the press release and presentation, the negative and significant relation between providing segment-level guidance and earnings forecast errors still holds. In both models, the coefficients on *DiffSeg\_Press\_Present* are not significant suggesting that for the sample of companies providing segment-level guidance, disclosing different segmentations across these two documents does not have a significant role for analysts' accuracy. However,

**Table C3: Segment-level guidance and financial analysts' earnings forecast accuracy (chapter III), controlling for operating segment disclosure inconsistency between the press release and the presentation to analysts (chapter II)**

Variables	(From ch. III)	(From ch. III)					(From ch. III)	
	(1)	(2)	(3)	(4)	(5)	(6)		
	FE	FE	FE	FE	FE	FE		
SLG	-0.1320 *** (-7.99)	-0.1145 *** (-7.11)	-0.1115 *** (-7.82)	-0.0945 *** (-7.22)				
Point_Range					0.0181 (1.15)	0.0120 (0.76)		
Narrative					-0.0351 *** (-2.72)	-0.0335 *** (-2.58)		
SEG					-0.0168 *** (-3.61)	-0.0138 *** (-2.85)		
DiffSeg_Press_Present			-0.0122 (-1.03)	-0.0212 (-1.56)				-0.0048 (-0.42)
AddDiscl_Press_Present			-0.0526 *** (-3.13)	-0.0733 *** (-3.35)				-0.0330 ** (-2.28)
Guidance	-0.0188 (-1.04)		-0.0581 *** (-3.40)					
DEG		-0.0576 *** (-9.34)		-0.0489 *** (-9.63)	-0.0277 *** (-6.78)		-0.0290 *** (-7.04)	
Other controls	YES	YES	YES	YES	YES	YES	YES	
Intercept	YES	YES	YES	YES	YES	YES	YES	
Industry FE	YES	YES	YES	YES	YES	YES	YES	
F-value	42.78 ***	34.98 ***	37.69 ***	37.64 ***	27.72 ***		23.19 ***	
Adj-R <sup>2</sup>	0.233	0.281	0.278	0.311	0.328		0.306	
Number of clusters	1859	1559	1703	1458	993		969	
N	4706	3394	4031	3030	1513		1450	

This table reports results from multivariate cross-sectional regression models as discussed in chapter III, with financial analysts' earnings forecast errors (*FE*) as dependent variable and segment-level guidance (*SLG*) as independent variable of interest. Additionally, the models include controls for the inconsistency of operating segments disclosed in the earnings announcement press release and in the presentation to financial analysts based on chapter II; *DiffSeg\_Press\_Present* takes the value 1 when there is variation between the operating segments disclosed across the two documents arising from different segmentations, and 0 otherwise; *AddDisc\_Press\_Present* takes the value 1 when there is variation between the operating segments disclosed across the two documents arising from some of the operating segments being further disaggregated in one of the documents compared to the other. All other variables are as defined in chapter III. Model (1), run on the full sample, and model (2), conditional on the company providing guidance, are the baseline models for the role of *SLG* in relation to *FE* as reported in chapter III. Model (3), run on the full sample, and model (4), conditional on the company providing guidance, also include *DiffSeg\_Press\_Present* and *AddDisc\_Press\_Present* as control variables. Models (3) and (4) are conditional on the company providing guidance. Models (5) and (6) test the role of segment-level guidance characteristics for analysts' accuracy. For this analysis, model (5) is the baseline model from chapter III. Model (6) also includes *DiffSeg\_Press\_Present* and *AddDisc\_Press\_Present* as control variables. The sample differs in between the baseline models and the ones controlling for inconsistency of operating segment disclosure between the press release and the presentation due to the inavailability of these documents for some companies. The unit of analysis is at the firm-analyst level. The models include other control variables as specified in chapter III, and industry fixed effects defined at the one-digit ICB code level. Including country fixed effects does not significantly change the results. Standard errors are clustered at the analyst level. Statistical significance is based on two-sided t-tests (t-stats in parentheses) and is indicated as follows: \*\*\* p-value<0.01; \*\* p-value<0.05; \* p-value<0.1.

