Economic consequences of adopting English for annual reports

Thomas Jeanjean, Hervé Stolowy, Michael Erkens

Economic consequences of adopting English for annual reports

Thomas Jeanjean, ESSEC Business School, jeanjean@essec.edu
Hervé Stolowy, HEC Paris, stolowy@hec.fr
Michael Erkens, University of Chicago and University of Trier, erkens@chicagobooth.edu

RESUME : Nous examinons les conséquences économiques de l'utilisation de l'anglais dans le rapport annuel de sociétés de pays non-anglophones. Nous utilisons un échantillon de 113 sociétés qui commencent à publier un rapport annuel en anglais en plus d'un rapport annuel dans leur langue locale au cours de la période 2004-2007, tout en : (1) n'étant pas cotées dans à l'étranger, (2) n'ayant pas été intégrées dans un indice boursier important ou dans un indice qui exige une communication en anglais et (3) n'ayant pas été parties prenantes à une opération de fusion-acquisition. Pour contrôler le phénomène d'endogénéité, nous mettons en œuvre une procédure de « différence dans les différence »s et d'appariement « par score de propension ». Nous montrons que l'asymétrie d'information est réduite, le suivi des analystes augmente et le nombre d'investisseurs étrangers est accru. Ceci suggère que la langue est un attribut de la visibilité de la firme.

Mots-clés : rapport annuel, conséquences économiques, traduction, anglais, asymétrie d'information, suivi des analystes, actionnariat étranger

ABSTRACT: We investigate the economic consequences of increasing financial report visibility, measured by the use of English as a reporting language for firms from non-English-speaking countries. We sample 113 firms that started publishing their annual report in English (in addition to their local language) during 2004-2007 while not cross listing, not joining a major stock index or a stock index that requires external reporting in English and not engaging in major M&A activity. Taking into account the endogeneity of the reporting language, with a difference-in-differences setting and propensity score matching, and controlling for confounding factors, we find that adoption of English in the annual report is associated with lower information asymmetry, greater analyst following and more foreign investors. This suggests that language *per se* is an attribute of the firm's visibility.

Keywords: *annual report; economic consequences; translation; English; information asymmetry; analyst following; foreign ownership*

Acknowledgments: We are grateful to Dan Collins, Jennifer Francis, Jere Francis, Laurent Frésard, John Hand, Bruno Oxibar (discussant), Thorsten Sellhorn, Teri Yohn, workshop participants at HEC Paris, the University of Trier, Paris Dauphine University, Stockholm School of Economics, the INTACCT 2010 Paris Meeting, WHU–Otto Beisheim School of Management and participants at the 2009 American Accounting Association Annual Meeting, the 2010 International Accounting Section Midyear Meeting and the 2010 AFC Annual Meeting, for insightful comments that helped us improve this paper. We express our thanks to the HEC Foundation (project F1102) and the INTACCT program (European Union, Contract No. MRTN-CT-2006-035850) for financial support. We are grateful to Infinancials (www.infinancials.com) for providing the data on annual reports for the purpose of this study. We acknowledge the research assistance of Emna Neifar and would also like to thank Ann Gallon for her much appreciated editorial help. Professor Stolowy is a member of the GREGHEC, CNRS unit, UMR 2959.

1. Introduction

Attracting investors' attention is a challenge for listed firms. Prior research finds that certain characteristics (size, liquidity, cross-listing) are associated with firm visibility (see, e.g., Baker et al. 2002 ; Bushee et Miller 2012). Firms lacking these characteristics are often neglected by investors and intermediaries. Prior research (Bushee et Miller 2012) also suggests that voluntary disclosure can improve analyst and investor following, and ultimately reduce the cost of capital. However, since such research generally focuses on highly-visible firms, it is not clear whether simply increasing disclosure is sufficient to overcome visibility and familiarity barriers. In addition, over the past decades several new reporting and financial regulations have forced companies to disclose more information to external users, making it more difficult for firms to use disclosure levels for differentiation purposes, to attract interest and increase their visibility.

To become more visible, some firms adopt an investor relations strategy involving more than simply changing disclosure practices (Bushee et Miller 2012). Other firms try to enhance their visibility by cross-listing in countries where the firm is not incorporated, such as the US or the UK (Baker et al. 2002). Both these strategies, however, involve significant costs and are confined to relatively large firms.

An alternative and relatively straightforward strategy is to adopt English as an external reporting language. Besides press releases and more informal communication channels, the most commonly used communication interface between a firm and its third parties is still the annual report. Smaller firms' annual reports are generally published in the language of the country where the company is incorporated. If the country of origin is a non-English speaking country, the information disclosed in the local-language annual report is, to put it baldly, inaccessible to external users who cannot understand the reporting language. At firm level, one way round this problem is to publish a second annual report in English, which is the "lingua franca of international business" (Charles 2007). Swedish firm Getupdated Internet Marketing AB (formerly Eastpoint AB), for instance, stated in its 2007 annual report (its first to be released in English): "Because language is the only barrier on the Internet, a presence in the major language groups is a prerequisite for profitable international growth" (p. 8). Nextevolution AG, a German firm, explained in its first annual report in English in 2006 that "[it] decided to adjust [its]

investor relations work to the international capital market standards. Therefore, [it is] reporting about the development of [the] company […], both in German and English" (p. 17).

The goal of this study is to analyze the economic consequences of using English as an external reporting language for firms from non-English speaking countries. To rule out the possibility of our findings being driven by one specific effect, we study a range of economic consequences. Specifically, we test the relationship between publishing an Annual Report in English (ARE)[1] and information asymmetry, plus analyst and investor behavior.

Predicting the effect of increasing the international visibility of financial reports by releasing them in English is not easy. It is possible that "going international" and reporting in English is simply a non-issue: financial institutions are sophisticated investors, able to understand any language used in the world. Moreover, financial data exist for all listed firms in financial databases, so information should be available to all interested users, whatever their language. From this standpoint, the use of English should not have any economic consequences. We label this possibility "Language irrelevance". Alternatively, perhaps the reporting language does matter, for two reasons at least. First, there are costs associated with issuing an ARE. As well as the direct costs of translation (probably negligible at firm level), indirect costs arise because the firm's annual reports will become readily available to a large class of sophisticated (mostly US and UK based) investors, who are likely to challenge managers' views and decisions. It is unlikely that rational managers would incur these costs without expected benefits. A second reason draws on Merton (1987, p. 489), who suggests that investors will only invest in firms they are familiar with (and we believe that one very important familiarity attribute is *language*). In line with this familiarity argument, Chui et al. (2010), for example, show that the foreigners' familiarity with a given country's equity market is positively related to momentum profits. Under this view, we expect that firms issuing an ARE will (1) experience decreasing information asymmetry, (2) increase their analyst following, and (3) attract more foreign investors. We label this possibility "language relevance".

We use a sample of firms that decided to publish an ARE in addition to their local-language annual report. We call these firms "ARE adopters" (or treatment firms) in the rest of this paper,

[1] For the sake of simplicity, in the rest of this paper we use the expression "annual report in English" or ARE to mean the English-language version of the annual report.

as they have adopted a new reporting policy. The sample is drawn from the Global Reports database, which states the language used by firms in their annual reports.

To discriminate between the "language irrelevance" and "language relevance" possibilities, our research design needs to avoid two pitfalls. The first pitfall is that the adoption of English in the annual report may result from "other events" that influence the economic consequences investigated. For instance, if a firm was taken over by a US firm, it is likely that the target will use English in its annual report and therefore benefit from lower information asymmetry and more analyst following. The same is likely to happen for firms that cross-listed, became part of a major stock index or were engaged in merger and acquisition activity. To avoid such ex-ante confounding effects, our research strategy is twofold. First, we exclude from our treatment sample all firms that cross-listed during or after the period of investigation, firms that joined a major stock index or a stock index that requires external reporting in English and firms engaging in merger and acquisition activities in the two years prior to adoption of English (as a target or an initiator), Second, we adopt a difference-in-differences setting where control firms are not randomly chosen. We first model the decision to use English for firms from non-English speaking countries, and then select control firms that have the closest propensity to use English in their annual report to the treatment firms but do not actually do so. The selection process for control firms helps to control the observable differences between control and treatment firms.

The second pitfall is that our treatment firms are likely to experience changes in their disclosure policies after the adoption of an ARE. More specifically, firms which issue an ARE may increase their disclosure levels or adopt financial reporting standards as part of their strategy to become "international". To mitigate the impact of this post-adoption effect, we include in our difference-in-differences regressions a number of control variables to take into account these effects.

Our first univariate test consists of observing our proxies for information asymmetry, analyst following and the presence of international investors before and after the change. We observe that information asymmetry decreases by almost 29.3% when measured by the bid-ask spread and by 39.6% when measured by the zero-return days, while analyst following increases (on average, ARE adopters increase the number of analysts from 0.5 to 1.7, i.e., by more than one analyst) and the proportion of foreign ownership surges by 17 points (which represents an additional 2.5 foreign owners on average). These magnitudes are much lower for control firms. In other words,

ARE adopters experience a decrease in information asymmetry and an increase in analyst following and foreign ownership relative to control firms. In a series of multivariate tests, we introduce control variables for the quantity of information disclosed, accounting standards, size, leverage and other control variables. Findings are similar. We carry out a number of additional analyses to check the robustness of our findings. First, we use an approach suggested by Heckman (1979) in which we control for unobservable factors associated with the decision to adopt an ARE. Second, we investigate whether the economic consequences of adopting an ARE vary with country size. We find that firms incorporated in "large countries" benefit more from adopting an ARE than firms domiciled in "small countries". The visibility effects resulting from the ARE seem to complement rather than substitute the visibility brought by a country. Finally, we provide a time analysis which reinforces our findings. We plot the effects of adoption of an ARE. We find that most of the decrease in information asymmetry follows changes in ownership, and that changes in analyst following trail changes in information asymmetry. This suggests that the economic consequences of ARE adoption stem from changes in ownership.

Our paper makes three contributions to the literature. First, the consequences of using a widespread language (English) in the accounting literature have never been studied before. However, language (or cultural and familiarity aspects, which are related) has been put forward as a possible explanation for a home investment bias (e.g., Dvorak 2005), the superiority of country-specialized analysts over industry specialists (Sonney 2009), more accurate forecasts by local analysts compared to foreign analysts (e.g., Bae et al. 2008a), different investment styles between domestic and foreign investors in conjunction with investor sophistication (e.g., Grinblatt et Keloharju 2000, p. 44, 66), a higher trading volume for local equity than foreign equity (see, e.g., Grinblatt et Keloharju 2001, p. 1054 ; Hau 2001a, p. 768), greater proximity between the company and its local investor base (e.g., Rauch 1999 ; Grinblatt et Keloharju 2001, p. 1054), lower information asymmetry (e.g., Hau 2001a, p. 768), and broader international ownership (e.g., Kalev et al. 2008, p. 2377). In contrast to this paper, none of these articles *directly* tests the consequences of using a specific language.

Second, our paper contributes to the growing field of research on non-numerical information. Baginski et al. (2004) investigate why managers augment voluntary earnings forecasts with explanations for forecasted performance. Tetlock et al. (2008) quantify the language used in financial news stories in an effort to predict firms' accounting earnings and stock returns and Li

(2010) applies a linguistic analysis to some sections of annual reports. Hales et al. (2011) mention that "although we often think of financial reporting in terms of numbers, language is, in fact, the medium through which companies communicate much of the information on their past and projected future performance" (p. 224). Our paper contributes to this field by showing the importance for market participants of the language (English or local) used in annual reports.

Third, we also add to the international accounting literature. There has been some debate over the desirability of common financial reporting standards: although the adoption of International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) is found to be associated with a lower cost of capital and transaction costs, a higher market value (Leuz et Verrecchia 2000) and reduced home bias (Covrig et al. 2007), these effects seem to be confined to early adopters and are economically relatively modest in magnitude. We argue that before we even reach the question of accounting standards, the first barrier to understanding and comparing financial statements and increasing transparency is the language barrier. Using English for external reporting purposes is therefore the only way to address anyone outside the firm easily and directly, and reduce the costs of information acquisition. We show that the language used in the annual report is a means of improving accessibility to financial statements for users of information.

The rest of the paper is organized as follows. In the following section, we provide some background on annual report language and develop our hypotheses. Section III describes the methodology, variables and sample, and section IV presents our empirical evidence. Section V provides additional analyses to confirm the validity of our study. Section VI concludes the paper.

2. Motivation and Hypothesis Development

2.1 Importance of Language for Financial Statements Users

Past literature concentrates on accounting as a language, not on the language used in annual reports *per se*. In this paper, we investigate whether the language used in the annual report has economic consequences, making the implicit assumption that the annual report is useful to investors.

