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Abstract

We examine the determinants and capital market consequences of linguistic complexity in conference calls held in English by non-U.S. firms. We find that linguistic complexity is positively associated with the language barrier in the firms' home country. Also, linguistic complexity in firms' conference calls affects the extent to which the capital market reacts to the information releases. Firms with more linguistic complexity in their conference calls show less trading volume and price movement following the information releases, after controlling for the actual earnings news. Further, the capital market's response to linguistic complexity is more pronounced when there is greater implicit (as captured by the presence of foreign investors) or explicit (as captured by how actively analysts ask questions) demand for the English conference calls. This suggests that the *form* in which financial information is presented can impose additional processing costs by limiting investors' ability to interpret the reported financials.

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1. Introduction

Against the backdrop of increased globalization in capital markets, it has become more important for firms to communicate effectively in a way that appeals to a global investor base. While the worldwide adoption of International Financial Reporting Standards (IFRS) indicates a trajectory towards cross-country harmonization of mandatory financial disclosure, little is known about firms' voluntary disclosure practices across jurisdictions. Yet, prior studies show that the quality of foreign firm financial reporting does not always measure up to global standards (Lang et al. 2003) and the reporting quality of firms continues to differ across countries.[1] Consequently, a better understanding of supplemental disclosure quality is warranted.

Most cross-country studies that consider the disclosure quality of foreign firms focus largely on quantitative information. For example, studies examine how the properties of reported earnings differ across countries and find that investor protection and rule enforcement in the home country can explain the variation in the quality of reported earnings (Leuz et al. 2008). This paper extends that line of inquiry with an important distinction. We focus on the *form* in which the information is presented – the linguistic complexity of the information disclosure. Using transcripts of conference calls from non-U.S. companies, we examine the causes of linguistic complexity in foreign firm disclosures and how that complexity affects the capital market response to the reported financials. Because all conference calls in our sample are held in English, we are able to measure linguistic complexity holding constant the language in which the information is disclosed.[2]

[1] We use the terms "foreign" and "non-U.S." interchangeably.
[2] This is analogous to the cross-listing literature where researchers are able to examine the reporting behavior of foreign firms while holding constant the underlying rules and regulation (Lang et al. 2006).

Recently, researchers began to explore the capital market implications of complexity in the disclosure of firms in the U.S. (Li 2010). Studies show how complexity in the text of a firm's filings can affect capital markets' reactions to the disclosed information. Greater complexity affects the properties of analysts' forecasts (Lehavy et al. 2011) and investor trading volume (Miller 2010; Loughran and McDonalds 2010). One simple explanation for the observed capital market reaction is that complexity directly affects the calls' information content of the calls by increasing the processing costs for investors. For example, complexity, by limiting investors' ability to interpret the implications of the reported financials, may reduce the precision of the information signal and lead to lower demand.

Disclosure by foreign firms will impose similar processing costs. Yet, there may be greater variation in the linguistic complexity for foreign firms due to language barriers. Managers may face a greater hurdle in their interactions with foreign interlocutors, especially for firms domiciled in countries where English is not commonly spoken.[3] It is also possible that linguistic complexity leads to capital market consequences by conveying additional information about the firm that investors find useful for valuation purposes (Lei 2010; Rennekamp 2012). For example, the fluency of a manager may provide meaningful signals of the firm's level of commitment to reach out to a global investor base. We therefore predict that linguistic complexity in foreign firms' disclosures will decrease the extent to which investors react to the information releases.

We choose conference calls as the setting of our inquiries for two reasons. First, financial reporting and disclosure are the centerpieces of firms' outreach efforts to investors. A large

[3] Firms are indeed aware of such barriers and use translators during conference calls. However, the portion of firms using translators are less than 1% in our sample, which suggests that the additional processing cost from using a translator exceeds the benefits.

number of firms use conference calls to explain both financial and non-financial information. Yet little is known about this voluntary disclosure practice outside the U.S. While many studies have looked at the properties of conference calls in the U.S. (e.g., Bushee et al. 2004; Hollander et al. 2010) and at the information content of those calls (e.g., Matsumoto et al. 2011), there is little research on this disclosure medium outside of the U.S. (Bassemir et al. 2012 is an exception).

Second, the Q&A section of the conference calls provides a unique opportunity to examine the effect of linguistic complexity and the resulting capital market consequences. The statements made by managers in the Q&A section of the conference calls are more spontaneous and thus less likely to be influenced by a staged preparation (Li 2010). Whereas other prepared disclosures (e.g., press releases and regulatory filings) can be scrutinized and carefully proofread ahead of their public release, conference calls are more likely to be revealing of the differences in corporate managers' levels of proficiency during the Q&A session.

Our sample consists of 11,740 conference call transcripts from non-U.S. firms between 2002 and 2010 available from Thomson StreetEvents. We measure linguistic complexity using the Gunning Fog (hereafter, Fog) and Flesch-Kincaid Grade Level (hereafter, Kincaid) Indexes. Both measures are based on the number of words per sentence and the number of syllables per word and were introduced in large sample studies of financial reporting complexity by Li (2008). According to the Fog and Kincaid Indexes, transcripts with more words per sentence and more syllables per word are more difficult to understand and therefore present information with greater complexity.

We first examine the determinants of linguistic complexity in the Q&A section of the conference calls of non-U.S. firms. We find that at the country level, linguistic complexity is positively associated with the language barrier in the companies' home-country. Firms from

countries linguistically more distant from English (e.g., China or Thailand) exhibit a higher degree of complexity in their interactions with analysts. Also, we find that the linguistic complexity of foreign firms exhibits a significantly negative association with firms' home country English Proficiency Index (EPI)[4], consistent with firms' ability to communicate in plain English being a function of their domestic roots in terms of English proficiency. This is despite the fact that our sample often includes large global corporations that choose to communicate directly with investors through conference calls and that supposedly have a strong command of English.

This is not to say that country-level determinants are the only drivers of linguistic complexity in the disclosures of foreign firms. As a matter of fact, the variation of linguistic complexity within countries is higher than the variation across countries.[5] Therefore, we also examine various determinants of linguistic complexity at the firm- and conference call- levels. We find that smaller firms show a higher level of linguistic complexity while those with more prior experience with English conference calls show lower level of complexity. Conference calls with more information, measured using the number of words, and those that use a translator show greater complexity. In our cross-sectional tests, we explore both firm- and conference call-level variation to better identify the conditions under which linguistic complexity leads to differential capital market consequences.

Next, we test our main hypothesis that linguistic complexity in foreign firms' disclosure will affect the disclosure's information content, i.e., the extent to which the capital market reacts to information releases. Conference calls reveal not only a significant amount of financial

[4] EPI is an index computed by EF Education First, based on data collected from free online English tests, using about 2 million observations across 44 countries.
[5] The average standard deviation of the Fog score within each country is 1.48 (untabulated) and the standard deviation of the average linguistic complexity across countries is 0.75 (Table 2).

information, but also provide firms with an opportunity to explain the context underlying the reported financials. If such explanations are presented in a complex manner, this may reduce the precision of the reported earnings signals. Kim and Verrecchia (1991) show that when investors form their demand function as the precision-weighted average of the reporting earnings signal (Grossman 1976), lower precision in the information release leads to lower price movements and lower trading volume. Thus, we predict a significantly negative association between the Fog (and Kincaid) Index and abnormal (i) trading volume and (ii) stock return volatility for foreign firms (Landsman et al. 2012), after controlling for the magnitude of the earnings surprise and for a variety of country, firm and call characteristics. The results suggest that a one standard deviation increase in the Fog index, which is equivalent to the change in complexity of an average firm in the U.K. to that of an average firm in China, will lead to a 2% reduction in abnormal volume following the conference call. Also, the negative relationship between linguistic complexity and capital market variables is stronger for firms domiciled in countries that face higher language barriers (e.g., non-English speaking countries with a high EPI).

In our cross-sectional analysis, we examine whether the capital market response to linguistic complexity is more pronounced when investors have greater demand for the English conference call information. We measure 1) implicit demand, using the portion of foreign investors (or foreign operating activities) and 2) explicit demand, by how actively analysts ask questions during calls. We find that the effect of linguistic complexity is limited to firms with a greater proportion of foreign investors and more foreign sales.[6] Also, linguistic complexity leads to a lower capital market response for calls where analysts are more active in asking questions.

[6] Interestingly, when we compare the market reaction of two different shares of an identical firm (e.g., shares cross-listed in the U.S. and primary shares in the home country), we find that only the cross-listed U.S. shares are affected by linguistic complexity in English conference calls, while the domestic listings show no relation between linguistic complexity and abnormal trading volume. This effect is limited to smaller firms. (See Section 5.2).

Taken together, these results are consistent with linguistic complexity being negatively associated with the information content of conference calls when there is greater demand for the information conveyed during the English conference call.

Overall, our results speak to capital market frictions associated with the linguistic complexity of foreign firms' voluntary disclosures. We contribute to the literature in several ways. First, we examine the determinants of linguistic complexity in an international setting. Unlike most studies that highlight the role of investor protection and rule enforcement in the home country as major drivers of disclosure quality, we highlight language barriers as a significant factor in the disclosure quality of foreign firms. Foreign firms' voluntary disclosures (e.g., conference calls held in English) provide a unique source of variation in complexity, which permits us to examine the implication of linguistic complexity holding the underlying language constant. This is one of the first studies to examine the implications of language barriers in a voluntary disclosure setting.

Second, our results provide new insights into how conference calls provide information to the capital markets. Prior research documents that conference calls provide significant information to market participants beyond the information contained in the earnings releases (Frankel et al. 1999). We show how linguistic complexity in information disclosures can be associated with lower information content, as measured by abnormal stock return volatility and trading volume. These sets of results most directly add to our understanding of how the *form* of disclosure can affect the information content of earnings news (Landsman et al. 2012; Bushee et al. 2011). Finally, our paper responds to a call for research in content analysis of corporate disclosure in an international setting (Li 2010).

The rest of the paper is organized as follows. In the next section, we review the prior literature and develop our main hypotheses. In section three, we describe our data and empirical measures, and present some summary statistics. We present our main results in section four and additional analysis in section five. Section six concludes.

2. Literature review and hypothesis development

In this section, we review the strands of literature relevant to our study as they pertain to (i) linguistic complexity, (ii) the role of non-financial information in capital markets and (iii) conference calls as a vehicle for firm disclosures. The intersection of those literature streams leads to our hypotheses.

