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The Impact of the Management Approach on Segment Reporting

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Abstract: Accounting standard setters have increasingly attempted to align external segment reporting disclosures to a firm's internal reporting structure. We study how this move to the management approach for segment reporting impacted the number of reported segments and the extent of line item disclosures when Australia adopted IAS 14 (revised) and IFRS 8. We find that both standards led to firms disclosing a greater number of segments. An examination of the motives behind the non-disclosure of segments suggests that segment information was withheld for agency cost reasons. We find only limited support for the proprietary cost motive for non-reporting of segments. We also document that IFRS 8 led to a reduction in the amount of line item disclosure. Consistent with a proprietary cost explanation, the decrease in disclosure is greatest for firms with a higher number of profitable segments. Our results indicate that the change to the management approach to segment identification is not associated with the properties of analyst forecasts, nor did it lead to increased analyst following.

Keywords: disclosure, segment reporting, IFRS 8, IAS 14, analyst forecasts

1. INTRODUCTION

Segment reporting is the disaggregation of a reporting entity's financial reports into segments. Users of financial statements, such as analysts, claim that segment information is essential in assessing and predicting firm performance (Knutson, 1993). Managers, however, have incentives to report fewer segments externally than are actually present within a firm to conceal industry diversity (Berger and Ofek, 1995) and to minimise proprietary (Hayes and Lundholm, 1996 and Botosan and Stanford, 2005) and agency costs (Berger and Hann, 2007).[1]

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1 The contention that managers can manipulate the definition of segments to minimise segment disclosures has been an issue recognised in prior studies over a long period of time. For instance, see Emmanuel and Gray (1977) who discuss issues related to the initial release of SFAS No. 14 *"Financial Reporting for Segments of a Business Enterprise"* in 1976.

In response to criticisms that firms were aggregating segments for external reporting purposes, standard setters have moved towards requiring firms to disclose segments in accordance with their internal reporting structure (i.e., the management approach). For example, in 1998 the FASB introduced SFAS 131 "*Disclosures about Segments of an Enterprise and Related Information*" which requires externally reported segments to be defined consistently with the internal reporting structure of the business. At the international level, these changes in reporting were implemented partially in the change from IAS 14 "*Segment Reporting*" to the revised IAS 14 "*Segment Reporting*",[2] and then further in the change from IAS 14R to IFRS 8 "*Operating Segments*".[3]

This study has a number of objectives. First, we determine whether the adoption of both IAS 14R and IFRS 8 resulted in an increase in the number of segments reported externally. Second, we provide evidence on the incentives that explain which firms revealed additional segments upon the adoption of both standards. Third, we take advantage of the discretion in segment line item disclosure provided in IFRS 8 to analyse potential motives for firms that reported less disclosure. Finally, we examine whether the adoption of both IAS 14R and IFRS 8 improved the properties of analyst forecasts.

There are three motivations for this study. First, US evidence subsequent to the introduction of SFAS 131 indicates that the standard was successful in increasing the number of reported segments (Street et al., 2000; and Berger and Hann, 2003). However, studies which examine the reasons for the non-disclosure of segments prior to SFAS 131 have provided mixed results. For example, Botosan and Stanford (2005) find that the newly revealed segments under SFAS 131 were operating in less competitive industries, which is consistent with a proprietary cost explanation for the non-disclosure of segments. In contrast, Berger and Hann (2003, 2007) report that newly disclosed segments were underperforming consistent with an agency explanation for segment non-disclosure. Given these contrasting results, Berger and Hann (2007) recommend that further evidence on the incentives of firms to aggregate segments be obtained from non-US studies. This study contributes such evidence by examining Australia's adoption of two separate accounting standards which were intended to shift firms' external segment reporting towards the reporting structure used internally within a firm.[4]

The second motivation for this study is to provide a comprehensive examination of the impact on firm reporting of international standard setters moving their segment accounting standards towards a management approach. Prior studies document that the adoption of both IAS 14R (Street and Nichols, 2002) and IFRS 8 (Crawford et al., 2012; and Nichols et al., 2012) led to firms reporting additional segments. Previous research also indicates that IFRS 8 resulted in less segment line item disclosure (Crawford et al., 2012; and Nichols et al., 2012). These studies however, typically examine only a small sample of the largest listed firms. In contrast, we use a sample of all Australian listed firms with available data to analyse the impact of both standards.

2 For ease of exposition, we hereafter refer to IAS 14 (revised) as IAS 14R.

3 A detailed discussion of the regulatory background is provided in section 2 of the paper.

4 By focussing on a single country (Australia) with an almost simultaneous adoption of each of IAS 14R and IFRS 8, we avoid problems caused by varying cross-country institutional environments and cross-time economic conditions.

A further limitation with prior research examining the effect of IAS 14R and IFRS 8 is that these studies are typically descriptive and do not attempt to analyse possible motives for the reporting of additional segments or a reduction in line item disclosure upon the adoption of IFRS 8. This study, however, attempts to provide evidence on why firms reported additional segments or reduced line item disclosures. In an ideal, full-disclosure world, management would report externally segments and segment information consistent with the internal reporting structure of the firm.[5] However, in the real world, firms are likely to report their segment information in an optimal fashion which reflects a cost–benefit trade-off. As a result, firms for which the perceived costs exceed the benefits, report more aggregated segments and less segment information.[6] Based on prior research we argue that these trade-offs are driven – at the margin – by agency and proprietary considerations and an incentive to report less industrial diversity. Accordingly, we expect that a change in accounting standards towards a more strict regulation of the segment identification process leads to, on average, the disclosure of a greater number of segments.[7] We also expect that, when accounting standards provide discretion as to the line items which need to be disclosed, that some firms choose to reduce disclosure. Furthermore, we expect the change in the number of reported segments and segment disclosures to be associated with factors proxying agency and proprietary costs and industrial diversity.[8]

The final motivation for this study is to provide evidence on whether the move internationally to the management approach for segment reporting resulted in an improved information environment for users. This research question has largely been unexamined in prior studies assessing the impact of IAS 14R and IFRS 8. We address this gap in the literature by analysing whether the adoption of either standard improved the properties of analyst forecasts. This investigation also adds to prior US research (Berger and Hann, 2003; and Botosan and Stanford, 2005) which finds inconsistent evidence on whether the adoption of SFAS 131 improved analyst forecast accuracy.

Our evidence is based on a sample of 1,241 Australian Securities Exchange (ASX) listed firms which adopted IAS 14R in 2002 and 1,617 ASX listed firms which adopted IFRS 8 in 2009.[9] We conduct our investigation by taking advantage of the availability

5 This assumes firms arrange their internal reporting structure in a manner that provides management with the most optimal information for decision making.

6 A maintained assumption of our study is that firms were previously under-reporting the number of segments. Prior studies, (Piotroski, 1999, 2003) attempt to measure the extent of segment under-reporting using SIC codes. However, historical SIC codes at the firm level are not available for Australian firms from the Thomson Reuters Datatream database and as a result we are unable to conduct a similar analysis. In the additional analysis section of the paper (section 5(*v*)), we make use of the narrative disclosures for a subsample of firms in an attempt to assess segment under-reporting.

7 This expectation assumes that external auditors are able to access internal firm documents to ensure compliance. Informal discussions with a small number of auditors, suggests that they are able to obtain internal documents for auditing purposes. We leave it to subsequent research to examine this issue further.

8 Arguably, reporting segment information externally consistent with the internal reporting structure of the business should reduce the workload of auditors in verifying the disclosures. We leave it to subsequent research to examine the possible implications of the change in segment reporting for auditors (e.g., audit fees).

9 IAS 14R was adopted in Australia in 2002 as a revised version of AASB 1005 "*Segment Reporting*". This revised standard was adopted as part of the Australian Accounting Standards Board's (AASB) international accounting standard convergence project and is equivalent to IAS 14R issued by the International Accounting Standards Committee in 1997. In 2004, as part of Australia's move from international accounting standard harmonisation to adoption, the revised AASB 1005 was replaced by AASB 114 "*Segment Reporting*", for financial years ending on or after 1 January 2005. As AASB 114 was a direct copy of IAS 14R, it was

of reporting on the same year of information using, respectively, the newly adopted and prior standard. IAS 14R required firms to choose either business or geographical segments for their primary segment reporting format. This choice was based on the dominant source and nature of an entity's "risks and returns". The standard indicated that the basis for determining the dominant source of an entity's "risk and returns" should be a firm's internal organisational and management structure and the system of internal reporting to the board of directors and CEO (para 4.2.1). As such, the standard intended that firms would externally report their segments on the same basis as reported internally within the firm. Subsequent to its release, IAS 14R was criticised due to the flexibility introduced by the "risks and returns" qualification contained in the accounting standard. This qualification potentially allowed managers to report segments externally in a manner inconsistent with the internal reporting structure of the business on the basis that the internal reporting structure did not reflect the nature and source of the business' "risks and returns".

These criticisms were addressed by the IASB in 2009 through the implementation of IFRS 8 which amended the operating segment definition to "components of the business whose results are regularly reviewed by the chief operating decision maker." Unlike the prior standard, IFRS 8 does not include a "risks and returns" qualification to the disclosure of segments, thus limiting management discretion in restructuring segment information for external reporting purposes. IFRS 8 however reduced the number of mandatory line item disclosures for reported segments.

We find that the adoption of both IAS 14R and IFRS 8 resulted in an increase in the number of reported segments. For instance, 16% (19%) of firms which reported only a single-segment prior to IFRS 8 (IAS 14R) disclosed multiple-segments after the change in accounting rules. Furthermore, 19% (14%) of multiple-segment firms reported additional segments under IFRS 8 (IAS 14R). Our findings for the Australian setting are largely consistent with the consequences of the management approach reported in the US (e.g., Street et al., 2000; Berger and Hann, 2003; and Botosan and Stanford, 2005) as well as those documented internationally (Crawford et al., 2012; Nichols et al., 2012; and Kang and Gray, 2013). However, as our sample comprises all listed Australian firms, our results are more comprehensive than prior international evidence assessing the impact of adopting the management approach.

We use a multivariate approach to try to distinguish between the alternative explanations for why firms reveal additional segments. This approach allows us to control for other reasons, identified from prior studies (McKinnon and Dalimunthe, 1993; Mitchell et al., 1995; and Aitken et al., 1997), which may influence the voluntary supply of segment information. Consistent with an agency explanation, our multivariate analysis indicates that the increase in the number of reported segments upon Australia's adoption of IFRS 8 is positively related to the number of segments reporting a loss. Interestingly, the adoption of IAS 14R provides the opposite result, with those firms disclosing a greater number of segments having fewer loss-making segments. This finding is suggestive of firms using the "risks and returns" qualification in IAS 14R to not report loss-making segments. Inconsistent with a proprietary cost explanation for the non-reporting of segments, we find that following the adoption

equivalent to both that standard and to the revised version of AASB 1005. In 2009, IFRS 8 replaced AASB 114 in Australia under the title AASB 8 "*Operating Segments*". For ease of reference, we refer to standards in the text using their international prefix and numbering.

of both accounting standards, a firm's concentration ratio is generally insignificant in explaining the increase in the number of reported segments. We do find, however, that firms revealing additional segments are significantly larger providing some support for the proprietary cost explanation. After the adoption of both IAS 14R and IFRS 8, the number of unique industries in which a firm operates is also significantly related to a firm revealing additional segments. This result is consistent with firms being eager to avoid their share price being traded at a diversification discount (Berger and Ofek, 1995).

We also examine whether firms took advantage of the discretion available in IFRS 8 to disclose less line item information about reported segments. For this analysis we focus on multiple-segment firms having no-change in the number of segments reported upon the implementation of IFRS 8. We focus on this group of no-change firms because for these firms there would be no additional costs of collecting the line item information, as their reporting systems had previously been designed to collect such information. Any reduction in disclosure thus represents a choice by management to provide less line item information for reported segments. Our investigation indicates that, after the adoption of IFRS 8, multiple-segment no-change firms disclosed less line item information, with the greatest decrease in disclosure occurring for capital expenditure. Similar results are reported in Crawford et al. (2012) and Nichols et al. (2012). Further analysis of the reduction in line item disclosures shows that firms with decreasing line item information had significantly fewer loss-making segments and operated in more concentrated industries. These findings are consistent with firms reducing line item disclosures due to proprietary cost reasons.

Using the properties of analyst cash flow and earnings forecasts, we investigate whether the adoption of both standards improved the information environment for company analysts. Unlike US evidence for SFAS 131 (Berger and Hann, 2003; and Botosan and Stanford, 2005), but similar to the findings in Leung and Verriest (2015), we find no significant change in analyst forecast accuracy or dispersion following the adoption of either standard. Our evidence suggests that information about the newly revealed segments was available to analysts through other sources or, alternatively, it may be driven by a loss of sample size due to a lack of analyst coverage in our refined sample.

This paper makes a number of contributions. Firstly, prior research examining the effects of the adoption of IAS 14R and IFRS 8 is typically based on a small sample of large listed firms and does not examine the motivations behind the prior non-disclosure of segments. In contrast, our study uses the entire population of Australian firms and empirically investigates the motivation for the change in quantity and quality of segment information using a wide range of tests. Secondly, there is limited prior evidence on the effects of the adoption of IAS 14R on the number of disclosed segments. As IAS 14R represented one of the initial attempts of standard setters outside the US to align internal and external segment reporting, it is important to have large sample evidence on the effects of the adoption of this standard. This study provides such evidence. Furthermore, having evidence on the impact of IAS 14R is particularly important, as this initial move to using the management approach for segment reporting possibly explains why IFRS 8 did not lead to more significant changes in segment disclosures. Thirdly, similar to a number of studies, we document a reduction in line item disclosures after the implementation of IFRS 8. We, however,

extend this prior literature by examining whether the reduction in disclosures is driven by proprietary or agency cost explanations. Finally, we add to the growing body of literature examining the consequences of the adoption of IFRS 8 (Blanco et al., 2015; and Leung and Verriest, 2015).

The remainder of this paper is structured as follows: in section 2 we explain the regulatory background before moving on to discussing previous segment disclosure research and our hypotheses in section 3. Section 4 discusses our method and sample selection, whilst section 5 presents our results. The final section of the paper provides a conclusion and suggestions for future research.

2. REGULATORY BACKGROUND

IAS 14R "*Segment Reporting*" was applicable in Australia for years beginning on or after 1 July 2001, with early adoption permitted. The new standard adopted a primary reporting format for segment information (i.e., either business or geographic segments) based on the predominant source and nature of an entity's "risks and returns".[10] According to the standard, an entity's organisational and management structure, as well as its internal financial reporting system to the CEO, normally provides the best evidence of whether the entity's predominant "risks and returns" relate to the product or services it provides or to the fact the entity operates in different geographical areas. As such, an entity should normally report segment information in its financial reports on the same basis as it reports internally to top management. IAS 14R also expanded the range of mandatory disclosures required for primary segments to include, among other items, segment liabilities and segment capital expenditures.

IFRS 8 "*Operating Segments"* replaced IAS 14R for financial years commencing on or after January 1, 2009.[11] IFRS 8 introduced two broad forms of change in comparison to IAS 14R. Firstly, primary and secondary segments are no longer determined using potential or actual "risks and returns". Instead, segments reported for external reporting purposes needed to be consistent with the information provided to a firm's chief operating decision maker (CODM). This change reduced the flexibility of managers to restructure their internal segments when reporting externally. Under the prior standard such a restructuring may have been justified by arguing that the internal reporting system did not reflect potential or actual "risks and returns".[12] IFRS 8 (para. 12) refers to a criterion of "similar economic characteristics" for segment aggregation, thus implying an additional barrier to segment aggregation (i.e., non-disclosure).

