

Chapter 2

The Economic Consequences of Increasing the International Visibility of Financial Reports

2.1 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 and Miller 2012). Firms lacking these characteristics are often neglected by investors and intermediaries. Prior research (Bushee and 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 disclosure 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 and 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). Hence, developing a foreign market for the company's products increases firm visibility as more foreign customers will become aware of the company. As a consequence, we expect that foreign investors and analysts also will be attracted to the company, resulting in changes of the overall information environment.

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.

It is not obvious whether releasing an annual report in English and thereby increasing the international visibility of the company has any effect on the firm's information environment. Opponents may argue that 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

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

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, 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. Following this view, we expect that firms issuing an ARE will (i) experience decreasing information asymmetry, (ii) increase their analyst following, and (iii) 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 study, 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 French firm merges with a US firm, the combined enterprise will likely use English in its annual report and therefore benefit from lower information asymmetry and more analyst following. Moreover, if a German firm acquires a US firm, the same is likely to happen. We expect a similar behavior 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 focus on information asymmetries between the firm and (i) investors, and (ii) information intermediaries. While information asymmetries arise due to asymmetric information between insiders and outsiders of the firm, they are also affected by the general information environment and infrastructure laid out by the company, even in the presence of information. To proxy for information asymmetries we use companies’ bid-ask spreads and zero returns. 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 an analysis of the economic effects over time that 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 study 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 and Keloharju 2000, 44, 66), a higher trading volume for local equity than foreign equity (see, e.g., Grinblatt and Keloharju 2001, 1054; Hau 2001a, 768), greater proximity between the company and its local investor base (e.g., Rauch 1999; Grinblatt and Keloharju 2001, 1054), lower information asymmetry (e.g., Hau 2001a, 768), and broader international ownership (e.g., Kalev et al. 2008, 2377). In contrast to this study, none of these articles *directly* tests the consequences of using a specific language.

Second, our study 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 (2010a) 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 study 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 and 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 and disclosure 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 chapter is organized as follows. In the following section, we provide some background on annual report language and develop our hypotheses. Section 2.3 describes the methodology, variables and sample, and section 2.4 presents our empirical evidence. Section

2.5 provides additional analyses to confirm the validity of our study. Section 2.6 concludes the chapter.

2.2 Motivation and Hypothesis Development

2.2.1 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 study, 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 and 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 and disclosure 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[®], Infiniti[®] 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.

2.2.2 Hypothesis Development

Information asymmetry exists because some investors possess private information about a firm that is unavailable to other investors. Economic theory and empirical evidence suggests that greater disclosure reduces information asymmetry (Diamond and Verrecchia 1991). This is because voluntary disclosure "levels the playing field" among investors and because public and private information are seen as substitutes. 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 study, 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 speakers², 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 capitalization³, 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. Cultural and geographical proximity themselves are mainly influenced and connected by the existence of a common language. Rauch (1999, 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

² Source: <http://www2.ignatius.edu/faculty/turner/languages.htm>.

³ Source <http://www.world-exchanges.org/statistics>.

⁴ See www.cfa.institute.com.

studies have explicitly linked the existence of a 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, 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).

Lundholm (1988) argues that public information may also complement private information. In this case, disclosure leads all investors to have more information; however, disclosure leads some investors to be better informed than others. This complementarity effect arises when some investors are better able to process the information disclosed or when the disclosure leads some investors to acquire private information (Kim and Verrecchia 1994). We posit that the issuance of an annual report in English in addition to the local language likely reduces the complementarity effect of disclosures and, therefore, information asymmetries related to the stock. That is, the decision to issue an annual report in English likely lowers the information processing costs for investors that do not speak the local language and, therefore, reduces the information asymmetries between the foreign and domestic investors.

In addition, if information processing costs associated with language barriers act as an impediment to financial analysis, some investors may choose to refrain from considering the company as an investment alternative. Merton (1987) suggests that “if, for each firm, investors must pay a significant ‘set-up’ (or ‘receiver’) cost before they can process detailed information released from time to time about the firm, then this fixed cost will cause any one investor to follow only a subset of traded securities.” Issuing an annual report in English may, therefore, increase the number of investors analyzing the company and, therefore, increase the market efficiency and decrease information asymmetries related to the stock.