2.1 Linguistic complexity

The lack of consensus on the definition and measurement of linguistic complexity notwithstanding, research in the fields of linguistics and psychology has documented the importance of the properties of language vis-à-vis the effectiveness of communication, both spoken and written. Of particular interest to our research question is the literature on cross-language comprehension. The theory of linguistic relativity holds that individuals' cognitive processes are influenced by language (Sapir 1921). Though there is no cohesive conceptual framework that encompasses both theoretical and empirical studies of linguistic relativity, the collective evidence from a large body of experimental studies suggests that some language patterns may influence aspects of thought and behavior (Lucy 1997). In the context of our study, this would suggest that corporate managers' linguistic upbringing could influence the way they

communicate with investors, assuming that the manager's fluency in English is a function of their mother tongue.[7]

The concept of interlanguage, coined by Selinker (1972), supports this assumption. Interlanguage is a linguistic system that is based on the observed output from an individual's attempt to learn a second language in comparison to (i) speech in the learners' native language and (ii) speech in the target language by native speakers of those languages. While interlanguage is defined from the perspective of the second-language learner (in our context, the manager), one can easily flip the perspective to that of the target language speaker with whom the learner attempts to communicate (in our context, investors). It follows that interlanguage can also measure the level of difficulty the recipients face in understanding the learner's message, especially if they themselves do not speak the learner's native language. In the context of our study, the interlanguage distance the manager exhibits when he/she communicates in a non-native language (e.g., English) may represent the level of difficulty English speaking investors face to process the information.

As far as we are aware, none of the aforementioned concepts has been used directly in capital market research. However, a long-standing literature has analyzed the content of corporate financial reports to assess their narrative complexity. Looking mostly at annual reports and using well-known proxies such as the Fog and Kincaid Indexes to measure readability, studies conclude that annual reports are 'difficult' to read for firms domiciled in the U.S. (Li 2008; Smith and Smith 1971). Similar findings have been documented using the annual reports

[7] In our empirical analysis, we use firms' headquarters location to proxy for their managers' English proficiency. This may result in measurement error for firms that hire foreign managers. While we do not have managers' nationality for all our sample firms, our results are robust to the exclusion of firm-years from non-English speaking countries where the CEO, CFO or investor relation officer was born (or educated) in an English-speaking country, as per the BoardEx database.

of foreign firms in New Zealand (Healy 1977), the U.K. (Jones 1988), Hong Kong (Courtis 1995), and Italy (Hammami 2011).

In terms of cross-country linguistic complexity, little research exists that speaks directly to our line of inquiry. Two exceptions are Campbell et al. (2005) and Courtis and Hassan (2002). Campbell et al. (2005) compare content analyses of voluntary environmental disclosures for original documents from German companies and the English translations provided by the same company. They find that the English translations are faithful to the German originals, suggesting that companies do not discriminate based on reporting jurisdiction. Courtis and Hassan (2002) compare the English and Chinese (Malay) versions of annual reports from Hong Kong (Malaysian) firms. Their results suggest that the indigenous-language version is more readable than the English translation. Thus, prior studies find mixed evidence on whether (written) annual reports released in different languages contain different levels of information quality.

Unlike written reports, which allow sufficient time for the presenter to prepare and the receiver to process the information, verbal speeches require almost immediate processing as the material is being presented. Thus the interlanguage distance of the presenter (e.g., the manager) will be an important determinant of how easily the receiver (e.g., investors) processes the information. Selinker (1972) observes that only about 5% of second-language learners achieve native-speaker competence. Unless the top executives of large corporations belong to that group, we expect to observe variation in the linguistic complexity of foreign managers' communication in English. Furthermore, we expect the complexity of the disclosures in English to be higher when a manager's firm is located in a country where English is not the primary language. While managers may be able to resolve this barrier by hiring a translator, using a translator also adds a different processing cost to the communication. Hence, our first hypothesis is that linguistic

complexity in foreign firms English conference calls will increase with the language distance between English and the firms' home countries:

H1: The linguistic complexity of conference call discussions is greater when the firm is headquartered in a country where English is not the primary language.

2.2 Qualitative information and capital markets

There exists a long stream of literature on how capital markets react to quantitative disclosures. Only recently, have studies begun exploring the capital market implications of qualitative information. To illustrate the difference between quantitative and qualitative disclosures, consider the task of an investor when evaluating a firm's earnings numbers vs. a transcript from a conference call. A net income figure is made up of a single number so that investors can easily process the information. The text of a conference call, on the other hand, often contains management interpretations and explanations of business operations. The information is more descriptive, therefore difficult to summarize and often subject to different interpretations.

One possible reason why processing qualitative information becomes a difficult task is because of the "soft" nature of the message being conveyed (Petersen 2004). Because such information is descriptive in nature, it may be more difficult to create a summary of its content. Understanding the content may require an understanding of the implicit signals inferred during the communication process. This implies that the form in which the information is conveyed becomes an important factor. If the description of the message is conveyed in a less complex manner, this will reduce the confidence interval of the underlying message. Indeed, consistent with predictions drawn from research in psychology, Rennekamp (2012) finds that less complex disclosure increases investors' belief in the disclosure's reliability. Under a rational expectations

framework, similar predictions can hold. For instance, Kim and Verrecchia (1991) show that the precision of announced information positively affects the volume and variance of the price change associated with the announcement. Insofar as message complexity negatively affects signal precision, one should observe a negative association between complexity and both trading volume and price variance.

A recent strand of the literature tests hypotheses related to the capital market consequences of complexity in corporate disclosures, again based primarily on the periodic regulatory filings by U.S. firms (see Li 2010 for a review). Studies show that more complex filings can reduce the precision of the reported information and affect investors' reactions to the disclosed information. For example, greater complexity in the text of a firm's filings is associated with greater analyst forecast dispersion and lower accuracy (Lehavy et al. 2011), lower trading volume (Miller 2010), less trading by small retail investors (Loughran and McDonalds 2010), and greater information asymmetry (Lei 2010). These findings inform our own hypothesis development by showing that even within a single country where English is the primary language, disclosure readability affects capital market participants' reaction to the information being conveyed.

2.3 Information content of conference calls

Conference calls are one of the main voluntary disclosure mechanisms firms employ to explain both financial and non-financial information. U.S. based studies find that firms that hold conference calls tend to be larger, more profitable, and have greater analyst following (Frankel et al. 1999), consistent with investor demand being an important determinant of the firm's choice to hold a conference call. Other studies also find that managers' incentives to use conference calls

as a way to increase their visibility and to explain this period's performance are additional reasons why firms initiate conference calls (Tasker 1998; Bushee et al. 2003).

In comparison, there is little academic evidence on non-U.S. firms' use of conference calls. Bassemir et al. (2012) examine the conference calls held by German firms listed on the Prime Standard Index of the Deutsche Börse. The stock exchange mandates that, as one of the disclosure requirements for being part of the index, firms must conduct at least one conference call per year. Bassemir et al. (2012) find that firms conduct on average two (mostly closed) calls per year, even though they are required to report earnings on a quarterly basis. Meanwhile, using a set of Thai firms, Liang et al. (2012) find foreign ownership to be an important motive behind firms in emerging markets holding a conference call. Firms may decide to hold conference calls based on the institutional features of their home countries and/or the main stock exchange on which they are listed. However, to our knowledge, there is no other cross-country study investigating conference calls.

Extant literature also documents that information released during conference calls has capital market consequences. Frankel et al. (1999) find increasing returns volatility during the conference call period. Bushee et al. (2003) examine open conference calls and find both a higher level of trading activity and returns volatility during the conference call period. Bowen et al. (2002) indicate that conference calls enhance analysts' ability to accurately forecast earnings and help level the playing field among analysts. Similarly, Bassemir et al. (2012) find that the calls in their German sample are associated with a greater reduction in analyst forecast errors, compared to non-call quarters. Of note, they also argue that the economic magnitude of analyst forecast error reduction is greater in their German sample than in Bowen et al. (2002). Hence, this suggests that the capital market consequences of conference calls may vary across countries.

Matsumoto et al. (2012) find that both the presentation and Q&A portions of the calls have incremental information content over the earnings press release. Moreover, the Q&A portion exhibits greater information content than the management discussion does, and this greater information content is positively associated with analyst coverage. These studies suggest that the information content of conference calls includes value relevant information for investors.

2.4 Capital market consequences of linguistic complexity: Hypothesis development

Based on the intersection of the aforementioned theoretical and empirical findings, we formulate two sets of hypotheses regarding the effect of linguistic complexity on the information content of conference calls, as measured by trading volume and price variance around the calls. Based on the Kim and Verrecchia (1991) model, if investors form their demand function as the precision-weighted average of the reported information signals (Grossman 1976), we predict that higher linguistic complexity—i.e., lower precision—in the information release during conference calls will lead to lower price movements and lower trading volume. Underlying this prediction is the assumption that, while quantitative data such as reported earnings remain the main input for firm valuation, the narrative around the implications of the current performance on future cash flows can affect the precision of the imperfect signal. This can happen for two non-mutually exclusive reasons. First, even if managers want to be transparent (as their choice to conduct a conference call would suggest), their ability to communicate in English in a non-rehearsed setting (the Q&A portion of the conference call) may condition the effectiveness of their answers in narrowing investors' uncertainty around the underlying financial performance signal they are reporting. Second, consistent with Li (2008), the management obfuscation hypothesis suggests that executives may purposefully communicate in a more complex manner, in order to conceal the fact that current negative earnings are likely to persist in the future or high abnormal earnings

are likely to soon reverse. Even in this case, we would still expect investors to trade (and/or revise their beliefs) less intensely in response to more complex language during conference calls, holding the earnings surprise constant. Hence, our first hypothesis is as follows:

H2: Greater linguistic complexity in foreign firms' conference calls will decrease the extent to which investors react to the information released.

Our interest is in how the linguistic complexity of conference call discussions – that is, the *form* rather than the content – affects their information content. If linguistic complexity affects investors' response to information disclosure as predicted in H2, we further expect this association to vary with demand-side forces (i.e., the mass of users likely to demand information from English-language conference calls). The demand can come directly from investors, or from information intermediaries such as sell-side analysts. In particular, analysts who participate in conference calls have an opportunity to ask managers for clarification in order to form their own forecasts of future earnings. The more questions they ask, the more likely it is that the management presentation during the conference call elicits uncertainty on the part of analysts and investors about the implications of the provided information for firm value.

Hence, our third hypothesis refines our expectations regarding the association between linguistic complexity and the information content of conference calls along the following partitions:

H3: The effect of linguistic complexity on the information content of earning releases will be greater when there is greater implicit (as captured by the presence of foreign investors) or explicit (as captured by how actively analysts ask questions) demand for the conference call information.

3. Data and descriptive statistics

3.1 Sample

We obtain conference call transcripts of non-U.S. firms between 2002 and 2010 from Thomson StreetEvents. Table 1 shows the details of the sample selection process. We use all conference call transcripts subject to some minimal constraints. First, we drop all conference calls that are unrelated to earnings announcements (e.g., M&A conference calls). Second, since our interest is in how linguistic complexity in the information disclosure affects the information content of the earnings releases, we require the conference calls in our sample to occur near the earnings announcement dates. Empirically, we require conference calls to be held within the 3 days around an earnings announcement.[8,9] Next, we drop calls that have a length in the bottom 5% of our sample, measured by the total number of words. This ensures that our complexity measure is based on dialogues with sufficient text. Finally, we require firms to have financial data (total assets (WC02999), net income (WC01706), common equity (WC03501), and total debt (WC03255)) from Worldscope and daily price (RI), volume (VO), and market value (MV) data from Datastream. We also obtain analyst data from I/B/E/S and guidance issuance from Capital IQ. Our final sample consists of 11,740 conference call observations from 4,757 firms domiciled in 41 different countries.