The second main change in IFRS 8 is a reduction in the number of mandated segment disclosures. IFRS 8 mandates disclosure only of profit/loss and assets of each reportable segment, whereas IAS 14R required, in addition, segment revenue,

10 The previous standard provided less guidance on how to identify segments (Birt et al., 2007) other than stating that industry segments should be based on the diversity of industry involvement of the company. It did not recommend that this segment identification process follow the internal reporting structure of the firm.

11 AASB 114 was issued in 2004 as part of the AASB's convergence process to international accounting standards. As AASB 114 was equivalent to IAS 14R, we refer to IFRS 8 replacing IAS 14R in the text to simplify the discussion.

12 Firms may still possibly withhold segment information under IFRS 8 by restructuring their internal reporting. Such an approach seems counterproductive, however, as it suggests managers would be receiving suboptimal information upon which to base business decisions. An additional method of concealing segments under IFRS 8 is by manipulating the definition of the CODM so that the information disclosed under the standard is highly aggregated (Crawford et al., 2012).

Figure 1
Key Disclosure Differences between IAS 14R and IFRS 8

	IAS 14R	IFRS 8
Profit/Loss	Y	Y
Assets	Y	Y
Liabilities	Y	N*
Depreciation	Y	N*
Revenue	Y	N*
Capital Expenditure	Y	N*

**only required if given to chief operating decision maker*

liabilities, depreciation and capital expenditure.[13] IFRS 8 requires disclosure of segment revenue, liabilities, depreciation and capital expenditure only if the CODM is provided with this information (para. 23). Furthermore, segment information no longer needs to be measured using the accounting policies applied for external reporting, but may be reported in the same way as disclosed by the internal reporting system. Figure 1 presents a summary of the key disclosure differences between IAS 14R and IFRS 8.

British segment reporting has (loosely) followed a similar development trajectory. Segment reporting was initially required by the Companies Act, 1967. However, Emmanuel and Garrod (1987) document criticism of the level of subjectivity allowed under the Act in relation to the segment identification process; the Act merely required identification of segments from substantially different industry or geographic sectors, without defining "substantially different". In 1990, this issue was partially addressed by the Accounting Standards Board's issuance of SSAP 25 "*Segmental Reporting*", which was equivalent to IAS 14 at the time of issue (1990). UK listed companies were subject to IFRS standards from 2005. Unlisted companies, however, continued to use SSAP 25 until the Financial Reporting Council's promulgation of FRS 102 "*The Financial Reporting Standard applicable in the UK and the Republic of Ireland*" in 2014 required them to apply IFRS 8 in relation to segment reporting.

3. BACKGROUND LITERATURE AND HYPOTHESES

(i) Influence of Moving to the Management Approach on the Number of Reported Segments

The consequence of adopting the management approach on the number of reported segments has been examined in both the US and elsewhere. The findings in these studies are consistent with the move to the management approach resulting in the disclosure of additional segments. For instance, a number of studies document an increase in the number of segments disclosed subsequent to the implementation of SFAS 131 in the US (Street et al., 2000; Berger and Hann, 2003; and Botosan and Stanford, 2005).

Street and Nichols (2002) investigate the effect of the adoption of IAS 14R and find a significant decrease in the number of firms reporting only a single-segment and an

13 IFRS 8 was amended from 2011 onwards to mandate disclosure only of a measure of segment profitability. The reporting of segment assets is now required only if also provided to the CODM.

increase in the amount of information disclosed. They however, find no significant difference in the number of reported segments. The impact of the adoption of IAS 14R within the Australian banking sector is investigated by Birt et al. (2007). They show that the standard led to an increase in both the reported number of segments and the number of line items disclosed.

The impact of the adoption of IFRS 8 on the number of reported segments has been examined in a number of studies using samples restricted to the largest listed firms. For example, Crawford et al. (2012) examine the impact of IFRS 8 in the UK using a sample of 150 companies and report an increase in the average number of segments disclosed. Kang and Gray (2013) investigate how IFRS 8 changed the reporting of the top 200 Australian firms. They show a significant increase in the average number of reported segments, although 45% of firms experienced no change. They also examine how firms delineate the CODM and indicate that 57% of firms state that the CODM is either the management team or the CEO. The effect of IFRS 8 on 335 large European companies is studied in Nichols et al. (2012). Similar to Crawford et al. (2012) and Kang and Gray (2013) they find a significant increase in the reported number of segments post-IFRS 8 and a decline in the number of firms reporting as a single-segment firm.[14]

The evidence, summarised above, indicates that the move by standard setters to having firms report external segment information according to the internal reporting structure of the business results in the disclosure of additional segments. These findings are consistent with some firms previously not reporting externally according to their internal reporting structure. In this study, we examine the impact of IAS 14R and IFRS 8 on the number of reported segments using all Australian listed firms with available data. This dataset provides a more comprehensive sample of firms than that used in prior research. As a result, we are able to provide more conclusive evidence on the impact of these two standards on the number of reported segments. Given the findings of prior studies, our first hypothesis predicts that Australia's adoption of both IAS 14R and IFRS 8 led to the disclosure of additional segments:

H1: The number of reported segments increases after the adoption of IAS 14R and IFRS 8.

(ii) Incentives for the Non-disclosure of Segments

Beyond documenting that the move to the management approach resulted in the reporting of additional segments, prior research has turned to studying the incentives for the non-disclosure of segments. It is likely that managers withhold segment information when they perceive the costs of disclosure to exceed the benefits. The incentives for under-reporting, which have received prominence in prior studies, relate to not disclosing industry diversity and minimising agency and proprietary costs. The reason for obscuring firm industrial diversity follows from prior research which documents that diversified firms trade at a share price discount (Lang and Stulz, 1994; and Berger and Ofek, 1995).[15] A firm will conceal a segment for agency

14 Nichols et al. (2013) provide a comprehensive review of studies examining the move to the management approach for segment reporting under SFAS 131 and IFRS 8.

15 Recent studies question whether a diversification discount exists. See for example: Campa and Kedia (2002), Villalonga (2004), Mansi and Reeb (2004) and Ammann, et al. (2012).

reasons if a segment is underperforming and the revelation of the segment would highlight monitoring deficiencies within the organisation. In contrast, the proprietary cost rationale for non-disclosure is that firms conceal segments in non-competitive industries since disclosure may encourage additional competition and lower the firm's ability to generate abnormal profits.

Several studies examine the reasons for firms' opposition to the use of the management approach for segment reporting by investigating constituent lobbying on the exposure drafts which preceded the standards. Ettredge et al. (2002) for example, study lobbying prior to the implementation of SFAS 131. Their results indicate that firms opposing the standard did so due to proprietary costs. More specifically, they find that opposition to the standard was significantly higher for: larger firms, complex firms, firms with fewer customers and firms operating in more concentrated industries. Firm industrial diversity measured by the number of SIC codes in which a firm operates was unrelated to a firm's lobbying position. Katselas et al. (2011) study the characteristics of firms that lobbied the IASB against the adoption of the exposure draft which preceded IFRS 8. Their results indicate that firms expressing opposition to the exposure draft were significantly smaller in size and reported fewer segments. These findings are consistent with firms opposing the proposed standard if it was more likely to lead to an increase in the number of reported segments.

Previous research has also studied the reasons for the non-disclosure of segments by analysing the newly revealed segments after the implementation of SFAS 131. For example, Berger and Hann (2003) compare restated disclosures under SFAS 131 to the original SFAS 14 disclosures. Univariate statistics indicate that segments disclosed under SFAS 131 are more numerous and diversified than under the superseded SFAS 14. In addition, newly reported segments were more likely to be poor performers (indicated by the incidences of loss-making segments and cross-segment resource transfers in the SFAS 131 disclosures). They also find that single-segment firms that subsequently disclose multiple-segments under SFAS 131 experience an increase in the diversification discount.

Botosan and Stanford (2005) examine firms that went from being single-segment firms pre-SFAS 131 to being multiple-segment firms post-SFAS 131. Consistent with newly revealed segments operating in less competitive industries, they find that the *median* (but not the mean) concentration ratio of segments not disclosed in pre-SFAS 131 reports is higher than the concentration ratio of the firm's primary industry. A comparison of profitability, however, indicates that firms which revealed additional segments were no different to single-segment firms which had no-change in the number of reported segments.

Berger and Hann (2007) provide an examination of whether the appearance of newly reported segments under SFAS 14 is consistent with agency or proprietary cost reasons and find greater support for the agency explanation for the non-disclosure of segments. They are also critical of the results of Botosan and Stanford (2005), arguing that the *mean* differences documented in that study are actually insignificant. Moreover, they argue that Botosan and Stanford (2005) should have compared single-segment firms which reported additional segments upon adoption of SFAS 131 with multiple-segment firms having no-change in the number of reported segments. If the new standard reveals "hidden" segments, then change firms have always been multiple-segment firms but have merely chosen not to disclose that fact. The appropriate comparison group is, therefore, multiple-segment firms which disclosed

their multiple segments. We take this criticism into account when conducting our analysis.

In contrast to other studies examining the impact of SFAS 131, Ettredge et al. (2006) examine firms that were already disclosing multiple-segments prior to the introduction of the standard. Also, rather than focus on newly disclosed segments they test the extent of variability in reported segment profitability pre- and post-SFAS 131. If firms are motivated to make themselves appear low-risk, then the flexibility in segment disclosure may be used to minimise inter-segment profit variability. They confirm that relative to SFAS 14, SFAS 131 disclosures show higher cross-segment variability of segment profits, a higher association between reported profits and inherent cross-segment variability, and a higher association between cross-segment variability of reported profits and reliance on external financing. They also report a negative association between cross-segment variability and variables proxying for proprietary costs (i.e., concentration ratio and abnormal profit), suggesting that managers still use accounting flexibility to limit the disclosure of potentially harmful information.

Wang et al. (2011) also focus on multiple-segment firms and examine incentives for the under-reporting of differences in segment earnings growth. They find that firms with higher proprietary and agency costs disclose less segment earnings growth variability. They also show that, after the adoption of SFAS 131, there was increased disclosure of differences in segment earnings growth consistent with the standard improving reporting quality.

To date, the evidence on the incentives for the non-disclosure of segments prior to the adoption of the management approach is limited to studies examining the adoption of SFAS 131 in the US. Although there are several prior studies examining the impact of the adoption of IFRS 8, these studies are typically limited to providing descriptive evidence for a sample of large listed companies. Unlike the present study they do not examine possible motivations for the non-reporting of segments. As such, this study addresses the call for additional non-US research on the explanations for the non-disclosure of segments (Berger and Hann, 2007).

Our hypotheses build on the incentives for the non-reporting of segments studied in prior US research. Whilst both IAS 14R and IFRS 8 intended to move firms towards more transparent disclosure consistent with their internal reporting structure, IAS 14R provided some discretion to managers to not report using their internal reporting structure by applying the "risks and returns" qualification. Therefore, whilst the next three hypotheses provide predictions regarding the newly revealed segments, the discretion provided in IAS 14R suggests that any effect may be strongest after the implementation of IFRS 8.

Prior evidence finds that single-segment firms which revealed additional segments experienced an increase in the diversification discount (Berger and Hann, 2003). If the costs associated with a diversification discount are substantial, managers have an incentive to aggregate segments when the firm operates across diverse activities. We therefore predict:

H2: The increase in the number of segments disclosed after IAS 14R and IFRS 8 is positively related to firm industrial diversity.

Managers frequently contend that the disclosure of segment information may result in "competitive harm" to the firm. Ettredge et al. (2002) and Botosan and

Stanford (2005) find that greater industry concentration is associated, respectively, with lobbying against SFAS 131 and the reporting of additional segments following the implementation of SFAS 131. These findings indicate that firms have a preference for not disclosing segments in non-competitive industries, as revealing such information has the potential to erode the abnormal profits sourced from these segments. Therefore, firms operating in concentrated industries would have been more likely to have restructured their segments for external reporting purposes. For such firms, a positive change in the number of segments is expected when they report consistently for external and internal reporting purposes. This leads to our third hypothesis:

H3: The increase in the number of segments disclosed after IAS 14R and IFRS 8 is positively related to the level of industry concentration.

Berger and Hann (2003, 2007) argue that managers have an incentive to not report segments which are underperforming, as disclosure reveals potential agency problems within the firm. In addition, disclosing loss-making segments potentially exposes a firm to possible takeover threats and may provide a poor impression of firm management. Prior to the adoption of IAS 14R and IFRS 8, managers had greater ability to not disclose the existence of such losses by not reporting externally in the same manner as the internal reporting structure of the business. As this type of restructuring of segments was made more difficult by IAS 14R and then further restricted by IFRS 8, we expect an increase in the disclosure of loss-making segments. We thus predict:

H4: The increase in the number of segments disclosed after IAS 14R and IFRS 8 is positively related to the number of loss-making segments.

Watts and Zimmerman (1978) discuss the political cost hypothesis, which posits a desire to suppress the salience of profit in order to minimise the chance of downward pressure on those profits through regulatory action. Although segment reporting has no impact on total profit, the identification of reportable segments can reveal highly profitable segments. If this alerts regulators to excess profitability, then the firm may be subject to regulatory action regarding the performance of that segment (e.g., through competition policy). This political cost motivation to withhold segment information has not been discussed in prior research. As regulatory intervention would be more likely to occur for segments in non-competitive industries, a political cost explanation for non-disclosure is subsumed in the proprietary cost hypothesis. In addition, as the political cost hypothesis suggests the suppression of information for profitable, rather than loss-making segments, it results in an opposite prediction to **H4**.

(iii) Influence of the Management Approach on the Quantity of Line Item Disclosure

As described above, IFRS 8 reduced the number of mandatory disclosures for reportable segments and instead only required the reporting of information that was provided to the CODM. At the time of this study, IFRS 8 mandated disclosure only of "profit/loss" and "assets" for each segment; while the previous standard required additional items to be disclosed, such as segment revenue, liabilities, depreciation and capital expenditure. A number of studies have examined the impact of this change

on the quantity of line item disclosures. Crawford et al. (2012) indicate, using UK evidence, that after the introduction of IFRS 8, there was a reduction in the reporting of segment line item information, with the largest reduction for capital expenditure and liabilities. Nichols et al. (2012) using a sample of European firms also find that IFRS 8 led to a reduction in the disclosure of line items, with the greatest decrease taking place for liabilities and capital expenditure. Kang and Gray (2013) using Australian data find that the extent of information disclosed (as measured by a count of the number of lines) increased for 45% of firms after the adoption of IFRS 8. Leung and Verriest (2015) study geographical segment disclosures after IFRS 8 and document the reporting of less geographical segment information.

This study extends this line of research by examining the motives for firms to decrease their line item disclosure. It is our contention that the extent of line-item disclosure is also subject to the influence of competitive forces and the desire to minimise agency costs. For firms already disclosing segments using their internal reporting structure under IAS 14R, the cost of disclosure for these additional items upon adopting IFRS 8 would be negligible. For these multiple-segment no-change firms, the new standard, however, allowed them to reduce the amount of detailed segment information disclosed. On the assumption that disclosure is viewed by the management of some firms as imposing proprietary and/or agency costs which exceed the benefits of disclosure, we hypothesise:

H5: A decrease in disclosure after IFRS 8 for multiple-segment firms with no-change in the number of reported segments is more likely for firms with higher agency and/or proprietary costs.