Finally, institutional theory (Meyer and Rowan 1977) suggests that formal mechanisms can allow organizations to be perceived as more legitimate. Based on legitimacy theory (Fiss and Zajac 2004; Westphal and Zajac 1994), we argue that investors could perceive annual

reports issued in English to be more credible than those issued only in the local language. More credible disclosures are likely to lead to less private information search and lower information asymmetries related to the company stock.

We recognize that there are arguments for increased information asymmetry with the release of English annual reports. Specifically, if companies issuing an annual report in English attract more foreign investors and if foreign shareholders by nature suffer from greater information asymmetry than local shareholders, then information asymmetry may increase. However, we argue that the reduced information asymmetries from decreased language barriers offset the increased information asymmetries from more investors with greater geographic and cultural distances. We, therefore, predict an overall reduction in information asymmetry from issuing English annual reports. This leads to our first hypothesis:⁵

Hypothesis 1: *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 and Mittendorf 2007; Lehavy et al. 2011).⁵ Most of these studies indicate that analysts prefer to follow large firms listed on major exchanges with lower performance volatility (O'Brien and Bhushan 1990; Lang and 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) assume that the decision to follow firms is based on the costs and benefits of following foreign firms. On the cost side they expect that "costs presumably include primarily the direct costs of acquiring information about a new firm". In their empirical tests 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, 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

⁵ For a review, see Ramnath et al. (2008).

similar position and propose that future research might consider the effects of cultural differences across countries on analysts' decision processes and forecasts. Our study 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:

Hypothesis 2: *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 empirical literature examining the firm characteristics associated with institutional investor ownership (see, for instance, Bushee 2001; Dahlquist and 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, 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 and Keloharju 2001, 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, 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, based on prior empirical evidence we hypothesize that a firm's international visibility is positively affected by adopting an ARE. Our third hypothesis is therefore:

Hypothesis 3: *Firms adopting English in their annual report attract more foreign investors.*

2.3 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: First, 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; second, there may be self-selection bias; and third, the proxies used to measure economic consequences may also influence findings. Our research design attempts to address each of these concerns.

2.3.1 Methodology

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 and 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 and Xu 2006; Wang et al. 2009; Altamuro and 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 estimate the following equation:

$$\begin{aligned} \text{Economic consequence} = & \beta_0 + \beta_1 \text{Treatment} + \beta_2 \text{Time} + \beta_3 \text{Treatment} \times \text{Time} \\ & + \beta_4 \text{Control variables} + \varepsilon \end{aligned} \quad (\text{E2.1})$$

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 <i>Economic consequence</i>	Time = 0	Time = 1
Treatment = 0	β_0	$\beta_0 + \beta_2$
Treatment = 1	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$

In the regression, β_0 represents the average for control companies before the initiation of an ARE, β_1 represents the difference between the two groups before the initiation, β_2 represents the time trend in the control group, and β_3 represents the difference in the change over time between the treatment and control groups. 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 disclosure effect, we include a variable that captures the extent of disclosure beyond the country average for both control and treatment firms. It is intended to reflect any information effect associated with the adoption of an ARE.

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 2.1, 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).

Despite the possibility to control for time trends and common company characteristics by choosing an appropriate set of control firms, the DiD estimator nevertheless can result in downward-biased standard errors due to a potential auto-correlation of the outcome variable (Bertrand et al. 2004). What is important for DiD to work is that the difference between treatment and control group is relatively stable over time in absence of the treatment. This can be examined by comparing the outcome variable before the treatment between treatment and control group. One should also correct the standard errors for clustering on the time variable. We indirectly address the former concern in a robustness analysis when analyzing the effects of adopting English over time (see Figure 2.1 and section 2.5.3). As can be seen from Figure 2.1, the differences between treatment and control group with regard to bid-ask spreads, analyst following, and foreign ownership are fairly stable up to three years prior to the treatment. Only the difference with regard to zero-return days reveals a potential time trend. With regard to the second concern, all standard errors are clustered by time and firm.