3.2 Measure of linguistic complexity

We use two measures of linguistic complexity. The first measure corresponds to the Fog index, which is a widely used measure of complexity in prior literature (e.g., Li 2008; De Franco et al. 2012). The measure is calculated as follows:

[8] Earnings announcement dates are collected from Bloomberg following Griffin et al. (2008). We thank Emmanuel DeGeorge for providing us with the earnings announcement dates of foreign firms.
[9] Consistent with prior literature (Matsumoto et al. 2011) we confirm that the majority of the conference calls (94 %) are held on the earnings announcement date or within the 3 days after the earnings announcement.

$$Fog = (\text{Words per sentence} + \text{percentage of complex words}) * 0.4$$

where complex words are measured as words with three or more syllables. The second measure we use is the Flesch-Kincaid index, which measures the level of difficulty in comprehending a text.[10] The index is calculated as follows:

$$Kincaid = C_0 * \text{Words per sentences} + C_1 * \text{Syllables per words} - C_3.$$

where the constant terms (C_0= 0.39, C_1= 11.8, and C_2= 15.59) scale the measure to map into the total years of U.S. education required to understand the text.

We obtain each measure for the Q&A section of the conference calls, using only the transcripts from the answers provided by the management team. That is, we exclude text from the questions that are more likely to reflect the fluency of the analysts. We focus on the Q&A section of the conference calls because the statements made by managers in the Q&A section are more spontaneous and thus less likely to be influenced by a staged preparation (Li 2010).

Table 2 provides the average Fog and Kincaid index scores per country, year, and industry. Panel A presents the descriptive statistics for linguistic complexity in our conference call sample. We find a mean Fog score of 11.84 (and a median of 11.71) in foreign firm conference calls. This is much lower than the mean Fog score of 18.23 (and median 17.98) found in the annual reports of U.S. based studies (Li 2008). The large difference likely reflects the inherent difference in the levels of complexity in written reports and the spoken language used during conference calls. We find that the mean Kincaid score of complexity in the conference calls is 9.01, indicating that the transcripts are comprehensible to a high school freshman. This value is similar to the mean score of 8.48 documented by De Franco et al. (2012) for analysts' reports.

[10] Examples of prior capital-market studies that use Kincaid include the following: Smith and Smith 1971, Healy 1977, Li 2008, De Franco et al. 2012.

Panel B presents the number of observations and mean complexity scores for the 41 countries included in our sample. Our sample comprises a cross-section of both English speaking and non-English speaking countries. The countries with the higher Fog scores are China, Portugal, and Turkey, while those that exhibit the lowest scores are Thailand, Taiwan and Malaysia. This could reflect country-level determinants as a possible driver of linguistic complexity but may also indicate the different types of firms that hold English conference calls in each country.

We also find great variation in linguistic complexity within countries, highlighting the importance of firm-level characteristics as another driver of linguistic complexity. In untabulated analysis, we find that the average standard deviation of the Fog score *within* each country is 1.38, which is higher than the 0.74 standard deviation in the mean Fog score *across* countries (Table 2). Thus, we include various firm-level determinants throughout our main empirical analysis and conduct a cross-sectional analysis to examine the differential effect of linguistic complexity by certain firm- and conference call-characteristics.

Panel C presents the distribution of linguistic complexity across industries using the Industry Classification Benchmark industry codes. The financial industry exhibits the highest level of linguistic complexity (a Fog score of 12.45 for banks), followed by the telecommunications industry. In our empirical analysis, we include industry fixed effects to control for systematic differences in linguistic complexity across industries that do not vary over time. Finally, Panel D presents the distribution across years. Both measures appear to be stable over time, especially from 2005 onward. Nonetheless, we include year fixed effects to control for systematic changes in linguistic complexity over time.

4. Empirical tests and results

4.1 Determinants of linguistic complexity in foreign firm conference calls

We begin by examining the determinants of linguistic complexity in a multivariate regression setting. We use the following empirical model:

$$Complexity_{i,t} = \beta_1 * Language\ Barrier + \sum \beta_k * Controls_{i,t} + Year\ FE + Industry\ FE + \varepsilon_{i,t.} \quad (1)$$

We use *Fog* and *Kincaid* described earlier in Section 3.2 to measure linguistic complexity in conference calls. We first examine whether linguistic complexity is associated with the language barrier measured as the level of English proficiency in the firm's home country. We proxy for language barrier using two measures. First, we use the inverse of the English Proficiency Index (EPI_c), a continuous measure of English proficiency in the firm's home country. The index is developed by EF Education First and measures a nation's average English proficiency. The index is based on the test scores of 2.3 million adults who took an online English test from 2007 to 2009. Second, we use the $Language\ Distance_c$ between the English language and the country's dominant language, as designed by Grimes and Grimes (1996). The distance is based on a classification system that groups languages together by families (e.g., Sino-Tibetan, Altaic, Indo-European) and up to three levels of branches and sub-branches within each family. English is classified under the Altaic family, within the Germanic branch and the Western/North Sea sub-branch (see Dow and Karunaratna 2006, for a summarized classification of 88 languages according to Grimes and Grimes 1996). Each country is given a score based on the distance between its dominant language and English as follows: 5 if it is from a different family, 4 same family but different branches, 3 same branch but different at the first sub-branch level, 2 same sub-branch at the first level but different at the second level, and 1 if it is the same language. The main advantage of this variable is to account for fundamental differences between languages in a

non-binary fashion (i.e., English versus not), recognizing that it is likely easier for a non-native English speaker to learn English if her native language is in the same branch (e.g., German or Dutch) than if it is in a different family (e.g., Spanish or Mandarin).

In addition, we include various country-level determinants that capture the information environment in each country. We include price synchronicity ($Synchronicity_{c,t}$), which measures the level of firm-specific information in stock price and $Zero\ Returns_{c,t}$, which captures price informativeness and liquidity. We predict a more transparent (liquid) information environment (i.e., lower price synchronicity and less frequent zero returns, respectively) to be associated with lower level of linguistic complexity. Finally, we control for the financial development in the country, using the log of equity market capitalization ($Market\ Cap_{c,t}$) and the annual changes in the market index ($Market\ Return_{c,t}$). We also account for cultural differences across countries that may explain variation in foreign managers' communication in English, without being necessarily a reflection of fluency per se. In particular, we include the *Uncertainty Avoidance* Index developed by Hofstede (1983). The index is defined as the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. It is a function of rules orientation, employment stability and stress at work. Country-level aversion for uncertainty is likely to be reflected in linguistic patterns that may affect how managers express themselves in English. Detailed definitions of each variable are provided in the appendix.

Following Li (2008), we include various firm-level determinants that have been shown to be associated with the level of complexity in financial reports.[11] *Size* is defined as the log market value of equity measured in U.S. dollars and captures many aspects of a firm's operations that

[11] Li (2008) examines complexity in the written text of financial reports while we examine the level of comprehension in verbal speeches. The complexity of written texts and verbal speeches might be driven by different factors. Nonetheless, since we attempt to explain variation in the common underlying construct – complexity – Li's analysis provides an obvious baseline for our examination.

are related to disclosure practices (Lang and Lundholm 1996). We include *Q* – defined as the log market value of assets over book value of assets – to capture the investment opportunity and growth potential of the firm. Bushee et al. (2003) argue that firms with higher *Q* are those with business models where it is more difficult to assess the valuation implications based on the firm's reported financial numbers. We control for *Leverage*, defined as total debt over book value of assets, to control for the differential incentives management may face when firms have greater levels of debt and resulting agency costs by releasing more information (Frankel et al. 1999). We also include other proxies for the information environment such as number of analyst (*Log_analysts*) and cross-listed firms (*ADR*) to account for differences in disclosure behavior driven by the demand side.

While the level of complexity in conference call disclosures may be driven by a firm's innate characteristics, it is also possible that strategic disclosure choices may drive the level of complexity in the firm's disclosure. For example, firms may obfuscate the message delivery when the underlying performance is weaker than are the reported figures. If complexity is indeed a choice variable for the firm, this implies that the level of complexity may change with the properties of reported earnings. In addition to including profits (*ROA*) in the determinants model, we include various conference call characteristics that capture the transparency in the message delivery process. For example, we include indicators for conference calls where the manager was reluctant to provide information, and for those where at least one answer was unclear to the analysts. *Reluctant* is a dummy variable that takes the value of one if the manager provides answers that show he does not want to directly address a question (e.g., "cannot answer") and zero otherwise; *Unclear* is defined as one if the analysts mention that they did not understand the manager or ask for the manager to repeat the information, and zero otherwise. We control for the

lack of vocal clarity of managers' answers by counting incidences of "[inaudible]" in the transcripts (*Inaudible*). *Inaudible*, which is likely correlated with managers' communication skills in English, should exhibit a negative association with information content of conference calls, assuming investors are as likely as professional transcribers to not understand what the speaker says. We include a *Translation* indicator for conference calls that used a professional translator and a *Quarter* dummy to control for the differential information content of conference calls in the fourth quarter versus interim periods. Finally, we control for the management team's prior experience with English conference calls using the total number of previous English conference calls held by the firm *(# Previous Calls*).

Table 3 presents descriptive statistics of the determinants included in the study. We present the results for the entire conference call sample and separately for calls of firms in English-speaking and non-English speaking countries. Panel A shows that our sample for English and non-English speaking countries is balanced, with 4,802 and 6,933 firm-quarter observations, respectively. English and non-English speaking countries differ along several dimensions. In terms of country level variables, English-speaking countries show a greater proportion of zero returns than non-English speaking countries do (0.56 versus 0.36) and lower stock market synchronicity. In terms of firm characteristics, our sample of English-speaking countries consists of smaller firms, but with greater analyst following. In terms of conference call characteristics, firms in non-English speaking countries show a higher number of words per conference calls and also more likely to issue guidance. In addition, managers are, on average, more likely to be unclear, reluctant to answer questions and inaudible in non-English speaking countries. Panel B presents the Pearson and Spearman correlations among the variables included in equation (1). Fog and Kincaid are highly correlated at 0.98, suggesting that both measures

capture largely similar variations in linguistic complexity. Greater complexity is positively associated with firm size (Spearman = 0.07) and leverage (Spearman = 0.05) and negatively associated with growth opportunities q (Spearman = –0.03) and analyst coverage (Spearman = –0.07). We next present a multivariate analysis of the determinants model in equation (1).

We test our first hypothesis that linguistic complexity will be positively associated with language barriers. The estimated results are presented in Table 4. We include both year and industry fixed effects to control for the systematic differences in the complexity measures over time and across industries shown earlier in Table 2.[12] Standard errors are clustered by firm and by year.