(iv) Impact of Segment Disclosures on the Information Environment

Earlier research has used the properties of analyst forecasts to examine whether SFAS 131 increased the extent of information available to users. Berger and Hann (2003) examine the accuracy of analyst forecast errors using SFAS 131 disclosures and pre-SFAS 131 disclosures. They generate 1-year-ahead forecasts based on both the pre-SFAS 131 data and the SFAS 131 restated information. They find that the restated information is related to analyst forecasts in the first half of the SFAS 131 adoption year, indicating that analysts considered the SFAS 131 information prior to the disclosure of the information. They also report that analyst earnings forecast errors decreased for firms that changed the number of reportable segments upon adopting SFAS 131, highlighting that the revised segment data contained significant new information. In contrast, Botosan and Stanford (2005) find that SFAS 131 increased analyst forecast errors and uncertainty but improved analyst forecast consensus.

Ettredge et al. (2005) analyse whether the capital market's ability to predict future earnings improved after the adoption of SFAS 131. Consistent with an improvement in the information environment, they find a significant increase in the forward earning response coefficient (FERC) post-SFAS 131. This improvement in the FERC exists for single-segment firms that disclosed more segments after the adoption of SFAS 131 and multiple-segment firms irrespective of whether they reported a larger number of segments. In contrast, there is no significant change in the FERC for single-segment firms that do not report additional segments upon the adoption of SFAS 131.

The impact of higher quality segment disclosures on a firm's cost of capital is investigated in Blanco et al. (2015). Using a proxy for a firm's voluntary reporting of segment information, they report a negative association between the extent of voluntary segment disclosures and estimates of a firm's *ex-ante* cost of capital. This association however is moderated for firms with greater competitive pressures.

Currently there is limited evidence outside the US on whether the adoption of the management approach for segment reporting led to an improvement in the properties of analyst forecasts. In a concurrent study, Leung and Verriest (2015) find a lack of evidence that analyst forecast accuracy or dispersion improved for firms that provided better geographic segment information post-IFRS 8.[16] We address this gap in the literature by studying whether the accuracy and dispersion of analyst cash flow and earnings forecasts improves after adopting either IAS 14R or IFRS 8. Given the contrary evidence from the US we do not state a formal hypothesis.

(v) Australian Voluntary Segment Disclosure Research

Early Australian research on segment disclosure focuses on investigating the incentives for voluntary segment reporting prior to the introduction of mandated segment disclosure in 1986 (i.e., AAS 16 "*Financial Reporting by Segments*"[17]). This literature is important as it identifies factors which motivate firms to supply segment information to meet the information needs of users. In consequence, these studies inform a number of variables included in our regression models which aim to control for demand side drivers of segment disclosures.

McKinnon and Dalimunthe (1993), examine voluntary segment disclosure among 65 diversified companies in 1985. Consistent with disclosures being provided to reduce agency costs, they find that voluntary disclosers of segment information had higher ownership dispersion. Voluntary disclosers were also larger and had greater complexity as measured by the number of subsidiaries. The voluntary disclosure of segment information was also related to the presence of minority interests in the group structure. This finding suggests that segment information was provided to meet the information needs of minority shareholders. They also report that leverage and diversification into unrelated industries are not significantly associated with voluntary segment reporting.

Mitchell et al. (1995) also examine the voluntary disclosure of segment reporting in Australia pre-AAS 16. Their results are consistent with those in McKinnon and Dalimunthe (1993) except that the presence of minority interests is not significantly associated with segment disclosure. In addition, they find that voluntary disclosers have higher leverage than non-disclosers. They attribute this result to firms providing segment information to reduce the agency costs of debt.

Neither McKinnon and Dalimunthe (1993) nor Mitchell et al. (1995) find that firm diversification influences voluntary segment reporting. Aitken et al. (1997) argue that this insignificant finding is due to the use of a categorical variable to

16 They also find no change in the cost of capital or bid–ask spreads for firms with improvements in the reporting of geographic segment information.

17 From the late 1980s until the early 2000s, Australia maintained two parallel sets of standards: the AAS series was imposed as a professional obligation by the accounting bodies, whilst the AASB standards were imposed on relevant entities by corporate law. In all other respects the standards were identical. AAS 16 was thus the parallel form of AASB 1005.

measure diversification. They utilise an alternative measure of firm diversification calculated using the correlation between share returns in the industries represented in a diversified firm's segments. Their findings are similar to those in McKinnon and Dalimunthe (1993), with the exception that they find firms with greater diversification are significantly more likely to voluntarily provide segment disclosures.

4. METHOD AND SAMPLE

Our analysis of the first hypothesis involves a descriptive comparison of the number of segments disclosed before and after the adoption of IAS 14R and IFRS 8. Hypotheses 2 to 4 consider whether the disclosure of additional segments after the adoption of IAS 14R and IFRS 8 is driven by diversity, industry concentration and the presence of loss-making segments. If agency and/or proprietary costs and industrial diversity drive segment disclosure strategy, then we would expect the move to IAS 14R and IFRS 8 to have resulted in the reporting of additional segments which are respectively loss-making, in highly concentrated industries and operating in different industries. Our initial test of Hypotheses 2 to 4 uses logistic regression predicting changes in the number of segments disclosed. The independent variables capture the alternative motivations for withholding segment information discussed above, as well as controlling for other factors which are associated with the demand for segment information by users. The logit model is specified as follows:

$$CHANGEUP = \alpha + \beta_1 DIVERSITY + \beta_2 CONCEN + \beta_3 NLSEG + \Sigma\ controls\ +\ \varepsilon. \quad (1)$$

CHANGEUP is an indicator variable taking the value of one if there is an increase in the number of segments reported after the adoption of the new accounting standard. Firms are defined to have increased the number of segments reported by comparing the number of segments disclosed in the year prior to the adoption of the new standard with the comparative information provided in the first year the new standard is adopted. This approach is similar to the method used to identify newly reported segments in Berger and Hann (2003). The primary segment disclosures are used as the basis of comparison for both the move to and away from IAS 14R.

To test **H2** we use a measure of firm industrial diversity (*DIVERSITY)* which is defined as the number of unique industries in which a firm operates. The coefficient, β_1, is predicted to have a positive sign. Industry concentration (*CONCEN)* measured using a four-firm concentration ratio is used to test **H3**. The four-firm concentration ratio for a firm's primary industry is the top four firms' sales in that industry divided by the sum of all the firms' sales in that industry. It is predicted that the coefficient β_2 has a positive sign. That is, firms operating in industries with a higher concentration (i.e., less competitive) are more likely to have not disclosed segments before the adoption of IAS 14R/IFRS 8, relative to firms that operate in industries with a lower concentration.[18] Lastly, *NLSEG* is the number of loss-making segments disclosed for the comparative year after the adoption of either IAS 14R or IFRS 8 divided by the total number of reported segments. **H4** predicts a positive coefficient on β_3, since loss-making segments would have been under-reported under the previous, more flexible, standards.

18 For the *DIVERSITY* and *CONCEN* measures, industries are defined using two digit GICS codes.

We include a number of control variables in the regression model to capture a firm's incentive to disclose accurate segment information to meet the information demand of users. These control variables are informed by the prior Australian voluntary segment disclosure research discussed above. These earlier studies suggest that segment information is provided voluntarily by firms with: greater ownership dispersion, higher complexity and a larger size (McKinnon and Dalimunthe, 1993). Ownership dispersion is measured using the percentage ownership held by the top twenty shareholders (*TOP20*), while firm complexity is proxied using the number of subsidiaries (*SUBSNUM)*. Firm size is calculated using the natural logarithm of total assets (*SIZE*).

McKinnon and Dalimunthe (1993) find that voluntary segment information is disclosed more frequently when the group structure includes an outside equity interest. We control for this effect by including an indicator variable in the model (*NCI*) coded as one when there is a non-controlling interest in the group. Mitchell et al. (1995) find that higher leverage leads to greater voluntary segment disclosure, consistent with providing information to reduce the agency costs of debt. We include *LEVERAGE* in the model, constructed as the book value of debt divided by the book value of equity. As prior studies indicate that these control variables are associated with the voluntary provision of segment information, we expect the coefficients on these variables to be negatively related to the reporting of additional segments after the adoption of IFRS 8 and IAS 14R.

The final two control variables included in model (1) are firm performance, measured by a firm's return on assets (*ROA*), and growth prospects, proxied for using a company's market-to-book ratio (*MTB*) at financial year-end. If profitable and growth firms have higher incentives to not disclose profitable and growth segments, perhaps due to proprietary or political cost reasons, we expect that the move to the management approach for segment reporting results in such firms revealing additional segments. All of our control variables are measured for the financial year (or year-end) which is used to calculate the change in the number of reported segments.[19]

The Morningstar DatAnalysis Premium database is used to identify the population of ASX firms in June 2002 and 2009 for the IAS 14R and IFRS 8 adoptions, respectively. We manually collect segment and other financial data from a firm's first year of adoption of IFRS 8 and IAS 14R by downloading each annual report from DatAnalysis. The retrospective application of each accounting standard is compared to the historical application of the prior standard for the same year. For firms that voluntarily adopted either standard earlier than the mandatory application date we obtained data for the first year of adoption.[20] To test **H5**, a segment disclosure checklist is completed for multiple-segment firms under IAS 14R that had no-change in the

19 A potential limitation of this study (and prior studies) examining the incentives for under-reporting of segments is that we measure our test and control variables at the same time as the adoption of the relevant accounting standard. As the incentives for under-reporting are unlikely to be static it may be more accurate to measure our variables using a time-series approach. We do not use such an approach due to a lack of machine readable data for all our variables and uncertainty over the appropriate time period over which to calculate an average measure. Our approach is also consistent with previous literature. This limitation needs to be considered when interpreting our findings. We thank an anonymous referee for pointing out this limitation.

20 The number of firms which adopted the standards early is 15 (1.2% of the sample) for IAS 14R and 29 (1.8% of the sample) for IFRS 8. The results in this study are unchanged if early adopting firms are excluded.

Table 1

Distribution (frequency) of Single-segment Firms and Multiple-segment Firms in the Lag Adoption Year.

Panel A

		IFRS 8		
IAS 14R		*Single-segment*	*Multi-segment*	*Total Number of Firms*
	Single-segment	1,007 *(84.1%)*	190 *(15.9%)*	1,197 *(100%)*
	Multi-segment	41	379	420
	Total number of firms	1,048	569	1,617

Panel B

		IAS 14 R		
IAS 14		*Single-segment*	*Multi-segment*	*Total Number of Firms*
	Single-segment	568 *(81.5%)*	129 *(18.5%)*	697 *(100%)*
	Multi-segment	21	523	544
	Total number of firms	589	652	1,241

number of segments disclosed under IFRS 8. Firms are excluded if they are new listings, do not have financial statements for the pre-adoption year, or if they report under non-Australian accounting standards.

The *CHANGEUP* variable is based on a count of segments disclosed in each firm's pre-adoption year financial report compared with a count of segments in the restated data in the first adoption year. The number of segments is not affected by mergers, acquisitions or divestitures since the lag adoption year is a pure restatement. The number of segments excludes segments labelled: "other", "corporate", "administration" and the like.[21] When examining the adoption of IFRS 8, multiple geographic segments were counted only as a single-segment since the aim of IFRS 8 was to disclose line of business or product/service segmentation. That is, firms that disclosed multiple geographic segments also state that they operate in a "single operating segment". Table 1 highlights that the sample includes 1,617 firm observations for the IFRS 8 adoption (Panel A) and 1,241 observations for the IAS 14R adoption (Panel B).

5. RESULTS

(i) Change in the Number of Segments

We commence with some descriptive statistics to evaluate **H1**. Table 1 shows a reduction in the number of single-segment firms and an increase in the number of multiple-segment firms upon the adoption of both accounting standards. The revision of IAS 14 and adoption of IFRS 8 reduced the number of single-segment firms by 19% and 16%, respectively. The reduction in the number of single-segment firms

21 We exclude such segments because the accounting standards focus on the disclosure of information for segments undertaking business activities and earning (or having the potential) to earn revenues.

supports the hypothesis that the move to requiring firms to use their internal reporting structure to report segments externally leads to an increase in the number of segments reported. Our finding of an increase in the number of reported segments is consistent with prior studies (Berger and Hann, 2003; Botosan and Stanford, 2005; Crawford et al., 2012; Nichols et al., 2012; and Kang and Gray, 2013). The data in Table 1 also indicate that (other than after the adoption of IAS 14R) the number of single-segment firms dominates multiple-segment firms.

Panels A–C of Table 2 report a comparison of the number of segments reported around the adoption of IFRS 8. A similar comparison for the move to IAS 14R is provided in Panels D–F. Panel A (D) shows that 88.6% (74.2%) of firms have one or two segments under IAS 14R (IAS 14 original). However, this decreases to 83% (68%) under IFRS 8 (IAS 14R). The proportion of firms with a change in the number of segments is slightly larger for the move to IAS 14R. Panel B indicates that 79% of the sample report no-change in the number of segments after the adoption of IFRS 8 compared to 77% following the move to IAS 14R. The greatest number of segment changes for both accounting standards reflects an increase of only one segment.[22] Panels C and F highlight that the single to multiple-segments change groups represent the dominant category which increased the number of reported segments.[23]

(ii) Motives for the Non-disclosure of Segments

Table 3 reports univariate tests of firm characteristics for different groups of firms based on whether the number of segments increased upon the adoption of IFRS 8/IAS 14R.[24] In Panel A, firms which change from single to multiple-segments are compared with firms that remain single-segment firms. In Panel B, firms which change from single to multiple-segments are compared with multiple-segment firms which do not change the number of reported segments. Finally, Panel C compares multiple-segment firms which increase the number of reported segments to multiple-segment firms with no-change in the number of segments.

Across all three panels of Table 3, there is no difference in industry concentration between firms reporting a greater number of segments and the no-change control groups after the adoption of either accounting standard. These results are, thus, inconsistent with the findings of Botosan and Stanford (2005). There is also limited support for **H2**, as the diversity measure is only significantly higher for firms increasing the number of reported segments in Panel C for the adoption of IAS 14R. Additionally, in Panel B when the single-segment change group is compared to the multiple-segment no-change group, the direction of the significant finding on *DIVERSITY* for the IFRS 8 sample is inconsistent with our predictions. The result on the number of loss segments is only consistent with predictions in Panel B for the IFRS 8 sample.

22 Sixty-two (eighty-one) firms report a decrease in the number of segments upon adoption of IFRS 8 (IAS 14R). These firms are excluded from subsequent tables as a detailed analysis of firms reducing the number of reported segments is beyond the scope of this study. We do provide some preliminary analysis of these firms in the additional analysis section of this study (section 5(*v*)).

23 Included in both the IAS 14R and IFRS 8 samples are 684 firms. Across these firms, 17% and 22%, respectively, disclose additional segments after the adoption of IAS 14R and IFRS 8. Only 30 firms (4%) disclose additional segments after the adoption of both standards.

24 For single-segment no-change firms, the calculation of industrial diversity or the proportion of loss-making segments does not apply. In consequence for these firms these variables are coded as n/a in Panel A of Table 3.