*AddDiscl\_Press\_Present* is negatively and significantly related to forecast errors, which suggests that providing more disaggregated operating segments in one of these documents contributes to lower forecast errors by providing more information to financial analysts. Model (5) represents the baseline model from chapter III that examines the association between segment-level guidance characteristics, i.e., *Point\_Range/Estimate/Narrative* and *SEG*, and forecast error. Model (6) suggests that the relations uncovered in chapter III remain qualitatively similar even after controlling for the inconsistency of operating segments disclosed across the press release and the presentation: (1) providing qualitative or narrative segment-level guidance (*Narrative*), compared to the benchmark category of low-precision estimates (*Estimate*), decreases forecast errors, but providing more precise segment-level guidance (*Point\_Range*) does not have a significant influence, and (2) more disaggregated segment-level guidance (*SEG*) is negatively and significantly associated with forecast errors, meaning that higher *SEG* improves analysts' earnings forecast accuracy.

The overall take-away from these unifying analyses is that the disclosure characteristics examined in the three chapters do not subsume each other and that the main inferences in each of the chapters hold even after controlling for additional disclosure characteristics. Nevertheless, the findings uncovered in this thesis must be interpreted keeping in mind the inherent limitations of empirical archival methodology and in light of the research design choices made in each of the essays (e.g., cross-sectional analyses, focus on a sample of European companies, focus on 2009 as the first year of IFRS 8 adoption etc.) Future research could extend our understanding of how and why these disclosure characteristics matter by overcoming some of these limitations.



### **3. Avenues for future research**

The analyses conducted in and the findings of this thesis could be used as a starting point for future research that aims towards a deeper understanding of managers' overall disclosure and communication strategy for financial information (Miller & Skinner, 2015), be it in the annual report or across various other venues that companies use to communicate with capital markets. Future research that improves the research designs used in the three essays, for example, in terms of extending the sample by looking at a different economic and legal environment or by collecting data for additional years, could contribute to the literature by adding to or confirming my findings. Other future research could explore the interconnections between the disclosure characteristics investigated in this thesis and characteristics such as readability (Li, 2008) or tone (e.g., Davis & Tama-Sweet, 2012) identified in prior literature, the role that auditors play for disclosure, or how exactly financial analysts use segment information.

#### *3.1 Different economic and legal environment*

Although based on a European sample of companies that apply IFRS 8, these findings extend to the U.S. setting, as well, for two main reasons. First, the segment reporting standards under IFRS and U.S. GAAP, IFRS 8 and SFAS 131, respectively, are completely converged (IASB 2006; FASB 1997). Second, the companies in the sample are companies listed on EU stock exchanges and included in STOXX Europe 600, a pan-European stock market index similar in the type of composition to the S&P 1500. Therefore, given the similarity of standard and representativeness of the sample, I believe that this thesis speaks to the U.S. environment, too. Nevertheless, the differences in standard enforcement, the quality

of the financial reporting environment in general, and differences in the business and legal environment (e.g., litigation risk) raise the question of whether these findings are indeed the same in the U.S. environment. More interestingly, extensions of the research paper included in chapter II could tackle the issue of inconsistency of operating segment disclosure in the U.S. setting. For example, it could be that U.S. managers are more consistent when disclosing operating segments in various documents than my findings about on the European sample given the increased litigation risk compared to the European setting, and the SEC's longer experience of enforcing SFAS 131.

### *3.2 Extending the sample across time*

Currently, the analyses in the three essays are run in cross-section with 2009, the first year of adoption of IFRS 8, as the point of focus. This research design choice is discussed and motivated in each essay, and is mostly due to the time restrictions imposed by manually collecting the data for the main variables across all three papers. Nevertheless, extending the sample across time may be a fruitful area of future investigation and may yield interesting, and potentially complementary, insights to the current findings.