Table 4 shows that linguistic complexity is positively associated with the language barrier in the firm's home country. We measure language barrier using 1) the inverse of the English Proficiency Index (EPI_c*(-1)) and 2) the language distance between the home country's main language and English ($Language\ Distance_c$). The estimated coefficient on *EPI*(-1)* is positive and significant, 0.02 (t-stat=2.76) using Fog in model (1) and 0.02 (t-stat=2.22) using Kincaid in model (3). The estimated coefficients suggest that a one standard deviation decrease (=7.97, Table 2) in the EPI score is associated with a 0.15 higher level of Fog score. Using the second measure, $Language\ Distance_c$, we find that the coefficient on language barrier is positive and significant, 0.05 (t-value=1.82) using Fog in model (1) but only marginally significant 0.04 (t-value=1.54) using Kincaid in model (3). This suggests that a higher language barrier leads to greater linguistic complexity in the disclosure of foreign firms, despite the fact that our sample consists—at least to some extent—of large global corporations that choose to communicate directly with investors through conference calls.

[12] Because many of the country-level determinants, e.g., language barrier, lack time-series variation, we cannot include country fixed effects.

Also, we find evidence that linguistic complexity is associated with various firm- and conference call-characteristics. Firm-level determinants show that smaller firms (*size*) that have less analyst following (*Log_analysts*) exhibit a higher level of linguistic complexity, although the association with analyst following is not statistically significant. This is consistent with linguistic complexity reflecting the poor information environment of small firms with low visibility (Li 2008; De Franco et al. 2012). Also, longer conference calls (*Words*) and those where a translator is used (*Translation*) show a higher level of complexity, while conference calls where managers are either reluctant to or unclear in providing information show a lower complexity.

4.2 Capital market consequences of linguistic complexity

4.2.1 Measures of capital market reaction

To capture the capital market consequences of linguistic complexity in conference calls, we examine the trading volume and variability of price around conference calls dates. Lev (1989) describes an information release as being useful if it entails greater changes in the stock price or trading volume from the capital market. Long-standing research from Ball and Brown (1968) and Beaver (1968) suggests that more information content in reported earnings releases will lead to greater price movements and trading volume.[13,14] If complexity affects the usefulness of the information being released, we expect more complexity to reduce the information content of the conference calls, leading to less trade volume and smaller price movements.

[13] Kim and Verrecchia (1997) interpret trading volume as capturing idiosyncratic interpretations of the earnings releases. A higher abnormal volume will represent the divergent opinions of investors. Thus, another interpretation of our measure of information content is that more informative earnings will lead investors to more actively interpret the announced news.

[14] Holthausen and Verrecchia (1990) demonstrate that abnormal return variance and trading volume are equally valid measures of information content, defined as a signal that alters investors' beliefs.

We follow Landsman et al. (2012) and DeFond et al. (2007), and measure the information content of the conference calls using abnormal volume and abnormal return volatility.

Abnormal volume (AVOL): Our measure of abnormal trading volume corresponds to the mean event-period volume divided by the average-estimation-period volume. Since the measure is highly skewed we use the log of the ratio (Landsman et al., 2012). Hence, we define *AVOL* as:

$$\text{AVOL}_{i,t} = \log\left(\frac{\bar{V}_{i,t}}{V_{i,t}}\right).$$

where $\bar{V}_{i,t}$ is the average trading volume of firm *i* over a three-day window, *t*= –1,0,+1. V_i is the average daily trading volume for firm i for days *t*–60 to *t*–10 and *t*+10 to *t*+60 relative to the conference call date (*t*=0).

Abnormal returns variance (AVAR): To obtain our measure of abnormal return variance, we first calculate the daily market-adjusted returns as:

$$u_{i,t} = R_{i,t} - (\alpha_{i,t} + \beta_{i,t} R_{m,t}).$$

where $R_{i,t}$ is the stock return of firm *i* on day t, and $R_{m,t}$ is the return of the Datastream Global market index in the country of firm *i.* Both $\alpha_{i,t}$ and $\beta_{i,t}$ are obtained by estimating each parameter during the non-event period which corresponds to *t*–60 to *t*–10 and *t*+10 to *t*+60 relative to the conference call date t=0. Following Landsman et al. (2012) and DeFond et al. (2007), we measure abnormal volatility as the mean of the squared market model adjusted returns divided by the variance of firm *i's* market model residuals during the non-event period. $AVAR_{i,t}$ is given by:

$$\text{AVAR}_{i,t} = \log\left(\frac{\bar{\mu}^2_{i,t}}{\sigma^2_{i,t}}\right).$$

where $\bar{\mu}_{i,t}^2$ is the average squared market model adjusted returns of firm *i* for days *t*= –1,0,+1 and $\sigma_{i,t}^2$ is the variance of firm *i's* market model residuals for days *t*–60 to *t*–10 and *t*+10 to *t*+60 relative to the conference call date (t=0).

Table 3 Panel A presents descriptive statistics for $AVAR_{i,t}$ and $AVOL_{i,t}$ and other controls included in the study. We present descriptives for the entire conference call sample as well as for calls of firms in English-speaking and non-English speaking countries. Panel A shows that the mean and median $AVAR_{i,t}$ and $AVOL_{i,t}$ are significantly larger in firms from non-English speaking countries than they are for firms in English speaking countries, suggesting that the two variables show systematic differences across the two sub-samples. The mean $AVAR_{i,t}$, 0.34, represents an unlogged value of 2.18. While the theoretical value of the unlogged value should equal one, we find slightly higher values because most of our conference call sample includes the earnings announcement periods. In our subsequent analysis, we also examine the effect of linguistic complexity on the two capital market variables for each country-partition.

4.2.2 The story in pictures

We first present a graphical representation of the changes in the capital market variables for the periods leading up to and immediately following the conference calls. Figure 1 shows the movements in $AVAR_{i,t}$ and $AVOL_{i,t}$ before and after the conference calls for firms in the highest and lowest complexity quartiles. The horizontal axis is the days before and after the conference calls; it ranges from –10 days to +10 days. We form the portfolios for each fiscal quarter by double-sorting first on the number of words and then on the capital market variable of interest (Dechow and Dichev 2002) to ensure that differences in the amount of information released during the calls do not drive the difference in the response of the capital market variables.

Figure 1, Panel A shows the movement in $AVAR_{i,t}$ before and after the conference call dates. Panel A shows a steep spike in $AVAR_{i,t}$ on the day of the conference call (from t= –1 to t=0). This immediately reverses back to its normal level two days after the conference calls. More importantly, we find that firms with a low level of linguistic complexity (measured using the Fog score) show a greater increase in $AVAR_{i,t}$ relative to those with high linguistic complexity. Similarly, in Panel B, we plot movement in $AVOL_{i,t}$ surrounding the conference call dates for firms in the highest and lowest linguistic complexity quartiles. We find that firms with higher linguistic complexity experience less $AVOL_{i,t}$ surrounding the conference call dates. Consistent with prior literature (Beaver 1968), we find that $AVOL_{i,t}$ dissipates slowly and the speed at which $AVOL_{i,t}$ reverts to its expected level is similar across firms with high and low complexity quartiles. The similar reversion speed rules out difference in the level of investor attention as an explanation for the difference in the level of $AVOL_{i,t}$ across the samples of high and low linguistic complexity firms. However, we cannot draw any inferences from the univariate results in these figures beyond those that are largely descriptive in nature, therefore, turn to our multivariate analysis.

4.2.3 Multivariate analysis

We test our second hypothesis, which predicts that greater linguistic complexity will reduce the information content of the information releases. We estimate the following regression model using ordinary least squares (OLS):

$$AVOL_{i,t}\,(AVAR_{i,t}) = \beta_1 * Complexity_{i,t} + \beta_2 * SUE_{i,t} + \sum_k \beta_k * Control_{i,t} + Fixed\ eff. + e_{i,t.} \quad (2)$$

Where $AVOL_{i,t}$ is abnormal volume in the 3-day conference call announcement window as described in section 4.2. $AVAR_{i,t}$ is abnormal stock price variance in the 3-day window around the conference call announcement. $Complexity_{i,t}$ is the Fog score or the Kincaid score described

in section 3.2. We control for $SUE_{i,t}$, defined as the absolute difference between the actual annual earnings (per share) minus the most recent mean consensus analyst forecast, scaled by the actual earnings per share. It is important to control for the level of earnings surprise during the conference call because this may be an important omitted variable that affects both linguistic complexity and our dependent variable. We also include an indicator for firms that issue guidance during (or within 10 days of) the call. Calls that include a discussion of quantitative forward looking information are likely to elicit a greater market reaction, insofar as management forecasts tend to be informative (see Radhakrishnan et al. 2012 for evidence in an international setting). However, the provision of this information (i.e., management guidance) may also reduce the weight that investors place on the qualitative information that is provided during the conference calls. As in our previous tests, we control for various firm, country, and conference call level variables, defined in the appendix. Finally, we include year, industry, and country fixed effects to control for the systematic differences in the capital market variables over time and across industries and countries.

Table 5 presents the results from estimating equation (2). In columns 1 and 2, we present the regression specification of linguistic complexity and the control variables using $AVOL_{i,t}$ as the dependent variable. Column 1 shows that the coefficient for *Fog* is negative and statistically significant (coef. = –0.01, t-stat = –2.34). The estimated coefficient suggests that a one standard deviation increase in linguistic complexity, which amounts to a change in complexity from an average firm in the U.K. to an average firm in China, will lead to a 1.5% reduction in abnormal volume following the conference call. Also, the coefficient on SUE is positive and significant, confirming the well-known earnings announcement effect documented in prior literature (Ball and Brown 1968). This suggests that greater linguistic complexity is associated with less information content, after controlling for the earnings surprise news.

In column 2, we find similar results using Kincaid as our measure of linguistic complexity. Column 2 shows a significant negative coefficient for *Kincaid* (coef. = –0.01, t-stat = –2.58) suggesting that linguistic complexity is correlated with abnormal volume around the 3-day window. The estimated coefficients on the control variables show that $AVOL_{i,t}$ is positively associated with the firm's information environment. Firms in countries with lower price synchronicity (*Synchronicity*), those with more analyst following (*Log_analysts*), and with U.S. listed depository receipts (*ADR*) show greater abnormal volume during conference calls. We find that the frequency of zero returns is negatively associated with $AVOL_{i,t}$, consistent with an environment of low liquidity. Also, at the conference call level, longer conference calls (*Words*), those that do not report losses (*Dloss*) and those that issue guidance exhibit greater abnormal volume during the conference call window.

In Columns 3 and 4, we repeat the estimation using abnormal stock price variance ($AVAR_{i,t}$) as the dependent variable. Column 4 in Table 5 shows that the coefficient for *Kincaid* is statistically significant (t-stat = –1.67). In economic terms, a one standard deviation increase in Kincaid (which equals 1.46 in Table 2, Panel A) translates to approximately a 3% reduction in abnormal stock price volatility. Overall, the results presented in Table 5 indicate that greater linguistic complexity leads to lower information content in the information releases, consistent with our second hypothesis.