Annual reports are comprehensive documents consisting of a variety of components, such as a presentation of the firm (history, products, operating and financial review), a letter from the Chairman, a management discussion and analysis section and a full set of financial statements. The literature on accounting information generally holds the view that accounting and financial statement data are not the only source of information for capital markets (e.g., Gonedes 1976). The annual report is part of a network including complementary instruments such as preliminary announcements and analyst presentations. Insider trading, for example, sends information to capital markets (Seyhun 1998): analysts and ratings agencies receive information before its publication in financial statements, and they convey this information to the capital markets through their own publications. However, surveys and other research evidence have shown that the annual report is a vital, though not sufficient, source of information for analysts both in the US and elsewhere (e.g., Chang et Most 1985 ; Vergoossen 1993). Chang et al. (1983) showed that the annual report was used as a basis for investment decisions. Barker (1998) concludes that the research literature has paid insufficient attention to the role of accounting information in direct communication between companies and fund managers. The importance of narratives and one-to-one contact also underlines the importance of language as an ingredient of the informational efficiency of markets. For instance, Nickerson and de Groot (2005) state that "European corporations will be increasingly reliant on the non-financial texts within the annual reports, as a means to distinguish themselves from competitors" (p. 328).

Hales et al. (2011) underline the importance of annual reports, as the qualitative information contained in financial reporting is not completely subsumed by the "hard" numbers produced by the financial accounting system. This is why we argue that an ARE enhances the information environment of a firm, and hence reduces information asymmetry in the market, even when the actual accounting figures are already accessible through financial databases such as Datastream©, Global©, Infinancials© or Worldscope©. Information asymmetry originates not only from unawareness of a firm's figures, but also through a lack of knowledge of corporate strategies, goals and management estimations. These ingredients of the information environment of a firm can typically be found in the firms' annual report.

2.2 Hypothesis Development

Information asymmetry exists because some investors possess private information about a firm that is unavailable to other investors. Economic theory suggests that greater disclosure reduces information asymmetry (Diamond et Verrecchia 1991). The associated disclosure literature implicitly assumes that all disclosure is read and utilized by market participants, but this assumption is contradicted by a large body of literature on firm visibility and its impact on price (e.g., Chan et al. 2005). This literature follows Merton's (1987) suggestion that investors will only invest in firms they are familiar with.

In this paper, we argue that issuing an ARE is a way for firms to increase their visibility to investors and financial analysts. Several factors underlie this positive association. First, English is a *lingua franca*: in terms of native speakers[2], it is the world's second most common language (after Mandarin and on an equal footing with Spanish). Second, English is the language of business: stock exchanges located in English-speaking countries represent 65% of the world stock market capitalization[3], and 93% of financial analysts who are members of the CFA institute are located in English-speaking countries.[4]

The visibility of a firm and the existence of information asymmetry can be captured by two often-used and cited proxies for informational advantage: "market proximity" and "familiarity". Market proximity and familiarity can concern geographical, economic, industrial, and cultural characteristics and among other effects, reduce information asymmetry in the market. Our proxies for information asymmetry are bid-ask spreads and zero-return trading days.[5] Cultural and geographical proximity themselves are mainly influenced and connected by the existence of a common language. Rauch (1999, p. 10, 25, 30) points out that a common language and colonial ties are of particular importance for product design, and shows that both have effects on matching international buyers and sellers for more differentiated products. In addition, his analysis confirms that search costs – which can in our case be interpreted as translation costs – are a great barrier to trade for those products. Various studies have explicitly linked the existence of a

[2] Source: http://www2.ignatius.edu/faculty/turner/languages.htm.

[3] Source http://www.world-exchanges.org/statistics.

[4] See www.cfa.institute.com.

[5] For a discussion on various proxies for information asymmetry, see section III.

common language to trading behavior, portfolio allocation decisions, and information asymmetry. Tesar and Werner (1995), for example, focus on "language, institutional and regulatory differences and the cost of obtaining information about foreign markets" (p. 479). They suggest that "geographic proximity seems to be an important ingredient in the international portfolio allocation decision" (p. 485). In their study on gross cross-border equity flows between 14 countries, Portes and Rey (2005) find that a language dummy is a significant factor in certain specifications for asset trade. Sarkissian and Schill (2004, p. 795) report as their main result that there is more cross-listing activity across countries that share a similar language or colonial ties, since there is lower information asymmetry. Hau (2001b), in his study on transaction data from the Xetra trading system at the German Security exchange, finds that traders outside Germany in non-German-speaking locations face an information disadvantage, and trade less and with lower profitability. He remarks that "the information barrier may be either linguistic or geographic in nature" (p. 1962). Altogether, these studies highlight the (potential) importance of the language a company communicates in and suggest that disclosure must be visible to be effective (in terms of capital market consequences as a result of internationalization). Therefore, our first hypothesis is the following:

H1: Firms adopting English in their annual report experience a reduction in information asymmetry.

As a second hypothesis, we focus on analysts' response to ARE adoption, which can be a strategy to channel information through intermediaries such as financial analysts (Beaver 1981) in order to increase firm visibility and attract investors. A huge body of literature exists on analyst following and the accuracy of analyst forecasts (see, for instance, Baker et al. 2002 ; Ali et al. 2007 ; Arya et Mittendorf 2007 ; Lehavy et al. 2011).[6] Most of these studies indicate that analysts prefer to follow large firms listed on major exchanges with lower performance volatility (O'Brien et Bhushan 1990 ; Lang et Lundholm 1996).

Some of the most recent studies on analyst following even mention the possible effect of domestic analysts' informational advantages compared to foreign analysts, due to language knowledge and cultural proximity. Bae et al. (2008b, p. 597) assume that the decision to follow firms is based on the costs and benefits of following foreign firms. On the cost side they expect

[6] For a review, see Ramnath et al. (2008).

that “costs presumably include primarily the direct costs of acquiring information about a new firm”. In their empirical tests (2008b, p. 606), they include a dummy variable indicating the existence of a common language between analysts and the firm followed by those analysts. The results confirm their expectation: foreign analyst following is greater when the firm’s country and the analyst’s country share a common language or colonial history. Bae et al. (2008a, p. 599) refine this finding further not by looking at the existence of a “common language”, but by focusing on the “English language” specifically. They assume that foreign analysts are likely to be fluent in English, and therefore expect those analysts “to be at a disadvantage with regard to firms in countries where English is not the main language”. Ramnath et al. (2008) take a similar position and propose that future research might consider the effects of cultural differences across countries on analysts’ decision processes and forecasts. Our paper differs from past literature by focusing on the firm’s point of view rather than the analyst’s point of view. Our second hypothesis addresses all these issues and is expressed as follows:

H2: Firms adopting English in their annual report increase their analyst following.

Finally, we examine whether foreign ownership depends on the reporting language. There is a large body of literature examining the firm characteristics associated with institutional investor ownership (see, for instance, Bushee 2001 ; Dahlquist et Robertsson 2001). These articles consistently find that institutions prefer larger firms that are listed on stock indexes and major exchanges. The possible interaction between language or cultural proximity and foreign ownership is less often mentioned in prior studies than the potential links between liquidity and language proximity. Grinblatt and Keloharju (2001, p. 1055) show that investors are more likely to trade in stocks of firms that share (or at least communicate in) the same language as the investor, and have a similar cultural background because of greater information flows between market participants with the same language or historical ties. They point out that “if a company perceives that a large proportion of its shareowners prefer a particular language, the company may choose to communicate in that language”. They also find that Finland-domiciled companies that publish their annual reports both in Finnish and Swedish are able to tap an abnormally large Swedish-speaking investor base, both in Finland and Sweden. They expect that “firms in other countries should be able to do the same to increase their investment appeal. For example, US companies, which generally publish their annual reports only in English, might be able to expand

their investor base by publishing their annual reports also in, say, Spanish and Japanese" (Grinblatt et Keloharju 2001, p. 1071). Pagano et al. (2002) find that a common language fosters "clustering" of institutions in countries that are geographically or culturally close to their country of incorporation. They believe this is mainly due to informational reasons. Kalev et al. (2008, p. 2377) compare the investor behavior of foreign and local investors on the Helsinki Stock Exchange. They expect and confirm "that information about single-listed stocks is more apparent to local investors who do not face language, distance or culture barriers". Hence, foreign ownership is smaller for firms that do not communicate in English, since the informational disadvantage for foreign investors is greater than with companies that publish their accounts in English as well as their local language. Graham et al. (2009) provide evidence that investor competence is an important determinant in investment decisions, especially for international investment. Holding competence constant, disclosing an ARE enables firms to target more competent investors, as it lowers the "language barrier".

Taken together, all these reasons lead us to hypothesize that a firm's international visibility is positively affected by adopting an ARE. Our third hypothesis is therefore:

H3: Firms adopting English in their annual report attract more foreign investors.

3. Methodology, Variable Description and Sample

As outlined in the previous section, economic theory suggests that commitment to increasing visibility should enhance the firm's information environment. The difficulty lies in demonstrating this relationship empirically. There are three major problems: (1) a commitment to greater visibility has effects both in terms of "news" (ARE adoption signals information about the firm's future prospects) and "information asymmetry" (adoption is a way to disseminate information to investors), and these effects must be separated; (2) there may be self-selection bias; and (3) the proxies used to measure economic consequences may also influence findings. Our research design attempts to address each of these concerns.

3.1 The Difference-In-Differences (DID) Methodology

To assess the impact of international reporting strategies on our proxies, we can study the effect across firms by explicitly controlling for other determinants of the information environment, or we can examine changes in the proxies around the adoption of an ARE strategy ("pre-post adoption study"). Each option has advantages and disadvantages (Leuz et Verrecchia 2000). The cross-sectional design is less prone to confusing the "news" and "information asymmetry" effects of a commitment to increasing visibility. The change in economic consequences that occurs when the firm adopts English in the annual report indicates both a change in expectations about the firm's future performance and a change in the information environment. The former occurs around the switch and its direction depends on the news or information content of the disclosure. The latter is permanent and captures the reduction in information asymmetry and increase in liquidity: its direction is therefore independent of the news content. By estimating a cross-sectional relationship between our proxies and the firm's reporting strategy well after firms have changed disclosure regime, we should be able to separate the two effects and focus on the "information asymmetry" effect. A "pre-post adoption study" design observes the behavior of our proxies around the reporting change and hence mitigates the possibility that some other unobserved variable (rather than the disclosure policy) is responsible for the cross-sectional differences in the proxies.

To test our hypotheses and address the research design issues outlined above, we use a difference-in-differences (DID) setting, an empirical estimation technique commonly used in economics and in the accounting literature (see Cheng et Xu 2006 ; Wang et al. 2009 ; Altamuro et Beatty 2010). Let us take a hypothetical example in which a firm decides to adopt English for external reporting purposes and publishes an ARE for 2006 (in the early months of 2007). Let us also assume that in the year the change becomes effective and known to interested parties (year 2007, called year 1 in our statistical treatments), an outcome variable (e.g., analyst following) increased by 50% compared to the year before the change became effective (year 2006, called year 0 in our treatments). To estimate the impact of the change on analyst following, we could simply conduct a "before and after" analysis and conclude that adoption of an ARE is associated with a 50% increase in analyst following. The problem is that there could be an unrelated trend

towards more analyst following over time, and it is impossible to know whether the firm's decision to publish an ARE or the time trend caused this increase in analyst following.

One way to identify the impact of ARE adoption is to run a DID regression. If there is another comparable firm that did not change its external reporting language, this could be used as a control to compare the year-on-year changes between ARE adopters and non-adopters. More precisely, we will run the regression:

$$Economic\ consequenc\ e = \beta_0 + \beta_1 Treatment + \beta_2 Time + \beta_3 Treatment \times Time + \beta_s Control\ variables + \varepsilon \quad (1)$$

Where

- *Economic consequence* is the economic consequence analyzed (analyst following for instance – we also use information asymmetry and foreign ownership);
- *Treatment* is a dummy coded 1 if the firm adopted English at some point in time, 0 otherwise;
- *Time* is a time dummy coded 1 from the year the change becomes effective (i.e., one year after the period concerned by the annual report, 2007 for the 2006 annual report, in our example) and 0 until the year the change becomes effective;
- *Treatment* × *Time* is the interaction of the *Treatment* dummy and the *Time* dummy;
- *Control variables* vary across the dependent variables. These variables are included to control for factors, other than time and language, associated with the economic consequence analyzed. They are presented below.

This setting can test the economic consequences of using English. We compute our proxies before and after the adoption of English, for treatment firms and for a control group (determined with a propensity score matching procedure – see below). If the adoption of English has economic consequences, we expect to see differences in the economic consequences between the treatment and control groups after the adoption. The use of a control group and the computation of time differences (before and after the change) provide natural controls for any confounding factors, such as the adoption of IFRS in 2005.