Table 2

Number of Reported Segments and Reporting Change in the Number of Segments in the Lag Adoption Year

Panel A: Number of Reported Segments: IAS14R vs. IFRS 8

	IAS 14R				*IFRS 8*			
No. of segments	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*
1	1,197	74.0	1,197	74.0%	1,048	64.8%	1,048	64.8%
2	236	14.6	1,433	88.6%	294	18.2%	1,342	83.0%
3	92	5.7	1,525	94.3%	133	8.2%	1,475	91.2%
4	55	3.4	1,580	97.7%	74	4.6%	1,549	95.8%
5	28	1.7	1,608	99.4%	44	2.7%	1,593	98.5%
6	5	0.3	1,613	99.8%	11	0.7%	1,604	99.2%
7	1	0.1	1,614	99.8%	6	0.4%	1,610	99.6%
8	1	0.1	1,615	99.9%	3	0.2%	1,613	99.8%
9	2	0.1	1,617	100.0%	2	0.1%	1,615	99.9%
10	0				1	0.1%	1,616	99.9%
11	0				1	0.1%	1,617	100.0%

Panel B: Change in Number of Segments under IFRS 8

Change in no. of segments	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*
−3	1	0.06%	1	0.06%
−2	8	0.49%	9	0.56%
−1	53	3.28%	62	3.83%
0	1,285	79.47%	1,347	83.30%
+1	181	11.19%	1,528	94.50%
+2	52	3.22%	1,580	97.71%
+3	20	1.24%	1,600	98.95%
+4	10	0.62%	1,610	99.57%
+5	5	0.31%	1,615	99.88%
+6	1	0.06%	1,616	99.94%
+10	1	0.06%	1,617	100.00%

(Continued)

Table 2
Continued

Panel C: Change in Number of Segments under IFRS 8 Classified by Number of Segments under IAS 14R

			Change in the Number of Reported Segments Under IFRS 8										
		No. of obs.	*−3*	*−2*	*−1*	*0*	*+1*	*+2*	*+3*	*+4*	*+5*	*+6*	*+10*
IAS 14R: No. of reported segments	1	1,197				1,007	130	37	11	7	3	1	1
	2	236			34	154	32	9	6	1			
	3	92		6	8	59	10	5	1	2	1		
	4	55	1	2	5	39	6		2				
	5	28			5	19	2	1			1		
	6	5			1	4							
	7	1					1						
	8	1				1							
	9	2				2							

Panel D: Number of Reported Segments: IAS 14 vs. IAS 14R

	IAS 14				*IAS 14R*			
No. of segments	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*
1	697	56.2%	697	56.2%	598	48.2%	598	48.2%
2	224	18.0%	921	74.2%	246	19.8%	844	68.0%
3	168	1.5%	1,089	87.8%	208	16.8%	1,052	84.8%
4	88	7.1%	1,177	94.9%	111	8.9%	1,163	93.7%
5	36	2.9%	1,213	97.7%	39	3.1%	1,202	96.9%
6	19	1.5%	1,232	99.3%	24	1.9%	1,226	98.8%
7	7	0.6%	1,239	99.8%	10	0.8%	1,236	99.6%
8	1	0.1%	1,240	99.9%	3	0.2%	1,239	99.8%
9	0		1,240	99.9%	1	0.1%	1,240	99.9%
10	0		1,240	99.9%	0		1,240	99.9%
11	0		1,240	99.9%	1	0.1%	1,241	100%
12	1	0.1%	1,241	100%				

(Continued)

Table 2
Continued

Panel E: Change in Number of Segments under IAS 14R

Change in no. of segments	*Firms*	*%*	*Cumulative Freq*	*Cumulative %*
−3	4	0.32%	4	0.32%
−2	22	1.77%	26	2.10%
−1	55	4.43%	81	6.53%
0	954	76.87%	1,035	83.40%
+1	113	9.11%	1,148	92.51%
+2	59	4.75%	1,207	97.26%
+3	22	1.77%	1,229	99.03%
+4	7	0.56%	1,236	99.60%
+5	3	0.24%	1,239	99.84%
+6	2	0.16%	1,241	100.00%

Panel F: Change in Number of Segments under IAS 14R Classified by Number of Segments under IAS 14

			Change in the Number of Reported Segments Under IAS 14R									
		No. of obs.	***−3***	***−2***	***−1***	***0***	***+1***	***+2***	***+3***	***+4***	***+5***	***+6***
IAS 14: No. of reported segments	1	697				568	60	42	17	6	2	2
	2	224			21	167	22	11	3			
	3	168		9	13	125	16	4			1	
	4	88	1	5	14	59	4	2	2	1		
	5	36	1	3	5	19	8					
	6	19	2	2	3	11	1					
	7	7			1	5	1					
	8	1					1					
	11	1			1							

Table 3
Univariate Tests between Samples

Panel A: Single to Multiple-segment (1) vs. Single-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
IFRS 8									
DIVERSITY	1	188	1	3	0.324	1.079	n/a	1	n/a
	0	0	n/a	n/a	n/a	n/a		n/a	
CONCEN	1	185	0.455	0.999	0.160	0.653	0.74	0.626	1.00
	0	941	0.486	0.975	0.194	0.633		0.626	
NLSEG	1	186	0	1	0.403	0.424	n/a	0.500	n/a
	0	942	n/a	n/a	n/a	n/a		n/a	
MTB	1	186	−10.918	37.804	3.562	2.040	0.342	1.278	0.025**
	0	948	−517.01	145.02	19.70	1.337		0.952	
ROA	1	189	−7.925	0.975	0.748	−0.21	0.136	−0.047	0.00**
	0	906	−162.42	59.686	7.687	−0.98		−0.154	
LEVERAGE	1	188	−10.838	17.953	2.165	0.920	0.03**	0.331	0.00**
	0	972	−58.598	50.378	4.307	0.452		0.920	
SIZE	1	189	5.286	10.344	0.469	7.588	0.00***	7.552	0.00**
	0	981	3.622	9.991	1.412	6.940		7.001	
NCI	1	186	0	1	0.447	0.272	0.00***	0	n/a
	0	921	0	1	0.055	0.298		0	
TOP20	1	188	0.100	0.990	0.199	0.637	0.001***	0.652	0.001***
	0	1,002	0.098	0.994	0.198	0.592		0.598	

(Continued)

Table 3
Continued

Panel A: Single to Multiple-segment (1) vs. Single-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
IFRS 8									
SUBSNUM	1	189	0	300	0.119	29.286	0.00***	5	0.00***
	0	1,003	0	100	0.101	8.470		3	
IAS 14R									
DIVERSITY	1	129	1	3	0.453	1.171	n/a	1	n/a
	0	0	n/a	n/a	n/a	n/a		n/a	
CONCEN	1	129	0.457	0.960	0.179	0.604	0.676	0.524	0.6141
	0	568	0.457	0.960	0.159	0.597		0.524	
NLSEG	1	129	0	1	0.070	0.012	n/a	0.000	n/a
	0	568	n/a	n/a	n/a	n/a		n/a	
MTB	1	129	−0.045	105.14	9.583	2.985	0.399	1.300	0.683
	0	568	−128.72	84.700	9.896	2.176		1.243	
ROA	1	129	−2.370	0.248	0.404	−0.128	0.347	0.025	0.00***
	0	568	−48.047	35.500	2.780	−0.359		−0.050	
LEVERAGE	1	129	−1.135	16.300	2.035	1.216	0.517	0.596	0.00***
	0	568	−77.677	61.374	5.501	0.897		0.272	
SIZE	1	129	12.937	23.250	2.045	17.65	0.00***	17.480	0.00***
	0	568	9.082	24.370	2.124	16.72		16.389	
NCI	1	129	0	1	0.371	0.163	0117	0	0155
	0	568	0	1	0.316	0.113		0	

(Continued)

Table 3
Continued

Panel A: Single to Multiple-segment (1) vs. Single-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
IFRS 8									
TOP20	1	129	0.176	0.981	0.182	0.665	0.074*	0.684	0.235
	0	568	0	0.996	0.212	0.629		0.656	
SUBSNUM	1	129	0	138	23.338	13.03	0.00***	5	0.00***
	0	568	0	154	11.705	5.234		2	

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed)
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(Continued)

Table 3
Continued

Panel B: Single to Multiple-segment (1) vs. Multiple-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
IFRS 8									
DIVERSITY	1	188	1	3	0.324	1.073	0.000***	1	0.000***
	0	276	1	6	0.847	1.263		1	
CONCEN	1	185	0.455	0.999	0.160	0.653	0.595	0.626	0.116
	0	272	0	0.975	0.183	0.643		0.655	
NLSEG	1	186	0	1	0.403	0.424	0.029***	0.500	0.025**
	0	277	0	1	0.384	0.306		0.225	
MTB	1	186	−10.918	37.804	3.562	2.040	0.129	1.278	0.000***
	0	273	−263.52	41.700	15.706	0.653		0.832	
ROA	1	189	−7.925	0.975	0.748	−0.214	0.892	−0.047	0.000***
	0	277	−9.835	0.588	0.978	−0.262		0.004	
LEVERAGE	1	188	−10.838	17.953	2.165	0.920	0.361	0.331	0.000**
	0	277	−1856.3	43.312	104.135	−4.523		0.748	
SIZE	1	189	5.286	10.344	0.469	7.588	0.000***	7.552	0.001***
	0	277	5.017	11.771	1.046	7.876		7.811	
NCI	1	186	0	1	0.447	0.272	0.001***	0	n/a
	0	276	0	1	0.489	0.392		0	
TOP20	1	188	0.100	0.990	0.199	0.637	0.077*	0.652	0.186
	0	276	0.223	0.997	0.188	0.662		0.671	
SUBSNUM	1	189	0	300	0.119	29.286	0.004**	5	0.159
	0	272	0	950	67.678	28.508		11	
IAS 14R									
DIVERSITY	1	129	1	3	0.453	1.171	0.132	1	0.184
	0	386	1	5	0.570	1.254		1	
CONCEN	1	129	0.457	0.960	0.179	0.604	0.388	0.524	0.356
	0	386	0.457	0.960	0.165	0.589		0.524	

(Continued)

Table 3
Continued

Panel B: Single to Multiple-segment (1) vs. Multiple-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
NLSEG	1	129	0	0.500	0.070	0.012	0.00***	0.000	0.00***
	0	386	0	1	0.389	0.502		0.500	
MTB	1	129	−0.045	105.136	9.583	2.985	0.856	1.300	0.666
	0	386	−1.700	96.301	7.950	2.832		1.223	
ROA	1	129	−2.370	0.248	0.404	−0.128	0.251	0.025	0.147
	0	386	−14.381	0.529	0.901	−0.223		−0.007	
LEVERAGE	1	129	−1.135	16.300	2.035	1.216	0.453	0.596	0.559
	0	386	−10.627	76.955	5.720	1.602	386	0.677	
SIZE	1	129	12.937	23.250	2.045	17.654	0.751	17.480	0.666
	0	386	12.559	26.163	2.267	17.725		17.230	
NCI	1	129	0	1	0.371	0.163	0.00***	0	0.00***
	0	386	0	1	0.463	0.311		0	
TOP20	1	129	0.176	0.981	0.182	0.665	0.072*	0.684	0.666
	0	386	0	0.999	0.231	0.624		0.665	
SUBSNUM	1	129	0	138	23.338	13.031	0.312	5	0.297
	0	386	0	895	59.400	18.461		6	

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(Continued)

Table 3
Continued

Panel C: Multiple-segment increase (1) vs. Multiple-segment no-change (0)

	Single to multiple-segments = 1	*N*	*Min*	*Max*	*Std Dev*	*Mean*	*Mean test*	*Median*	*Median test*
IFRS 8									
DIVERSITY	1	80	1	4	0.837	1.588	0.187	1	0.699
	0	276	1	6	0.847	1.263		1	
CONCEN	1	77	0	0.980	0.216	0.650	0.694	0.660	0.517
	0	272	0	0.975	0.183	0.643		0.655	
NLSEG	1	80	0	0.800	0.263	0.237	0.013**	0.230	0.176
	0	277	0	1	0.384	0.306		0.225	
MTB	1	77	−2.48	13.250	2.558	1.995	0.138	1.000	0.028**
	0	273	−263.52	41.700	15.706	0.653		0.832	
ROA	1	80	−1.810	0.300	0.313	−0.021	0.039**	0.050	0.194
	0	277	−9.835	0.588	0.978	−0.262		0.004	
LEVERAGE	1	79	−46.30	39.98	7.561	1.482	0.322	0.750	0.524
	0	277	−1856.33	43.312	104.135	−4.523		0.748	
SIZE	1	80	6.460	11.640	1.146	8.586	0.000***	8.670	0.039**
	0	277	5.017	11.771	1.046	7.876		7.811	
NCI	1	78	0	0	0.502	0.538	0.446	0	n/a
	0	276	0	1	0.489	0.392		0	
TOP20	1	80	0.32	0.92	0.154	0.685	0.733	0.700	1
	0	276	0.223	0.997	0.188	0.662		0.671	
SUBSNUM	1	79	0	276	53.814	41.575	0.560	18.5	0.458
	0	272	0	950	67.678	28.508		11	

(Continued)

Table 3
Continued

Panel C: Multiple-segment increase (1) vs. Multiple-segment no-change (0)									
IAS 14R									
DIVERSITY	1	77	1	7	0.896	1.442	0.018**	1	0.066*
	0	386	1	5	0.570	1.254		1	
CONCEN	1	77	0.458	0.960	0.165	0.584	0.799	0.484	0.845
	0	386	0.457	0.960	0.165	0.589		0.524	
NLSEG	1	77	0	0.750	0.237	0.204	0.00***	0.143	0.00***
	0	386	0	1	0.389	0.502		0.500	
MTB	1	77	0.094	8.494	1.670	2.018	0.372	1.470	0.023**
	0	386	−1.700	96.301	7.950	2.832		1.223	
ROA	1	77	−4.083	0.145	0.578	−0.110	0.293	0.046	0.00**
	0	386	−14.381	0.529	0.901	−0.223		−0.007	
LEVERAGE	1	77	0.011	18.562	3.590	2.209	0.371	1.280	0.00***
	0	386	−10.627	76.955	5.720	1.602		0.677	
SIZE	1	77	14.753	25.969	2.656	19.616	0.00***	19.438	0.00
	0	386	12.559	26.163	2.267	17.725		17.230	
NCI	1	77	0	1.000	0.501	0.455	0.015**	0	0.021**
	0	386	0	1.000	0.463	0.311		0	
TOP20	1	77	0.207	0.997	0.169	0.631	0.808	0.641	0.467
	0	386	0	0.999	0.231	0.624		0.665	
SUBSNUM	1	77	0	423	72.552	43.597	0.00***	17	0.00***
	0	386	0	895	59.400	18.461		6	

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

In contrast, for the IAS 14R sample, the proportion of segments making a loss is actually lower for change firms for both single-segment (Panel B) and multiple-segment change firms (Panel C). Similarly, for the IFRS 8 sample, in Panel C when multiple-segment change firms are compared with multiple-segment no-change firms, the number of loss segments is significantly lower (mean only) for the change group. Overall, our univariate results do not lend support to the proprietary cost argument. Moreover we find only limited and mixed findings in relation to the agency cost explanation for under-reporting.