4.3 Cross sectional tests

In this section, we test our final hypothesis, which predicts that the effect of linguistic complexity will be greater when there is greater demand for the information released during the conference calls. We measure investors' demand for information 1) directly, using the number of questions raised during conference calls and 2) indirectly, using the characteristics of the investor base. To test this hypothesis, we partition the sample into two high and low demand sub-samples

and estimate equation (2) separately. We examine whether the effect of linguistic complexity is greater in the high demand sub-sample. We measure investor demand using three proxies.

Our first partition is the number of questions raised during the conference calls. Prior research has established that the questions asked during conference calls lead to releases of important information (Matsumoto et al. 2011; Hollander et al. 2010; Mayew and Venkatachalam 2012). Analysts who ask questions are likely to provide more informative forecast revisions following a conference call relative to those who did not participate (Mayew et al. 2011). This implies that the questions asked during conference calls represent relevant information gathering activities on the analysts' part. Thus, we use the number of questions analysts ask, scaled by the total number of analysts participating in the call, as our first measure of level of demand for information released therein.

Our second partition is based on the percentage of the firm's foreign investor base. Prior literature finds that, when investing abroad, foreign investors are more likely to rely on public information and less on private information sources (Aggarwal et al. 2005). Thus we assume that firms with a greater foreign investor base will have a greater implicit demand for English conference calls. We predict that firms with a greater foreign investor base will exhibit a greater capital market response to linguistic complexity. We collect foreign investor holdings using the percentage of foreign institutional holdings using the Thomson Financials international mutual fund database.

Our third partition is the level of the firm's foreign operating activities in relation to all firm activities, using the % of U.S. sales. Prior studies find that firms with more interactions with foreign markets are more likely to provide disclosures on par with global standards (Bradshaw et al. 2004; Khanna et al. 2004). We argue that firms with greater interactions with the U.S. market will have greater demand for English conference calls from their U.S. stakeholders (e.g., customers and employers). We collect U.S. sales information from Thomson Worldscope

(WC08731). For firms with missing U.S. sales information, we assume the U.S. sales figure to be zero.

Table 6 shows the estimated results across the three cross-sections. For each partitioning variable, we divide the sample into two high and low demand sub-samples using the annual sample median. Panel A shows the estimated results using *AVOL* as the dependent variable. We find that when the *Intensity of question* is high (Column 2) the coefficient of –0.02 on *Fog* is negative and statistically significant. In contrast, when the *Intensity of question* is low (Column 1) the coefficient on *Fog* is negative but insignificant. Furthermore, the difference between the coefficients on *Fog* across the two samples is statistically different from zero (p-value of 0.04).[15] For our partitions on *Foreign ownership* and *Foreign activities*, we find that the coefficients on *Fog* are statistically significant only for the *high* partitions. For the *low* partitions, the coefficients on *Fog* are negative but insignificant. The differences between the coefficients are statistically significant for the *Foreign ownership* partition (p-value= 0.05) but insignificant for the *Foreign activities* partition (p-value= 0.21). In Panel B, we show the estimated results using Kincaid as our measure of linguistic complexity. We find largely similar results. Overall, the results in Table 6 provide evidence consistent with our third hypothesis. The effect of linguistic complexity on the information content of earnings releases is driven by firms from which there is greater demand for conference call information.

5. Additional analysis

5.1 *Effect of linguistic complexity pre and post IFRS adoption*

[15] We test for the difference in coefficients using a bootstrap test. We randomly assign the distance classification to each observation and estimate model (2) for the pseudo high and low demand group, respectively. We then compute a pseudo difference in coefficients for the high and low demand group. Repeating this procedure 1,000 times yields a null distribution of the difference in coefficients, which we use to test the significance of the difference in coefficients.

We examine how investors' ability to process conference call information varies by the quality of the firm's mandatory disclosure. If voluntary and mandatory disclosures are complements, this suggests that an improvement in the quality of mandatory disclosure will also improve the processing ability of voluntary disclosures (e.g., conference calls). However, if investors use the two disclosure mechanisms as substitutes, this implies that improvements in mandatory disclosure will reduce the investor's reliance on voluntary disclosures. In this section, we use IFRS as the time-series change in the quality of mandatory disclosure across countries and ask how the effect of linguistic complexity in voluntary disclosure (i.e., conference calls) changed following the mandatory IFRS adoption.

The mandatory adoption of IFRS is one of the largest changes in mandatory disclosure around the globe (Daske et al. 2008). Studies show that IFRS creates a common framework for financial reporting, allowing users to better compare information across countries (Hail et al. 2010; DeFond et al 2011). Also, studies find that IFRS adoption reduced the information processing cost of foreign investors leading to higher demand for IFRS adopting firms (Yu 2011). Therefore, if investors use mandatory filings and conference calls as substitutes, we expect IFRS adoption to *reduce* the weight investors place on linguistic complexity when processing the information disclosed during conference calls. Consistent with the substitution effect of IFRS vis-à-vis alternative sources of information, Brochet et al. (2012) find that IFRS adoption leads to a *decrease* in the informativeness of corporate insider trades and analyst recommendations. However, if investors use conference calls and mandatory filings as complements, we expect IFRS adoption to lead to an even greater reliance on conference calls, increasing the relevance of linguistic complexity during conference calls.

We re-run our main analyses and compare the effect of linguistic complexity pre- and post-IFRS adoption. We expand equation (2) and examine the effect of mandatory IFRS adoption using the following model:

$$AVOL_{i,t}\ (AVAR_{i,t}) = \beta_1 * Complexity_{i,t} * Post\ IFRS_{i,t} + \beta_2 * Post\ IFRS_{i,t} + \beta_3 * Complexity_{i,t} + \beta_4 * SUE_{i,t} + \sum_k \beta_k * Control_{i,t} + Fixed\ effects + e_{i,t.} \quad (3)$$

$Post\ IFRS_{i,t}$ is an indicator that takes a value of one for the years after IFRS was required in the firm's country and zero otherwise. We concentrate on the mandatory adoption of IFRS and exclude firms that voluntarily adopted the set of standards. β_1 is our main variable of interest, which identifies the changes in the effect of linguistic complexity following mandatory IFRS adoption.

Table 7 Panel A shows the estimated results of equation (3). Column 1 shows the effect of linguistic complexity, measured using the Fog index, on abnormal volume. We find a positive β_1 (coefficient = 0.02, t-stat = 2.06), suggesting that following IFRS adoption, the negative effect of linguistic complexity on the information content of conference calls is reduced. In column 2, we repeat our analysis using only the countries from non-adopting countries. $Post\ IFRS_{i,t}$ is now an indicator that takes a value of one for 2005, the year most mandatory adopters required IFRS adoption, and for subsequent years. Surprisingly, we find that the coefficient on β_1 is significantly *negative*, suggesting an increase in the capital market consequences of linguistic complexity for firms not reporting under IFRS in more recent times. However, this also indicates that the positive coefficient observed in column 1 cannot be explained by the unobserved structural changes that occurred around the time of IFRS adoption. Column 3 and 4 repeat the analysis using $AVAR_{i,t}$ as the dependent variable. We find that β_1 is positive but statistically insignificant when we use abnormal returns volatility as the dependent variable. In Panel B, we

repeat our analysis using Kincaid as our measure of linguistic complexity; we find very similar results. Overall, we find some evidence of improvement in the quality of mandatory disclosure (i.e., IFRS adoption) reducing the effect of linguistic complexity in voluntary disclosure (i.e., conference calls).[16]

5.2 *Cross-listed firms: The differential effect of linguistic complexity for shares listed in the home country and shares listed in the U.S.*

One potential concern with our empirical test is that linguistic complexity may be confounded by other factors that simultaneously affect the capital market reactions during the calls. For example, one can argue that firms with more linguistic complexity in the calls are those that are less likely to actively disseminate the call information; hence, dissemination activity will represent an omitted variable in our analysis.

To address this concern, we use cross-listed firms and compare the price and volume reaction to linguistic complexity of the two different securities of an identical firm (e.g., the ADR security and the primary security of a cross-listed firm). Although representing only a limited portion of our sample, cross-listed firms offer a unique opportunity to compare the market reaction of shares with different investor bases, while holding all other firm characteristics constant. We predict that linguistic complexity will have a greater effect on the shares with a more global investor base (i.e., ADR securities) than the shares with more local investor base (i.e., security in the home country).

We identify cross-listed firms using Citibank's ADR database and use Datastream to collect the returns and volume information of securities in the home country. We use CRSP to collect returns and volume information of the corresponding ADR security. This process yields

[16] This is also consistent with IFRS partially homogenizing the narrative of conference calls, as call participants discuss the latest financials using a framework that it better understood by an international audience.

1,368 conference call observations with sufficient returns data for both the home country and the ADR security.

Table 8 shows the estimated results across the two different sub-samples. The first two columns show the estimated results using *AVOL* as the dependent variable, using the entire sample. For both the home-country security (column 1) and the ADR security (column 2) the effect of linguistic complexity, measured using Fog is positive yet insignificant. One explanation for this finding is that cross-listed firms are global firms that voluntarily bond to the U.S. capital market and thus unlikely to show great variation in their level of linguistic complexity. Interestingly, once we limit our sample to firms that are likely to be limited in their resources to improve disclosure quality (e.g., small sized firms), we find meaningful differences.

Model (3) and (4) show the estimated results using only the subsample of small firms. We use the sample median in each year to classify firms into small and large firms. We find that the coefficient on *Fog* for the home country security (column 3) is negative but statistically insignificant. In contrast, when we examine the ADR security of the same firms, the coefficient on *Fog* is significant and negative (column 4). This suggests that for smaller firms, linguistic complexity will have a greater effect on the shares that have a more global investor base. We interpret this as the demand for the English conference calls arising in part from the global investors affecting the market reaction to linguistic complexity.

6. Conclusion

We examine the linguistic complexity of conference calls held in English by firms headquartered outside of the U.S. and the consequences of such complexity for the information content of the calls. We posit that language barrier affects managers' ability to communicate

with investors in a simple manner. Consistent with this hypothesis, we find that the complexity of conference call discussions, as measured by the Fog and Kincaid Indexes, is negatively associated with the country-level English proficiency of the firm's headquarters. Next, we hypothesize that investors react less intensively to conference calls when the narrative of those calls is more complex. This is because more complex language decreases the precision of the signal associated with a given piece of information, such as an earnings surprise. We find evidence consistent with our hypothesis. That is, abnormal trading volume and stock price variance in a short window around a conference call are negatively associated with the linguistic complexity of that call. Moreover, we find that the effect is significant in partitions where (i) the firm has a greater proportion of its sales or investor base abroad and (ii) when analysts are more active in asking questions during the call. This is consistent with linguistic complexity affecting investors' belief when there is more implicit or explicit demand for the information.