The following table indicates the predicted value of an economic consequence for each of the possible scenarios.

Predicted *Economic consequence*	Time = 0	Time = 1
Treatment = 0	β_0	$\beta_0 + \beta_2$
Treatment = 1	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$

β_0 is the baseline average for non-adopters before the adoption, β_1 represents the differences between the two groups in year 0 (before the adoption), β_2 represents the time trend in the control group (non-adopters), and β_3 represents the difference in the changes over time. Assuming that both groups have the same analyst following trend over time, we have now controlled for a possible time trend effect. We can thus identify the true impact of ARE adoption on analyst following (β_3).

Under our DID procedure, a significant β_3 can be interpreted in at least four different ways. A first interpretation is that issuing an ARE is indeed associated with economic consequences. A second possible explanation is that an ARE contains more information than a local-language annual report. Under this interpretation, a significant β_3 would not mean that using English has economic consequences, but that *increased disclosure in the English version* of the annual report has economic consequences. However, past research suggests that firms do not "take advantage" of the English version to report additional information and increase transparency. Campbell et al. (2005), for instance, carry out a content analysis of voluntary disclosure in an international comparison context. They examine the validity of volumetric comparison by recording word and sentence counts, using both original German documents and their English translations published by German companies themselves. They find that the English rendering of German environmental narrative is generally faithful to the German, suggesting that companies do not deliberately discriminate by reporting jurisdiction. In other words, we can study the use of English *per se* because there is no difference in content between the local-language annual report and the ARE.

A third explanation for a significant β_3 is that firms that adopted an ARE committed to disclose more information in their annual report after the adoption. Following this reasoning, β_3 does not capture the economic consequences of adopting an ARE, but the economic consequences of *increased disclosure* (either in the local language or its English equivalent). To

control for this possibility, we control for the quantity of information disclosed in the annual report for both control and treatment firms.

A last possible reason for a significant β_3 is self-selection if factors associated with the issuance of an ARE are also associated with outcome variables. We will see below in Table 1, Panel B that English adopters are smaller than other listed firms and have more growth opportunities. Since these factors are potentially correlated with the economic consequences analyzed, we implement a propensity score matching (PSM) procedure initially proposed by Rosenbaum and Rubin (1983).

3.2 The Propensity Score Matching (PSM) Procedure

The standard "proper" DID approach relies on a natural experiment, i.e., some change is expected to affect treatment for one group more than another, but the two groups should not otherwise differ. For this to work properly, the natural experiment should be exogenous (i.e., the change must not be a reaction to behavior) and unlikely to encourage people to "play the system" and change their behavior in unpredictable ways. In other words, the choice of a matching sample is a critical step in our methodology.

The key problem in estimating the cross-sectional regression is that firms *choose* their reporting strategy, and their decision will take the costs and benefits of reporting in English into consideration. To mitigate this possibility, we use a non-random control sample of firms which have the same propensity to adopt English, but did not do so. This methodology, known as "propensity score matching", is becoming increasingly popular in the accounting literature (see Armstrong et al. 2010 ; Lawrence et al. 2011) and involves two stages.

In the first stage, we estimate the probability of publishing an ARE with a Logit model. This enables us to identify control firms that (1) have the same predicted propensity to use English as the treatment firms (adopters), or (2) continue to use the local language only for external reporting. In the second stage, we estimate Equation 1 for treatment firms (adopters) and control firms (firms that continue to use only the local language but show the same propensity as our sample firms to issue an ARE). Propensity score matching essentially estimates each firm's propensity to make a binary choice as a function of observables, and matches firms with similar propensities. As Rosenbaum and Rubin (1983) showed, if the propensities were known for each

firm year, they would incorporate all the information about possible self-selection issues, and propensity score matching could achieve optimal efficiency and consistency. In practice, the propensity must be estimated and selection is not only on observables, so the estimator may be both biased and inefficient.

At the general level, we hypothesize that the decision to issue an ARE is driven by external financing needs, as suggested by Jeanjean et al. (2010). In other words, the issuance of an ARE should be related to the desire to attract new investors. More precisely, we expect the following variables to influence the likelihood of using an ARE: firm size, profitability, growth opportunities, leverage, international sales, ownership structure and issuance of debt or equity. The rationale for including these variables in our propensity score procedure is discussed below.

Bonaccorsi (1992) develops a theoretical analysis of the obstacles preventing small firms' internationalization: limited resources, lack of scale economies and perceived high risk for international operations. Consistent with this framework, we expect the benefits of an ARE to increase with a firm's *Size.*

All other things being equal, a highly profitable firm generates a large free cash flow. This lowers the need for external financing. If the annual report is used to increase the visibility of the firm, then the need for an ARE should decrease with ROA and ARE adoption should show a negative association with *Return on assets.* Prior research has divided firm value into two components (Myers 1977): the assets-in-place, which are valued independently of the firm's future investment opportunities, and the growth options, which are valued on the basis of the firm's future investment decisions. As it depends on future discretionary expenditures by managers, the value of growth options is subject to far more uncertainty than the value of assets-in-place. Myers (1977) notes that firms with abundant growth opportunities are more likely to be in need of external financing to fund current and future profitable projects. Reporting in English as well as the local language could facilitate fund-raising by enlarging the base of potential investors. This is why ARE adoption should be positively related to *Growth opportunities.*

Myers and Majluf (1984) show that firms may refuse to issue stock, sometimes choosing to pass up valuable investment opportunities. Their findings are based on the assumptions that (1) managers know more about the firm's value than potential investors and (2) managers act in the interest of existing shareholders, but also that (3) investors interpret the firm's actions rationally. This model implies that highly-leveraged firms will not seek external equity financing. We

expect the use of English as a second reporting language to be linked to the desire to raise equity. Thus, the ARE adoption is expected to be negatively related to *Leverage*.

Raffournier (1995) states that companies are induced to comply with the usual practices of countries in which they operate. "The more international the operations of a firm, the larger is the inducement" (1995, p. 266). Many previous studies in international business use international sales as an indicator for the degree of internationalization of a firm (see Raffournier 1995). Companies with international sales should need an ARE more than others and therefore, ARE adoption is expected to be positively related to the degree of *Foreign sales*.

Past research (Dahlquist et Robertsson 2001) showed that institutional shareholders prefer to invest in firms with a widespread ownership. If the adoption of English is related to the desire to attract new shareholders, then we should observe that issuance of an ARE is negatively associated with the proportion of *Closely held shares*.

Finally, we expect the likelihood of issuing an ARE to be positively associated with the issuance of debt or equity in the future. We therefore anticipate a positive and significant coefficient on *Future debt increase* and *Future equity increase*.

In addition to these eight variables, we also include industry and year dummies to control for fixed factors correlated with industry or year. We estimate the following Logit for each country:

$$\begin{aligned} Log\left[\frac{\Pr(ARE=1)}{1-\Pr(ARE=1)}\right] &= \alpha_0 + \alpha_1 Size + \alpha_2 Return\ on\ assets + \alpha_3 Growth\ opportunities \\ &+ \alpha_4 Leverage + \alpha_5 Foreign\ sales + \alpha_6 Closely\ held\ shares + \alpha_7 Future\ equity\ increase \\ &+ \alpha_8 Future\ debt\ increase + \sum_k \alpha_{9,k} Industry + \sum_t \alpha_{10,t} Year \end{aligned} \quad (2)$$

To estimate Equation 2, we use the global reporting universe described later in this section. Table 1, Panel A, reveals that the sample size is 11,338 firm-year observations, 49.5% classified as publishing an ARE and 50.5% as publishing only in their local language.

As noted by Li and Prabhala (2006), propensity-score matching estimators are consistent estimators for treatment effects (the adoption of English in the annual report in our case) if the assignment to treatment is not endogenous, i.e., if unobserved variables that affect the assignment process are not related to the outcomes. In other words, a PSM procedure controls for self-selection on observable but not unobservable factors. We think that including control variables in our second stage equation and studying several outcomes (information asymmetry, analyst following, foreign ownership) provide controls for these unobservable factors. Moreover, we

believe that our sampling procedure (i.e.: the exclusion of firms that cross list, join a major stock index or engage in M&A activity) mitigates the possible effect of self-selection since ARE adopters are excluded if these events occur either concomitantly or after the adoption of English. Consistent with past research, we also provide additional tests in which we control for unobservable factors in our analysis (see section V).

3.3 Variable Description

Variable descriptions are presented in Appendix 1.

3.3.1 Dependent Variables

In studying the economic consequences of ARE adoption, we use proxies for information asymmetry, analyst following and ownership structure. To proxy for information asymmetry we use companies' bid-ask spreads and zero returns. Although previous literature has found various other proxies for information asymmetries, such as share price volatility (Leuz et Verrecchia 2000), analyst following and forecast accuracy (Lang et al. 2003), price impact of trades and probability of informed trading (Chan et al. 2008), availability of SEC filings and third-party credit ratings (Sufi 2007), we follow Welker (1995), Healy et al. (1999) and Leuz and Verrecchia (2000). According to Leuz and Verrecchia (2000), among the different proxies for information asymmetry, the bid-ask spread is the best option to address the adverse selection problem that arises on share trading (p. 99). Less information asymmetry implies less adverse selection, which, in turn, implies smaller bid-ask spreads. This measure is also used in other studies as a proxy for information asymmetry (e.g., Lev 1988 ; Armstrong et al. 2011).

As the bid-ask spread is not the only existing proxy for information asymmetry, we add a second proxy for adverse selection and information asymmetry: the proportion of zero-return days. This approach is consistent with Daske et al. (2008) and Ashbaugh-Skaife et al. (2006), who find that a zero-return metric is a summary measure of the extent to which firm-specific information is reflected in share price. Higher values for this proxy correspond to greater illiquidity. We follow Bekaert et al. (2007) and define the zero-return metric as the number of zero-return trading days over the firm's fiscal year divided by the total number of trading days in the fiscal year. Using the zero-return metric is convenient in our setting because the information necessary to compute it is readily available consistently across markets. Lesmond et al. (1999)

argue that illiquidity will be visible in infrequent trading, reflected in days without price movements.

Our next proxy relates to analyst following. Since analysts serve as information intermediaries, their presence should tend to increase transparency. We measure analyst following as the number of analysts issuing at least one EPS forecast during the year.[7] Our fourth measure of economic consequences relates to the internationality of ownership. Data on ownership are provided by Thomson Ownership. This database indicates the country of residence (the "country" column) as well as the number of shares owned by each shareholder. We compute three measures of the internationality of ownership. For each measure, we count the number of "Foreign owners" (FO) for each firm-year observation.[8] FO are defined as (1) owners from a country whose language is different from the one used in the firm's country of incorporation; (2) owners from any country that is not the firm's country of incorporation; (3) owners from an English-speaking country. Consider for instance a German firm, with four shareholders: one German, one Austrian, one Italian, and one British. Our three metrics set FO respectively at 2 (as Austria's language is German), 3, and 1. For the sake of simplicity, we report only the first measure.

3.3.2 Control Variables

For each dependent variable, we add control variables in Equation 1. In all regression models, we include industry-, country-, and year-fixed effects. Our specifications therefore control for differences in countries' ARE adoption rates as well as time trends.

For all regressions, we also control for the quantity of information disclosed. There is a possibility that the adoption of English is accompanied by more disclosure; this additional disclosure is likely to be associated with our outcome variables (information asymmetry, analyst following and foreign ownership). To control for this disclosure effect, we include a variable named *Quantity of information,* computed as the number of pages in the local-language annual

[7] It would have been interesting to identify financial analysts and their characteristics (such as nationality, employer, etc.), in order to directly test whether firms are able to attract more UK or US-based analysts by issuing an ARE. This is not possible, as IBES has eliminated the possibility of matching analysts with their employers.

[8] We did not use the alternative method of computing the total shareholdings of non-local owners, because we found inconsistencies in the continuity of this data as provided by Thomson Ownership.

report, scaled by the average number of pages in all sampled (local-language) annual reports in the country. This variable captures the extent of disclosure beyond the country average and is intended to reflect any information effect associated with adoption of English.

In the spread regression, we control for *Size*, *Return variability*, *Share turnover* and *International standards* (Daske et al. 2008). In the zero-return regression, we control for *International standards, Size, Return variability*, occurrence of a *Loss, Growth opportunities* and *Analyst following* (Daske et al. 2008). In the analyst following regression, we control for *Size, Return on assets* and *Growth opportunities.* We expect to find greater analyst following for bigger firms, and for firms with higher profitability and growth opportunities. In the foreign ownership regression, we control for *International standards*, *Size*, *Financial leverage*, *Return on assets*, and *Growth opportunities* (Dahlquist et Robertsson 2001).