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 the self-selection problem, 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. 2010c; 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 (i) have the same predicted propensity to use English as the treatment firms (adopters), or (ii) continue to use the local language only for external reporting. In the second stage, we estimate Equation 2.1 (E2.1) 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 because of information asymmetries between the company and investors. Their findings are based on the assumptions that (i) managers know more about the firm's value than potential investors and (ii) managers act in the interest of existing shareholders, but also that (iii) investors interpret the firm's actions rationally. They also show that companies are less likely to seek external equity financing as their leverage increases. Since the issuance of an annual report in English is positively associated with companies' equity financing needs (Jeanjean et al. 2010), and based on the pecking order theory (Myers and Majluf 1984), we expect the issuance of an annual report in English to be negatively related to the company's *Leverage*.

Raffournier (1995, 266) states that companies are induced to comply with the usual practices of countries in which they operate and that more international operations require more broadly accepted practices ("The more international the operations of a firm, the larger is the inducement"). Raffournier confirms his hypothesis based on a sample of Swiss companies by using international sales as an indicator for the degree of internationalization of a firm. We expect this relationship to hold in an international setting and, therefore, expect the issuance of an annual report in English to be positively related to *Foreign sales*.

Past research (Dahlquist and 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:

$$\begin{aligned} \text{Log} \left[\frac{\Pr(ARE = 1)}{1 - \Pr(ARE = 1)} \right] = & \alpha_0 + \alpha_1 \text{Size} + \alpha_2 \text{Return on assets} + \alpha_3 \text{Growth opportunities} \\ & + \alpha_4 \text{Leverage} + \alpha_5 \text{Foreign sales} + \alpha_6 \text{Closely held shares} + \alpha_7 \text{Future equity increase} \\ & + \alpha_8 \text{Future debt increase} + \sum_k \alpha_{9,k} \text{Industry} + \sum_t \alpha_{10,t} \text{Year} \end{aligned} \quad (\text{E2.2})$$

To estimate Equation 2, we use the global reporting universe described later in this section. Table 2.1, 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.

2.3.2 Variable Description

Variable descriptions are presented in the Appendix to Chapter 2.

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 and 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 most important premise for this proxy is having data for all sample firms available that is consistent across markets. Since detailed transaction data are of relatively poor quality in some countries, we use a measure that is based on observed zero daily returns. We therefore use the proportion of zero-return days as a second proxy. If the benefits associated with trading do not outweigh the costs, then market participants will elect not to trade. Hence, illiquidity will be visible in infrequent trading, reflected in days without price movements, and therefore in observed zero returns (Lesmond et al. 1999). Moreover, this measure requires only a time series of daily equity returns. Finally, the use of the proportion of zero-return days as a measure for information asymmetry 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. 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. Higher values for this proxy correspond to greater information asymmetry. Using the zero-return metric is convenient in our setting because the information necessary to compute it is readily available consistently across markets.

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.⁶ 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.⁷ FO are defined as (1)

⁶ It would have been interesting to identify financial analysts, their location and first language in order to directly test whether firms are able to attract more UK or US-based analysts, and/ or analysts with English as their first language by issuing an ARE. This is not possible, as IBES has eliminated the possibility of matching analysts with their employers.

⁷ 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.

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.

Control Variables

For each dependent variable, we add control variables in Equation 2.1 (E2.1). 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 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.

We follow prior literature to control for firm characteristics that are related to our variables of interest. In the spread regression, we control for *Size*, *Return variability*, *Share turnover* and *International standards* (Chordia et al. (2000), Leuz and Verrecchia (2000) Daske et al. (2008), Daske et al. (2013)). In the zero-return regression, we control for *International standards*, *Size*, *Return variability*, occurrence of a *Loss*, *Growth opportunities* and *Analyst following* (Chordia et al. (2000), Leuz and Verrecchia (2000), Daske et al. (2008), Daske et al. (2013)). In the analyst following regression, we control for *Size*, *Return on assets* and *Growth opportunities* (Bae et al. 2008b). 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 and Robertsson 2001).

2.3.3 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). The GR database is part of Infiniti (http://www.infini.com) which covers more than 70,000 listed active

companies around the world and aggregates data from WVB, Factset, Thomson Reuters, and Morningstar. The GR database provides access to annual and interim reports for more than 40,000 global companies from 126 countries. 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).⁸ 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. The following table 2.1 presents our sample selection and descriptive statistics.