Our study is the first to analyze conference calls in a cross-country setting. We find that the linguistic complexity of calls varies with country-level factors such as language barriers, but also with firm characteristics. Furthermore, we show that linguistic complexity has capital market consequences. Our results can be informative to foreign firms that wish to communicate with investors globally. Analysts around the world may also find the results informative, as they might be able to push managers to speak in a less complex manner. Our study also responds to a call for research on the content analysis of non-U.S. firms' disclosures (Li 2010). We believe there is much more to examine in an international setting, using conference calls or other venues.

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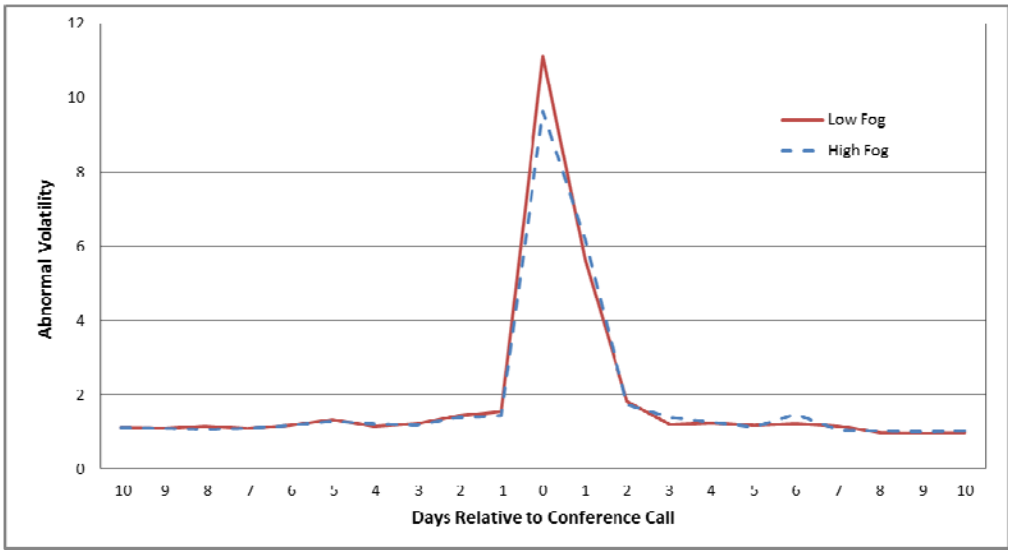
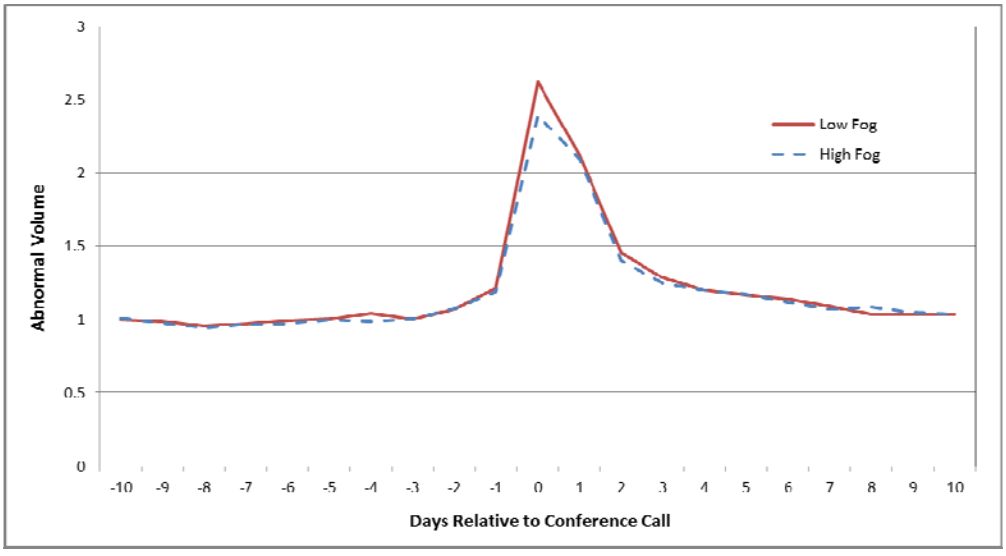
Figure 1: Capital market reaction to conference calls by level of linguistic complexity

Panel A: Abnormal volume for firms with high and low linguistic complexity



Panel B: Abnormal returns volatility for firms with high and low linguistic complexity



Notes: This figure shows the movements in abnormal return volatility and abnormal volume before and after conference calls for firms in the highest and lowest linguistic complexity quartiles (based on the Fog Index). We form the portfolios for each fiscal quarter by double sorting first on the number of words and then on the capital market variable of interest (Dechow and Dichev 2002). Abnormal volume corresponds to the daily volume divided by the average non-event period volume. Abnormal return volatility corresponds to the daily squared market model adjusted returns divided by the variance of the market model residuals during the non-event period. The non-event period corresponds to days t-60 to t-10 and t+10 to t+60 relative to the conference call date (t=0).

Table 1 Sample selection

	# of conference calls	# of firm-years
Number of conference call transcripts 2002-2010	25,830	7,925
Less: Analyst calls etc.	(4,911)	(412)
Less: Short conference calls	(814)	(203)
	20,105	7,310
Less: Missing identifiers, Years	(7,394)	(2,126)
	12,711	5,184
Less: Incomplete returns	(85)	(43)
Less: Incomplete financials	(886)	(384)
Total number of observations	**11,740**	**4,757**

Notes: This table presents the sample selection procedure. We limit our sample to conference calls that occur within the 3 days around an earnings announcement and the top 95% of our sample, measured using total number of words. We require firms to have financial data from Worldscope, and daily transaction data from Datastream.

Table 2 Distribution of linguistic complexity of foreign firm conference calls

Panel A: Descriptive statistics of linguistic complexity

Variable	N	Mean	ST Dev	P10	P25	P50	P75	P90
Fog	11,740	11.84	1.59	9.92	10.76	11.71	12.76	13.88
Kincaid	11,740	9.01	1.46	7.26	8.02	8.89	9.85	10.89

Panel B: Distribution of linguistic complexity by country

Countries	Total # of firm-quarters	Language Distance	EPI	Mean Fog score	Mean Kincaid
Argentina	37	5	53.49	13.00	9.90
Australia	207	1	69.90	11.94	9.16
Austria	122	2	58.58	11.97	9.17
Belgium	258	2	57.23	11.90	9.11
Brazil	81	5	47.27	11.89	8.87
Canada	3739	1	69.90	11.58	8.78
Chile	2	5	44.63	12.65	9.72
China	33	5	47.62	13.29	10.44
Czech Rep.	18	5	51.31	12.98	9.94
Denmark	317	3	66.58	11.95	9.19
Finland	432	5	61.25	11.86	9.07
France	625	5	53.16	11.90	8.97
Germany	1116	2	56.64	11.83	9.04
Greece	148	4	.	12.22	9.26
Hong Kong	68	1	54.44	12.26	9.42
Hungary	73	5	50.80	12.32	9.41
India	42	1	47.35	11.61	8.82
Indonesia	2	5	44.78	11.30	8.39
Ireland	86	1	69.90	12.49	9.72
Israel	326	5	.	11.72	8.89
Italy	577	5	49.05	12.94	9.86
Luxembourg	90	2	.	12.91	9.98
Malaysia	14	5	55.54	10.86	7.99
Mexico	87	5	51.48	11.77	8.79
Netherlands	385	2	67.93	11.70	8.92
New Zealand	8	1	69.90	11.48	8.76
Norway	348	3	69.09	11.99	9.25
Pakistan	2	1	69.90	11.64	8.62
Poland	23	5	54.62	13.00	10.10
Portugal	136	5	53.62	13.24	10.15
Singapore	66	1	69.90	10.98	8.32
South Africa	56	1	69.90	11.77	8.95
South Korea	71	5	54.19	11.64	8.94
Spain	251	5	49.01	12.51	9.36
Sweden	735	5	66.26	11.28	8.62
Switzerland	414	2	54.60	12.02	9.21
Taiwan	53	5	48.93	10.26	7.65
Thailand	15	5	39.41	10.22	7.49
Turkey	36	4	37.66	13.19	10.24
UK	528	1	69.90	11.84	9.03
St. deviation of Country mean		1.77	9.75	0.74	0.66

Table 2 (Continued)

Panel C Distribution of linguistic complexity by ICB industry classification

Industry Description	Total # of firm-quarters	Mean Fog score	Mean Kincaid
Oil & Gas	900	11.74	8.97
Chemicals	360	11.89	9.08
Basic Resources	1,009	11.39	8.66
Construction & Materials	480	11.37	8.59
Industrial Goods & Services	1,550	11.66	8.86
Automobiles & Parts	204	11.55	8.78
Food & Beverage	305	12.00	9.18
Personal & Household Goods	420	11.39	8.67
Health Care	795	12.05	9.30
Retail	457	11.61	8.85
Media	559	12.03	9.08
Travel & Leisure	493	11.89	9.04
Telecommunications	649	12.31	9.41
Utilities	451	12.27	9.25
Banks	825	12.45	9.51
Insurance	414	12.24	9.23
Real Estate	253	11.14	8.32
Financial Services & Investments	384	11.88	8.98
Technology	1232	11.88	9.09

Panel D Distribution of linguistic complexity by year

Year	Total # of firm-quarters	Mean Fog score	Mean Kincaid
2002	24	12.44	9.67
2003	463	12.33	9.49
2004	892	12.30	9.46
2005	1,135	11.75	8.95
2006	1,462	11.81	8.98
2007	1,770	11.90	9.06
2008	2,079	11.77	8.94
2009	2,104	11.70	8.86
2010	1,811	11.76	8.95

Notes: This table presents descriptive statistics. Panel A presents descriptive statistics for our linguistic complexity measure. Panel B, Panel C, and Panel D present the number of observations and mean values of our linguistic complexity measures by country, industry, and year, respectively.