A number of the control variables reported in Table 3 are significantly different between the change firms and the comparison control groups. The findings, however, are inconsistent both across panels and between the changes in accounting standards. For example, the median market-to-book ratio is significantly higher for the change firms, particularly for the IFRS 8 sample in all three panels of Table 3. This indicates that firms which disclosed additional segments typically have higher growth prospects than firms already disclosing segments using their internal reporting structure. Similar to Botosan and Stanford (2005), for both samples the single to multiple-segment change group has a higher median profitability than the single-segment no-change comparison group (Panel A). For the IFRS 8 sample, the multiple-segment firms with an increase in the number of reported segments also had better average profitability when compared to the multiple-segment no-change comparison group. Similar results are found using the median for the IAS 14R sample. The results largely show that both single and multiple-segment change firms are larger than the control comparison groups when compared respectively with single-segment no-change firms (Panel A) and multiple-segment no-change firms (Panel C). Additionally, there is some support for change firms having a significantly greater number of subsidiaries (*SUBSNUM*) than no-change firms. For the IFRS 8 sample, the tests for differences in the mean show that the proportion of single-segment change firms with a non-controlling interest (*NCI*) is lower than both the single and multiple-segment firm no-change groups. This finding supports earlier Australian research which indicates greater voluntary segment disclosure when the firm ownership structure includes a minority interest. The results for the IAS 14R sample are consistent in Panel B but provide the opposite conclusion in Panel C. Other than the IFRS 8 sample in Panel B, the average *TOP20* shareholding is significantly higher for change firms in both Panels A and B.[25] The results on firm leverage provide no consistent significant differences between change and no-change firms.

Table 4 presents Pearson correlation coefficients amongst the variables for both the IFRS 8 (Panel A) and IAS 14R (Panel B) samples. Although there are a number of significant correlations, the levels are generally not high enough to raise concerns regarding multicollinearity (Pearson, 2010). Interestingly, the correlation between the proportion of loss making segments (*NLSEG*) and firm size and industrial diversity are negative for the IAS 14R adoption and positive for the IFRS 8 adoption. As would be expected, firms with the presence of a non-controlling interest are larger in size, have more subsidiaries and exhibit greater industrial diversity. The calculation of VIF

25 The data presented in Table 3 show the presence of significant outliers. The main results presented in Tables 5, 6 and 8 were also re-estimated after winsorising the top and bottom 5% of the continuous variables. The conclusions drawn from this alternative analysis are unchanged to those presented in the paper.

Table 4
Pearson Correlation Matrix

Panel A

IFRS 8	*DIVERSITY*	*CONCEN*	*NLSEG*	*MTB*	*ROA*	*LEVERAGE*	*SIZE*	*NCI*	*TOP20*	*SUBSNUM*
DIVERSITY	1									
CONCEN	0.026	1								
NLSEG	0.493***	0.032	1							
MTB	−0.011	0.014	−0.021	1						
ROA	0.051**	−0.031	0.018	−0.009	1					
LEVERAGE	−0.041	−0.028	−0.076***	0.415***	0.001	1				
SIZE	0.307***	−0.074***	0.056**	0.033	0.128***	0.019	1			
NCI	0.524***	0.018	0.322***	−0.014	0.037	−0.054**	0.276***	1		
TOP20	0.148***	−0.046*	0.055**	−0.007	0.025	−0.028	0.084***	0.112***	1	
SUBSNUM	0.352***	−0.076***	0.212	0.003	0.027	0.014	0.343***	0.335***	0.090***	1

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(Continued)

Table 4
Continued

Panel B

IAS 14R	*DIVERSITY*	*CONCEN*	*NLSEG*	*MTB*	*ROA*	*LEVERAGE*	*SIZE*	*NCI*	*TOP20*	*SUBSNUM*
DIVERSITY	*1*									
CONCEN	0.005	1								
NLSEG	−0.072**	0.093***	1							
MTB	0.066**	−0.012	0.002	1						
ROA	−0.028	−0.008	−0.173***	−0.011	1					
LEVERAGE	0.012	−0.069**	−0.068**	0.355***	0.021	1				
SIZE	0.052*	−0.022	−0.526***	−0.046	0.194***	0.126***	1			
NCI	0.180***	0.010	−0.075**	−0.009	0.012	0.065**	0.267**	1		
TOP20	−0.049*	0.052*	−0.083**	0.014	0.047	0.016	−0.025	0.000	1	
SUBSNUM	0.113***	0.054*	−0.164***	−0.009	0.032	0.056*	0.425**	0.277***	0.032	1

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

factors after estimating our regression model confirms that multicollinearity is not a concern with our analysis.

Table 5 presents our test results for Hypotheses 2–4 using a logistic specification. Each of the five columns in this table represents a logistic regression explaining *CHANGEUP*. This variable is defined as one when a firm increases the number of its reported segments as a result of the change to either IFRS 8 (Panel A) or IAS 14R revised (Panel B), and is zero otherwise. Each group of change firms is compared to a reference group. Columns (1) and (2) compare single-segment change firms against, respectively, single-segment no-change firms and multiple-segment no-change firms. Column (1) is analogous to the Botosan and Stanford (2005) approach, where the appropriate comparison group for single-segment firms that changed to multiple-segment firms is the group of single-segment firms with no-change in the number of reported segments. In contrast, column (2) highlights an important issue not addressed in Botosan and Stanford (2005); if the new standard better reflects economic reality, then single to multiple-segment change firms are really multiple-segment firms that did not disclose some of their segments. Looked at this way, the appropriate comparison group is multiple-segment firms which were unaffected by the two standards, that is, multiple-segment no-change firms (column (2)). Overall, each of the standards appear to have contributed to resolving potential under-reporting issues in different ways.

H2 predicts that a firm is more likely to reveal additional segments if it operates across an increasing number of industries. The results for the adoption of both accounting standards lend some support to this hypothesis as the coefficient on the diversity variable is positive and significant in columns (3) and (4) of both Panels A and B. In contrast, when single-segment change firms are compared to multi-segment non-change firms (i.e., column (2)), the coefficient on diversity is negative and is significant for the IFRS 8 sample. This finding is possibly explained by the single-segment change firms being smaller than multiple-segment no-change firms (see Panel B of Table 3).

The results on the concentration variable are generally insignificant providing very little support for **H3**. For the IFRS 8 sample, when single-segment change firms are compared with single-segment no-change firms (i.e., column (1)), the concentration variable is positive and significant indicating that firms with newly revealed segments operated in more concentrated industries. This finding is consistent with that reported in Botosan and Stanford (2005). In contrast, when single-segment change firms are compared with multiple-segment no-change firms (i.e., column (2)), the concentration variable is insignificant for the IFRS 8 sample. Interestingly, for the IAS 14R sample shown in Panel B, the results on the concentration variable provide opposite conclusions, with the variable being positive and significant in column (2), but insignificant in column (1). The sensitivity of the significance of the concentration variable to the choice of control group is consistent with concerns about the approach of Botosan and Stanford (2005) noted in Berger and Hann (2007).

The findings for **H4** provide contrasting results between the adoption of IFRS 8 and the adoption of IAS 14R. In Panel A, other than column (3), the results indicate that change firms after the adoption of IFRS 8 had a higher proportion of loss-making segments consistent with expectations. However, the results in each column of Panel B indicate that change firms disclosed a lower frequency of loss-making segments after the implementation of IAS 14R. These findings are suggestive of firms using the "risks and returns" qualification embodied in IAS 14R to reduce the disclosure of

Table 5

Logit Regression Testing which Firms Disclosed Additional Segments after the Accounting Standard

Panel A: IFRS 8

	Single to Multi-segment changer vs. Single- Segment non-changer (1)	*Single to Multi-segment changer vs. Multi-segment non-changer (2)*	*Multi-segment changer vs. Multi-segment non-changer (3)*	*Single and Multi changer vs. Single and Multi non- changer (4)*	*Single and Multi changer vs. Multi-segment non- changer (5)*
Intercept	−6.8915	−0.1386	−6.9201	−6.7267	−1.0073
	(−5.76)***	(−0.14)	(−4.63)***	(−6.86)***	(−1.20)
DIVERSITY	–	**−0.3854**	**0.3747**	**1.0409**	−0.0317
		(−2.85)***	**(2.30)****	**(7.57)*****	(−0.27)
CONCEN	**1.7032**	0.5771	0.2203	0.5544	0.4688
	(2.68)***	(1.04)	(0.32)	(1.26)	(0.98)
NLSEG	–	**0.8983**	0.0825	**1.8445**	**0.6091**
		(3.43)***	(0.22)	**(6.85)*****	**(2.52)****
MTB	0.0012	0.0330	**0.0680**	**0.0155**	**0.0412**
	(0.31)	(1.45)	**(2.14)****	**(2.30)****	**(1.68)***
ROA	0.0232	0.3226	0.3251	**0.0505**	0.2877
	(1.48)	(1.64)	(1.06)	**(2.11)****	(1.57)
LEVERAGE	0.0053	−0.0026	**−0.0085**	0.0002	−0.0039
	(0.30)	(−0.76)	**(−1.84)***	(0.15)	(−1.07)
SIZE	**0.4501**	−0.0086	**0.5015**	**0.4516**	0.0891
	(3.39)***	(−0.07)	**(3.32)*****	**(4.11)*****	(0.98)
Top20	**0.8540**	−0.3697	0.9198	0.4729	−0.3053
	(1.74)*	(−0.73)	(1.29)	(1.05)	(−0.65)
NCI	**4.6647**	−0.3175	0.3161	0.1714	−0.1619
	(8.01)***	(−1.33)	(1.11)	(0.69)	(−0.87)
SUBSNUM	0.0038	−0.0124	−0.0041	−0.0080	−0.0034
	(0.72)	(−1.18)	(−1.21)	(−1.55)	(−1.36)

(Continued)

Table 5
Continued

Panel A: IFRS 8

	Single to Multi-segment changer vs. Single- Segment non-changer (1)	*Single to Multi-segment changer vs. Multi-segment non-changer (2)*	*Multi-segment changer vs. Multi-segment non-changer (3)*	*Single and Multi changer vs. Single and Multi non- changer (4)*	*Single and Multi changer vs. Multi-segment non- changer (5)*
N	1,198	510	399	1,597	590
Pseudo R^2	0.213	0.071	0.085	0.264	0.025
Wald Chi-sq	103.00***	42.56***	35.31***	278.31***	21.57***

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(Continued)

Table 5
Continued

Panel B: IAS 14R

	Single to Multi-segment changer vs. Single- Segment non-changer (1)	*Single to Multi-segment changer vs. Multi-segment non-changer* (2)	*Multi-segment changer vs. Multi-segment non-changer* (3)	*Single and Multi changer vs. Single and Multi non- changer* (4)	*Single and Multi changer vs. Multi- segment non- changer* (5)
Intercept	−4.6542	4.9925	−5.6476	−1.0643	1.0478
	(−4.82)***	(3.13)***	(−3.64)***	(−1.04)	(0.89)
DIVERSITY	−	−0.3612	**0.3566**	**0.6265**	0.0847
		(−1.20)	**(1.81)***	**(3.20)*****	(0.50)
CONCEN	0.3490	**1.6514**	0.2857	0.7869	0.7298
	(0.56)	**(1.97)****	(0.34)	(1.47)	(1.19)
NLSEG	−	**−10.2367**	**−2.0609**	**−3.8305**	**−4.7907**
		(−6.25)***	**(−4.73)*****	**(−12.21)*****	**(−10.69)*****
MTB	0.0121	−0.0069	**−0.0550**	−0.0019	−0.0127
	(1.05)	(−0.44)	**(−2.13)****	(−0.21)	(−0.82)
ROA	0.0270	**−0.5621**	**−0.4452**	**−0.0717**	**−0.3048**
	(0.98)	**(−2.61)****	**(−2.45)****	**(−2.74)*****	**(−2.22)****
LEVERAGE	−0.0053	0.0136	0.0130	0.0121	0.0127
	(−0.41)	(0.69)	(0.74)	(0.81)	(0.62)
SIZE	**0.1329**	**−0.2954**	**0.1993**	−0.0465	−0.0726
	(2.76)***	**(−4.11)*****	**(2.90)*****	(−0.96)	(−1.32)

(Continued)

Table 5
Continued

Panel B: IAS 14R

	Single to Multi-segment changer vs. Single- Segment non-changer (1)	*Single to Multi-segment changer vs. Multi-segment non-changer (2)*	*Multi-segment changer vs. Multi-segment non-changer (3)*	*Single and Multi changer vs. Single and Multi non- changer (4)*	*Single and Multi changer vs. Multi- segment non- changer (5)*
Top20	**0.7921**	0.1734	0.5060	0.1416	0.3535
	(1.73)*	(0.25)	(0.92)	(0.38)	(0.73)
NCI	0.0154	−0.3537	0.2460	0.2595	0.0371
	(0.05)	(−0.97)	(0.81)	(1.15)	(0.14)
SUBSNUM	**0.0187**	0.0001	−0.0005	0.0024	0.0005
	(2.01)**	(0.06)	(−0.30)	(0.80)	(0.23)
N	698	516	464	1,161	593
Pseudo R^2	0.050	0.451	0.150	0.246	0.269
Wald Chi-sq	25.58***	68.53***	55.56***	180.29***	120.73***

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

loss-making segments.[26] The removal of this qualification in IFRS 8, however, appears to have been associated with the disclosure of more loss-making segments.

The results on the control variables are not consistently significant across alternative models and samples presented in Table 5. The size variable is positive and significant in three (two) of the IFRS 8 (IAS 14R) models suggesting that change firms are larger than their no-change counterparts. A possible interpretation of this result is that larger firms presented fewer segments for political cost reasons. For the IFRS 8 sample, firm return on assets is significant and positive only in column (4). In contrast, firms with higher profitability were less likely to reveal new segments after the adoption of IAS 14R. These results are suggestive of more profitable firms using the "risk and returns" qualification in IAS 14R to not disclose segments perhaps due to proprietary or political cost concerns. Debt to equity (*LEVERAGE*) has explanatory power in only one of the models. Prior Australian studies indicate that firms voluntarily provide segment information when there are a greater number of subsidiaries or lower ownership concentration. Our results however report generally insignificant findings on both the *TOP20* and *SUBSNUM* variables. In contrast to previous Australian research which documents higher voluntary disclosure of segment information in the presence of a minority interest, we only find a positive significant result for *NCI* when we compare single-segment change firms to single-segment no-change firms for the IFRS 8 sample (column (1)). All the other results on *NCI,* however, are insignificant.[27]

As an assessment of the economic significance of the results we calculate the marginal effects following each regression. We do not tabulate these results in the interest of brevity and restrict our discussion to those cases for which the key variables testing Hypotheses 2–4 report statistical significance in Table 5. The largest marginal effects arise for *NLSEG*. Using the IFRS 8 sample, in those models in which *NLSEG* is significant, a 25% increase in the proportion of loss-making segments increases the probability of a firm disclosing additional segments by 4% to 5%. For the IAS 14R sample, a similar increase in *NLSEG* lowers the probability of a firm disclosing additional segments by 8% to 18%. For firm industrial diversity, the disclosure of 25% more industries results in approximately a 1% to 2% change in the probability of a firm reporting additional segments using both accounting standard changes.[28] Recall that the results on *CONCEN* are largely insignificant in Table 5. For the two instances that provide a significant result in Table 5 the marginal effect of a 25% change in industry concentration is a 1% (IFRS 8) and 3% (IAS 14R) increase in the probability of a firm disclosing additional segments.