Table 2. 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
	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	

Observations to compute propensity scores (PS) in section IV are taken from sub-samples A and B. For each “Treatment group” firm in section 2.4, we choose one “Control group” firm that must: (i) be located in the same country, (ii) have a similar propensity to use English to the treatment firm the year preceding the change to English, (iii) not issue an ARE either before or after the change observed for our treatment firm. See the Appendix to Chapter 2 for a description of variables.

⁸ 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.

Panel B: Descriptive statistics of financial data

	N (Firms)			Mean			Median			N (Firms)			Mean			Median			p-value (t-test)			p-value (t-test)			p-value (MW U-test)		
	(Universe)			(Treatment)			(Control)			(Treatment vs Universe)			(Treatment vs Control)			(Treatment vs Universe)			(Treatment vs Universe)			(Treatment vs Control)			(Treatment vs Universe)		
Size (Sales)	3,543	4,549	4,732	113	4.002	4.385	107	4.406	4.458	0.002	0.000	0.005	0.002	0.000	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.005	0.453	0.066	0.000	0.000	0.000
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	0.305	0.866	0.066	0.305	0.866	0.453	0.305	0.866	0.453	0.453	0.066	0.066	0.066	0.066	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.469	0.450	0.419	0.469	0.450	0.542	0.469	0.450	0.542	0.542	0.419	0.419	0.419	0.419	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	0.000	0.000	0.015	0.000	0.000	0.002	0.000	0.000	0.002	0.002	0.015	0.015	0.015	0.015	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	0.275	0.176	0.377	0.275	0.176	0.512	0.275	0.176	0.512	0.512	0.377	0.377	0.377	0.377	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	0.006	0.006	0.222	0.006	0.006	0.222	0.006	0.006	0.222	0.222	0.222	0.222	0.222	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	0.977	0.977	0.666	0.977	0.977	0.666	0.977	0.977	0.666	0.666	0.666	0.666	0.666	0.666	0.666

See the Appendix to Chapter 2 for a description of variables.

As shown in Table 2.1, 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 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).⁹ Even if the choice of language is independent of the decision to adopt different accounting policies¹⁰, 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 2004-2009¹¹ so as to avoid simultaneity in the consequences of adopting an ARE and the benefits of cross-listing.¹² 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 2.1, 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).¹³ 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). 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)

⁹ Annual reports were collected from the www.infinancials.com website, or if unavailable, from the firms' websites.

¹⁰ 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).

¹¹ 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.

¹² 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.

¹³ For the composition and selection of our control sample, see below.

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.

Table 2.2 provides descriptive statistics for our treatment sample. Panel A reports the country of origin and Panel B the industry classification of our sample.

Table 2. 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

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 the Appendix to Chapter 2 for a description of variables.

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 2.2 reveals that three sectors (Manufacturing, Service and Finance) account for more than 78% of the observations.

2.4 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.

2.4.1 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 (E2.2) 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 2.3 reports the estimated coefficients for the whole sample, to demonstrate the economic intuition of our model. Findings are quite similar across countries.

Table 2. 3 Results of the Logit Regression in Preparation of the Propensity 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 the Appendix to Chapter 2 for a description of variables.

Overall, the model is significant ($\text{Chi}^2 = 2261.572$, $p = 0.000$) 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%¹⁴ for Italy to 90.9% for the Netherlands. On average, when Equation 2.2 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 2.1, 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 2.2 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: First, it must be located in the same country; second, it must have a similar propensity to use English as the treatment firm the year preceding the adoption of English; and third, it 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). As propensity scores are expressed in percentages, this emphasizes that our matching procedure works reasonably well. In section 2.5 we use an alternative test to address this issue by including in all specifications of our basic model firm characteristics that turned out to be important for distinguishing

¹⁴ The country with the second-lowest proportion of correctly classified firms is Germany, with a rate of 72.7%.

treatment and control firms. We also rerun our tests, excluding all treatment firms for which the difference in propensity scores was higher than 0.005. Findings are similar in magnitude and significance.

2.4.2 Univariate Findings

As a first pass on the economic consequences of issuing an ARE, we tabulate a simple before/after test in Table 2.4 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.

Table 2. 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 the Appendix to Chapter 2 for a description of variables.