3.3.3 Sample

To test our hypotheses, we created a sample of firms that have adopted English for their financial reporting (i.e., publish both a local-language annual report and an ARE). The primary data source is the "Global Reports database" (GR database) which contains all annual reports, whatever their language. From this database, we selected all firms from non-English speaking European countries which issued an annual report (in any language) from 2004 to 2007. We restricted our sample to European firms because of the harmonization of European regulations, which gives us a homogenous set of countries where cross-border movements of goods, services and people are facilitated (see Bekaert et al. 2010).[9] We dropped all pre-2004 observations because the European Union decided to mandate the adoption of IFRS for all listed firms in 2005, and the transition process required all 2004 financial statements to be restated under IFRS. This makes it possible to control for the potential influence of accounting standards on the attributes measured, as both treatment and control firms are impacted by IFRS adoption due to its mandatory nature.

Insert Table 1 About Here

As shown in Table 1, Panel A, from this initial database of 3,543 firms (11,338 firm-year observations over the period 2004-2007), we analyzed the external language(s) used for each

[9] Although Switzerland does not belong to the European Union (EU), it is included in our sample because it is part of the EFTA (European Free Trade Association) and is highly integrated with the EU.

firm-year observation (Local language/English/Both). Out of the 11,338 observations, 49.5% publish an ARE at least once, whereas 50.5% publish only local-language annual reports.

From the GR database, we were able to identify firms which issued a local-language annual report and an ARE between 2004 and 2007. We hand-collected and checked the languages of annual reports before and after the change date as identified from this database (208 changes in all).[10] Even if the choice of language is independent of the decision to adopt different accounting policies[11], we believe that companies listed in the US or UK will be tempted to publish an ARE to facilitate understanding of their financial statements by US or UK investors, and consequently we excluded cross-listed firms from our sample. We also excluded firms listed on the NEXT segment (Euronext) or Prime segment that require firms to publish an ARE in English. This resulted in elimination of 30 firms during the period 2004-2009[12] so as to avoid simultaneity in the consequences of adopting an ARE and the benefits of cross-listing.[13] We also dropped 36 firms engaging in merger-acquisition activity during 2004-2009 (as initiator or target) according to the SDC Platinum Database, because such firms engaged could experience changes in ownership or analyst following that are unrelated to the issuance of an ARE. We also checked that no firms joined a major stock market index, as this event would enhance the visibility of the firm. We finally dropped 29 companies with missing data on some of our independent variables. Our final working sample consists of 113 firms.

In Table 1, Panel B, we provide descriptive statistics on financial data for the universe (11,338 firm-year observations for 3,543 firms), the treatment sample (113 firms) and the control sample (107 firms).[14] Note that there are fewer control firms than treatment firms, as the same firm can be a control firm for more than one treatment firm (but not for the same adoption year).

---

[10] Annual reports were collected from the www.infinancials.com website, or if unavailable, from the firms' websites.

[11] For example, foreign companies listed in the US must prepare a 20-F form, which of course is in English. However, the annual report of these companies (which is a separate document from the 20-F form) may still be published in their local language. In addition, evidence on whether the 20-F form is the source of the information is mixed, because the information release date is generally unclear (see Lang et al. 2003).

[12] We include in our initial dataset all firms that first issued an ARE in the period 2004-2007. Consequently, we exclude all firms that cross-listed up to two years after the last adoption of an ARE.

[13] To test the robustness of our results with regard to this hypothesis, we run the basic model including companies listed in the US or UK. Findings are robust to the inclusion of cross-listed firms in our sample.

[14] For the composition and selection of our control sample, see below.

On average, mean (median) firm size, measured as the log of sales, is 4.002 (4.385) for treatment firms, which appears to be smaller than for the entire universe: 4.549 (4.732). This difference is significant in both the mean and the median. The mean (median) return on assets (ROA) is 0.2% (3.0%) for the treatment group. These figures are statistically indistinguishable from the mean (1.7%) and median ROA (3.6%) for all listed firms. The growth opportunities of the treatment firms equal an average (median) 2.154 (1.452), compared to 1.672 (1.306) for all listed firms. Firms that adopted an ARE appear to have more growth opportunities than the whole universe (p-value of the t-test = 0.000, p-value of the Mann-Whitney U test = 0.000). One unexpected finding concerns leverage: its mean (median) value is 50.7% (52.2%) for the ARE adopters, which is comparable to the 51.6% (54.1%) for all listed firms. Surprisingly, firms from our treatment group exhibit a lower proportion of foreign sales (mean of 11.9%) than the entire universe (22.5%). However, intra-industry variation in the proportion of ARE could explain this finding. Firms with an ARE do not differ from the entire universe in terms of ownership structure: on average, their closely held shares represent 33.7% of the total number of shares, versus 36.3% for the whole universe. Firms that adopt an ARE seem to lever funds either through equity or debt offerings more frequently than other firms. On average, 58.4% (81.4%) of ARE adopters issued equity (debt) during the period versus 43.5% (73.8%) for all firms. The proportion of future equity increases differs statistically and economically across sub-samples, whereas the proportion of future debt increases is statistically indistinguishable.

To summarize, ARE adopters are smaller, have more growth opportunities, lower international sales and more funding needs than the average listed firm in their respective countries. Meanwhile, the group of all ARE adopters is smaller, has more growth opportunities and lower international sales than the group of all control firms. However, at the firm-to-firm level we control for these differences by the propensity-score matching procedure. To further test the robustness of our results with regard to this finding, we include these firm characteristics in our basic model. Findings are robust to the inclusion of more control variables.

Table 2 provides descriptive statistics for our treatment sample. Panel A reports the country of origin and Panel B the industry classification of our sample.

Insert Table 2 About Here

Panel A reveals that the sample firms come from 15 different countries. Eight countries (Germany, Sweden, Norway, Italy, Denmark, Greece, Switzerland and France) account for nearly

84% of the observations. Those eight countries have relatively well-developed capital markets, a useful factor in computation of information asymmetry measures; yet across and within these markets, firms are likely to differ substantially in terms of transparency and liquidity. Firms also differ in terms of dominant local language, with 12 different languages used in the sample countries. Panel B of Table 2 reveals that three sectors (Manufacturing, Service and Finance) account for more than 78% of the observations.

4. Empirical Findings

We expect the adoption of English in the annual report to have consequences for visibility. However, it could be argued that most adoptions occurred around 2005 and that the effects shown reflect an IFRS effect rather than a visibility effect resulting from ARE publication. It is also probable that the likelihood of ARE adoption is correlated with factors associated with visibility. To control for alternative explanations, we benchmark our findings against a control group comprising firms selected for their likelihood of publishing an ARE in a multivariate analysis. We describe selection of the control firms before presenting a change analysis of the economic consequences before and after ARE adoption. In a third paragraph, we use a Difference-in-Differences (DID) setting.

4.1 First Stage of the Propensity Score Matching Procedure

We first report the results of the first stage of the propensity score matching. The selection equation (Equation 2) was estimated country by country to determine the likelihood of ARE adoption for each firm-year observation. As we cannot report the regression results for each country, Table 3 reports the estimated coefficients for the whole sample, to demonstrate the economic intuition of our model. Findings are quite similar across countries.

Insert Table 3 About Here

Overall, the model is significant ($Chi^2 = 2261.572$, $p = 0.000$) and correctly classifies 73.6% of the observations when run on the universe. At country level, the percentage of correctly

classified firms per country ranges from 68.8%[15] for Italy to 90.9% for the Netherlands. On average, when Equation 2 is estimated country by country, 77.4% of the observations are correctly classified. These percentages are significantly higher than in a naïve model (no ARE adopters) that would have correctly classified 50.5% of observations (see Table 1, Panel A).

All coefficients are significant, with the predicted signs. The coefficient on *Size* is positive (coeff = 0.494, z = 26.393), suggesting that large firms tend to issue an ARE more frequently. This finding is consistent with intuition. As expected, the coefficient on *Return* is negative (coeff = -0.599, z = -3.740), suggesting that profitable firms tend to issue an ARE less frequently. Firms with high *growth opportunities* tend to issue an ARE more frequently (0.244, z = 11.215), whereas the opposite is true for more highly-leveraged firms (coef = -1.245, z = -11.131). These findings are consistent with the idea that firms use English to increase their visibility and thus raise funds. Consistent with our expectation, the more international the sales, the more likely the issuance of an ARE as indicated by the positive and significant coefficient on *Foreign sales* (coef = 0.017, z = 18.160). The firm's ownership structure is associated with the likelihood of issuing an ARE: the coefficient on *Closely held shares* is negative (-0.006) and significant (z = -7.435), consistent with the idea that closely held firms are not prone to issue an ARE. Finally, firms that will issue debt or equity in the future have a greater tendency to issue an ARE, as the coefficients on *Future equity increase* and *Future debt increase* are positive (0.434 and 0.194 resp.) and significant (resp. z = 9.006, z = 3.600). Overall, our findings suggest that firms issue an ARE when they need to raise money, or in response to demands from external parties (such as investors or customers). Findings are similar if we run Equation 2 country by country.

The treatment group consists of all firms that decided to issue an ARE for the first time between 2004 and 2007. For each treatment group firm, we select one control group firm that meets all three of the following conditions: (1) it must be located in the same country, (2) have a similar propensity to use English to the treatment firm the year preceding the adoption of English, and (3) must not adopt an ARE either before or after the change observed for our treatment firm. The mean (median) difference in the propensity scores between treatment and control firms is 0.0058 (0.0009). This emphasizes that our matching procedure works reasonably well. In section V we use an alternative test to address this issue by including in all specifications of our basic

[15] The country with the second-lowest proportion of correctly classified firms is Germany, with a rate of 72.7%.

model firm characteristics that turned out to be important for distinguishing treatment and control firms. We also rerun our tests, excluding all treatment firms for which the difference in propensity score was higher than 5 points. Findings are similar in magnitude and significance.

4.2 Univariate Findings

As a first pass on the economic consequences of issuing an ARE, we tabulate a simple before/after test in Table 4 for our four variables of interest for treatment and control firms. For each variable, we tabulate the mean value for up to three years before the change (subject to data availability) and up to three years after the change (subject to data availability). We then test the statistical and economic significance of the change.

Insert Table 4 About Here

On average, the mean bid-ask spread drops from 3.4% to 2.4% for our treatment firms. This represents a 29.3% reduction in the bid-ask spread after ARE adoption. This change is economically (and statistically) significant (p-value of t-test = 0.000). The mean bid-ask spread for the control sample increases from 3% to 3.8%. This finding strongly supports our hypothesis that ARE adoption enhances a firms' information environment – particularly in times of economic downturns such as the financial crisis which started in 2007. While the mean difference of the bid-ask spread between treatment and control firms was not significant in the pre-adoption period (t=1.388, p=0.166), it becomes highly significant after the adoption (t=-4.903, p=0.000). As a consequence, the difference-in-differences is significant (t=-3.667, p-value of t-test = 0.000). Similar patterns are observed for zero-return days, analyst following and foreign ownership. The number of zero-return days decreases from 39% of the trading days to 23.5% after the change for treatment firms. The difference in the zero-return measure between treatment and control firms after controlling for time trend effects is -0.112 (p-value = 0.000).

The log of analyst following increases from 0.413 per firm to 1.003 after the release of an ARE. This represents an increase in analyst following from 0.51 analyst per firm on average to 1.72. Compared to control firms and taking possible time trend effects into account, the difference between both groups is 0.439 (p-value=0.000), that is an increase by one analyst on average. The proportion of foreign owners of treatment firms more than doubles (from 10.4% to 27.3%). The difference between treatment and control firms before and after the change is 7.4% and significant (p-value =0.008).

These changes are all the more significant since our sample excludes firms that (1) cross-list, (2) have been included in a major stock market index or a stock index that requires external reporting in English, (3) engage in M&A activity during the period. We tabulate in section V a time analysis of the economic consequences, which confirms that they follow ARE adoption.

4.3 Difference-In-Differences Regressions

We now present our findings controlling for confounding factors. We estimate Equation 1 using a double clustering on firm and time dimension (Petersen 2009) in Table 5. In each panel of Table 5, we present the results of the following regression (1) [16]:

$$Economic\ consequence = \beta_0 + \beta_1 Treatment + \beta_2 Time + \beta_3 Treatment \times Time + \beta_s Control\ variables + \varepsilon$$

Table 5 consists of four panels: Panel A and Panel B (findings for H1 Information asymmetry), Panel C (findings for H2 Analyst following) and Panel D (findings for H3 Foreign ownership).

Insert Table 5 About Here

The main coefficient of interest is coefficient β_3 which translates the value of the effect of ARE adoption after controlling for time effects and factors that affect all comparable firms.