In chapter I, the sample contains one year of data in order to avoid the issue of disclosure stickiness, and extending the sample to more years makes little sense. We know from prior literature that disclosure tends to be sticky from one year to the other (Beyer et al., 2010). Including more than one year of data could potentially limit the variation in our measures of disclosure due to this phenomenon. Choosing the first year of IFRS 8 adoption as sample year has the advantage of the “shake-up” that the change in standards brings to disclosure. This is the time when managers, guided by auditors, need to decide how much information and what operating segments to disclose under the requirements of the new

standard. Therefore, stickiness of disclosure from the previous year is less of a concern for 2009. At the same time, using data for the first year of adoption makes it more likely to find results for the determinants of quality and quantity, if firm-level characteristics indeed matter. To corroborate this argument, I compared the segment line item disclosure for 2009 with that for 2010 for a random subsample of 27 firms (10% of the full sample) and there are no significant differences in segment reporting quantity between the two years.

Extending the sample across time in the context of chapter II makes more sense and would potentially complement the current results with a time-trend view of inconsistency in disclosure. In a time-series, the focus of the research questions would necessarily change from the current comparison between inconsistent and consistent disclosers to within-firm investigations of the effects that changing from consistent to inconsistent disclosure has. For example, it would be interesting to examine whether there is demand from financial analysts for consistent disclosure in years subsequent to an “inconsistent disclosure” episode. A view of the pattern of inconsistency across corporate documents in time would also allow an examination of the reasons for which managers disclose inconsistently, and has the potential to confirm the intuition that arises from looking at cross-sectional data that inconsistent disclosure is a strategic choice that managers make in order to avoid disclosing some sensitive information at the operating segment level.

For chapter III, extending the sample across multiple years is necessary to strengthen the analyses since currently the sample for some of the tests is small which comes at the expense of the power of the test. Additionally, prior literature on management guidance typically employs data on several years, which allows better insights into the determinants of the choice to provide a particular type of guidance, in this case, segment-level guidance.

### *3.3 The relation between disclosure characteristics*

One potential avenue for future research, in the spirit of Francis, LaFond, Olsson, & Schipper (2004), is to examine the relation between all (or a number of) disclosure characteristics that prior literature has been looking at, including the ones examined in this thesis. Francis et al. (2004) examine the relation between the cost of equity capital and seven attributes of earnings: accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism. Their interest is to find which of these attributes has a stronger relation to an important economic outcome and how these attributes behave when considered interdependently rather than independently. In a similar fashion, future research could investigate disclosure quantity, quality, readability, tone, inconsistency etc. in relation to an outcome variable such as earnings forecast accuracy in an attempt to characterize the relative importance of these disclosure characteristics, their interdependencies, and the role each characteristic plays (if any) as part of an obfuscation strategy that managers may be using, for example, in bad times. For example, is inconsistency used as part of an obfuscation strategy? From this respect, chapter I represents a first step in this direction by investigating the interplay between disclosure quantity and quality. The unifying analyses I report above represent an additional step in this direction.

### *3.4 How do financial analysts use segment information?*

Although there is extensive evidence on the usefulness of historical segment information for financial analysts, as discussed throughout this thesis, there is little, if any, direct evidence on exactly what information about a company's operating segments analysts use. Although some analyst reports contain earnings forecasts at the operating segment level,

there is no prior evidence on how analysts make these forecasts. In the interviews I have conducted, the financial analysts seem to suggest that the secondary segmentation that some companies provide in the spirit of the late IAS 14R is equally important to the (main) operating segments disclosed as it is used to cross-check that forecasts for the operating segments make sense (e.g., cross-check line-of-business earnings forecasts with geographical forecasts), and that only a few of the accounting line items disclosed at the operating segment level (i.e., those that are more likely to be disclosed by all companies, such as revenue and EBITDA) are used in the valuation models. More insights can be drawn by looking at the transcripts of a large sample of conference call Q&A sections. These transcripts may reveal the questions that analysts ask about the firm's segments, the additional information that management is willing to give orally, but not in writing, and the areas related to operating segments about which analysts challenge managers (e.g., questions to which managers do not respond, or to which they give vague answers.)