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 (i) cross-list, (ii) have been included in a major stock market index or a stock index that requires external reporting in English, (iii) engage in M&A activity during the period. We tabulate in section 2.5 an analysis of the economic consequences over time, which confirms that they follow ARE adoption.

2.4.3 Difference-In-Differences Regressions

We now present our findings controlling for confounding factors. We estimate Equation E2.1 using a double clustering on firm and time dimension (Petersen 2009).¹⁵ Table 2.5 presents the results. It 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).

¹⁵ Observations are pooled three years before (after) ARE adoption, and we compute the mean economic consequence before (after) ARE adoption.

Table 2. 5 Difference-In-Differences Analysis 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. Panel 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. Panel 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. Panel C: *Analyst following* equals $\ln(1 + \# \text{ of analysts})$. Panel 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. Note that all standard errors are clustered following White (1980). The R^2 's are consistent with prior research (Leuz and Verrecchia (2000); Bae et al. (2008a); Daske et al. (2008)). See the Appendix to Chapter 2 for a description of variables.

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 2.3 but remains 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 suggests that, after controlling for time and other factors that affect all firms, the initiation of issuing English annual reports 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 2.3), 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, $p = 0.000$). Hence, the adoption of English translates into a 29.7% increase in the number of analysts who follow the firm. Compared to Table 2.3, 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, $p = 0.030$). After controlling for time effects and other factors, this means that 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 and 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).

As already outlined above, we have three different definitions of foreign ownership (FO). FO is defined as (1) owners from a country whose language is different from the one used in the firm's country of incorporation (FO1); (2) owners from any country that is not the firm's country of incorporation, even if the foreign owner shares the same language (FO2); (3) owners from an English-speaking country (FO3). The definition FO3 is not suitable, as we would miss on average about 70 percent of owners who do not come from an English speaking country. In our main analysis, we focus only on definition FO1. We, however, remodel the univariate tests with the second definition. Results obtained from these tests are relatively consistent. However, with regard to the main regression model, our findings are not significant when we use this alternative definition. We explain this difference in results as follows. By definition, FO1 is more restrictive than FO2, which leads to a higher proportion of foreign owners. We compute the variable FO-diff as the difference between FO2 and FO1. Given that FO1 represents shareholders from a different country and that do not speak the same language (e.g., an Italian shareholder of an Austrian firm) and that FO2 include foreign shareholders from a different country even if they speak the same language (e.g., an Italian shareholder of an Austrian firm or a German shareholder for an Austrian firm), FO-diff captures the proportion of foreign shareholders who speak the same language as the firm (e.g., a German shareholder of an Austrian firm). Table 2.6 below displays univariate statistics concerning the variable FO-diff.

Table 2. 6 Univariate Test Statistics for Differences in Ownership Measures

	N (Total)	Mean (before) (a)	Mean (after) (b)	Difference (b-a)	T-test	p-value
FO - Diff - Treatment(i)	551	0.054	0.064	0.010	0.697	0.486
FO - Diff - Control (ii)	529	0.010	0.019	0.008	1.676	0.094
Difference (i-ii)	.	0.044	0.045	0.001	.	.
T-Test	.	4.132	4.206	0.219	.	.
p-value	.	0.000	0.000	0.827	.	.

These results suggest that English adopters (treatment companies) have a higher percentage of non-national shareholders with a shared language (e.g., Austrian firms attracting German owners) than control companies. This difference is significant before and after the initiation of issuing an annual report in English. We also note that this percentage of “non-national shareholders with a shared language” does not increase significantly after the initiation of an annual report in English.

In other words, English adopters (treatment companies) internationalize their ownership before adopting English by attracting non-national shareholders with a shared language. The “next step” is to use English in the annual report to attract new investors.

Overall this suggests a process by which companies expand their investor base. They first look for new shareholders with a pool of investors with a cultural proximity – proxied by language; before attracting new investors by using English. This is indeed consistent with Grinblatt and Keloharju (2001) who document that investors are more likely to hold, buy, and sell the stocks of firms that communicate in the investor’s native tongue.

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.

2.5 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.

2.5.1 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 (E2.2), 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.