A potential shortcoming of the results presented in Table 5 is that a firm is classified as increasing the number of segments irrespective of the number of segments that are newly disclosed after the adoption of the accounting standard. To partially address this concern, we estimate a multinomial regression model using three categories for

26 A possible alternative explanation is that firms withheld details of profit-making segments prior to the adoption of IAS 14R, consistent with a proprietary or political cost explanation.

27 We do not include industry fixed effects in the estimation of model (1) as the *CONCEN* variable is measured using the top four firms' sales in a firm's primary GICS industry. The inclusion of both variables simultaneously would result in perfect collinearity. We re-estimate model (1) after removing *CONCEN* and including indicator variables for a firm's two-digit GICS code. The industry indicator variables are typically insignificant other than GICS 20 (Industrials), which is positively associated with *CHANGEUP* for the IAS 14R sample when comparing multiple segment no-change firms with multiple segment change firms. The conclusions from the results on the other variables remain unchanged to those presented.

28 The direction of the change in probability varies according to the sign of the coefficients in Table 5.

the dependent variable. The dependent variable is coded as: one if a firm reports one additional segment, two if a firm reports two or more additional segments, and zero otherwise. The results of this analysis are presented in Table 6 using the same comparison groups as used in Table 5. Panel A presents the results for the IFRS 8 sample and Panel B shows the results for the IAS 14R sample.

The results of the multinomial regression largely support the findings of our hypotheses presented in Table 5. The concentration variable remains largely insignificant providing only minimal support for proprietary costs explaining the non-disclosure of segments before the adoption of either accounting standard. Furthermore, the number of loss segments continues to provide different findings for the two accounting standards with the results on *NLSEG* continuing to be significant in the same direction and for the same tests as shown in Table 5. The only exception is in column (5) of Panel A with an insignificant coefficient for firms that increased the number of segments by two or more. We also continue to find some support for industry diversity resulting in the disclosure of additional segments. The results in column (3), however, provide differing results between the two samples as to whether diversity led to a significant increase of one or more segments. The results in column (2) for the IAS 14R sample also now report a significant negative coefficient on the diversity variable for firms that disclosed one additional segment. This finding is consistent with the results for the IFRS 8 sample and, as discussed above, is likely to be explained by the larger firm size of the control group in this model.

Overall, our results are consistent with the agency explanation for the non-disclosure of segments before the adoption of IFRS 8. This conclusion can be drawn as firms with an increase in the number of reported segments post-IFRS 8 have a significantly higher proportion of loss-making segments. Interestingly, the results also suggest that after the adoption of IAS 14R, firms disclosed fewer loss-making segments. This is consistent with the possibility that the "risks and returns" qualification allows firms to avoid identifying (as reportable) loss-making segments. This interpretation is also consistent with an agency explanation. The results from the adoption of both IAS 14R and IFRS 8 provide only minimal support for the proprietary cost explanation for the non-disclosure of segments, as sales concentration is generally insignificant. This result is somewhat puzzling as many firms lobbied against reform to segment reporting on the grounds that increased disclosure would result in competitive harm (Ettredge et al., 2002). Our findings also provide some evidence that the newly disclosed segments operated in a number of industries. This result provides partial support for **H2** that firms withhold segment information which would otherwise reveal the number of industries in which the firm operates.

(iii) Change in Line Item Disclosures under IFRS 8

Tables 7 and 8 address **H5**. We posit that multiple-segment firms with no-change in segments reduce segment-level disclosures after the move to IFRS 8 and that this decrease in disclosure is explained by agency and or proprietary costs. Recall that IFRS 8 mandates fewer segmental disclosures (see Figure 1). The descriptive statistics in Table 7 demonstrate that disclosures have clearly reduced. Segment capital expenditure is the line item with the greatest reduction in disclosure. Crawford et al. (2012) and Nichols et al. (2012) find similar results in the UK and Europe. In contrast,

Table 6

Multinomial Logit Regression Testing which Firms Disclosed Additional Segments after the Accounting Standard

Panel A: IFRS 8

	Single to Multi-segment changer vs. Single-segment non-changer		*Single to Multi-segment changer vs. Multi-segment non-changer*		*Multi-segment changer vs. Multi-segment non-changer*		*Single and Multi changer vs. Single and segment non-changer*		*Single and Multi changer vs. Multi-segment non-changer*	
	(1)		*(2)*		*(3)*		*(4)*		*(5)*	
Category	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*
Intercept	−6.4297	−10.7820	−0.3101	−2.7897	−8.6326	−6.4924	−6.9481	−8.5335	−1.1500	−3.2211
	(−4.99)***	(−5.48)***	(−0.28)	(−1.93)*	(−4.31)***	(−3.75)***	(−6.15)***	(−6.85)***	(−1.13)	(−2.84)***
DIVERSITY	–	–	**−0.3847**	**−0.3907**	**0.4502**	0.2553	**1.1120**	**0.9040**	−0.0167	−0.0602
			(−2.56)***	**(−2.06)****	**(2.39)****	(1.02)	**(7.97)****	**(4.98)****	(−0.12)	(−0.36)
CONCEN	**1.4069**	**2.4070**	0.4554	0.7575	0.2842	0.1581	0.4350	0.7015	0.4416	0.5030
	(2.18)**	**(2.32)****	(0.75)	(0.84)	(0.32)	(0.16)	(0.86)	(1.03)	(0.76)	(0.77)
NLSEG	–	–	**0.9548**	**0.6199**	0.3584	−0.5412	**1.9658**	**1.5392**	**0.7376**	0.2880
			(3.12)***	**(1.69)***	(0.83)	(−0.82)	**(6.72)*****	**(4.22)*****	**(2.72)*****	(0.85)
MTB	−0.0008	0.1428	0.0179	**0.0568**	**0.0745**	0.0560	0.0099	**0.0229**	0.0297	**0.0609**
	(−0.26)	(1.44)	(0.82)	**(1.90)***	**(2.01)****	(1.31)	(1.24)	**(2.73)*****	(1.23)	**(2.00)****
ROA	0.0253	0.0138	0.3860	0.2067	0.3475	0.2386	**0.0530**	**0.0444**	0.3420	0.1747
	(1.51)	(0.76)	(1.33)	(1.17)	(0.87)	(0.59)	**(2.16)****	**(1.71)***	(1.36)	(1.04)
LEVERAGE	0.0089	−0.0082	0.0007	−0.0064	**−0.0090**	**−0.0075**	0.0014	−0.0014	−0.0015	−0.0073
	(0.46)	(−0.34)	(0.10)	(−1.47)	**(−1.69)***	**(−1.21)**	(0.93)	(−0.96)	(−0.38)	(−1.63)
SIZE	**0.3856**	**0.7011**	0.3335	0.1103	**0.5766**	**0.4557**	**0.4423**	**0.5275**	0.0686	**0.2178**
	(2.61)***	**(3.32)*****	(0.25)	(0.72)	**(2.95)*****	**(2.43)*****	**(3.50)*****	**(3.98)*****	(0.62)	**(1.80)***
Top20	0.7726	1.0869	−0.5279	0.0284	**1.7790**	0.5439	0.4918	0.4552	−0.2497	−0.3971
	(1.39)	(1.44)	(−0.89)	(0.04)	**(1.97)****	(−0.57)	(0.94)	(0.75)	(−0.46)	(−0.65)
NCI	**4.5132**	**5.0566**	−0.4054	0.0403	0.2753	0.5286	0.0043	**0.5657**	−0.2758	0.1543
	(7.78)***	**(7.96)*****	(−1.50)	(0.12)	(0.81)	(1.18)	(0.02)	**(1.68)***	(−1.29)	(0.58)

(Continued)

Table 6
Continued

Panel A: IFRS 8

	Single to Multi-segment changer vs. Single-segment non-changer		*Single to Multi-segment changer vs. Multi-segment non-changer*		*Multi-segment changer vs. Multi-segment non-changer*		*Single and Multi changer vs. Single and segment non-changer*		*Single and Multi changer vs. Multi-segment non-changer*	
Category	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*
SUBSNUM	−0.0036	0.0071	**−0.0459**	−0.0037	**−0.0097**	−0.0004	**−0.0147**	−0.0043	**−0.0104**	−0.0007
	(−0.39)	(1.26)	**(−1.72)***	(−0.54)	**(−1.87)***	(−0.18)	**(−2.43)****	(−0.89)	**(−1.99)****	(−0.34)
Pseudo R^2	0.185		0.081		0.086		0.225		0.036	
Wald Chi-sq	113.40***		43.19***		50.55***		322.34***		33.19***	

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Categories in the regression are:
No-change in segments (0); an increase of one segment (1); an increase of two or more segments (2).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(Continued)

Table 6
Continued

Panel B: IAS 14R

	Single to Multi-segment changer vs. Single-segment non-changer		*Single to Multi-segment changer vs. Multi-segment non-changer*		*Multi-segment changer vs. Multi-segment non-changer*		*Single and Multi changer vs. Single and segment non-changer*		*Single and Multi changer vs. Multi-*segment *non-changer*	
Category	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*
Intercept	−3.6408	−7.1487	10.4778	0.6169	−6.0311	−7.3572	−0.6563	−3.4728	1.6517	−1.6352
	(−2.77)***	(−5.87)***	(3.61)***	(0.39)	(−3.36)***	(−2.88)***	(−0.49)	(−2.65)***	(1.07)	(−1.14)
DIVERSITY	–	–	**−1.8060**	0.1046	0.2872	**0.4845**	**0.4716**	**0.8673**	−0.1152	0.2950
			(−2.88)***	(0.37)	(1.25)	**(1.99)****	**(1.87)***	**(2.93)*****	(−0.39)	(1.51)
CONCEN	0.3885	0.3191	**2.3344**	1.3992	−0.0874	1.4007	0.6788	0.9813	0.7151	0.9242
	(0.47)	(0.36)	**(2.19)****	(1.42)	(−0.09)	(0.98)	(1.05)	(1.30)	(1.02)	(1.12)
NLSEG	–	–	**−9.5970**	**−11.7395**	**−1.3793**	**−4.5319**	**−3.1844**	**−6.0697**	**−3.9150**	**−7.7453**
			(−4.95)***	**(−5.18)*****	**(−2.93)*****	**(−5.17)*****	**(−9.26)*****	**(−7.71)*****	**(−8.41)*****	**(−8.39)*****
MTB	−0.0064	**0.0294**	−0.1036	0.0080	−0.0280	**−0.1266**	**−0.0150**	0.0118	−0.0523	0.0003
	(−0.84)	**(2.24)****	(−1.13)	(0.47)	(−1.03)	**(−2.19)****	**(−2.03)****	(1.15)	(−1.53)	(0.02)
ROA	0.0241	0.0408	−0.5320	**−0.6115**	−0.2439	**−0.9195**	**−0.0477**	**−0.1385**	**−0.3289**	**−0.4534**
	(0.91)	(0.97)	(−1.12)	**(−2.56)*****	(−1.15)	**(−3.44)*****	**(−1.99)****	**(−4.03)*****	**(−1.78)***	**(−2.93)*****
LEVERAGE	0.0080	−0.0161	0.0295	−0.0089	0.0035	**0.0363**	0.0145	0.0069	0.0131	0.0185
	(0.51)	(−1.08)	(1.25)	(−0.17)	(0.17)	**(1.66)***	(0.87)	(0.29)	(0.56)	(0.76)
	0.0310	**0.2387**	**−0.5556**	−0.1218	**0.1922**	**0.2904**	−0.0951	0.0268	**−0.1290**	0.0153
SIZE	(0.51)	**(3.90)*****	**(−4.15)*****	(−1.56)	**(2.56)*****	**(2.01)****	(−1.57)	(0.43)	**(−1.89)***	(0.23)
Top20	0.9329	0.6457	−0.1948	0.4921	0.8211	−0.1021	0.1978	0.1072	0.3744	0.4272
	(1.44)	(1.10)	(−0.21)	(0.64)	(1.38)	(−0.11)	(0.43)	(0.21)	(0.68)	(0.64)
NCI	−0.1025	0.1324	−0.4476	−0.2867	0.3902	−0.0200	0.4203	0.0924	0.1894	−0.1337
	(−0.22)	(0.34)	(−0.81)	(−0.72)	(1.15)	(−0.04)	(1.61)	(0.29)	(0.66)	(−0.38)
SUBSNUM	0.0091	**0.0204**	−0.0115	−0.0004	−0.0000	−0.0021	0.0032	0.0012	0.0015	−0.0013
	(0.86)	**(1.96)****	(−0.59)	(−0.21)	(−0.00)	(−0.71)	(0.98)	(0.38)	(0.65)	(−0.50)

(Continued)

Table 6
Continued

Panel B: IAS 14R

	Single to Multi-segment changer vs. Single-segment non-changer		*Single to Multi-segment changer vs. Multi-segment non-changer*		*Multi-segment changer vs. Multi-segment non-changer*		*Single and Multi changer vs. Single and segment non-changer*		*Single and Multi changer vs. Multi-*segment *non-changer*	
	(1)		*(2)*		*(3)*		*(4)*		*(5)*	
Category	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*	*1/0*	*2/0*
Pseudo R^2	0.057		0.391		0.146		0.210		0.221	
Wald Chi-sq	45.28***		91.61***		74.82***		180.21***		142.02***	

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Categories in the regression are:
No-change in segments (0); an increase of one segment (1); an increase of two or more segments (2).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

Table 7

Comparison of Disclosures Made by Multiple-segment Firms with No-change in the Number of Segments upon Adoption of IFRS 8

	IAS 14R "before"	*IFRS 8 "after"*
Segment Assets	277	244
Segment Liabilities	277	218
Segment Revenue	277	274
Segment Capital Expenditure	277	160
Segment Result	277	277
Segment Depreciation	277	200

only three firms discontinue the disclosure of segment revenue. Interestingly, 33 firms no longer present segment assets even though this is a requirement of the accounting standard, highlighting potential non-compliance issues.

We estimate a number of regression models to test factors which influence a reduction in line item disclosures. The independent variables included in this analysis are identical to those adopted in model (1). Table 8 presents the results from estimating the alternative models. The dependent variable in column (1) is a binary dummy variable coded as one if a firm no longer discloses any line item. In columns (2) through (6), the dependent variable is set to one if the firm reduces respectively each specific disclosure: asset, liabilities, revenue, capital expenditure or depreciation. In the final regression, the reduction in disclosure is a count of the number of the six previously disclosed items that are no longer provided. As the dependent variable is a count, we estimate the model in column (7) using a Poisson regression.[29]

The variable which is consistently significant across the models presented in Table 8 is the number of loss-making segments, indicating that firms with a greater percentage of profitable segments are more likely to reduce a line item disclosure. Firms operating in more concentrated industries (columns (5) and (7)) are also more likely to have a higher number of undisclosed items and exhibit a reduction in capital expenditure disclosures. Taken together, these findings are consistent with the proprietary cost argument as the greatest reduction in disclosure occurs for firms with a higher proportion of profitable segments and those operating in more concentrated industries.[30] Furthermore, smaller firms are also more likely to reduce disclosure (columns (1) and (6)). If one accepts that smaller firms are more likely to be concerned about disclosing information to competitors, then this result is also consistent with a proprietary cost argument.