### *3.5 Auditors' influence on disclosure*

Considering the variation in segment information disclosed in the note across companies that I uncover in chapter I, some companies blatantly non-complying with standard requirements, one question that arises relates to the role of auditors for disclosure. For example, how much importance do auditors attach to the information provided in the notes, and particularly how much importance do they attach to complying with disclosure standards such as IFRS 8 or SFAS 131? Auditors are also reviewing, although not providing an opinion on, the MD&A. In chapter II, I find that, in a significant number of cases, the operating segments disclosed in the MD&A are not the operating segments disclosed in the note to financial statements, i.e., there is inconsistency between the operating segments

disclosed in the annual report. It would be interesting to investigate the role that auditors play in this matter. In an informal discussion, a former auditor suggested that auditors need “to pick their battles” with management and oftentimes other aspects of applying financial accounting take precedence over segment reporting. Litigation risk may also play a role on auditors’ decision to challenge management on disclosure choices. While prior literature has extensively investigated the role of auditors for earnings quality, there is less evidence on the role that auditors play for accounting disclosures.

In conclusion, this thesis focuses on an important type of disclosure, segment reporting, to provide insights into managers’ disclosure strategy and its usefulness for a sophisticated category of users, sell-side equity analysts. By looking at the disclosure on operating segments through an empirical archival lens and using manually-collected data, from a quantity versus quality perspective, from an across multiple corporate documents perspective, and from a forward-looking perspective, this thesis contributes to our understanding of disclosure of operating segment information, in particular, and of financial information, in general. Nevertheless, many aspects related to how and why managers make certain choices when disclosing operating segment information remain a “black box.” Future research could employ other research methodologies such as interviews or experiments with managers and different categories of users to shed more light on the reasons behind managers’ disclosure choices and the chain of causality between these choices and users’ decisions, and potentially support and/or complement the findings in this thesis.

## Abstract

This thesis contains three stand-alone essays on the operating segment disclosures that European multi-segment companies make under IFRS 8 Operating Segments. Each essay aims to improve our collective understanding about managers' disclosure strategy by examining various characteristics of operating segment disclosure. Chapter I, entitled "*The Interplay between Segment Disclosure Quantity and Quality*," investigates managers' choices with respect to both disclosure quantity and disclosure quality, and the usefulness of these two characteristics for financial analysts. Focusing on segment disclosures under the management approach, I measure quantity as the number of segment-level line items and quality as the cross-segment variation in profitability, and argue that greater managerial discretion can be exercised over quality than over quantity. I hypothesize and find that managers solve proprietary concerns either by deviating from the suggested line-item disclosure in the standard, or if following standard guidance, by decreasing segment reporting quality. Moreover, financial analysts do not always understand the quality of segment disclosures, which suggests that a business-model type of standard creates difficulties even for sophisticated users. My results inform standard setters as they start working on a disclosure framework and as they seem to consider the business model approach to financial reporting. Chapter II is entitled "*Inconsistent Segment Disclosure across Corporate Documents*." Market regulators in the U.S. and Europe investigate cases of inconsistent disclosures when a company provides different information on the same topic in different documents. Focusing on operating segments, this essay uses hand-collected data from four different corporate documents of multi-segment firms to analyze the impact of inconsistent disclosure on financial analysts' earnings forecast accuracy. Inconsistencies that arise from further disaggregation of operating segments in some documents seem to bring in new information and increase analyst accuracy. However, when analysts must work with different, difficult-to-reconcile segmentations, their information processing capacity and forecasts are less accurate. These findings contribute to our understanding of the effects of managers' disclosure strategy across multiple documents and have implications for regulators and standard setters' work on a disclosure framework. Chapter III is entitled "*Management Guidance at the Segment Level*." Prior research has found that managers add information to their earnings guidance to justify, explain, or contextualize their forecasts. I identify segment-level guidance (SLG) as a type of disaggregated information that multi-segment firms provide with their management guidance, and investigate its usefulness for financial analysts' earnings forecasting accuracy, as well as its influence on managers' earnings fixation. I further characterize the level of precision (point and range, maximum or minimum estimate, or simply narrative) and of disaggregation of SLG. I find that companies in high tech industries known for increased uncertainty in future performance are less likely to provide SLG, and that SLG is associated with better forecasting accuracy. However, while providing more item-disaggregated SLG improves accuracy, increased precision has no impact on forecast accuracy. From the manager's point of view, SLG creates incentives to engage in earnings management, and the more precise the SLG is the greater the incentive. In contrast, more item-disaggregated SLG discourages earnings management, perhaps by improving monitoring. In a context where qualitative, narrative, and disaggregated guidance is regarded

as a solution to avoid earnings fixation and short termism, understanding which types of information achieve this goal, and how, is relevant for managers, investors, and regulators alike.