As recalled by Tucker (2010), there are two potential sources of selection bias. “Selection bias due to observables” arises from sample differences that researchers can observe but fail to control for, and “selection bias due to unobservables” arises from the unobservable and thus uncontrolled sample differences that affect managers’ decisions and their consequences. To overcome the first potential self-selection issue, we apply a propensity score matching procedure to select control companies with a similar propensity to issue an annual report in English as the treatment companies. However, we recognize that the selection process is based on the fitted values of our selection model (Equation 1) for observable differences between control and treatment companies. While we attempt to account for the potential factors influencing the issuance of an English annual report, it is impossible to control for all factors. Failing to account for relevant factors to select control companies may lead to inappropriate inferences, especially if unobserved variables that affect the selection process are also related to the outcomes.

To mitigate this concern and address the second selection bias due to unobservables, we apply the Heckman (1979) two-stage approach. The first stage is to estimate the decision model for the initiation of an English annual report. We model this decision via Equation 1. Again, our model is run on a country-by-country basis. The percentage of correctly-classified companies ranges from nearly 70 percent to more than 90 percent. The mean over all

countries is nearly 80 percent. This highlights that our model is correctly specified and identifies most of the factors that result in the (non-) issuance of an English annual report. As noted in Li and Prabhala (2006), the validity of the Heckman (1979) methodology relies on the “restriction exclusion”, or the existence of at least one variable that explains the decision to adopt English but not the outcome variables. For each outcome, at least one independent variable of the first stage is not a control variable in the second stage.

The second stage is to add a bias correction variable in the form of the Inverse Mills ratio (obtained from Equation E2.1) to the main regression in Equation E2.2. We continue to run our analysis with the matched control sample to control for time trends, factors associated with the outcome variables, and omitted factors which are constant over time. We report the regression results with the Inverse Mills ratio included in the regression in Table 2.7.

Table 2. 7 Difference-In-Differences 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 2.2. See the Appendix to Chapter 2 for a description of variables.

Overall, the signs, magnitude and significance levels of our variable of interest (β_3) are very consistent with those reported in Table 2.5. 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 2.1, 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.

2.5.2 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.¹⁶

¹⁶ This distribution is based on the number of speakers (see Lewis (2009)).

Table 2.8 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 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.

2.5.3 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 2.9 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.

Table 2.9 Analysis over Time

	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 the 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.

Table 2.9 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).

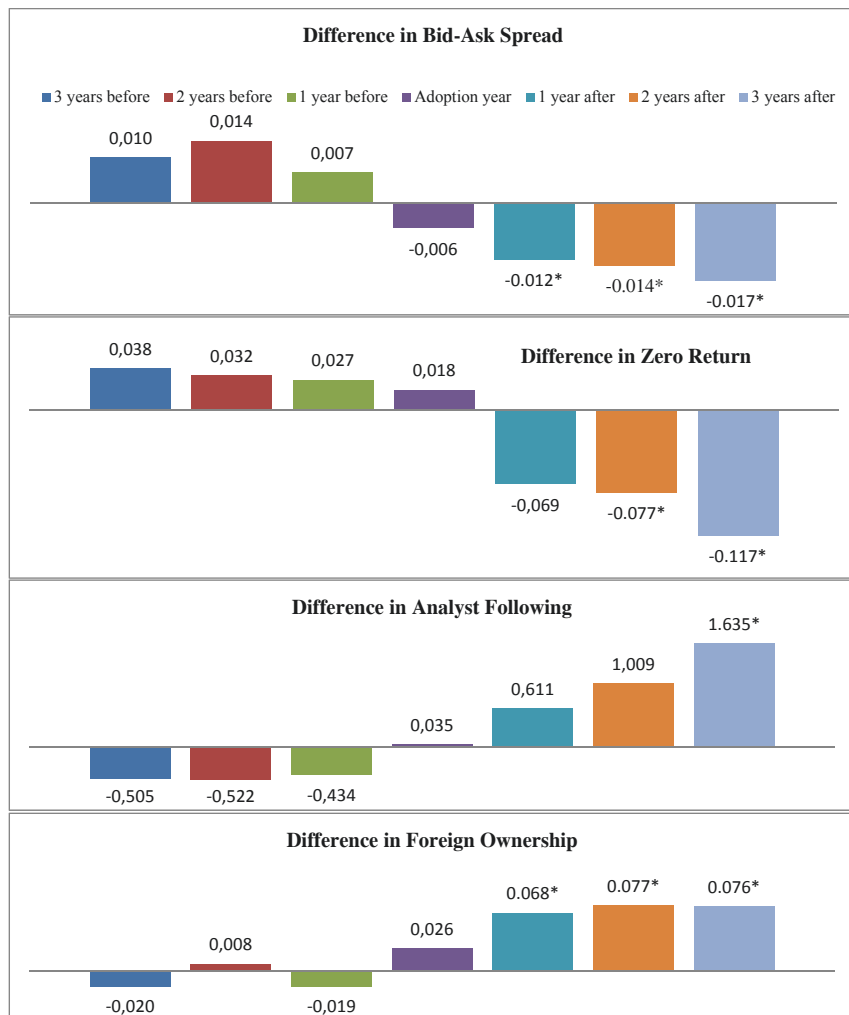
The number of zero-return trading days for treatment firms becomes marginally smaller than for control firms in the first year after the adoption (difference = -0.069, p-value = 0.095). This effect becomes much more pronounced during the second and third year after the adoption (difference = -0.077, 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. Figure 2.1 illustrates the results of the analysis of the economic effects over time. 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.