Panel A tabulates findings for the bid-ask spread, our first proxy for information asymmetry. Coefficient β_1 is positive (0.147) and significant (p = 0.049), which means that there is a difference between the treatment and control sample before the adoption of English. Coefficient β_2 is positive (0.056) and non-significant (p = 0.340), showing that there is no difference for the control sample before and after the adoption. The β_3 coefficient is negative (-0.182) and significant (p = 0.001). This means that, after controlling for time effects and factors that affect all firms, ARE adoption is associated with lower information asymmetry. In other words, by publishing an ARE, firms can reduce their bid-ask spread by more than 18.2% compared to the control group. This figure is much lower than the 29% decrease reported in Table 3 but remains

[16] Observations are pooled three years before (after) ARE adoption, and we compute the mean economic consequence before (after) ARE adoption.

economically significant. Control variables are usually significant and consistent with prior literature. *Quantity of information* is negative (-0.105) and barely significant (p = 0.099). Consistent with intuition, firms with a better overall information environment exhibit smaller bid-ask spreads and hence less information asymmetry. *International standards* is positive (0.064) and non-significant (p = 0.351), consistent with Daske et al. (2008) who find a modest average effect of IFRS adoption on their proxies for information asymmetry. Coefficients on *Firm size* (Log of market value) and *Share turnover* are negative and significant. Consistent with intuition, large firms and firms with frequently traded shares exhibit less information asymmetry. Finally, the coefficient on return variability is non-significant (p = 0.382).

Findings for the zero-return measure are presented in panel B. They are qualitatively similar to the results for the bid-ask spread: Coefficient β_1 is positive (0.028) and non-significant (p = 0.158), which means that there is no difference between the treatment and control sample before ARE adoption. Coefficient β_2 is negative (-0.019) and non-significant (p = 0.409), showing that there is no difference for the control sample before and after ARE adoption. The β_3 coefficient is negative (-0.065) and significant (p = 0.000). This means that, after controlling for time effects and factors that affect all firms, the adoption of English is associated with a 6.5 point reduction in the number of zero-return days. Given that the mean percentage of zero-return days before the adoption of English is 39% for treatment firms (see Table 3), this represents a decrease of more than 16% (6.5/39).

Findings for analyst following are presented in Panel C. Coefficient β_1 (0.013) is positive and non-significant (p = 0.852), which means that the treatment group and the control sample are indistinguishable before the adoption. Coefficient β_2 is positive (0.045) and significant (p = 0.072), which shows that there is a common time-trend for the control and treatment groups. More importantly, the β_3 coefficient is positive and significant (0.297, p = 0.000). This means that, after controlling for time effects and factors that affect all firms, the adoption of English translates into a 29.7% increase in the number of analysts who follow the firm. Compared to Table 3, this effect is much lower, underlying the need to control for other factors. *Quantity of information* is positive (0.160) and significant (p = 0.019), showing that the general amount of disclosed information is an important determinant of analyst following. All other control variables are consistent with prior literature.

Panel D tabulates findings for foreign ownership. Coefficient β_1 (0.009) is not significant (p = 0.637), which shows that there is no difference between the treatment and control sample before the adoption. Coefficient β_2 is positive (0.039) and significant (p = 0.055), which again shows that there is a common time-trend effect for the control and treatment groups. More importantly, the β_3 coefficient is positive and significant (0.030, p = 0.030). This means that, after controlling for time effects and factors that affect all firms, the adoption of English translates into a 3.0 point increase in the number of foreign owners. Control variables are usually significant and consistent with prior literature (see Dahlquist et Robertsson 2001) with the notable exception of *International standards*, which appears to be non-significant (p = 0.195), whereas Covrig et al. (2007) showed that the voluntary adoption of IAS/IFRS is associated with a lower home investment bias. Note, however, that our sample includes mandatory IAS/IFRS adopters, and past literature has shown that the benefits of the transition to IFRS may be restricted to early adopters (see Christensen et al. 2008).

Taken as a whole, all four panels are consistent with the hypotheses that ARE adoption is associated with lower information asymmetry, greater analyst following and higher foreign ownership. Our findings are also consistent with the idea that firms try to make up for a lack of visibility by using English for their external reporting purposes.

5. Additional Analyses

In this section, we test the robustness of our findings. First, we report our findings when alternative specifications are applied to deal with the self-selection issue. Second, we replicate our main analysis for groups of countries: we expect that the reduction in information asymmetry associated with ARE adoption will be more prevalent for firms from countries whose language is relatively uncommon. Third, we analyze at what points in time the economic consequences of ARE publication occur.

5.1 Alternative Specifications to Take Self-Selection into Account

To overcome the self-selection issue, we apply a propensity score matching procedure using a control sample that is "identical", except for the ARE decision, to the treatment sample. However, the selection process is based on the fitted values of our selection model (Equation 2), that is, the observable differences between control and treatment firms. In other words, we use smaller sets of information to evaluate managers' decisions than the information sets used by managers and investors. Failing to take into account a relevant factor to select control firms may lead to inappropriate inferences about treatment effects, especially if unobserved variables that affect the assignment process are also related to the outcomes.

The concern of selection bias due to unobservables was first addressed by Heckman (1979), who proposes a two-stage approach. The first stage is to estimate the ARE decision model (Equation (2)), then a bias correction term is added in the second-stage regression. After further restricting unobservables to multivariate normal distributions, Heckman (1979) measures the bias correction variable in the form of the inverse Mills ratio (IMR), that is, the ratio of standard normal probability density function to standard normal cumulative density function. In order to estimate the extent to which such "selection on unobservables" may bias our qualitative and quantitative inferences about the adoption of English in the annual report, we add to our main tables the inverse Mills ratio (IMR) to account for self-selection based on unobservables in our models.

Insert Table 6 About Here

Table 6 reports our findings. Overall, the signs, magnitude and significance levels of our variable of interest (β_3) are very consistent with those reported in Table 5. The IMR proves to be significant for the analyst following model (at the 10% level), and non-significant in the other three models. However, as noted in Li and Prabhala (2006), the validity of these inferences relies on the "restriction exclusions", that is, the existence of at least one variable that explains the decision to adopt English but not our outcome variables. For each outcome, at least one independent variable of the first stage is not a control variable in the second stage.

To test the robustness of our results with regard to possible omitted variables, we also included in all specifications of our basic model firm characteristics that turned out to be important for distinguishing treatment and control firms. As shown in Table 1, Panel B these are

the proportion of foreign sales to total sales, growth opportunities, return on assets, and future equity increases. Untabulated results show that the signs, magnitude and significance levels of our variable of interest (β_3) are very consistent.

5.2 Impact of Countries

In this section, we show that the effect of ARE adoption differs across countries. The rationale is as follows. We hypothesize that English helps to increase the firm's visibility, because more investors are able to understand the annual report. Consequently, the magnitude of the effect should differ between a relatively widespread and well-known language (say Spanish) and a relatively rare language (say Danish). We test this prediction by running our DID regressions for two sub-samples. The first sub-sample (labeled "big countries") comprises all observations from countries whose languages are commonly spoken. The second sub-sample is made up of observations from "small countries" (in terms of the number of speakers of their language). The first group includes all countries where French, German or Spanish are the official language. The second group includes countries whose official languages are Danish, Dutch, Finnish, Greek, Italian, Norwegian, Polish, Portuguese, or Swedish.[17]

Insert Table 7 About Here

Table 7 shows that publishing an ARE has economic consequences mainly in "small countries". We focus our comments on the interaction term between *Treatment* and *Time*, our variable of interest (β_3). On the bid-ask spread, we find a negative (-.146) but non-significant coefficient (p = 0.102) for "big countries", whereas it is negative and significant for small countries (-0.219, p = 0.024). This suggests that the decrease in information asymmetry is concentrated in firms that originally use a language unlikely to be understood by many speakers.

For the zero daily return, the overall picture is dissimilar: the number of zero-return days is reduced by 9.8% in big countries versus 4.2% in small countries. Note however, that the coefficient on *Size* is negative and significant (-0.025, p = 0.021) for smaller countries, showing that the number of zero-return days is smaller for larger firms. This is not the case in big

[17] This distribution is based on the number of speakers (http://en.wikipedia.org/wiki/List_of_languages_by_number_of_native_speakers).

countries, where the coefficient is non-significant (p = 0.465). This suggests that the effect of firm size to some extent outstrips the effect of publishing an ARE in smaller countries. An alternative explanation might be that the bid-ask spread and zero-return days capture different dimensions of information asymmetry.

The same pattern arises for analyst following: although coefficients are positive for both "big" and "small" countries, they appear much higher in big countries (0.375) than in small countries (0.236). This difference is both economically and statistically significant (p = 0.007 for "big" countries and 0.000 for "small" countries). Note however, that the time trend is different in big and small countries. The coefficient on *Time* is positive and significant in small countries, suggesting that the number of analysts following a firm increased by 10.1% after ARE adoption (around 2005). This is not the case in big countries, where the coefficient on *Time* (-0.042) is negative and non-significant (p = 0.228). This reveals that there was a general trend towards greater analyst focus on smaller countries over time, probably because of the adoption of IFRS (positive and significant coefficient for small countries (0.264, p = 0.017). This suggests that a modest increase in small countries after controlling for time-trend effects has more economic significance than the increase in big countries. Concerning foreign ownership, β_3 is positive for both the small and big countries sub-samples and marginally significant for big countries. Again, the coefficient for small countries is smaller than the coefficient for big countries. As with analyst following, a time-trend effect in small countries attenuates the magnitude of the coefficient and reduces its significance.

Taken together, the evidence for a "small vs. big language effect" on the four variables of interest is mixed. On the one hand, for some dependent variables the effect of language is more pronounced in countries with a relatively rare spoken language – especially taking into account time-trend and size effects. On the other hand, it seems that institutional factors – which have stronger links with bigger countries – do also play a significant role in determining the effect of the variable β_3 on the four dependent variables. In these cases, the effect is more pronounced in bigger countries.

5.3 Temporal Analyses of Consequences

In our main analyses we show that ARE adoption is associated with a decrease in bid-ask spreads, a decrease in zero-return trading days, and an increase in analyst following and foreign ownership. However, it remains unclear at what point in time and to what extent these consequences appear, and how far each one causes the others. Therefore, we tabulate a simple "year test" in Table 8 for our four variables of interest for treatment and control firms. For each variable, we tabulate the mean value for three years before the change and three years after the change. We then test the statistical and economic significance of the change.

Insert Table 8 About Here

Table 8 reveals that for all our four variables of interest, control and treatment firms are indistinguishable until one year after the adoption: the differences in means between treatment and control firms are almost always statistically non-significant for years prior to the adoption.

From the adoption year, bid-ask spreads for treatment firms fall below those of control firms (0.018 vs. 0.024). Their difference (-0.006) is marginally significant (p-value of t-test = 0.076). In the following years the differences become even more significant (all p-values < 0.010).

The number of zero-return trading days for treatment firms becomes marginally smaller than for control firms in the first year after the adoption (difference = -0.069, p-value = 0.095). This effect becomes much more pronounced during the second and third year after the adoption (difference = -0.077, p-value = 0.054, and difference = -0.117, p-value = 0.010).

Until the first year after the adoption there is no significant difference in analyst following between treatment and control firms. However, two years after the change the difference (1.009) is significant (p-value = 0.055), and three years after it is even more pronounced (1.635, p-value = 0.007).

Concerning foreign ownership, the effect of ARE adoption is much more rapid. As early as one year after the change, a statistically significant increase in foreign owners is visible for treatment firms compared to control firms (difference = 0.068, p-value = 0.031). The effect tends to amplify slightly 2 and 3 years after the adoption.

Taken together, ARE adoption is associated with more foreign investors becoming aware of the existence of the firm. These investors are likely to be sophisticated owners and this translates into smaller bid-ask spreads. This demonstrates that companies can significantly reduce

information asymmetries by communicating in English. This in turn creates more liquidity, as measured by the zero-return metric. Finally, this activity attracts more attention from analyst due to investor demands for analyst recommendations.

Insert Figure 1 About Here

Figure 1 illustrates the results of the time analysis. We plotted the effects of ARE adoption. We find that most of the decrease in information asymmetry follows changes in ownership, and that changes in analyst following trail changes in information asymmetry. This suggests that the economic consequences of ARE adoption stem from changes in ownership.