Of the control variables included in the models, we find that firms with an outside equity interest are less likely to suppress disclosures (columns (6) and (7)). Perhaps the presence of outside shareholders in the corporate group motivates more transparent disclosure to meet the information demand of these users. The results in column (3) indicate that segment liabilities are less likely to be disclosed for firms with lower ownership concentration.

29 The results are qualitatively similar if we use a negative binomial regression instead of a Poisson regression.

30 Alternatively, these findings can be explained by an incentive to minimise political costs.

Table 8

Analysis of Disclosure Changes for Multiple-segment Firms with No-change in the Number of Disclosed Segments Post IFRS 8

Dependent Variable	*Dummy = 1 if reduce any disclosure (1)*	*Dummy = 1 if no longer disclose assets (2)*	*Dummy = 1 if no longer disclose liabilities (3)*	*Dummy = 1 if no longer disclose revenue (4)*	*Dummy = 1 if no longer disclose capital exp (5)*	*Dummy = 1 if no longer disclose depreciation (6)*	*Poisson regression of number of items not disclosed (7)*
Intercept	2.7424	−1.4795	−1.4287	−4.4023	0.9974	1.0524	0.7491
	(1.78)*	(−0.62)	(−0.72)	(−0.65)	(0.60)	(0.59)	(0.97)
DIVERSITY	−0.0645	−0.2846	−0.2250	1.1826	0.1582	0.0117	−0.0052
	(−0.35)	(−0.89)	(−0.94)	(1.41)	(0.83)	(0.05)	(−0.05)
CONCEN	0.9997	1.9875	0.7922	−0.6048	**1.5184**	1.3564	**0.8801**
	(1.30)	(1.60)	(0.85)	(−0.16)	**(1.88)***	(1.49)	**(2.26)****
NLSEG	**−1.0162**	**−2.5987**	**−2.4118**	0.6512	**−0.9465**	−0.1375	**−0.7342**
	(−2.59)**	**(−2.88)*****	**(−3.82)*****	(0.33)	**(−2.35)****	(−0.33)	**(−3.25)*****
MTB	0.0235	0.0549	0.0760	0.1816	−0.0002	0.0282	**0.0239**
	(0.53)	(0.86)	(1.44)	(1.42)	(0.04)	(0.65)	**(1.83)***
ROA	−0.1192	0.2382	−0.2098	0.4966	−0.1916	0.0845	−0.0543
	(−0.52)	(0.37)	(−0.61)	(0.42)	(−0.83)	(0.37)	(−0.55)
LEVERAGE	−0.0010	−0.0074	−0.0101	0.0182	0.0026	−0.0006	0.0012
	(−0.14)	(−0.66)	(−1.10)	(0.21)	(0.34)	(−0.06)	(0.08)
SIZE	**−0.3303**	−0.0390	0.2149	−0.0247	−0.2594	**−0.3850**	−0.1034
	(−2.10)**	(−0.17)	(1.05)	(−0.05)	(−1.49)	**(−2.15)****	(−1.64)
Top20	−0.1866	−0.8841	**−1.6985**	−0.9115	0.0213	0.6343	−0.2269
	(−0.26)	(−0.80)	**(−1.92)***	(−0.26)	(0.03)	(0.80)	(−0.57)
NCI	−0.3922	−0.3216	−0.5449	−0.1933	−0.1958	**−0.6966**	**−0.2753**
	(−1.52)	(−0.76)	(−1.58)	(−0.12)	(−0.72)	**(−2.31)****	**(−1.81)***
SUBSNUM	−0.0009	0.0024	0.0004	−0.2012	−0.0035	−0.0002	−0.0004
	(−0.45)	(0.78)	(0.12)	(−1.03)	(−0.86)	(−0.06)	(−0.39)
N	277	277	277	277	277	277	277
McFadden R^2	0.090	0.085	0.106	0.214	0.017	0.027	–
Likelihood Test	**17.20*****	**23.47*****	**39.58*****	8.03	**19.89*****	**20.15*****	–
% Predicted Correctly	59.12	88.32	78.10	98.91	0.6168	73.36	–

(Continued)

Table 8
Continued

Dependent Variable	*Dummy = 1 if reduce any disclosure (1)*	*Dummy = 1 if no longer disclose assets (2)*	*Dummy = 1 if no longer disclose liabilities (3)*	*Dummy = 1 if no longer disclose revenue (4)*	*Dummy = 1 if no longer disclose capital exp (5)*	*Dummy = 1 if no longer disclose depreciation (6)*	*Poisson regression of number of items not disclosed (7)*
Pseudo R^2	–	–	–	–	–	–	0.042
Wald chi-square	–	–	–	–	–	–	**30.28*****

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
DIVERSITY: number of unique second level GICS (Global Industry Classification Standard) industries (n = 24) in which a firm operates;
CONCEN: top four firms' sales in a firm's primary GICS industry divided by the sum of all the firms' sales in that industry;
NLSEG: the number of segments reporting losses after the adoption of IFRS 8 or IAS 14R divided by the total number of segments post IFRS 8 or IAS 14R;
MTB: market-to-book ratio;
ROA: return on assets;
LEVERAGE: total debt divided by total equity;
SIZE: firm size calculated as the log of total assets;
NCI: indicator variable coded as 1 for the existence of a non-controlling interest, 0 otherwise;
TOP20: percentage ownership of the top 20 shareholders; and
SUBSNUM: the number of subsidiaries.

(iv) Impact on Analyst Forecasts

To analyse whether the adoption of IAS 14R and IFRS 8 improves the information set available to analysts, we investigate whether the adoption of the standards leads to lower analyst forecast errors and analyst forecast dispersion. Analysts are a useful proxy for economic effects because they provide explicit measures of expectations (forecast errors) and uncertainty therein (forecast dispersion). If adoption of a given reporting regime provides a reduction in forecast error or dispersion, then that reporting regime can be argued to enhance the prediction-usefulness of accounting reports. Evidence from the US after the adoption of SFAS 131 provides inconsistent results with Berger and Hann (2003) and Botosan and Stanford (2005) finding a decrease and increase, respectively, in analyst forecast errors. As such, there is a need for additional evidence on whether the move to the management approach for segment reporting increased the availability of information to analysts. Furthermore, examining whether IAS 14R and IFRS 8 provided analysts with new information is pertinent as analysts typically claim that accurate segment information is vital to estimating future performance (Knutson, 1993).

We estimate the following models to test respectively the impact of the adoption of the new accounting standards on analyst forecast errors and analyst forecast dispersion:

$$AFE = \alpha + \beta_1 POST + \beta_2 CHANGE + \beta_3 POST{*}CHANGE + \Sigma\ controls + \varepsilon, \quad (2)$$

$$AFD = \alpha + \beta_1 POST + \beta_2 CHANGE + \beta_3 POST{*}CHANGE + \Sigma\ controls + \varepsilon. \quad (3)$$

Similar to Berger and Hann (2003) absolute analyst forecast errors (*AFE*) are calculated as the average forecast error for analyst forecasts issued during the 180 days following the previous financial year's announcement date, deflated by share price. Analyst forecast dispersion (*AFD*) is measured as the standard deviation of all analyst forecasts issued during the 180 days following the previous financial year's announcement date. Analyst forecast errors and dispersion are calculated for the 1 year immediately before and after segment information is released for the first time using either IFRS 8 or IAS 14R. The year after adoption is denoted in the regression using an indicator variable coded as one (*POST*). We also include an indicator variable in the model denoting firms that disclose a higher number of segments after the adoption of IFRS 8 or IAS 14R (*CHANGE*). An interaction variable between *POST* and *CHANGE* is also included in the models (*POST*CHANGE*). If the adoption of the standards releases new information to analysts, we expect that analyst forecast errors and dispersion are lower after the adoption of the standards, thereby providing a negative coefficient on *POST*. Furthermore, any effect on analyst forecasts would be expected to be greater for firms that reported additional segments after the adoption of the new standards, which leads us to expect a negative coefficient on β_3. We estimate models (2) and (3) separately for analyst cash flow and earnings forecasts and in turn for the adoption of IAS 14R and IFRS 8.

The following control variables are included in the models:

SIZE: measured as the natural logarithm of firm market capitalisation at the end of the financial year being forecast;

AFOLLOW: the maximum number of analysts following a firm during the 180 day window;
MTIMELY: average number of days between the analyst forecast and the announcement date of the number being forecast; and
D_LOSS: an indicator variable coded as one for observations where the earnings or cash flow for the forecast period is less than zero.

These control variables are included in the models as prior studies (e.g., Lang and Lundholm, 1993; and Tan et al., 2011) show that analyst forecast properties are related to firm size, analyst following, forecast age and whether a firm is loss making.[31]

Details on analysts and earnings and cash flow forecasts are obtained from the I/B/E/S database. As not all firms in our two samples have analyst coverage, the sizes of the samples available to estimate models (2) and (3) are significantly reduced.[32] Tables 9 and 10 present descriptive statistics on the analyst forecast errors and analyst forecast dispersion, respectively.

The mean analyst earnings forecast error is 2.43% of the price around the IFRS 8 adoption and 1.56% of the price surrounding the IAS 14R adoption. The statistics in both Tables 9 and 10 indicate that the average firm has around six or seven analysts and the average length of time between the forecast and the announcement of earnings for the financial year being forecast is about 9 months.

Table 11 provides the results of estimating regression model (2) testing whether the adoption of either standard improves analysts' cash flow or earnings forecast errors.

Although the coefficient on *POST* is negative in all four columns of Table 11, all four coefficients are insignificant differently from zero. Similarly, the interaction of *POST* with *CHANGE* also provides insignificant results indicating there is no change in analyst forecast accuracy for firms that disclose additional segments after the adoption of the respective accounting standards. The only variable consistently significant in Table 11 is firm size, which is negatively associated with analyst forecast errors.

The findings from testing model (3), which determine whether the adoption of the two accounting standards reduced analyst forecast dispersion, are presented in Table 12.

Similar to the results in Table 11, we do not find any significant effect on the standard deviation of analyst forecasts around the changes in either accounting standard. Additionally, the interaction between *POST* and *CHANGE* is once more insignificant. The results on the control variables indicate that analyst forecast dispersion is significantly higher around the adoption of IAS 14R for loss-making firms.

In additional testing, we estimate models (2) and (3) with the *CHANGE* variable redefined as a rank variable measuring the size of the increase in the number of reported segments. Using this alternative definition does not change the conclusions from our results. We also repeat the analysis in Tables 11 and 12 alternately on the following subgroups: single-segment change firms and single-segment no-change firms, single-segment change firms and multiple-segment no-change firms, multiple-segment change firms and multiple-segment no-change firms, single and

31 Berger and Hann (2003) include the stock return volatility measured over the prior 36 months as an additional control variable in their model. We do not include this variable as it further limits our sample size.

32 For both standard changes, firms with analyst following are significantly larger and more profitable than those firms without analyst following. There is no significant difference on leverage between the two groups of firms.

Table 9
Descriptive Statistics on Analyst Forecast Errors

Panel A: Earnings Forecast Errors

	IFRS 8 (n = 440)			*IAS 14R (n = 377)*		
	Mean	*Median*	*St Dev*	*Mean*	*Median*	*St Dev*
AFE	2.4362	0.0300	44.2626	1.5684	0.0359	17.6711
POST	0.5045	1.0000	0.5005	0.5093	1.0000	0.5006
CHANGE	0.2727	0.0000	0.4459	0.3793	0.0000	0.4859
SIZE	19.9052	19.7241	1.6141	19.7161	19.4653	1.8148
AFOLLOW	6.5136	5.0000	4.7789	6.4615	6.0000	4.1991
MTIMELY	268.3914	267.1667	22.7923	268.5089	271.0000	29.4767
D_LOSS	0.1909	0.0000	0.3935	0.1698	0.0000	0.3759

(Continued)

Table 9
Continued

Panel B: Cash Flow Forecast Errors

	IFRS 8 (n = 449)			*IAS 14R (n = 384)*		
	Mean	*Median*	*St Dev*	*Mean*	*Median*	*St Dev*
AFE	2.3896	0.0302	43.8170	1.5423	0.0361	17.5100
POST	0.5056	1.0000	0.5005	0.5078	1.0000	0.5006
CHANGE	0.2762	0.0000	0.4476	0.3802	0.0000	0.4861
SIZE	19.9195	19.7450	1.6104	19.7206	19.4659	1.8148
AFOLLOW	6.4588	5.0000	4.7555	6.4349	6.0000	4.1745
MTIMELY	267.6154	267.1667	23.5958	267.8796	270.9167	31.8011
D_LOSS	0.1871	0.0000	0.3904	0.1667	0.0000	0.3732

Note:
Variables are:
AFE: Absolute forecast error relating to the upcoming financial year earnings (operating cash flow), calculated as the average absolute forecast error of forecasts issued during the 180 days following the previous financial year's announcement date;
POST: indicator variable coded as one for observations after the change in accounting standard;
CHANGE: indicator variable coded as one for firms with an increase in the number of segments after the change in accounting standard;
SIZE: natural logarithm of the market value of the firm for the financial year end being forecast;
AFOLLOW: the maximum number of analysts following a firm during the 180-day window;
MTIMELY: average number of days between the analyst forecast and the announcement date of the number being forecast; and
D_LOSS: indicator variable coded as one for observations where the earnings or cash flow for the forecast period are less than zero.

Table 10
Descriptive Statistics on Analyst Forecast Dispersion

Panel A: Earnings Forecast Dispersion

	IFRS 8 (n = 418)			*IAS 14R (n = 343)*		
	Mean	*Median*	*St Dev*	*Mean*	*Median*	*St Dev*
AFD	0.0534	0.0206	0.2245	0.0388	0.0153	0.0824
POST	0.5000	0.5000	0.5006	0.5102	1.0000	0.5006
CHANGE	0.2775	0.0000	0.4483	0.3790	0.0000	0.4858
SIZE	20.0052	19.8188	1.5740	19.8780	19.6861	1.8032
AFOLLOW	6.7990	5.0000	4.7335	6.8921	6.0000	4.1057
MTIMELY	269.0335	267.5000	21.2204	269.4276	270.8333	26.3929
D_LOSS	0.1866	0.0000	0.3901	0.1429	0.0000	0.3504

Panel B: Cash Flow Forecast Dispersion

	IFRS 8 (n = 415)			*IAS 14R (n = 340)*		
	Mean	*Median*	*St Dev*	*Mean*	*Median*	*St Dev*
AFD	0.5789	0.0443	6.8726	0.1232	0.0447	0.4266
POST	0.5036	1.0000	0.5006	0.5059	1.0000	0.5007
CHANGE	0.2892	0.0000	0.4539	0.3824	0.0000	0.4867
SIZE	20.0177	19.8393	1.6008	19.9230	19.7593	1.7892
AFOLLOW	6.8627	5.0000	4.7184	6.9588	6.0000	4.0576
MTIMELY	268.8153	267.1667	17.4213	268.6302	270.7500	27.6713
D_LOSS	0.1711	0.0000	0.3770	0.1412	0.0000	0.3487

Note:
Variables are:
AFD: Analyst forecast dispersion relating to the upcoming financial year-end earnings (operating cash flow), calculated as the standard deviation of all analyst earnings (cash flow) forecasts issued during the 180 days following the previous financial year's announcement date;
POST: indicator variable coded as one for observations after the change in accounting standard;
CHANGE: indicator variable coded as one for firms with an increase in the number of segments after the change in accounting standard;
SIZE: natural logarithm of the market value of the firm for the financial year end being forecast;
AFOLLOW: the maximum number of analysts following a firm during the 180-day window;
MTIMELY: average number of days between the analyst forecast and the announcement date of the number being forecast; and
D_LOSS: indicator variable coded as one for observations where the earnings or cash flow for the forecast period are less than zero.

multiple-segment change firms and multiple-segment no-change firms. The results from this testing (not tabulated) continue to provide no evidence that the adoption of either accounting standard changed analyst forecast errors or forecast dispersion.[33] Furthermore, for the IFRS 8 sample, we estimate models (2) and (3) using only multiple-segment firms with no-change in reported segments. For these tests, we define the *CHANGE* variable as an indicator variable equal to one if the firm reduced one of

33 He et al. (2012) report that IFRS 8 adoption in Australia improves analyst forecast accuracy but has no impact on analyst forecast dispersion. Given that our findings are based on a larger sample, the results of the mentioned study may not be directly comparable to the results documented here.