Figure 2. 1 Analysis over Time



*Significant at the 0.05 level.

2.6 Conclusion

In this study, 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 and 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 study, 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 study 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 study is the first to directly address the question of the possible economic consequences of issuing an annual report in English.

This study 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? Another interesting setting would be to analyze companies that stop publishing English annual reports in addition to their local language annual report. Do they experience any economic drawbacks?

Appendix to Chapter 2

Description of variables

Variable	Description	Source
Dependent variables		
<i>Analyst following</i>	= $\ln(1 + \# \text{ of analysts})$.	IBES through WRDS
<i>Bid-ask spread</i>	= 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)
<i>Foreign ownership</i>	= 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)
<i>Zero return</i>	= 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		
<i>Closely held shares</i>	= $(\text{Number of closely held shares} / \text{Common shares outstanding}) \times 100$	Worldscope (WS. CloselyHeldSharesPct)
<i>Foreign sales</i>	= $\text{International sales} / \text{Net sales or revenues} \times 100$ Firms with missing data are assumed not to have international sales.	Worldscope (WS.ForeignSalesPctSales)
<i>Future debt increase</i>	= 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)
<i>Future equity increase</i>	= 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)
<i>Growth opportunities</i>	= $(\text{Market value} + \text{Total debts}) / \text{Assets}$ (simplified version of the definition provided by (Klein 2002)). Data winsorized at 0.01.	Datastream: (DS.MarketValue), ¹⁷ Global (Standard and Poor’s): (mnemonic: [MKVAL + DT]/AT), Infancials: (Market capitalization: code 11937, Total debts: code 54022), Worldscope (Thomson Financial): (WS.TotalAssets, WS.TotalDebt).

¹⁷ First source for Market value was *Datastream*. When data were not available, the other indicated databases were used (Global (S&P), Infancials, Worldscope).

<i>Industry</i>	=	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).	Infancials (SIC sector code: code 20004), Worldscope (WS.PrimarySICCode). Classification: www.siccode.com
<i>International standards</i>	=	Dummy variable coded 1 if the firm adopts IAS/IFRS or US GAAP and zero otherwise.	Worldscope (WS.acctgstdfollowed)
<i>Leverage</i>	=	Total debt/total assets ratio at year-end. Data winsorized at 0.01.	Global: (mnemonic: [DT/AT]), Infancials: (codes: 54022/53077), Worldscope: (WS.TotalAssets, WS.TotalDebt). Hand collected from annual reports
<i>Quantity of information</i>	=	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).	
<i>Return on assets</i>	=	Income before extraordinary items/Total assets. Data winsorized at 0.01.	Global: (mnemonic: ROA), Infancials: (code: 5020), Worldscope: (WS.ReturnOnAssets), Datastream (DS.index)
<i>Return variability</i>	=	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.	
<i>Size (Market value)</i>	=	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)
<i>Size (Sales)</i>	=	Natural logarithm of the sales for the year.	Global: (mnemonic: SALE), Infancials: (code: 53002), Worldscope: (WS.Sales). Datastream (DS.volume)
<i>Share turnover</i>	=	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.	

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