## Résumé

Cette thèse contient trois essais distincts sur la publication d'information sectorielle que les entreprises européennes ayant plusieurs secteurs opérationnels effectuent en vertu des IFRS 8 Secteurs Opérationnels. Chaque essai vise à améliorer notre compréhension collective sur la politique de communication financière des cadres dirigeants en examinant diverses caractéristiques des informations sectorielles. Le chapitre I, "*L'interaction entre la qualité et la quantité des publications sur l'information sectorielle*" examine le choix des cadres dirigeants à l'égard de la quantité et de la qualité, ainsi que l'utilité de ces deux caractéristiques pour les analystes financiers. J'utilise le nombre de segments opérationnels publiés comme mesure quantitative et la variation inter-sectorielle de la profitabilité comme mesure qualitative et soutiens que plus de pouvoir discrétionnaire peut être exercé par les dirigeants sur la qualité que sur la quantité. Je trouve que les cadres dirigeants résolvent les préoccupations liées aux renseignements commerciaux de nature exclusive soit en déviant de la quantité recommandée par la norme, ou, lorsqu'ils suivent la norme, en réduisant la qualité de l'information sectorielle. Les analystes financiers n'apprécient pas toujours la qualité de l'information sectorielle, ce qui suggère que le modèle business crée des difficultés même pour des utilisateurs avertis. Mes résultats informent les normalisateurs lorsque ceux-ci initient le développement d'un nouveau cadre conceptuel et lorsqu'ils semblent envisager l'approche du modèle business pour le reporting. Le chapitre II s'intitule "*La non-conformité des secteurs opérationnels à travers des documents d'entreprise*". Les régulateurs de marché examinent des cas de présentations lorsqu'une entreprise fournit des informations différentes sur le même sujet dans différents documents. En mettant l'accent sur les secteurs opérationnels, cet essai utilise des données recueillies manuellement auprès de quatre documents d'entreprise afin d'analyser l'impact de la publication d'information non-conforme sur l'exactitude des prévisions de résultat des analystes financiers. La non-conformité qui découle de la déségrégation supplémentaire des secteurs semble introduire de nouveautés et contribue à l'exactitude des prévisions. La publication des segmentations difficilement réconciliables entraîne une exactitude réduite des prévisions. Ces résultats contribuent à notre compréhension des effets de la politique de communication des dirigeants à travers plusieurs documents et ont des répercussions sur le travail des régulateurs. Le chapitre III s'intitule "*Prévisions managériales au niveau sectoriel*". Je considère les prévisions au niveau sectoriel (PNS) comme un type d'information désagrégé que les entreprises fournissent ensemble avec leur stratégie de gestion. J'examine l'utilité de cette information pour l'exactitude des prévisions de résultat par les analystes ainsi que l'impact de cette information sur la manipulation du résultat. Je constate que les entreprises de haute technologie réputées pour l'incertitude supplémentaire liée à profitabilité sont moins susceptibles de fournir des PNS et que le PNS est associé à une prévision améliorée. Cependant, alors que la communication de davantage de PNS désagrégé par secteur a tendance à améliorer la précision, plus de précision ne semble pas avoir d'importance. Du point de vue des cadres dirigeants, les PNS les incitent à manipuler le résultat comptable, mais le PNS désagrégé par poste semble décourager la manipulation, fort probablement due à une surveillance supplémentaire. Dans un contexte où une orientation narrative et désagrégée est considérée comme la solution pour empêcher la vision à court terme, comprendre quel type d'information permet d'atteindre cet

objectif, et de quelle manière, est tout autant pertinent pour les cadres dirigeants, les investisseurs et les régulateurs.

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