Table 3 Descriptive statistics

Panel A: Descriptive statistics for all conference calls and for calls in English and non-English speaking countries

	(1)		(2)		(3)		
	All firms		Firms from English speaking countries		Firms from non-English speaking countries		P-values (2)=(3)
	# of firm-quarters	Mean	# of firm-quarters	Mean	# of firm-quarters	Mean	
Volume and Volatility							
AVOL	8,352	0.34	3,938	0.24	4,414	0.43	0.00
AVAR	8,352	0.49	3,938	0.34	4,414	0.63	0.00
Linguistic Complexity							
Fog	11,740	11.84	4,802	11.65	6,938	11.98	0.00
Kincaid	11,740	9.01	4,802	8.82	6,938	9.13	0.00
Country characteristics							
Market Cap	11,740	0.05	4,802	0.02	6,938	0.06	0.00
Market Return	11,740	0.11	4,802	0.11	6,938	0.11	0.80
Synchronicity	11,740	0.08	4,802	0.04	6,938	0.11	0.00
Zero Returns	11,740	0.44	4,802	0.56	6,938	0.36	0.00
Uncertainty Avoidance	11,740	57.42	4,802	45.60	6,938	65.59	0.00
Firm characteristics							
Size	11,740	14.66	4,802	14.17	6,938	15.00	0.00
Q	11,740	1.61	4,802	1.61	6,938	1.61	0.94
Leverage	11,740	0.24	4,802	0.23	6,938	0.26	0.00
Log_analysts	11,740	1.26	4,802	1.49	6,938	1.10	0.00
ADR	11,740	0.42	4,802	0.38	6,938	0.44	0.00
ROA	11,740	0.03	4,802	0.02	6,938	0.04	0.00
Conference-call characteristics							
Guidance	11,740	0.27	4,802	0.17	6,938	0.33	0.00
# Previous Calls	11,740	13.00	4,802	16.00	6,938	11.00	0.00
Translator	11,740	0.00	4,802	0.00	6,938	0.00	0.01
Words	11,740	3,031	4,802	2,951	6,938	3,085	0.00
Reluctant	11,740	0.63	4,802	0.61	6,938	0.65	0.00
Unclear	11,740	0.40	4,802	0.27	6,938	0.50	0.00
Inaudible	11,740	0.18	4,802	0.11	6,938	0.23	0.00
Quarter	11,740	0.25	4,802	0.27	6,938	0.24	0.00
SUE	8,352	0.50	3,938	0.50	4,414	0.51	0.82
Replag	8352	14.38	3938	14.07	4,414	14.66	0.00
Dloss	8,352	0.13	3,938	0.15	4,414	0.11	0.00

Table 3 Descriptive statistics (Continued)

Panel B: Correlation of linguistic complexity and other variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(15)
(1) Fog	1	0.99***	0.00	-0.01	0.06***	-0.08***	0.05***	-0.04***	0.04***	-0.08***	0.01	0.01	0.02**	-0.04***	0.11***	0.01
(2) Kincaid	0.98***	1	-0.01	0.00	0.05***	-0.08***	0.05***	-0.03***	0.03***	-0.07***	0.01	0.02**	0.02**	-0.03***	0.11***	0.01
(3) market cap	-0.05***	-0.06***	1	-0.06***	0.14***	-0.13***	0.1***	0.04***	-0.02**	-0.04***	-0.01	0.08***	0.01	0.02**	-0.01	0.00
(4) market return	-0.02**	-0.02	0.00	1	-0.27***	0.03***	0.1***	0.13***	-0.07***	0.00	0.01	-0.03***	0.04***	0.05***	-0.03***	0.02*
(5) synchronicity	0.08***	0.07***	-0.4***	-0.19***	1	-0.77***	0.22***	0.01	0.13***	-0.09***	0.03***	0.08***	0.00	0.09***	0.03***	-0.07***
(6) zero returns	-0.09***	-0.08***	0.35***	0.04***	-0.83***	1	-0.26***	-0.07***	-0.09***	0.14***	-0.04***	-0.1***	0.01	-0.09***	-0.05***	0.07***
(7) Size	0.07***	0.06***	0.05***	0.05***	0.23***	-0.27***	1	0.06***	0.11***	0.15***	0.13***	0.08***	-0.15***	0.32***	0.31***	-0.33***
(8) Q	-0.03***	-0.01	0.07***	0.13***	-0.03***	-0.06***	0.12***	1	-0.23***	-0.01	0.05***	0.06***	-0.03***	0.29***	-0.02*	-0.04***
(9) Leverage	0.05***	0.03***	-0.12***	-0.03***	0.13***	-0.11***	0.15***	-0.22***	1	-0.05*	-0.02***	-0.07*	0.02***	-0.15***	0.05***	0.04***
(10) LogAnalysts	-0.07***	-0.06***	0.05***	0.00	-0.12***	0.11***	0.13***	0.01	-0.03***	1	0.05***	-0.01	-0.14***	0.08***	0.14***	-0.13***
(11) adr	0.02*	0.02	-0.12***	0.01	0.03***	-0.05***	0.14***	0.07***	-0.02*	0.05***	1	0.07***	-0.03**	-0.02**	0.07***	-0.01
(12) guidance	0.02**	0.03***	0.02**	-0.03***	0.11***	-0.1***	0.07***	0.08***	-0.07***	-0.01	0.07***	1	-0.01***	0.06***	0.08***	-0.01***
(13) sue	0.00	0.00	-0.03***	0.06***	0.02**	0.00	-0.25***	-0.16***	0.02*	-0.32***	-0.04***	0.00	1	-0.12***	-0.03***	0.25***
(14) roa	-0.05***	-0.04***	0.01	0.00	0.06***	-0.08***	0.19***	0.54***	-0.2***	0.07***	-0.02**	0.06***	-0.28***	1	0.06***	-0.43***
(15) words	0.12***	0.13***	0.1***	-0.04***	0.03***	-0.03***	0.32***	-0.01	0.07***	0.14***	0.08***	0.08***	-0.1***	0.02**	1	-0.08***
(16) d_loss	0.01	0.01	0.02	0.02**	-0.06***	0.08***	-0.3***	-0.12***	0.02	-0.13***	-0.01	-0.01	0.34***	-0.42***	-0.08***	1

Notes: Panel A presents descriptive statistics for our sample for English and non-English speaking countries. Panel B reports the Pearson (above the diagonal) and Spearman (below the diagonal) correlation coefficients for the variables used in the analysis. Refer to the appendix for a detailed definition of each variable. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4 Determinants of linguistic complexity

	(1) *Fog*	(2) *Fog*	(3) *Kincaid*	(4) *Kincaid*
EPI *(–1)	0.02***		0.02**	
	(2.76)		(2.22)	
Language Distance		0.05*		0.04
		(1.82)		(1.54)
Country characteristics				
Market Cap	0.00	0.01***	0.00	0.01***
	(1.57)	(4.42)	(1.02)	(3.25)
Market Return	–0.10	–0.12	–0.14**	–0.15**
	(–1.43)	(–1.62)	(–2.25)	(–2.38)
Synchronicity	–0.15	–0.18	–0.13	–0.17
	(–0.75)	(–0.95)	(–0.71)	(–1.13)
Zero Returns	–0.18	–0.88	–0.39	–1.03
	(–0.14)	(–0.67)	(–0.31)	(–0.80)
Uncertainty Avoidance	–0.12	–0.35	–0.27	–0.44
	(–0.36)	(–1.03)	(–0.83)	(–1.38)
Firm characteristics				
Size	–0.08***	–0.06**	–0.06***	–0.04**
	(–3.09)	(–2.50)	(–2.60)	(–2.14)
Q	–0.05*	–0.04	–0.04*	–0.03
	(–1.66)	(–1.28)	(–1.66)	(–1.29)
Leverage	0.20	0.20	0.13	0.15
	(1.20)	(1.29)	(0.88)	(1.07)
ROA	–0.35	–0.25	–0.26	–0.16
	(–1.35)	(–0.95)	(–1.08)	(–0.67)
ADR	–0.05	–0.09	–0.05	–0.09
	(–0.69)	(–1.41)	(–0.82)	(–1.52)
Log_analysts	–0.04	–0.05	–0.04	–0.04
	(–1.09)	(–1.43)	(–1.22)	(–1.38)
Conference–call characteristics				
Guidance	0.05	0.04	0.07*	0.06
	(1.24)	(0.98)	(1.93)	(1.49)
Words	0.47***	0.50***	0.44***	0.47***
	(9.90)	(10.39)	(10.19)	(10.73)
Translation	0.35***	0.38***	0.20	0.23**
	(2.79)	(3.49)	(1.56)	(1.99)
Inaudible	0.04	0.05	0.03	0.02
	(0.52)	(0.57)	(0.32)	(0.31)
Reluctant	–0.33***	–0.33***	–0.31***	–0.30***
	(–6.44)	(–6.30)	(–6.45)	(–6.28)
Unclear	–0.19***	–0.19***	–0.17***	–0.17***
	(–5.28)	(–5.17)	(–5.19)	(–4.94)
Quarter	–0.08	–0.05	–0.11**	–0.08
	(–1.49)	(–0.88)	(–2.05)	(–1.47)
# Previous Calls	–0.00	–0.00*	–0.00	–0.00*
	(–1.21)	(–1.86)	(–1.24)	(–1.77)
# of observations	11,084	11,645	11,084	11,645
R-squared	0.1041	0.0984	0.0911	0.0865
Fixed Effects	Year & Industry	Year & Industry	Year & Industry	Year & Industry

Notes: This table presents coefficient estimates from the OLS regressions of linguistic complexity on various country-, firm-, and conference call level characteristics. Refer to the appendix for a detailed definition of each variable. T-statistics are reported in parentheses below the regression coefficients. We cluster standards errors at the firm and year levels. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 5 Capital market consequences of linguistic complexity

	(1) *AVOL*	(2) *AVOL*	(3) *AVAR*	(4) *AVAR*
Measure of	*Fog*	*Kincaid*	*Fog*	*Kincaid*
Linguistic Complexity	–0.01**	–0.01***	–0.02	–0.02*
	(–2.34)	(–2.58)	(–1.60)	(–1.67)
Country characteristics				
Market Cap	–0.18*	–0.18*	–0.43	–0.43
	(–1.91)	(–1.91)	(–1.40)	(–1.40)
Market Return	0.12**	0.12**	0.09	0.09
	(2.41)	(2.41)	(0.63)	(0.63)
Synchronicity	0.17	0.17	0.73	0.73
	(0.64)	(0.64)	(1.07)	(1.07)
Zero Returns	–0.02	–0.02	–0.05	–0.05
	(–0.28)	(–0.28)	(–0.36)	(–0.36)
Firm characteristics				
Size	–0.01	–0.01	–0.00	–0.00
	(–1.14)	(–1.13)	(–0.26)	(–0.25)
Q	0.00	0.00	–0.02	–0.02
	(0.50)	(0.52)	(–1.26)	(–1.24)
Leverage	0.05	0.05	–0.01	–0.01
	(1.07)	(1.06)	(–0.11)	(–0.12)
ROA	0.25***	0.25***	0.31***	0.31***
	(3.45)	(3.49)	(4.66)	(4.70)
Log_analysts	0.02**	0.02**	0.10***	0.10***
	(2.43)	(2.43)	(4.16)	(4.17)
ADR	0.04***	0.04***	–0.02	–0.02
	(2.74)	(2.74)	(–0.72)	(–0.72)
Conference-call characteristics				
Guidance	0.04***	0.04***	0.06**	0.06**
	(4.22)	(4.23)	(2.48)	(2.48)
SUE	0.00	0.00	0.01	0.01
	(0.13)	(0.13)	(0.29)	(0.29)
Translation	–0.08	–0.08	0.33*	0.33*
	(0.00)	(0.00)	(1.70)	(1.70)
Replag	0.00	0.00	0.00*	0.00*
	(0.15)	(0.15)	(1.76)	(1.76)
Words	0.14***	0.14***	0.21***	0.21***
	(8.98)	(8.97)	(8.08)	(7.99)
Dloss	–0.04*	–0.04*	–0.10**	–0.10**
	(–1.70)	(–1.70)	(–2.51)	(–2.50)
Quarter	0.00	0.00	–0.16***	–0.16***
	(0.11)	(0.10)	(–2.68)	(–2.69)
Inaudible	–0.03	–0.04	–0.05	–0.05
	(–1.56)	(–1.57)	(–1.49)	(–1.51)
# of observations	8,352	8,352	8,352	8,352
R-squared	0.1281	0.1280	0.0847	0.0847
Fixed Effects	Country, Year &	Country, Year &	Country, Year &	Country, Year &