Table 11

Analyst Forecast Errors Pre- and Post- the Segment Accounting Standard Change

	IFRS 8		*IAS14R*	
	Earnings Forecasts	*Cash Flow Forecasts*	*Earnings Forecasts*	*Cash Flow Forecasts*
Intercept	100.9512	97.1004	36.2496	35.5162
	(2.18)	(2.17)	(2.03)	(2.05)
POST	−6.1477	−5.9333	−1.2284	−1.1929
	(−1.25)	(−1.22)	(−0.53)	(−0.52)
CHANGE	−3.2049	−3.5643	−3.5059	−3.2816
	(−0.47)	(−0.54)	(−1.31)	(−1.25)
*CHANGE*POST*	6.3649	6.2365	5.9457	5.7538
	(0.67)	(0.68)	(1.61)	(1.58)
SIZE	**−5.9090**	**−5.6102**	**−2.2892**	**−2.1733**
	(−2.78)***	**(−2.75)*****	**(−2.60)****	**(−2.53)*****
AFOLLOW	1.0151	0.9249	**0.7171**	**0.6800**
	(1.38)	(1.31)	**(2.00)*****	**(1.93)***
MTIMELY	0.0595	0.0546	0.0207	0.0156
	(0.64)	(0.61)	(0.68)	(0.56)
D_LOSS	−1.9225	−2.1110	**5.9705**	**6.0971**
	(−0.34)	(−0.38)	**(2.19)****	**(2.26)****
N	440	449	377	384
Adjusted R^2	0.0107	0.0104	0.0421	0.0411
F-stat	1.68	1.67	3.36***	3.34***

Note:

***Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).

Variables are:

POST: indicator variable coded as one for observations after the change in accounting standard;

CHANGE: indicator variable coded as one for firms with an increase in the number of segments after the change in accounting standard;

*CHANGE*POST*: interaction variable between *POST* and *CHANGE;*

SIZE: natural logarithm of the market value of the firm for the financial year end being forecast;

AFOLLOW: the maximum number of analysts following a firm during the 180-day window;

MTIMELY: average number of days between the analyst forecast and the announcement date of the number being forecast; and

D_LOSS: indicator variable coded as one for observations where the earnings or cash flow for the forecast period are less than zero.

the line item disclosures after adopting IFRS 8. We continue to find no evidence that the adoption of IFRS 8 changes the properties of analyst forecasts.[34]

Overall, our results do not support an association between the new approach to segment identification and the properties of analysts' forecasts in Australia. Leung and Verriest (2015) reach a similar conclusion for their analysis of the change in geographic segment information after the adoption of IFRS 8. One possible interpretation for these findings is that the new information revealed upon the adoption of the standards was already available from other sources. Alternatively, as many firms in our original sample do not have analyst coverage, our sample size to test models (2) and (3) was significantly reduced. This smaller sample size perhaps limits our ability to find a significant effect on the properties of analyst forecasts around the

34 We also alternatively define the *CHANGE* variable as a count of the number of disclosures that were no longer provided after the adoption of IFRS 8. The results on the *POST* and *CHANGE* variable and the interaction remain insignificant.

Table 12
Analyst Forecast Dispersion Pre- and Post- the Segment Accounting Standard Change

	IFRS 8		*IAS 14R*	
	Earnings Forecasts	*Cash Flow Forecasts*	*Earnings Forecasts*	*Cash Flow Forecasts*
Intercept	0.0177	1.4562	−0.1769	−0.3828
	(0.07)	(0.18)	(−2.03)	(−0.83)
POST	−0.0374	−0.3800	0.0022	−0.0178
	(−1.46)	(−0.47)	(0.19)	(−0.29)
CHANGE	−0.0218	−0.7895	−0.0093	−0.0816
	(−0.62)	(−0.74)	(−0.72)	(−1.19)
*CHANGE*POST*	0.0202	0.2328	0.0083	0.0738
	(0.41)	(0.16)	(0.46)	(0.77)
SIZE	−0.0168	−0.1519	**0.0123**	0.0248
	(−1.50)	(−0.45)	**(2.94)*****	(1.13)
AFOLLOW	0.0048	0.1714	−0.0021	−0.0015
	(1.25)	(1.47)	(−1.22)	(−0.16)
MTIMELY	**0.0013**	0.0052	−0.0001	0.0001
	(2.53)**	(0.26)	(−0.53)	(0.07)
D_LOSS	0.0378	−0.0835	**0.0715**	**0.2236**
	(1.27)	(−0.09)	**(5.03)*****	**(2.98)*****
N	418	415	343	340
Adjusted R^2	0.0141	−0.0054	0.0555	0.0082
F-stat	1.85*	0.68	3.87***	1.40

Note:
*** Significant at the 0.01 level (2- tailed); ** Significant at the 0.05 level (2- tailed); * Significant at the 0.10 level (2- tailed).
Variables are:
POST: indicator variable coded as one for observations after the change in accounting standard;
CHANGE: indicator variable coded as one for firms with an increase in the number of segments after the change in accounting standard;
*CHANGE*POST*: interaction variable between *POST* and *CHANGE;*
SIZE: natural logarithm of the market value of the firm for the financial year end being forecast;
AFOLLOW: the maximum number of analysts following a firm during the 180-day window;
MTIMELY: average number of days between the analyst forecast and the announcement date of the number being forecast; and
D_LOSS: indicator variable coded as one for observations where the earnings or cash flow for the forecast period are less than zero.

adoption of the new accounting standards. For instance, it is possible that the effect of the new standards on a firm's information environment is greater in firms without analyst following.

We also examine whether the adoption of IAS 14R or IFRS 8 resulted in an increase in analyst following for firms that reported additional segments. To conduct these tests we calculated analyst following 1 year before and 1 year after the adoption of each standard. We then compare whether the change in analyst following differs depending on whether the firm reports additional segments when each standard is first adopted. This univariate comparison (not tabulated) reveals no significant difference in the increase in analyst following between the two groups of firms. We also estimate a regression for each accounting standard adoption with the change in analyst following around the adoption of each standard as the dependent variable. The independent variables include: an indicator variable denoting firms with an increase in

the number of reported segments (*CHANGE*), return on assets, firm size, the number of analysts following the firm in the year prior to the adoption of each standard and an indicator variable denoting firms making a loss. The findings from this regression (not tabulated) provide an insignificant coefficient on *CHANGE* suggesting that the change in analyst following is not associated with the disclosure of additional segments. The results on the other variables indicate that the change in analyst following is positively related to firm size and negatively related to existing analyst following.[35]

(v) Additional Analysis

(a) Was there Under-reporting Prior to the Adoption of IAS 14R and IFRS 8?

An assumption which underpins our study is that prior to the adoption of IAS 14R and IFRS 8 firms under-reported segments for external reporting purposes. The amendments in IAS 14R and IFRS 8 which moved firms towards a management approach for segment reporting suggest that standard setters also perceived that at least some firms were under-reporting their segments. Without access to internal firm documents it is very difficult to assess whether or not firms are accurately disclosing their segment information.

To at least partially address this issue we follow the approach of Street and Nichols (2002) and Nichols et al. (2012) and manually compare the segment information in the financial statements footnote disclosure with the firm organisational structure described in the other parts of the annual report. Each observation is then coded as being consistent, inconsistent or not applicable if no information on organisational structure was disclosed in the other parts of the annual report.[36] To limit manual data collection requirements this analysis was conducted for the largest 150 firms (as measured by total assets) for the year of adoption of IFRS 8 and IAS 14R. We also conducted the analysis for the same set of firms for the year prior to the adoption of each standard. The results of this examination are presented in Table 13 separately for the adoption of IFRS 8 (Panel A) and IAS 14R (Panel B).

Panel A of Table 13 reveals that 51% of firms reported segment data consistent with the annual report information in the year prior to IFRS 8 adoption. This percentage increased to 67% upon the adoption of IFRS 8. A chi-square test indicates that this increase is significant at the 10% level. The results for the adoption of IAS 14R are shown in Panel B and indicate an improvement in segment disclosure consistency from 67% in the year before adoption to 73% in the year of standard adoption. This increase however is not statistically significant.

Assuming that the narrative disclosure in the annual report reflects the actual organisational structure of the firm, the findings in Table 13 suggest that many firms presented segment information inconsistent with their internal reporting structure. This result provides a level of assurance that some firms under-report their segment information and this supports the move by standard setters to attempt to align internal and external reporting. We leave it to subsequent research to further investigate

35 The *CHANGE* variable is alternatively measured using a rank of the number of additional segments disclosed after the adoption of IAS 14R or IFRS 8. The results on this variable remain insignificant.
36 This approach is subject to the limitation that it assumes the narrative disclosure in the annual report reflects the actual organisational structure of the firm.

Table 13
Comparison of Segment Disclosure with Annual Report Information

Panel A: IFRS 8

	IFRS 8			*IAS 14R*		
	Consistent	*Inconsistent*	*No Details*	*Consistent*	*Inconsistent*	*No Details*
Number of firms	101 (67%)	48 (32%)	1 (1%)	76 (51%)	74 (49%)	0 (0%)
Chi-square	2.93*					

Panel B: IAS 14R

	IAS 14R			*IAS 14*		
	Consistent	*Inconsistent*	*No Details*	*Consistent*	*Inconsistent*	*No Details*
Number of firms	110 (73%)	33 (22%)	7 (5%)	101 (67%)	39 (26%)	10 (7%)
Chi-square	1.14					

Note:
Observations are coded as consistent/(inconsistent) if the organisation structure described in the annual report is the same/(different) as the segments disclosed in the financial statements footnote disclosure.
*Significant at the 0.10 level (2- tailed).

the under-reporting of segment information possibly through the use of alternative techniques.

(b) Over-reporting of Segments

The data in Table 2 indicate that upon the adoption of IFRS 8 (IAS 14R), 41 (31) firms moved from being multiple-segment firms to single-segment firms. Although a detailed investigation of these firms is beyond the scope of this study, we undertake some preliminary analysis on how these firms differ from both single and multiple-segment no-change firms. This analysis involved a univariate comparison of means and medians for each of the independent variables included in regression model (1).[37] In the interests of brevity, we do not tabulate these results. The main findings from this analysis are that firms which over-reported the number of segments: had significantly higher ownership concentration, were less likely to have an NCI stake in the group, were larger in size and had more subsidiaries. It is surprising that these firms had a higher ownership concentration and the absence of an outside equity interest, as evidence from previous Australian studies suggests that these factors lead to lower and not higher disclosure (McKinnon and Dalimunthe, 1993; and Mitchell et al., 1995). As these over-reporting firms were larger and had more subsidiaries, a possible interpretation for their greater disclosure is that the firms chose to provide additional information due to the breadth and scope of their activities. The number of loss-making segments, industry diversity and ownership concentration were generally insignificantly different between the over-reporting firms and both single and multiple-segment no-change firms. The only exception is that firms that over-reported the number of segments prior to the adoption of IFRS 8 had higher mean and median sales concentration compared to the single-segment no-change

37 This testing is undertaken separately for the IAS 14R and IFRS 8 samples.

group. This is suggestive of these firms over-reporting their segments to make it more difficult for competitors and perhaps regulators to assess their revenues and profitability in their dominant industry.

6. CONCLUSION

Segment reporting is considered important in the prediction of future firm profitability. To improve the usefulness of segment disclosures, accounting standard setters have mandated the management approach based on which firms report their segments externally on a similar basis to their internal reporting structure. This study examines the impact on Australian listed firms of adopting the management approach for segment reporting. This analysis involves an examination of the effect of the adoption of both IAS 14R in 2002 and IFRS 8 in 2009. Our results indicate that the adoption of both standards results in an upward change in the number of segments disclosed. Our results suggest that a number of factors explain this increase. For instance, consistent with an agency explanation, the proportion of loss-making segments in a firm is positively associated with an increase in the segments disclosed at the time of the adoption of IFRS 8. Interestingly, around the adoption of IAS 14R, we document that firms that reveal additional segments report fewer loss-making segments, suggestive of the use of the "risks and returns" qualification to avoid reporting segments operating at a loss. We find only minimal evidence that industry competitiveness, as measured by our concentration ratio, and higher firm profitability are related to the change in the number of reported segments. Greater segment industry diversity is related to an increase in the number of segments, although this finding is not consistent across our tests. We also investigate whether the adoption of IAS 14R and IFRS 8 resulted in lower analyst forecast errors or dispersion. Our results suggest that neither standard improved the properties of analyst forecasts. However, given that these results are based on a relatively small sample of firms, they need to be interpreted with caution.

We also examine whether multiple-segment firms that did not change the number of their reported segments exploit the flexibility in IFRS 8 to reduce the extent of per-segment disclosures. Our results show a reduction in the number of line items disclosed under IFRS 8. The extent of the reduction in disclosure is negatively associated with the existence of loss-making segments and is higher for firms operating in more concentrated industries. These findings are consistent with a proprietary and political cost explanation.

A firm's segment disclosures are expected to reflect a cost–benefit analysis of providing transparent segment information consistent with the internal reporting structure of the firm. Our analysis investigates whether segments which are newly disclosed upon the adoption of IFRS 8 and IAS 14R reflect agency, proprietary and other costs of providing this information. Informed by prior research on voluntary segment reporting, this examination attempts to include controls which reflect demand-side factors for segment information. To the extent that these variables do not fully capture the demand for segment information, our results may be an artefact of the research method employed.

This study adds to the body of evidence on the impact of the management approach to segment reporting outside the US. We recommend that further research be conducted in other countries to determine the motivations for the non-disclosure

of segments prior to the use of the management approach. In particular, we find little evidence to support the proprietary cost explanation for the non-disclosure of segments. Future research can further examine this finding perhaps through the use of alternative or more sophisticated measures for the proprietary costs of segment disclosure. Also, the influence of political costs on segment disclosure is largely unexamined and warrants further research. In addition, our results for analyst forecasts do not support an association between the management approach and analysts' information environment in Australia. We leave it to future studies to examine this result in more detail, perhaps using a longer time series of data or using alternative measures to test whether segment reporting improves firms' information environment. Furthermore, future research can examine more comprehensively whether firm segment disclosures complied with the detailed requirements of the new accounting standards. Subsequent research can also consider whether there is a relationship between a firm's segment and other disclosures in the financial and annual report.

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