6. Conclusion

In this paper, we argue that the annual report language is a crucial ingredient of a firm's visibility. Past literature has stressed the importance of accounting harmonization, suggesting that if the "language of business" is unified then information asymmetry should decrease. This view has received considerable attention from academics over the last twenty years (see Leuz et Verrecchia 2000 ; Covrig et al. 2007). Nonetheless, the association between accounting harmonization and positive economic consequences relies heavily on the assumption that market participants are able to read and understand any set of financial statements as long as they are governed by the same accounting rules. In practice, before we even reach the question of accounting standards, the first barrier to understanding and comparing financial statements and increasing transparency is the language barrier. Therefore, using English for external reporting purposes is the only way to address any outsider of the firm easily and directly, irrespective of their nationality, and reduce the costs of information acquisition by making the firm's financial statements more accessible for investors and analysts. In this paper, we set out to analyze and assess the economic consequences of using English as an external reporting language for firms from non-English speaking countries. We test the relationship between publishing an annual report in English (ARE) and several measures of information asymmetry, and analysts' and investors' behavior.

We use a sample of "adopter" firms that issued an ARE for the first time. This sample is drawn from the Global Reports database, which states the language used by firms in their annual

reports. From this initial database of 3,543 firms (11,338 observations), we identify 113 firms which published an ARE in addition to their local-language report.

Our findings are consistent with the idea that issuing an ARE in addition to the local-language report reduces information asymmetry, and increases analyst following and foreign investor ownership, after controlling for endogeneity. This paper thus contributes to the literature on market participants' responses to firms' communication policy and disclosure patterns. While prior literature has identified the use of the English language as a possible explanation for various phenomena observed in capital markets (home bias, institutional ownership, trading behavior etc.), our paper is the first to directly address the question of the possible economic consequences of issuing an annual report in English.

This paper could be extended in a number of different directions. One possibility would be to study how financial analysts' forecast properties may be influenced by the language of the annual report. For instance, researchers could analyze whether the country-specialist analyst's superiority over industry specialists documented by Sonney (2009) holds for firms that publish an ARE. Second, researchers might extend examination of the "language barrier issue" beyond the annual report. Hales et al. (2011), for example, investigate the effect of vivid language on investor judgments. In the same vein, the following questions could be raised: Are CEOs who are non-native English speakers able to express themselves as clearly as native speakers in their roadshows? How do analysts respond to the information conveyed? Are analysts who share the language of the CEO/CFO better able to capture the subtleties of their discourse?

Appendix 1

Description of variables

Variable		Description	Source
Dependent variables			
Analyst following	=	ln(1+ # of analysts).	IBES through WRDS
Bid-ask spread	=	Yearly median value of the absolute value of the daily bid-ask spread scaled by the mid point between the bid and ask price.	Datastream (DS.Bidprice, DS.Askprice)
Foreign ownership	=	Number of "foreign" investors over the total number of investors, as identified in the database. We define a "foreign" investor as an investor from a country whose language is different from the one used in the firm's country of incorporation.	Thomson Ownership (Thomson Financial)
Zero return	=	Number of zero-return trading days over the firm's fiscal year divided by the total trading days of the fiscal year.	Datastream (DS.Bidprice, DS.Askprice)
Independent variables			
Closely held shares	=	(Number of closely held shares / Common shares outstanding) × 100	Worldscope (WS. CloselyHeldSharesPct)
Foreign sales	=	International sales / Net sales or revenues × 100 Firms with missing data are assumed not to have international sales.	Worldscope (WS.ForeignSalesPctSales)
Future debt increase	=	Dummy variable coded 1 if the firm has a debt increase superior to the median debt increase of the sample in the next two years, and 0 otherwise.	Worldscope (WS.TotalLiabilities)
Future equity increase	=	Dummy variable coded 1 if the firm shows an equity increase that is higher than the median equity increase of the sample in the next two years, and 0 otherwise.	Worldscope (WS.CommonStock)
Growth opportunities	=	(Market value + Total debts)/Assets (simplified version of the definition provided by (Klein 2002)). Data winsorized at 0.01.	Datastream: (DS.MarketValue),[18] Global (Standard and Poor's): (mnemonic: [MKVAL + DT]/AT), Infinancials: (Market capitalization: code 11937, Total debts: code 54022), Worldscope (Thomson Financial): (WS.TotalAssets, WS.TotalDebt).

[18] First source for Market value was *Datastream*. When data were not available, the other databases were used.

Industry	=	Dichotomous variables used to represent different industries at the two-digit SIC code level: Agriculture (01-09), Mining-construction (10-17), Manufacturing (20-39), Transportation (40-49), Trade (50-59), Finance-Insurance (60-67), Services (70-89), Public administration (91-99).	Infinancials (SIC sector code: code 20004), Worldscope (WS.PrimarySICCode). Classification: www.siccode.com
International standards	=	Dummy variable coded 1 if the firm adopts IAS/IFRS or US GAAP and zero otherwise.	Worldscope (WS.acctgstdfollowed)
Leverage	=	Total debt/total assets ratio at year-end. Data winsorized at 0.01.	Global: (mnemonic: [DT/AT]), Infinancials: (codes: 54022/53077), Worldscope: (WS.TotalAssets, WS.TotalDebt).
Quantity of information	=	ln(number of pages in the annual report in the local Language/ average number of pages in each country). We scale by the average number of pages in each country to control for "language efficiency" (certain languages need more words to express the same idea).	Hand collected from annual reports
Return on assets	=	Income before extraordinary items/Total assets. Data winsorized at 0.01.	Global: (mnemonic: ROA), Infinancials: (code: 5020), Worldscope: (WS.ReturnOnAssets),.
Return variability	=	Return variability is computed as the annual standard deviation of monthly stock returns. We compute return variability beginning in month -2 through month +10 relative to fiscal year end. We use the log transformation of this measure to mitigate the use of outliers.	Datastream (DS.index)
Size (Market value)	=	Natural logarithm of the market value of equity measured as the stock price times the number of shares outstanding (in US$ millions).	Worldscope (WS.marketcap)
Size (Sales)	=	Natural logarithm of the sales for the year.	Global: (mnemonic: SALE), Infinancials: (code: 53002), Worldscope: (WS.Sales).
Share turnover	=	Accumulated US$ trading volume during the year divided by market value of outstanding equity. We compute return variability beginning in month -2 through month +10 relative to fiscal year end. We use the log transformation of this measure to mitigate the use of outliers.	Datastream (DS.volume)

References

Ali, A., Chen, T.-Y., Radhakrishnan, S. (2007). Corporate disclosures by family firms. *Journal of Accounting & Economics* 44 (1/2): 238-286.

Altamuro, J., Beatty, A. (2010). How does internal control regulation affect financial reporting? *Journal of Accounting & Economics* 49 (1/2): 58-74.

Armstrong, C. S., Core, J. E., Taylor, D. J., Verrecchia, R. E. (2011). When does information asymmetry affect the cost of capital? *Journal of Accounting Research* 49 (1): 1-40.

Armstrong, C. S., Jagolinzer, A. D., Larcker, D. F. (2010). Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2): 225-271.

Arya, A., Mittendorf, B. (2007). The interaction among disclosure, competition between firms, and analyst following. *Journal of Accounting & Economics* 43 (2/3): 321-339.

Ashbaugh-Skaife, H. A., Gassen, J., LaFond, R. (2006). *Does stock price synchronicity represent firm-specific information? The international evidence.* Available at SSRN: http://ssrn.com/abstract=768024.

Bae, K.-H., Stulz, R. M., Tan, H. (2008a). Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics* 88 (3): 581-606.

Bae, K.-H., Tan, H., Welker, M. (2008b). International GAAP differences: The impact on foreign analysts. *The Accounting Review* 83 (3): 593-628.

Baginski, S. P., Hassell, J. M., Kimbrough, M. D. (2004). Why do managers explain their earnings forecasts? *Journal of Accounting Research* 42 (1): 1-29.

Baker, H. K., Nofsinger, J. R., Weaver, D. G. (2002). International cross listing and visibility. *Journal of Financial and Quantitative Analysis* 37: 595-521.

Barker, R. G. (1998). The market for information -- evidence from finance directors, analysts and fund managers. *Accounting & Business Research* 29 (1): 3-20.

Beaver, W. H. (1981). Market efficiency. *The Accounting Review* 56 (1): 23-37.

Bekaert, G., Harvey, C. R., Lundblad, C. (2007). Liquidity and expected returns: Lessons from emerging markets. *Review of Financial Studies* 20 (6): 1783-1831.

Bekaert, G., Harvey, C. R., Lundblad, C. T., Siegel, S. (2010). *The European union, the euro, and equity market integration.* Working paper, Available at SSRN: http://ssrn.com/abstract=1573308.

Bonaccorsi, A. (1992). On the relationship between firm size and export intensity. *Journal of International Business Studies* 23 (4): 605-635.

Bushee, B. J. (2001). Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research* 18 (2): 207-246.

Bushee, B. J., Miller, G. S. (2012). Investor relations, firm visibility, and investor following. *The Accounting Review* Forthcoming.

Campbell, D., Cornelia Beck, A., Shrives, P. (2005). A note on comparative language interrogation for content analysis: The example of English vs. German. *British Accounting Review* 37 (3): 339-350.

Chan, K., Covrig, V., Ng, L. (2005). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *Journal of Finance* 60 (3): 1495-1534.

Chan, K., Menkveld, A. J., Yang, Z. (2008). Information asymmetry and asset prices: Evidence from the China foreign share discount. *Journal of Finance* 63 (1): 159-196.

Chang, L. S., Most, K. S. (1985). *The perceived usefulness of financial statements for investors decisions.* Miami, FL.: Florida International University Press.

Chang, L. S., Most, K. S., Brain, C. W. (1983). The utility of annual reports: An international study. *Journal of International Business Studies* 14 (1): 63-84.

Charles, M. (2007). Language matters in global communication: Article based on ORA lecture, October 2006. *Journal of Business Communication* 44 (3): 260-282.

Cheng, S., Xu, X. (2006). The role of peer performance in managerial compensation surrounding the 1996 telecommunications act. *Journal of Accounting & Public Policy* 25 (5): 596-608.

Christensen, H. B., Lee, E., Walker, M. (2008). *Incentives or standards: What determines accounting quality changes around IFRS adoption?* SSRN eLibrary, Available at SSRN: http://ssrn.com/abstract=1013054.

Chui, A. C. W., Titman, S., Wei, K. C. J. (2010). Individualism and momentum around the world. *Journal of Finance* 65 (1): 361-392.

Covrig, V. M., DeFond, M. L., Hung, M. (2007). Home bias, foreign mutual fund holdings, and the voluntary adoption of international accounting standards. *Journal of Accounting Research* 45 (1): 41-70.

Dahlquist, M., Robertsson, G. (2001). Direct foreign ownership, institutional investors, and firm characteristics. *Journal of Financial Economics* 59 (1): 413-440.

Daske, H., Hail, L., Leuz, C., Verdi, R. S. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research* 46 (5): 1085-1142.

Diamond, D. W., Verrecchia, R. E. (1991). Disclosure, liquidity and the cost of capital. *Journal of Finance* 46 (2): 1325-1359.

Dvorak, T. (2005). Do domestic investors have an information advantage? Evidence from Indonesia. *Journal of Finance* 60 (2): 817-839.

Gonedes, N. J. (1976). The capital market, the market for information, and external accounting. *Journal of Finance* 31 (2): 611-630.

Graham, J. R., Harvey, C. R., Huang, H. (2009). Investor competence, trading frequency, and home bias. *Management Science* 55 (7): 1094-1106.

Grinblatt, M., Keloharju, M. (2000). The investment behaviour and performance of various investor types: A study of Finland's unique data set. *Journal of Financial Economics* 55 (1): 43-67.

Grinblatt, M., Keloharju, M. (2001). How distance, language, and culture influence stockholdings and trades. *Journal of Finance* 56 (3): 1053-1073.

Hales, J., Kuang, X. I., Venkataraman, S. (2011). Who believes the hype? An experimental examination of how language affects investor judgments. *Journal of Accounting Research* 49 (1): 223-255.

Hau, H. (2001a). Geographic patterns of trading profitability in Xetra. *European Economic Review* 45 (4-6): 757-769.

Hau, H. (2001b). Location matters: An examination of trading profits. *Journal of Finance* 56 (5): 1959-1983.