Notes: This table presents coefficient estimates from the OLS regressions of abnormal volatility and abnormal variability on our linguistic complexity measures. Refer to the appendix for a detailed definition of each variable. T-statistics are reported in parentheses below the regression coefficients. We cluster standards errors at the firm and year levels. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 6 Capital market consequences of linguistic complexity by demand for English conference calls

Panel A: Regression analysis of abnormal volume using Fog as a measure of linguistic complexity

	Dependent variable: AVOL					
Measure of level of demand:	*Intensity of questions*		*Foreign ownership*		*Foreign activities*	
	(1) Low	(2) High	(3) Low	(4) High	(5) Low	(6) High
Fog	–0.00	–0.02***	–0.00	–0.02***	–0.01	–0.01*
	(–0.60)	(–3.39)	(–0.20)	(–2.92)	(–0.87)	(–1.70)
Bootstrap test (fog score): Low barrier= High	*P*-value: 0.04		*P*-value: 0.05		*P*-value: 0.21	
SE Clustering	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year
Country characteristics	Included	Included	Included	Included	Included	Included
Firm & conference call characteristics (Table 5)	Included	Included	Included	Included	Included	Included
# of observations	4,192	4,157	4,183	4,169	4,187	4,165
R-squared	0.1457	0.1315	0.1476	0.1297	0.1180	0.1403
Year & Industry Fixed Effects	Included	Included	Included	Included	Included	Included

Panel B: Regression analysis of abnormal volume using Kincaid as a measure of linguistic complexity

	Dependent variable: AVOL					
Measure of level of demand:	*Intensity of questions*		*Foreign ownership*		*Foreign activities*	
	(1) Low	(2) High	(3) Low	(4) High	(5) Low	(6) High
Kincaid	–0.00	–0.02***	–0.00	–0.01***	–0.00	–0.01**
	(–0.68)	(–3.74)	(–0.48)	(–2.75)	(–0.70)	(–1.98)
Bootstrap test (fog score): Low barrier= High	*P-value*:0.05		*P-value:* 0.10		*P-value:*0.15	
SE Clustering	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year
Country characteristics	Included	Included	Included	Included	Included	Included
Firm & conference call characteristics (Table 5)	Included	Included	Included	Included	Included	Included
# of observations	4,192	4,157	4,183	4,169	4,187	4,165
R-squared	0.1457	0.1313	0.1476	0.1294	0.1179	0.1403
Year & Industry Fixed Effects	Included	Included	Included	Included	Included	Included

Notes: This table presents coefficient estimates from the OLS regressions of abnormal volatility on our linguistic complexity measures for the partitions based on the *Intensity of questions*, *Foreign ownership*, and *Foreign activities*. Refer to the appendix for a detailed definition of each variable. T-statistics are reported in parentheses below the regression coefficients. We cluster standards errors at the firm and year levels. p-values corresponds to bootstrap tests for the difference in coefficients for our linguistic complexity measures. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 7 Change of the effect of linguistic complexity before and after IFRS adoption

Panel A: Regression analysis using Fog as a measure of linguistic complexity

	Dependent variable: AVOL		Dependent variable: AVAR	
	(1)	*(2)*	*(3)*	*(4)*
	IFRS Adopting Countries	*Non-IFRS Adopting Countries*	*IFRS Adopting Countries*	*Non-IFRS Adopting Countries*
Post IFRS * Fog	0.02**	–0.01**	0.04	0.02
	(2.06)	(–2.35)	(1.17)	(0.48)
Post IFRS	–0.33***	0.09	–0.63	–0.22
	(–3.04)	(0.53)	(–1.55)	(–0.41)
Fog	–0.02**	–0.01**	–0.04*	–0.03
	(–2.46)	(–2.35)	(–1.76)	(–1.33)
SE Clustering	Firm & Year	Firm & Year	Firm & Year	Firm & Year
Country characteristics	Included	Included	Included	Included
Firm & conference call characteristics (Table 5)	Included	Included	Included	Included
Observations	4,129	3,670	4,129	3,670
R-squared	0.1762	0.0585	0.0985	0.0479
Fixed Effects	Country & Industry	Country & Industry	Country & Industry	Country & Industry

Panel B: Regression analysis using Kincaid as a measure of linguistic complexity

	Dependent variable: AVOL		Dependent variable: AVAR	
	(1)	*(2)*	*(3)*	*(4)*
	IFRS Adopting Countries	*Non-IFRS Adopting Countries*	*IFRS Adopting Countries*	*Non-IFRS Adopting Countries*
Post IFRS * Kincaid	0.02*	–0.01	0.04	0.02
	(1.81)	(–0.41)	(1.16)	(0.41)
Post IFRS	–0.27***	0.09	–0.54	–0.16
	(–2.88)	(0.61)	(–1.60)	(–0.34)
Kincaid	–0.02**	–0.01*	–0.05*	–0.02
	(–2.27)	(–1.80)	(–1.74)	(–0.96)
SE Clustering	Firm & Year	Firm & Year	Firm & Year	Firm & Year
Country characteristics	Included	Included	Included	Included
Firm & conference call characteristics (Table 5)	Included	Included	Included	Included
Observations	4,129	3,670	4,129	3,670
R-squared	0.1762	0.0581	0.0985	0.0476
Fixed Effects	Country & Industry	Country & Industry	Country & Industry	Country & Industry

Notes: This table presents coefficient estimates from the OLS regressions of abnormal volatility and abnormal variability on our linguistic complexity measures post-IFRS adoption. Post IFRS equals one if the country of the firm has adopted IFRS in that year and zero otherwise. IFRS adoption dates by country are obtained from Ramanna and Sletten (2010). For the non-adopting countries the adoption date is assumed to be fiscal year 2005. Refer to the appendix for a detailed definition of each variable. T-statistics are reported in parentheses below the regression coefficients. We cluster standards errors at the firm and year levels. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 8 Capital market consequences of linguistic complexity for cross-listed securities

	Dependent variable: AVOL			
	Entire Sample		*Small Firms*	
	(1) Home country security	*(2)* ADR security	*(3)* Home-country security	*(4)* ADR Security
Fog	–0.01	0.00	–0.00	–0.02**
	(–0.47)	(0.13)	(–0.22)	(–2.29)
SE Clustering	Firm & Year	Firm & Year	Firm & Year	Firm & Year
Country characteristics	Included	Included	Included	Included
Firm & conference call characteristics (Table 5)	Included	Included	Included	Included
# of observations	1,321	1,321	667	667
R-squared	0.1595	0.1130	0.1576	0.1676
Fixed Effects	Year & Industry	Year & Industry	Year & Industry	Year & Industry

Notes: This table presents coefficient estimate from OLS regressions of abnormal volatility on our linguistic complexity measures for cross-listed firms. Models (1) and (3) present the results for the local security and Model (2) and (4) present the results for the ADR security. Refer to appendix for detailed definition of each variable. T-statistics are reported in parenthesis below the regression coefficients. We cluster standards errors at the firm and year level. p-values corresponds to bootstrap tests for difference in coefficients for our linguistic complexity measures. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix: Variable definitions

Category	Variable name	Definition	Empirical measure & data source
Firm-characteristics	*Size*	Market Value	Log market value of equity measured in U.S. dollars
	Q	Market to Book	Log market value of assets over book value of assets
	Leverage	Leverage	Total debt over book value of assets
	ROA	Return on Assets	Net income over total value of assets
	ADR	Cross-listed Indicator	Indicator variable that indicates whether or not the firm is cross-listed.
	Log_analysts	Log # of Analysts	Log number of analysts
	Foreign activities	% of US Sales	Percentage of US Sales
	Foreign ownership	Foreign ownership	Average percentage of foreign institutional ownership between 2002 and 2007
Conference call characteristics	*Fog*	Fog Index	Fog= (words per sentence + percentage of complex words) *0.4
	Kincaid	Kincaid Index	Kincaid = (C0 * Words per sentences + C1 * Syllables per words) - C3, where the constant terms are (C0= 0.39, C1= 11.8, and C2= 15.59)
	AVOL	Abnormal Volume	Mean event-period volume divided by the average estimation period volume (Landsman et al., 2012)
	AVAR	Abnormal Volatility	Mean of the squared market model adjusted returns divided by the variance of the market model residuals during the non-event period (Landsman et al., 2012)
	Guidance	Earnings guidance	Indicator variable that takes de value of 1 if the firm issued earnings guidance in a 10 days period surrounding the conference call or the corresponding earnings announcement.
	SUE	Unexpected Earnings	Absolute difference between the actual annual earnings per shares minus the most recent mean analyst forecast, divided by the actual annual earnings per shares.
	Translated	Translation Indicator	Indicator for conference calls that use a professional translator
	Replag		Time from the firm's fiscal year end to the conference call date
	Words	Conference Call Number of Words	Conference call number of words in the Q&A section
	Reluctant	Reluctant	Indicator variable that takes the value of one if the manager provides answers that show he does not want to directly address a question, zero otherwise.
	Unclear	Unclear	Indicator variable that takes the value of one if analysts ask the manager to repeat or clarify, and zero otherwise.
	Inaudible	Inaudible	Indicator variable that takes the value of one if the conference call transcript contains the word inaudible, and zero otherwise.
	Dloss	Loss indicator	Indicator for firms reporting negative earnings.
	Quarter	4^{th} quartercall	Indicator for conference calls corresponding to the

		indicator	fourth fiscal quarter.

Appendix: Variable definitions (Continued)

Category	Variable name	Definition	Empirical measure & data source
	# Previous Calls	Number of conference calls	Mean number of previous conference calls made my management
	Intensity of Question	Number of questions	Number of questions asked by analysts during the conference calls divided by the number of analysts attending the conference.
Country characteristics	*Language Distance*	Language Distance from English	Distance between the English language and the main language of each country studied, based on a 5-point scale classification system (see Dow and Karunaratna 2006 for details).
	EPI	English Proficiency Index	Measure of a country's average English proficiency (EF Education First).
	Uncertainty Avoidance	Uncertainty avoidance	Cultural uncertainty avoidance measure of a country defined by Geert Hofstede (www.geert-hofstede.com)
	Market Return	Country Market Return Index	Annual change in the Datastream global market index
	Synchronicity	Synchronicity	National average firm-level measure of synchronicity following Morck et al. (2000). *Synchronicity* $=\log(R^2/(1-R^2)$ where R^2 is obtained from the yearly market model regression of daily returns.
	Zero Returns	Percentage of Zero Returns	Yearly country average firm level percentage of daily zero returns.
	Market Cap	Country Market Capitalization	Log of equity market capitalization of the country's global Datastream Index.