Healy, P. M., Hutton, A. P., Palepu, K. G. (1999). Stock performance and intermediation changes surrounding sustained increases in disclosure. *Contemporary Accounting Research* 16 (3): 485-520.
Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica* 47 (1): 153-161.
Jeanjean, T., Lesage, C., Stolowy, H. (2010). Why do you speak English (in your annual report)? *The International Journal of Accounting* 45 (2): 200-223.
Kalev, P. S., Nguyen, A. H., Oh, N. Y. (2008). Foreign versus local investors: Who knows more? Who makes more? *Journal of Banking & Finance* 32 (11): 2376-2389.
Klein, A. (2002). Economic determinants of audit committee independence. *The Accounting Review* 77 (2): 435-452.
Lang, M. H., Lins, K. V., Miller, D. P. (2003). ADRs, analysts, and accuracy: Does cross listing in the United States improve a firm's information environment and increase market value? *Journal of Accounting Research* 41 (2): 317-345.
Lang, M. H., Lundholm, R. J. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review* 71 (4): 467-492.
Lawrence, A., Minutti-Meza, M., Zhang, P. (2011). Can big 4 versus non-big 4 differences in audit-quality proxies be attributed to client characteristics? *The Accounting Review* 86 (1): 259-286.
Lehavy, R., Feng, L., Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review* 86 (3): 1087-1115.
Lesmond, D. A., Ogden, J. P., Trzcinka, C. A. (1999). A new estimate of transaction costs. *Review of Financial Studies* 12 (5): 1113-1141.
Leuz, C., Verrecchia, R. E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research* 38 (3): 91-136.
Lev, B. (1988). Toward a theory of equitable and efficient accounting policy. *The Accounting Review* 63 (1): 1-22.
Li, F. (2010). The information content of forward-looking statements in corporate filings-a naã¯ve bayesian machine learning approach. *Journal of Accounting Research* 48 (5): 1049-1102.
Li, K., Prabhala, N. R. (2006). Self-selection models in corporate finance. In *Handbook of corporate finance: Empirical corporate finance, volume a, chapter 2, handbooks in finance series* (Ed, Eckbo, B. E.). North-Holland: Elsevier, 39-83.
Merton, R. C. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42 (3): 483-510.
Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics* 5 (2): 147-175.
Myers, S. C., Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13 (2): 187-221.
Nickerson, C., de Groot, E. B. (2005). Dear shareholder, dear stockholder, dear stakeholder: The business letter genre in the annual general report. In *Genre variation in business letters* (Eds, Gillaerts, P., Gotti, M.). Bern: Peter Lang., 325-346.
O'Brien, P. C., Bhushan, R. (1990). Analyst following and institutional ownership. *Journal of Accounting Research* 28 (3): 55-82.

Pagano, M., Roell, A. A., Zechner, J. (2002). The geography of equity listing: Why do companies list abroad? *Journal of Finance* 57 (6): 2651-2694.
Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22 (1): 435-480.
Portes, R., Rey, H. (2005). The determinants of cross-border equity flows. *Journal of International Economics* 65 (2): 269-296.
Raffournier, B. (1995). The determinants of voluntary financial disclosure by Swiss listed companies. *European Accounting Review* 4 (2): 261-280.
Ramnath, S., Rock, S., Shane, P. (2008). The financial analyst forecasting literature: A taxonomy with suggestions for further research. *International Journal of Forecasting* 24 (1): 34-75.
Rauch, J. E. (1999). Networks versus markets in international trade. *Journal of International Economics* 48 (1): 7-35.
Rosenbaum, P. R., Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika* 70: 41–55.
Sarkissian, S., Schill, M. J. (2004). The overseas listing decision: New evidence of proximity preference. *Review of Financial Studies* 17 (3): 769-809.
Seyhun, H. N. (1998). *Investment intelligence from insider trading*. Cambridge, MA: MIT Press.
Sonney, F. (2009). Financial analysts' performance: Sector versus country specialization. *Review of Financial Studies* 22 (5): 2087-2131.
Sufi, A. (2007). Information asymmetry and financing arrangements: Evidence from syndicated loans. *Journal of Finance* 62 (2): 629-668.
Tesar, L. L., Werner, I. M. (1995). Home bias and high turnover. *Journal of International Money and Finance* 14 (4): 467-492.
Tetlock, P. C., Saar-Tsechansky, M., Macskassy, S. (2008). More than words: Quantifying language to measure firms' fundamentals. *Journal of Finance* 63 (3): 1437-1467.
Vergoossen, R. G. A. (1993). The use and perceived importance of annual reports by investment analysts in the Netherlands. *European Accounting Review* 2 (2): 219-244.
Wang, S., Li, W., Cheng, L. (2009). The impact of h-share derivatives on the underlying equity market. *Review of Quantitative Finance & Accounting* 32 (3): 235-267.
Welker, M. (1995). Disclosure policy, information asymmetry, and liquidity in equity markets. *Contemporary Accounting Research* 11 (2): 801–827.
White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48 (4): 817-838.

Table 1

Sample Selection and Descriptive Statistics

Panel A: Sample selection

	Number of firm-year observations	%
Total number of annual reports stated in Global Reports (Infinancials) with available financial data over the period 2004-2007	11,338*	
Split between:		
- Number of firm-year observations with an annual report in English (A)	5,607	49.5
- Number of firm-year observations without an annual report in English (B)	5,731	50.5

*Corresponding to 3,543 firms.

	Number of "adopters"*
Adopters identified among firm-year observations with an annual report in English (A)	208
Exclusion of cross-listed firms	-24
Sub-total	184
Exclusion of companies listed in the NEXT segment	-6
Sub-total	178
Exclusion of firms with merger & acquisitions activity	-36
Sub-total	142
Elimination of companies with missing data	-29
Final sample	113

*"Adopter": company deciding for the first time to publish an English version of its annual report, in addition to the local-language version

Observations to compute propensity scores (PS) in section IV are taken from sub-samples A and B. For each "Treatment group" firm in section IV, we choose one "Control group" firm that must: (1) be located in the same country, (2) have a similar propensity to use English to the treatment firm the year preceding the change to English, (3) not issue an ARE either before or after the change observed for our treatment firm.

See Appendix 1 for a description of variables.

Panel B: Descriptive statistics of financial data

	N (Firms)	Mean	Median	N (Firms)	Mean	Median	N (Firms)	Mean	Median	p-value (t-test)	p-value (MW U-test)	p-value (t-test)	p-value (MW U-test)
	(Universe)			(Treatment)			(Control)			(Treatment vs Universe)		(Treatment vs Control)	
Size (Sales)	3,543	4.549	4.732	113	4.002	4.385	107	4.406	4.458	0.002	0.000	0.005	0.009
Return on assets	3,543	0.017	0.036	113	0.002	0.030	107	0.014	0.029	0.305	0.866	0.453	0.066
Growth opportunities	3,543	1.672	1.306	113	2.154	1.452	107	1.503	1.189	0.000	0.000	0.000	0.000
Leverage	3,543	0.516	0.541	113	0.507	0.522	107	0.508	0.519	0.469	0.450	0.542	0.419
Foreign sales	3,543	0.225	0.000	113	0.119	0.000	107	0.181	0.000	0.000	0.000	0.002	0.015
Closely held shares	3,543	0.363	0.362	113	0.337	0.289	107	0.314	0.247	0.275	0.176	0.512	0.377
Future equity increase	3,543	0.435	0.000	113	0.584	1.000	107	0.495	0.000	0.006	0.006	0.222	0.222
Future debt increase	3,543	0.738	1.000	113	0.814	1.000	107	0.757	1.000	0.977	0.977	0.666	0.666

See Appendix 1 for a description of variables.

TABLE 2

Descriptive Statistics of the Treatment Sample

Panel A: Distribution of adopters by country and languages spoken

Country name	N	%	Main language spoken
Austria	3	2.7	German
Belgium	1	0.9	Dutch
Denmark	10	8.8	Danish
Finland	3	2.7	Finnish
France	5	4.4	French
Germany	28	24.8	German
Greece	10	8.8	Greek
Italy	11	9.7	Italian
Netherlands	4	3.5	Dutch
Norway	12	10.6	Norwegian
Poland	1	0.9	Polish
Portugal	4	3.5	Portuguese
Spain	2	1.8	Spanish
Sweden	13	11.5	Swedish
Switzerland	6	5.3	German
Total	113	100.0	

*Multi-lingual countries: For Belgium and Switzerland, we chose the language spoken by the majority of the population: Dutch (Flemish) for Belgium (see http://www.nationmaster.com/country/be-belgium/lan-language), and German for Switzerland (see http://www.swissworld.org/en/people/language/language_distribution).

Panel B: Distribution of adopters by industry

Industry	N	%
Mining-Construction	5	4.4
Manufacturing	31	27.4
Transportation	8	7.1
Trade	11	9.7
Finance-Insurance	27	23.9
Services	31	27.4
Total	113	100

See Appendix 1 for a description of variables.

TABLE 3

Results of the Logit Regression in Preparation of the Propensity Score Matching

	Predicted signs	Coefficients	z	p
Size (sales)	+	0.494	26.393	0.000
Return on assets	-	-0.599	-3.740	0.000
Growth opportunities	+	0.244	11.215	0.000
Leverage	-	-1.245	-11.131	0.000
Foreign sales	+	0.017	18.160	0.000
Closely held shares	-	-0.006	-7.435	0.000
Future equity increase	+	0.434	9.006	0.000
Future debt increase	+	0.194	3.600	0.000
Industry effects		Included		
Year effects		Included		
Country effects		Included		
Constant		-2.198	-8.919	0.000
Number of observations		11,338		
Chi square		2261.572		
p(chi2)		0.000		
Nagelkerke R-square		0.382		
Pct classified in sample		73.602		

A logit regression is run for each country. The dependent variable is coded 1 if the firm issues an annual report in English, 0 otherwise. As we cannot display the tables for all the countries, this table presents the results for a logit regression run on all firms with available data (N = 11,338).

See Appendix 1 for a description of variables.

Table 4

Univariate Findings

	N (Total)	Mean (before) (a)	Mean (after) (b)	Difference (b-a)	T-test	p-value
Bid ask spread – Treatment (i)	546	0.034	0.024	-0.010	-3.505	0.000
Bid ask spread - Control (ii)	560	0.030	0.038	0.008	2.694	0.007
Difference (i-ii)	.	0.004	-0.014	-0.018	.	.
T-Test	.	1.388	-4.903	-3.667	.	.
p-value	.	0.166	0.000	0.000	.	.
Zero return – Treatment (i)	614	0.390	0.235	-0.154	-6.121	0.000
Zero return - Control (ii)	629	0.363	0.321	-0.043	-1.742	0.082
Difference (i-ii)	.	0.026	-0.085	-0.112	.	.
T-Test	.	1.044	-3.563	-3.992	.	.
p-value	.	0.297	0.000	0.000	.	.
Analyst following – Treatment (i)	772	0.413	1.003	0.590	10.557	0.000
Analyst following - Control (ii)	772	0.481	0.633	0.152	2.603	0.009
Difference (i-ii)	.	-0.069	0.370	0.439	.	.
T-Test	.	-1.413	5.522	5.093	.	.
p-value	.	0.158	0.000	0.000	.	.
Foreign ownership – Treatment (i)	772	0.104	0.273	0.170	10.844	0.000
Foreign ownership - Control (ii)	772	0.105	0.200	0.095	5.645	0.000
Difference (i-ii)	.	-0.001	0.073	0.074	.	.
T-Test	.	-0.084	3.597	2.661	.	.
p-value	.	0.933	0.000	0.008	.	.

This table presents a before / after test for the four variables of interest for treatment firms. For each variable, we tabulate the mean value for up to three years before the change (subject to data availability) and up to three years after the change (subject to data availability). We then test the statistical and economic significance of the change. See Appendix 1 for a description of variables.

Table 5

Difference-In-Differences Analysis of Economic Consequences Around the Change to English (With a Propensity Score Matching)

	Panel A		Panel B		Panel C		Panel D	
	Ln(Bid-Ask Spread)		Zero Daily Return		Analyst Following		Foreign Ownership	
	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
Treatment	0.147	0.049	0.028	0.158	0.013	0.852	0.009	0.637
Time	0.056	0.340	-0.019	0.409	0.045	0.072	0.039	0.055
Treatment * Time	-0.182	0.001	-0.065	0.000	0.297	0.000	0.030	0.030
Quantity of information	-0.105	0.099	-0.013	0.339	0.160	0.019	0.012	0.405
IFRS	0.064	0.351	-0.008	0.793	0.150	0.026	0.036	0.195
Log of market value	-0.398	0.000	-0.013	0.209				
Share turnover	-0.240	0.000						
Return variability	-0.014	0.382	-0.003	0.709				
Growth opportunities			0.004	0.593			0.037	0.001
Loss			-0.017	0.240				
Number of analysts			-0.060	0.000				
Size (Sales)					0.106	0.000	0.044	0.000
Lag return on assets					0.006	0.003		
Leverage							-0.009	0.851
Return on assets							-0.001	0.190
Country effects	Included		Included		Included		Included	
Industry effects	Included		Included		Included		Included	
Year effects	Included		Included		Included		Included	
Number of observations	1,061		1,173		1,200		1,305	
F	94.209		133.340		29.095		20.520	
Prob>F	0.000		0.000		0.000		0.000	
R-square	0.678		0.650		0.340		0.304	

The difference-in-differences analysis is based on all companies issuing an English version of their annual report and selected control companies with data available over the period. Control firms are comparable with treatment firms on the basis of a propensity score matching (same country, same year). The table reports regression results for the dependent variables, independent variables and control variables. We use four dependent variables in the analyses. Each panel displays the results of the analyses we run: (A) *Bid-ask spread* is the yearly median value of the absolute value of the daily bid-ask spread scaled by the mid point between the bid and ask price. *(B) Zero daily return*: number of zero-return trading days over the firm's fiscal year divided by the total trading days of the fiscal year. (C) *Analyst following* equals ln(1+ # of analysts). (D) *Foreign ownership* is the number of "foreign" investors over the total number of investors, as identified in the Thomson Ownership database. We define a "foreign" investor as an investor located in a different country that uses a different language from the country of the company in which she invests. We assess the statistical significance of the difference-in-differences values by using the β_3 coefficient for the following regression:

$$Economic\ \ Consequenc\ \ e = \beta_0 + \beta_1 Treatment\ \ + \beta_2 Time + \beta_3 Treatment\ \ \times Time + \beta_s Control\ \ variables\ \ + \varepsilon$$

where *Treatment* is a dummy variable coded one if the firm is a treatment firm (company which issued an ARE for the first time) and zero otherwise, *Time* is a dummy variable coded one if the year is at least one year after the change (first publication of an ARE), and zero otherwise, and *Treatment*Time* is an interaction variable. Note that all standard errors are clustered following White (1980).
See Appendix 1 for a description of variables.

Table 6

Difference in Difference Analysis Including Controls for Self Selection

	Ln(Bid-Ask Spread)		Zero Daily Return		Analyst Following		Foreign Ownership	
	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
Treatment	0.150	0.045	0.027	0.184	0.006	0.936	0.010	0.590
Time	0.056	0.305	-0.020	0.390	0.050	0.082	0.037	0.056
Treatment * Time	-0.181	0.002	-0.065	0.000	0.301	0.000	0.029	0.032
Inverse Mills ratio	-0.262	0.432	0.128	0.205	-0.600	0.057	0.146	0.170
Quantity of information	-0.108	0.095	-0.012	0.358	0.162	0.014	0.011	0.428
IFRS	0.060	0.374	-0.007	0.834	0.146	0.028	0.038	0.159
Log of market value	-0.405	0.000	-0.008	0.414				
Share turnover	-0.242	0.000						
Return variability	-0.014	0.375	-0.003	0.679				
Growth opportunities			0.003	0.627			0.040	0.000
Loss			-0.017	0.251				
Number of analysts			-0.060	0.000				
Size (Sales)					0.085	0.002	0.050	0.000
Lag return on assets					0.006	0.002		
Leverage							-0.022	0.664
Return on assets							-0.001	0.167
Country effects	Included		Included		Included		Included	
Industry effects	Included		Included		Included		Included	
Year effects	Included		Included		Included		Included	
Number of observations	1,061		1,173		1,200		1,305	
F	94.779		131.562		29.227		19.592	
Prob>F	0.000		0.000		0.000		0.000	
R-square	0.679		0.651		0.344		0.307	
Adjusted R-square	0.667		0.639		0.323		0.285	

We test the economic consequences of an ARE by running our DID regressions, taking self-selection of matched firms into account by adding to our models the inverse Mills ratio (IMR) computed from the fitted value obtained in Equation 2.

See Appendix 1 for a description of variables.

Table 7

Difference-In-Differences Analysis of Economic Consequences Around the Change to English, Analysis by Group of Countries

	Panel A				Panel B				Panel C				Panel D			
	Ln(Bid-Ask Spread) - Big countries		Ln(Bid-Ask Spread)- Small countries		Zero Daily Return - Big countries		Zero Daily Return - Small countries		Analyst Following - Big countries		Analyst Following - Small countries		Foreign Ownership - Big countries		Foreign Ownership - Small countries	
	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
Treatment	0.259	0.041	0.041	0.609	0.035	0.253	0.030	0.251	-0.032	0.803	0.077	0.382	-0.005	0.883	0.025	0.215
Time	0.156	0.005	-0.043	0.436	0.021	0.360	-0.026	0.369	-0.042	0.228	0.101	0.048	0.003	0.822	0.057	0.050
Treatment * Time	-0.146	0.102	-0.219	0.024	-0.098	0.003	-0.042	0.079	0.375	0.007	0.236	0.000	0.044	0.068	0.031	0.117
Quantity of information	-0.022	0.777	-0.217	0.003	-0.006	0.812	-0.015	0.333	0.143	0.080	0.136	0.157	-0.022	0.442	0.037	0.004
IFRS	-0.026	0.776	0.011	0.931	-0.040	0.277	0.057	0.281	0.133	0.143	0.264	0.017	0.045	0.264	0.043	0.262
Log of market value	-0.452	0.000	-0.358	0.000	-0.011	0.465	-0.025	0.021								
Share turnover	-0.233	0.000	-0.254	0.000												
Return variability	0.030	0.317	-0.035	0.086	-0.002	0.917	-0.003	0.671								
Growth opportunities					0.013	0.377	0.001	0.910					0.052	0.000	0.024	0.058
Loss					-0.013	0.596	-0.018	0.278								
Number of analysts					-0.090	0.000	-0.029	0.050								
Size (Sales)									0.082	0.028	0.140	0.000	0.048	0.000	0.039	0.000
Lag return on assets									0.004	0.139	0.007	0.001				
Leverage													-0.069	0.424	0.063	0.262
Return on assets													-0.001	0.258	-0.001	0.233
Industry effects	Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.	
Country effects	Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.	
Year effects	Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.		Incl.	
Constant																
Number of observations	459		602		467		706		473		727		509		796	
F	51.098		46.663		17.458		227.257		24.872		17.644		19.261		21.432	
Prob>F	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	

We test the economic consequences of an ARE by running our DD regressions for two sub-samples, based on the number of speakers. The first sub-sample ("big countries") comprises all observations from countries with commonly-spoken languages (French, German and Spanish). The second sub-sample is made of observations from "small countries" with relatively rare languages (Danish, Dutch, Finnish, Greek, Italian, Norwegian, Polish, Portuguese, or Swedish).

See Appendix 1 for a description of variables.

Table 8

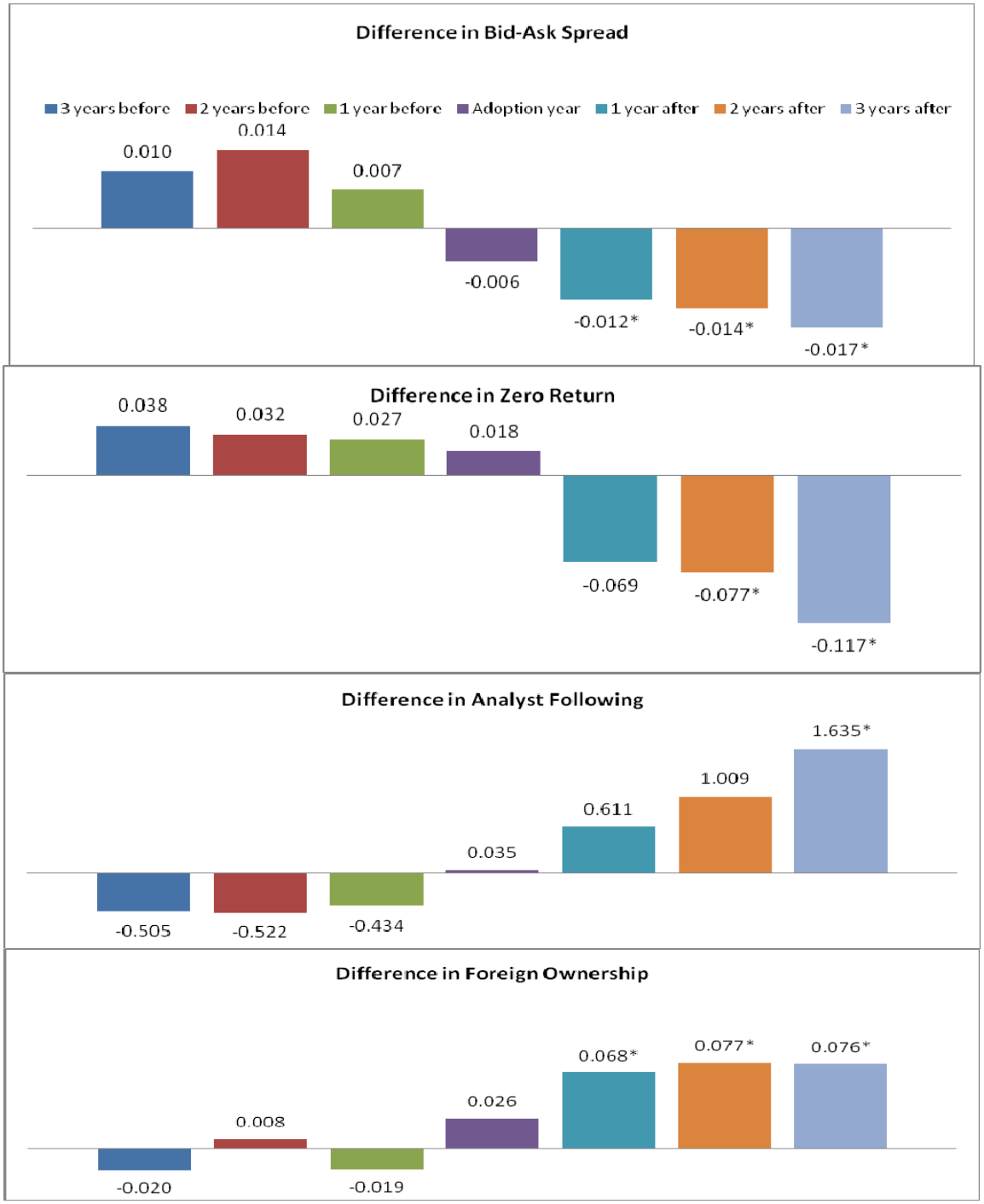
Time analysis

	3 years before	2 years before	1 years before	Adoption year	1 years after	2 years after	3 years after
Bid-ask spread - Treatment	0.054	0.046	0.030	0.018	0.019	0.024	0.031
Bid-ask spread - Control	0.044	0.032	0.023	0.024	0.031	0.038	0.048
Difference	**0.010**	**0.014**	**0.007**	**-0.006**	**-0.012**	**-0.014**	**-0.017**
T-test	**1.106**	**1.896**	**1.330**	**-1.783**	**-3.034**	**-3.197**	**-2.610**
p-value	**0.271**	**0.060**	**0.186**	**0.076**	**0.003**	**0.002**	**0.010**
Zero return - Treatment	0.424	0.417	0.379	0.358	0.230	0.236	0.241
Zero return - Control	0.386	0.385	0.351	0.340	0.299	0.313	0.358
Difference	**0.038**	**0.032**	**0.027**	**0.018**	**-0.069**	**-0.077**	**-0.117**
T-test	**0.707**	**0.607**	**0.527**	**0.404**	**-1.676**	**-1.935**	**-2.620**
p-value	**0.481**	**0.545**	**0.599**	**0.687**	**0.095**	**0.054**	**0.010**
Analyst following - Treatment	0.937	0.858	0.885	1.673	2.637	3.044	3.469
Analyst following - Control	1.441	1.381	1.319	1.637	2.027	2.035	1.833
Difference	**-0.505**	**-0.522**	**-0.434**	**0.035**	**0.611**	**1.009**	**1.635**
T-test	**-1.241**	**-1.401**	**-1.259**	**0.085**	**1.164**	**1.931**	**2.722**
p-value	**0.216**	**0.163**	**0.209**	**0.932**	**0.246**	**0.055**	**0.007**
Foreign ownership - Treatment	0.063	0.091	0.094	0.166	0.236	0.286	0.303
Foreign ownership - Control	0.082	0.083	0.113	0.139	0.168	0.209	0.227
Difference	**-0.020**	**0.008**	**-0.019**	**0.026**	**0.068**	**0.077**	**0.076**
T-test	**-0.835**	**0.319**	**-0.743**	**0.963**	**2.171**	**2.186**	**1.898**
p-value	**0.405**	**0.750**	**0.458**	**0.337**	**0.031**	**0.030**	**0.059**

This table tabulates changes in bid-ask spread, zero return, analyst following and foreign ownership for the treatment and the control groups, 3-year, 2-year, 1-year before the adoption of an ARE, the year of the adoption, and 1-year, 2-year and 3-year after the adoption. The line difference is computed as the value for Treatment group minus the value for the Control group. T-statistics and p-value (2-sided) are also reported.
See Appendix 1 for a description of variables.

Figure 1

Time analysis



*Significant at the 0.05 level.